

Quay County Community Wildfire Protection Plan



**QUAY COUNTY, NEW MEXICO
COMMUNITY WILDFIRE PROTECTION PLAN**

Prepared for

QUAY COUNTY
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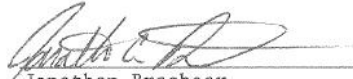
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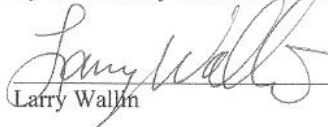

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List of Acronyms

°F	degrees Fahrenheit
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BNSF	Burlington Northern-Santa Fe Railroad
BOR	Bureau of Reclamation
BTU	British Thermal Units
ch/h	chains per hour
CRP	Conservation Reserve Program
CVAR	Community Values at Risk
CWPP	Community Wildfire Protection Plan
FBFM	Fire Behavior Fuel Model
FIREMON	Fire Effects Monitoring and Inventory System
FRCC	Fire Regime Condition Class
FSA	Farm Service Agency
GIS	Geographic Information System
HFRA	Healthy Forest Restoration Act
ISO	International Organization for Standardization
ICC	International Code Council
MFI	Mean Fire Interval
NFP	National Fire Plan
NIFC	National Interagency Fire Center
NMSF	New Mexico State Forestry Division
NPS	National Park Service
NRCS	Natural Resources Conservation Service
RAW	Remote Automated Weather
SAF	Society of American Foresters
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

While the eastern plains of New Mexico do not exhibit the typical characteristics of communities that are highly prone to fire, such as steep slopes or dense timber, Quay County (County) has a need for a Community Wildfire Protection Plan (CWPP). Grasses in the region are the predominant fuel type and the topography is flat and rolling, which creates an environment that is familiar to high-speed wind events. Although not commonly viewed as a severe fire risk environment, these grasslands and high-wind characteristics make the County prone to wildfires, and this fire risk must be mitigated.

The four largest municipalities, Logan, Tucumcari, House, and San Jon, are identified as the highest priorities for protection in the event of a wildfire, and efforts to reduce risk and prevent the loss of life and property need to focus on these communities

The Quay County CWPP addresses hazards and risks of wildland fire throughout the County and makes recommendations to mitigate these hazards. Some of the recommendations for this plan include fuels reduction projects to reduce fuel loading along roads; public education and outreach directed at homeowners to help them prepare for wildland fire through events like pre-planned triages; strategies for fire responders to enhance their capabilities through increased water supply, improved communication, and upgraded equipment; and the reduction of structural ignitability by providing public education on defensible space.

The plan highlights the need for increased preventive activities to reduce the negative impacts that wildland fire can have on communities and community members living in the Wildland Urban Interface. The County relies on volunteer firefighters to respond to the majority of fires in the County, and the demand for their services often exceeds the amount of available resources. The limitations of fire responders in the County are addressed to heighten citizens' awareness of the risks associated with the fire environment and the need for homeowners to contribute to preparing for wildland fire events by taking actions on private property. Also, the CWPP identifies a need for the County to engage in planning for publicly-managed resources. Strategies and policies created at the County level serve to protect and preserve county-managed resources and communities from wildfire, and these actions will benefit the entire County, the public, and individual communities.

The purpose of the CWPP 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 Forest Restoration Act (HFRA) of 2003.

The Quay County CWPP meets the requirements of the HFRA by:

1. Having been developed collaboratively by multiple agencies at the state and local levels in consultation with federal agencies and other interested parties.
2. Prioritizing and identifying fuel reduction treatments and recommending the types and methods of treatments to protect at-risk communities and pertinent infrastructure.

3. Suggesting multi-party mitigation, monitoring, and outreach.
4. Recommending measures and action items that residents and communities can take to reduce the ignitability of structures.
5. Facilitating public information meetings to educate and involve the community to participate in and contribute to the development of the CWPP.

A group of multi-jurisdictional agencies (federal, state, and local), organizations, and residents joined together as a Core Team to develop this plan. After the Core Team was assembled, public meetings were held in conjunction with other events to raise awareness about the project and obtain information from stakeholders and homeowners in the County regarding wildfire protection and community concerns.

The CWPP provides background information, a risk assessment, and recommendations. Section 1 provides a general overview of CWPPs and describes the County's need for a plan; Section 2 provides demographic and background information about the County; Section 3 presents an overview of the fire environment and specific information about the fuel types; Section 4 describes in detail the methodology and results of the risk assessment; and Section 5 provides recommendations that incorporate action plans and monitoring strategies for implementing fuels reduction projects, reducing structural ignitability, improving fire response capabilities, and initiating public outreach and education. The plan does not require implementation of any of the recommendations. However, the message throughout this document is that the greatest fire mitigation could be achieved through the joint actions of individual homeowners and local, state, and federal governments. It is important to stress that this document is an initial step in raising public awareness and treating areas of concern, and should serve as a tool in doing so. The CWPP should be treated as a living document to be updated approximately every year.

1.0 INTRODUCTION

1.1 OVERVIEW OF QUAY COUNTY'S COMMUNITY WILDFIRE PROTECTION PLAN

While ecosystems are able to naturally adapt to wildland fires, communities located in environments surrounded by grasslands or forests need to have a plan for preparing for, reducing the risk of, and adapting to wildland fire events. Living in the Wildland Urban Interface (WUI) means that both communities and individuals need to learn how to prepare for wildland fires and reduce their negative impacts. Community Wildfire Protection Plans (CWPPs) help accomplish both goals. The CWPP attempts to reduce, but not eliminate, the extreme severity or risk of wildland fire. Eliminating all risk is not possible given the various and uncontrollable factors, such as climate, that affect wildland fire.

SWCA Environmental Consultants produced a CWPP, which addresses wildfire threat to the communities in Quay County (hereafter referred to as County) and reduces the risk of wildfire to community members, property, and landscapes. The plan provides background information, a risk assessment, and recommendations. Section 1 provides an overview of CWPPs and describes the County's need for a plan; Section 2 provides demographic and background information about Quay 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 and monitoring strategies for reducing fuels and structural ignitability, improving fire response capabilities, and administering public outreach and education. 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, landownership, topography, soils, and fuels would need to be employed upon implementation. Also, recommendations are specific to WUI areas and intend 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 the recommendations in this plan address reducing the hazards and risks associated with wildland fire in WUI areas.

1.2 OVERVIEW OF COMMUNITY WILDFIRE PROTECTION PLANS

The summer of 2000 demonstrated how devastating severe wildfires could be, particularly with the Cerro Grande fire. The Cerro Grande Fire was the largest wildfire in New Mexico's history, burning approximately 48,000 acres, 235 homes, and 39 structures at Los Alamos National Laboratory, and leaving almost 400 families without homes (Los Alamos County Reports 2000). 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 in 2002 by the 10-Year Comprehensive Strategy Implementation Plan, which focuses on using a collaborative framework for restoring fire-adapted ecosystems, reducing hazardous fuels, reducing risks to communities, and providing economic benefits, as well as improving fire prevention and suppression strategies (Western Governors' Association 2006).

In recognition of widespread declining forest health, in 2003 the U.S. Congress passed and President Bush signed into law the Healthy Forest Restoration Act (HFRA) (White House 2003). The HFRA expedites the development and implementation of hazardous fuels reduction projects on federal land. A key component of the HFRA is the development of CWPPs. Collaboration between federal agencies and communities is necessary to develop hazardous fuels reduction projects and place priority on treatment areas identified by communities in a CWPP. In addition, communities with an established CWPP will be 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 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.

1.3 NEED FOR CWPP

Catastrophic losses have occurred recently throughout southwestern grassland areas because communities were not prepared to mitigate or were unable to respond effectively to wildfire. In December 2005 a devastating wildfire ripped through the town of Cross Plains, Texas, destroying 85 single family homes and 25 mobile homes, killing 2 firefighters and 17 citizens (Texas Forest Service 2007). This town was not the stereotyped mountain community, packed in against dense forest stands and steep inaccessible terrain; instead it was a community in the northern plains of Texas, predominantly grassland and agricultural with flat terrain and typified by non-combustible home construction. Lost structures were not consumed by the flaming front, but instead burned after the main fire had passed, ignited by embers that had passed through open vents, collected under unscreened foundations, or smoldered under wooden decks that acted like a fuse to the main structure. This community was not unlike the many communities that are scattered throughout the grasslands of Quay County, highlighting that grassland areas are as much at risk of wildland fire as their forested counterparts.

Quay County is mostly rural, surrounded by shortgrass prairie grassland, agricultural land, and rangeland. Municipal areas include Tucumcari, San Jon, Logan, and House, which are served solely by voluntary firefighting and emergency response staff. In these landscapes, fire can spread rapidly due to the continuous fuels and wind direction. Grassland fires can be difficult to maintain, as they move quickly across the landscape because of the speed and fire behavior under which these light, flashy fuels burn.

Grassland areas have often been perceived as being at lower risk of wildland fire, particularly in relation to forested regions. However, many factors increase the likelihood of fires in grassland ecosystems, including prolonged periods of drought; closure of ranches and reduced grazing; set-aside programs, such as the Conservation Reserve Program (CRP), which contribute to high fuel loading; expansion of roads and railroad through grassland areas that provide sources of ignition; and the growing WUI, which is encroaching into a fire-dependent ecosystem. 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 has occurred. This seasonal rainfall leads to increased fuels, and drought experienced in the fall or winter often leaves these

fuels dried and prone to ignition. These fuel loads are subject to human activity, such as crop production and lawn maintenance in the home ignition zone (30 feet surrounding the house), and can contribute to the level of risk. The WUI areas of the County are most at risk, as there are often increased sources of ignition in these locations. A plan to mitigate the effects of wildfire is crucial if these rural communities are to protect their homes, lands, and livelihoods.

Many communities are not fully prepared for potentially large-scale fires and the limited emergency response in the County exacerbates this problem. This CWPP will make recommendations to prepare for wildland fire, improve fire response capabilities, and raise awareness to the likelihood of wildfire. Communities must prepare for wildland fire events by reducing fuel loads, preparing resources, and raising awareness on how homeowners can protect their own properties to mitigate the impacts of wildland fire. Local response agencies must train for, plan, and execute a rapid coordinated response to all wildland incidents. The need for a CWPP is particularly important for strengthening organizational response, improving communication, and re-examining priorities of the County, communities, and citizens.

These communities are in a remote area of the state with a low population density and are dependent on one another in the event of responding to a wildland fire. Because of the geographic location, flat topography, and regular wind events, unique challenges for fire response are created, which presents a need for landowners, communities, and jurisdictional entities to take actions to prepare for wildland fire events. The Core Team (see Section 1.6), a working group involved in this project, has demonstrated their commitment to best prepare the County for wildfire through their ongoing participation in the planning process.

1.4 GOALS OF CWPP

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

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 and recommend the types and methods of treatment that will protect one or more at-risk communities and their essential infrastructure (SAF 2004).
3. Treatments of Structural Ignitability: A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan (SAF 2004).

The Quay County CWPP addresses all the requirements for completion of a CWPP outlined in the HFRA, with special attention to the characteristics of grassland and shrubland communities.

1.5 PLANNING PROCESS

The SAF (2004), 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" 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 Quay County CWPP. 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 agency responsible for forest management.

Step Two: Involve Federal Agencies. Identify and engage local representatives of the U.S. Forest Service (USFS) and 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(s). Work with partners to establish a baseline map (or 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.

Step Five: Develop a Community Risk Assessment. Work with partners to develop a community risk assessment that considers fuel hazards; risk of wildfire occurrence; homes, businesses, and essential infrastructure at risk; other community values at risk (CVAR); 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(s) and community risk assessment to facilitate a collaborative community discussion that leads to the identification of local priorities for fuel treatment, 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.

1.6 CORE TEAM

The Core Team for the Quay County CWPP includes about 15 to 20 people representing various agencies and levels of government, including the County Manager; County Fire Marshall; County Emergency Management Officer; County Fire Districts; City Manager from Tucumcari

and Village Managers of San Jon, House, and Logan; Canadian River and Southwest Quay Soil and Water Conservation Districts; Energy Minerals Natural Resources Department, Forestry Division; United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS); New Mexico Environment Department; and Union Pacific Railroad. All members have experience or interest in preparing for wildland fires, planning, response, mitigation, or education. The Core Team has met five times over the course of twelve months to discuss issues related to completing the project. The group met for the first time on June 4, 2007, and their final meeting was March 4, 2008. Please see Appendix A for a contact list for the Core Team.

1.7 PROJECT AREA

The project area includes all of Quay County as delineated by its geographic and political boundaries (Figure 1.1). Within the project area, land ownership is predominantly private, with some federally-managed CRP lands and small in-holdings of land managed by the BLM; New Mexico State Parks, which is housed in the New Mexico Energy Minerals and Natural Resources Department; and New Mexico State Land Office.

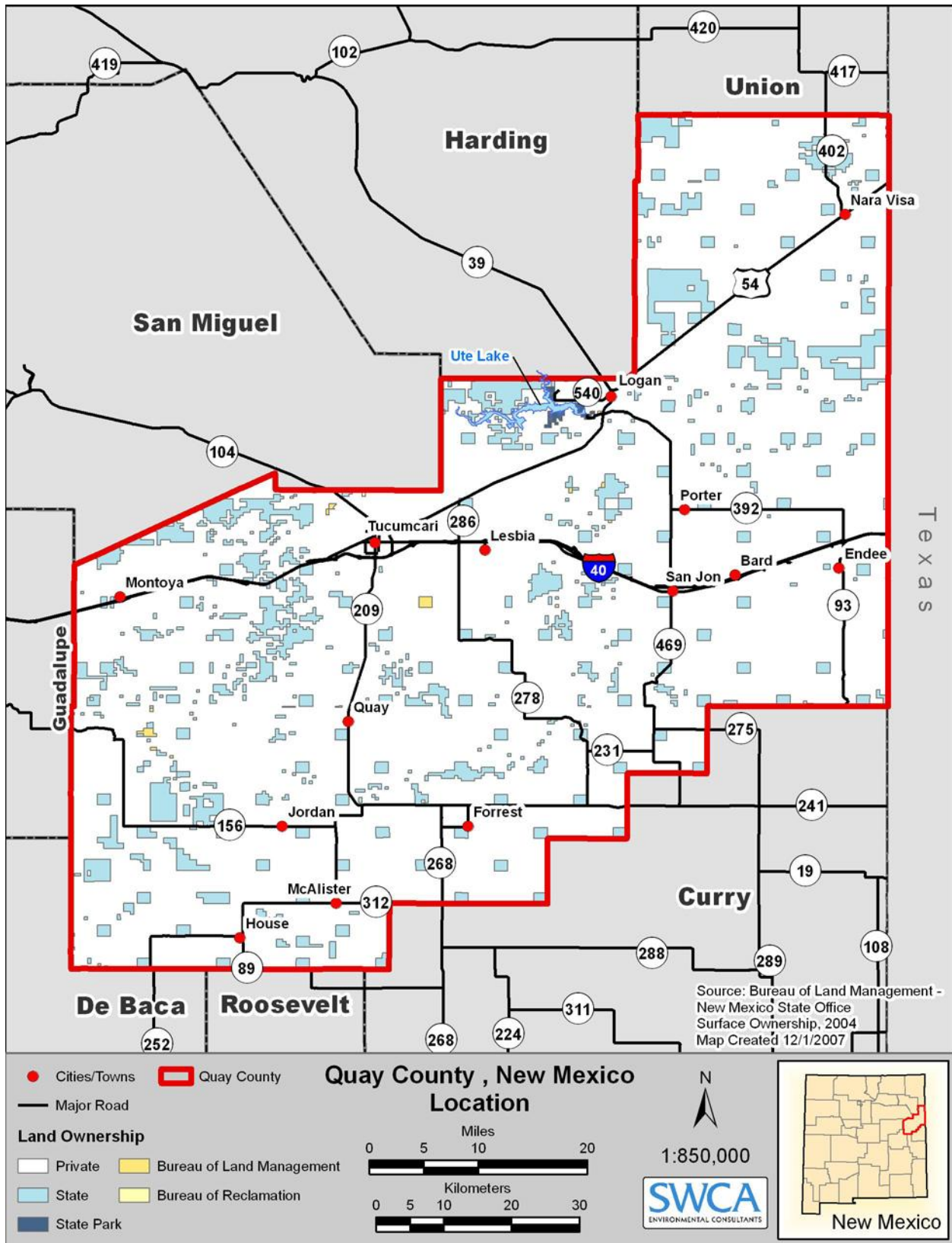


Figure 1.1. Project boundary map.

1.8 PUBLIC INVOLVEMENT

Engaging interested parties is critical in the CWPP process, as 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).

For Quay County, the public involvement process commenced with public meetings, held in conjunction with the Quay County Fair. Often it is difficult for community members to attend public meetings due to the long distances required for travel in this rural County, so the Core Team decided that the most effective way to interact with the public was to be present at an event that was widely attended by community members throughout the state. The meeting was announced using a variety of media, including the local radio station, newspapers, and flyers posted in public places. At the meeting, educational information focused on defensible space was provided, maps were posted, and surveys requesting feedback regarding wildfire protection from community members were distributed. Fire chiefs solicited public involvement by distributing surveys throughout their fire districts. The second public meeting was held in conjunction with the final Core Team meeting. At this meeting participants reviewed the draft document and shared comments and concerns. These comments were addressed and revisions were incorporated into the final document. The public responses to the surveys are provided in Appendix B.

2.0 QUAY COUNTY BACKGROUND

2.1 LOCATION AND GEOGRAPHY

Quay County is on the eastern plains of New Mexico and is bordered by Curry, Roosevelt, De Baca, Guadalupe, San Miguel, Harding, and Union counties and shares its eastern border with Texas. The total land area of the County is 2,874.93 square miles with Tucumcari residing as the County seat. The population is 9,155 (U.S. Census Bureau 2006 estimate) with an average of 3.5 persons per square mile (U.S. Census Bureau 2000). In total, private land ownership is 88.2% and publicly managed lands are accounted for by the state with 11.6%, state parks with 0.09%, BLM with 0.10%, and Bureau of Reclamation (BOR) with 0.01%.

2.2 TOPOGRAPHY

The topography in Quay County is predominantly flat and rolling. The landscape is characterized by high plains topography with occasional canyons, bluffs, and riparian bosque areas. The elevation ranges from 3,484 to 5,885 feet.

2.3 CLIMATE

According to climate records for Tucumcari that span from 1971 to 2000, Quay County experiences a mild-semiarid climate, with annual average maximum temperatures of 72.2 degrees Fahrenheit (°F) and annual minimum temperatures of 43.9 °F (Western Regional Climate Center 2007). The highest temperatures are experienced from the end of May through the first weeks of September, with maximum temperatures peaking in July. Minimum temperatures and periods of extended freeze extend from November through February (Figure 2.1) with coldest temperatures experienced in January. The average total annual precipitation, including snowfall, is 15.04 inches. The majority of precipitation is received with monsoonal rains from June through September (Table 2.1).

Table 2.1. Average Monthly Temperatures and Precipitation for Tucumcari, NM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	51.3	56.7	64.8	72.3	80.8	90.9	92.4	89.2	81.9	72.7	58.2	52.9	72.2
Average Min. Temperature (°F)	23.0	27.3	34.4	42.6	51.4	61.0	65.5	63.3	55.9	44.6	31.5	24.7	43.9
Average Total Precipitation (in.)	0.25	0.34	0.52	1.02	1.33	1.84	2.75	2.71	1.96	1.27	0.83	0.22	15.04

(Western Regional Climate Center Data, retrieved July 2007)

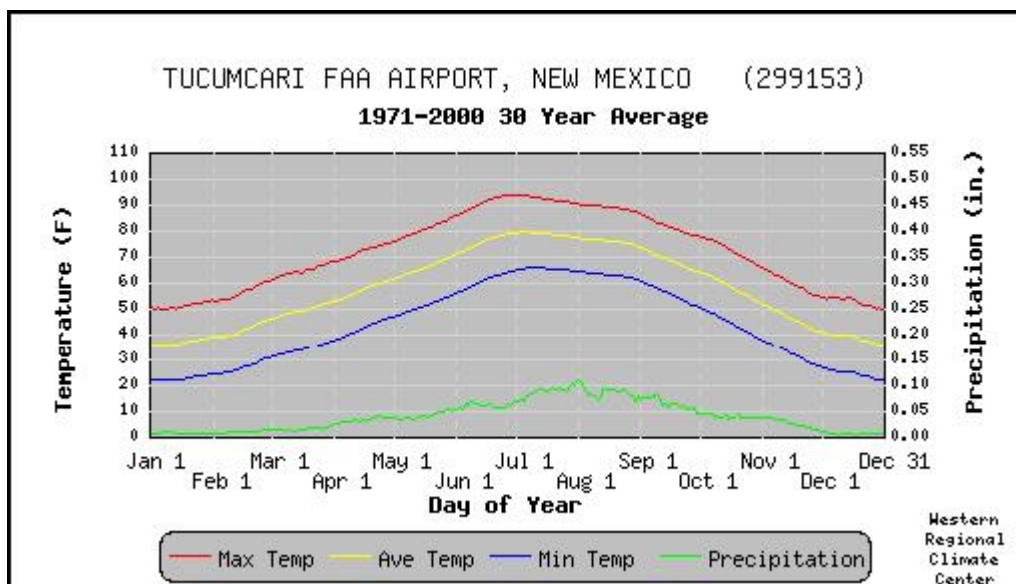


Figure 2.1. Average monthly temperatures and precipitation for Tucumcari, NM (Western Regional Climate Center Data, retrieved July 2007).

2.4 VEGETATION

Quay County encompasses a variety of vegetation types. Vegetation zones are primarily a function of elevation, slope, aspect (direction a slope faces), substrate, and associated climatic regimes. Although location varies to some degree, the biophysical habitat types described in this section are typically governed by topography and substrate within the County.

Dominant vegetation types described in this section for Quay County represent the general overall community structure that will play a role in fire occurrence and behavior on a large scale. Expected fire behavior for each vegetation type is described in more detail in the Risk Assessment section (Section 4.0). Although the vegetation types are outlined and described for the entire County, site-specific evaluations of the vegetative composition and structure in each area of concern should take place prior to planning fuels treatments.

2.4.1 VEGETATION TYPES

In general, Quay County’s location on the eastern plains of New Mexico describes its vegetation type as almost strictly Plains Grassland, with small islands of Great Basin Conifer Woodland (Brown et al. 1980; Figure 2.2). However, a more detailed look at the County using a smaller scale description shows a much greater diversity of vegetation types and land uses. Invasive species, such as wheeping lovegrass (*eragrostis curvula*) (see Section 5.3.1), also are becoming more prevalent in the County. Vegetation in Quay County is described here using the NatureServe United States Ecological Systems categories (NatureServe 2007). Other types of land cover (e.g., agricultural, developed, and other land cover types) that do not play a role in fire behavior and spread are described below (Table 2.2).



Figure 2.2. Typical Quay County vegetation.

Table 2.2. Others Types of Land Cover

Existing Types of Land Cover	Structural Type	Acres	Percent
Western Great Plains Shortgrass Prairie	Herbaceous/Grassland	826,910	45
Western Great Plains Sandhill Steppe	Shrubland	362,971	20
Western Great Plains Mesquite Woodland and Shrubland	Shrubland	262,747	14
Central Mixed-grass Prairie	Herbaceous/Grassland	113,733	6
Agriculture-cultivated Crops and Irrigated Agriculture	Herbaceous/Grassland	112,060	6
Developed	No Dominant Lifeform	28,418	2
Other Types		119,479	7

2.4.2 AGRICULTURE - CULTIVATED CROPS AND IRRIGATED AGRICULTURE

This generic land cover type can encompass any type of agriculture. In Quay County agriculture types include dairy farming, alfalfa, wheat, sorghum, and cotton (Quay County Chamber of Commerce 2007).

2.4.3 DEVELOPED

This generic land cover type describes human-made developed areas. It can include structures, parking lots, dirt lots, and roads. Although these areas are not typically described under a natural fire regime, structures can be a receptive fuel, and these areas are most typically what define the WUI areas of concern.

2.4.4 OTHER TYPES

This is a catch-all category for vegetation types that are not well represented in Quay County. This category consists of 34 other vegetation types that each account for less than 2% total cover throughout Quay County. These types include riparian areas along streams, rivers, and lakes, and areas of introduced species and open water. Please see Appendix C for the Regional Hydrology Map.

2.5 POPULATION

The following information is drawn primarily from 2000 U.S. Census Bureau data; more current census data was used when available (U.S. Census Bureau 2000). In 2006 Quay County's population was estimated to be 9,155 persons with a population density of 3.5 per square mile. The U.S. Census Bureau estimates a 9.8% decrease in total population over the 2000 U.S. Census Records (10,155 persons). Within the County boundaries, 4,201 households (averaging 2.37 persons per household) are present with an average household income of \$24,779.

The census data indicate that as of 2005, 5,859 housing units were located in Quay County, with the greatest housing density located in the Tucumcari area in close proximity to U.S. Interstate 40. As the County seat, Tucumcari represents the largest population, with approximately 6,000 people (Tucumcari / Quay County Chamber of Commerce 2008), of any town in Quay County and is the economic center of the County as well.

2.6 HISTORY AND LAND USE

Human occupation within eastern New Mexico is believed to date back about 10,000 years ago to the Clovis culture of hunters and gatherers who originally inhabited the region (Fagan 1987). Most archaeologists believe that during this time, these bands of mobile hunter-gatherers (Paleoindians) subsisted primarily on large game supported by the cooler, wetter environment of that era (Wase et al. 2003). The Paleoindian hunting-dependent subsistence decreased as climate conditions became increasingly warmer and drier around the Archaic period (6000 B.C.–A.D. 900), and as large game animal populations declined. Near the beginning of the twelfth century, early Puebloan cultures began to appear across regions of New Mexico (primarily west of the Pecos River). These communities may have developed from the earlier transient populations, which settled permanently in the area (Ivey 1988). Climate change led to migration and cultural evolution into the modern Pueblo peoples who lived primarily along the few major rivers of the region, including the Pecos River. These Puebloan people of the Late Prehistoric period (A.D. 1300–1600) built sedentary communities where they used agriculture, constructed elaborate dwelling structures, and relied on persistent surface water resources. From the 1500s to the 1800s semi-nomadic mobile hunting groups, such as the Navajo and Apache, occupied the area.

Quay County was named for Matthew S. Quay, a United States Senator from Pennsylvania that played a large role in helping New Mexico become a state. Quay County was created as the twenty-second County on January 28, 1903, prior to New Mexico becoming a state in 1912 (Quay County 2008).

The economy of Quay County is based on agriculture and tourism. Conchas Lake to the north of Quay County in San Miguel County makes it possible for large areas to be irrigated for farming, and Ute Lake in the northern portion of the County provides fishing and boating activities for recreationists. According to the Quay County Extension, water is one of the most important limiting resources for the County's agriculture, and its long-term utilization for agriculture is threatened by urbanization and industrialization (Quay County Extension 2008).

2.7 FIRE RESPONSE CAPABILITIES

Nine County and four municipal fire departments operate in Quay County, of which all are volunteer. In total, approximately 250 to 300 volunteer firefighters live in the County.

Many of the volunteer fire stations within the planning area boundary are in the vicinity of small villages. Appendix D includes fire station locations and firefighting resource lists for the entire planning area.

The International Organization for Standardization, commonly referred to as ISO, develops standards for managing and measuring levels of risk. These standards are based on information related to municipal fire-protection efforts in communities throughout the United States. A Public Protection Classification from 1 to 10 is assigned. Class 1 represents exemplary public protection and Class 10 signifies that the area's fire suppression program doesn't meet the ISO's minimum criteria. The ISO ratings help communities evaluate their public fire-protection services (Insurance Services Offices 2008).

The ISO ratings for communities in the County are: House is 8, Logan is 7, San Jon is 7, Tucumcari is 5, Bard-Endee is 8B, and all other areas are 9.

3.0 FIRE ENVIRONMENT

3.1 DEFINITION OF WILDLAND URBAN INTERFACE

The WUI is defined as areas where human habitation and development meet or are intermixed with wildland fuels (U.S. Department of Interior [USDI] and USDA 2001:752–753). Human encroachment into wildland ecosystems in recent decades is increasing the extent of the WUI and is therefore having a significant influence on wildland fire management practices within these areas. 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. The expansion of the WUI into areas with high fire risks, combined with the collective effects of past management policies and resource management practices, land use patterns, hydrologic changes, and introduction of non-native species 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). Strategically planning and implementing fuels and fire management mitigation techniques in WUI areas has proven to be effective; however, all WUI mitigation focus areas will be different and should be planned for accordingly.

A CWPP offers the opportunity for the Core Team to establish a definition and a boundary for the local WUI to better reflect the unique resources, fuels, topography, and climatic and structural characteristics of the area, as well as 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.

For Quay County's CWPP, the WUI is defined as the area extending 1 mile from the towns of Tucumcari and Logan and 0.5 miles from the boundary of other communities, towns, villages, and rural fire stations (Figure 3.1). The WUI map also shows digitized WUI boundaries based on aerial photography of Tucumcari, Logan, and San Jon in addition to the 1-mile and 0.5-mile areas, and the map provides a more detailed outline based on the locations of the structures on the perimeter of the towns. The definition of the WUI was created with the consideration of where the greatest loss of life is likely to occur, critical infrastructure (Appendix C), and the areas that are most likely to experience a source of ignition.

The rural nature of Quay County made it challenging to determine which areas should be identified as WUI. Traditional definitions of WUI based on population density were not applicable due to the sparse population. The lack of population centers led to the question of how to address large ranches or other isolated areas where only a few homes or structures are present. This segment of the population constitutes a significant portion of Quay County. The Core Team decided that the fire stations would be critical to protecting these individuals and therefore the fire stations would be identified as WUI rather than identifying each individual home or structure as WUI.

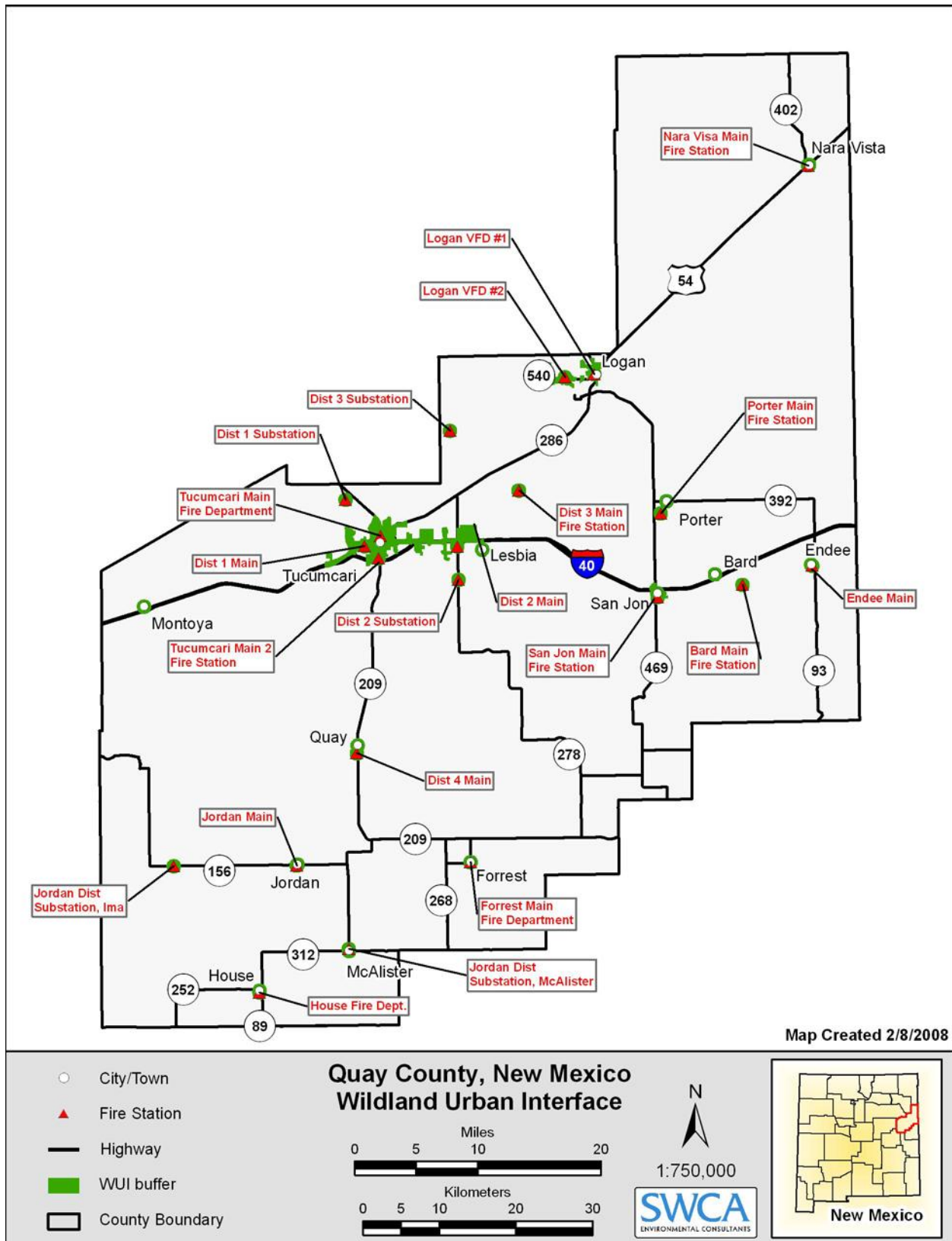


Figure 3.1. WUI map.

3.2 FIRE BEHAVIOR OVERVIEW

3.2.1 THE FIRE ENVIRONMENT

The wildland fire environment consists of three factors that influence fire behavior: 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 fire environment, fuels refer to the live and dead vegetative component. Fuels vary over time and space in loading, size and shape, compactness, horizontal continuity, chemical composition, and moisture content. Topography includes elements such as slope, position on the slope, aspect, elevation, and the general “lay of the land,” which varies over space. The third factor, weather, is also variable across time and space and includes elements such as temperature, wind speed and direction, relative humidity, cloud cover, precipitation, and atmospheric stability. Of the three fire behavior components, weather is most variable and can significantly and rapidly change fire behavior. Changes in wind speed, wind direction, and relative humidity can change a creeping ground fire into a rapidly spreading canopy fire in a short period of time and may be difficult to predict.

3.2.2 FIRE SPREAD

Fire can spread across an area as a surface fire, a crown fire, or by spotting. A surface fire is where the fire remains on the ground surface. Resistance to control is variable within this type of fire behavior depending on the structure and condition of the fuels on the ground surface. For example, if the fuel bed consists of densely packed pine needles or moist fuels, the fire will creep along the surface and can be suppressed at the flaming front. If the fuels consist of tall, loosely packed, continuous grasses, the fire may exhibit a rapid rate of spread (especially in the presence of wind) as a running surface fire making it more difficult to control.

Crown fires are elevated from the ground surface and burn in the canopies of trees or shrubs and can be passive, active, or independent. Passive crown fires take place when trees or shrubs torch individually as they are ignited by the passing surface fire. Active crown fires are those fires in which a solid flaming front develops with both the surface fire and the canopy fire advancing as a single unit dependent on one another. Finally, an independent crown fire is a fire that advances in the canopy individually and independent of the surface fire. Active and independent crown fires are very difficult to control and must be suppressed from a distance. Effective fuels treatments are designed with the goal in mind of keeping the fire out of the canopy and on the ground surface to provide a safe buffer around the WUI where fire suppression activities can take place.

The third way that a fire can advance across the landscape is by spotting, where embers are lifted and carried by wind or topography to receptive fuels in front of the head of the fire. When excessive, long-range spotting occurs, resistance to control can be very high and the fire can move across the landscape rapidly. Spotting occurs most frequently when fire is burning in the tree or shrub canopy, which reiterates the importance of designing fuels treatments to keep fire on the ground surface and out of the canopy.

3.3 FIRE OCCURRENCE

Residents of Quay County are familiar with fire use, as fire is one of the most important ecological processes in grasslands, occurring naturally for millennia and more recently by anthropogenic means, such clearing of land by Native Americans and early pioneers (Rickel 2005).

Native Americans modified the landscape in the United States before the arrival of European settlers by tilling land for crops, such as maize and squash; constructing houses of mud bricks or tree bark; building mounds and terraces; harvesting and gathering wild rice, nuts, and roots; hunting deer, rabbits, and other animals; and igniting fires in prairies, fields, and forests (Wuerthner 2006). In the past, tribes have used fire as a tool to open land for agricultural use, hunting, or travel; to drive game for hunting; to promote desirable post-fire herbaceous vegetation; or to manage the land for habitat protection and resource use (Scurlock 1998). Although the specific influence that Native Americans had on historic fire regimes remains uncertain, human-caused fires can also be attributed to having played a role in influencing historical fire occurrences.

Fires were historically used to help rejuvenate the land by recycling nutrients and increasing productivity. However, in the 1800s when European pioneers began moving to the West, land uses shifted and as grasslands were increasingly settled and used for livestock grazing. Fire began to be negatively viewed as a destructive force by many landowners and fire suppression became a dominant practice.

Some species of non-native vegetation were also introduced during the European settlement throughout the West, which eventually invaded many native landscapes across the West and altered natural fire disturbance processes, the natural fire frequency and fire regime of New Mexico's eastern grasslands. As a result, there was a shift in species composition in many areas as grass-dominated landscapes gave way to shrubs and trees (Rickel 2005).

3.3.1 FIRE MANAGEMENT POLICIES

Beginning in the early 1900s, the policy for handling wildland fire leaned heavily toward suppression and was initiated by the USFS. 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 proper means for protecting the nation from wildfire. As a result, many areas currently have excessive fuel build-ups, dense and continuous vegetative cover, and tree and shrub encroachment into open grasslands.

Over the last decade, fire has rarely been applied as a management tool largely in the County due to the prevalence of drought, which has meant few ranchers can depend upon the spring rains that would have traditionally replenished the grasses following a burn. Fires continue to be suppressed in the County and throughout New Mexico.

3.3.2 HISTORICAL FIRE REGIMES AND PRESENT CHANGES

Fire has played an important role in all grassland ecosystems and is thought to have been a significant ecological component of Great Plains shortgrass prairie ecosystems in the past

(Brockway et al. 2002). Historically, frequent, low-intensity, surface fires burned throughout many large-scale areas within Quay County, creating a mosaic of different stages of vegetative structure across the landscape. Mixed-grass communities experienced fire every three to five years and fire is likely to have been an important component of maintaining those ecosystems (Unbanhowar 1996). Although fires may have burned less frequently in shortgrass prairies than in mixed or tallgrass prairies, they were likely to have burned over large areas. For the most part, in all grassland communities, fires helped to preserve an open vegetative community structure by consuming excess fuel buildup and suppressing the development of woody vegetation.

The natural fire regime has been altered in all types of grassland ecosystems since the mid 1800s by systematic heavy grazing of large herds of domestic livestock and since the early 1900s by effective fire suppression efforts. These management practices have led to a reduction in fine fuels and fire occurrence, which has caused a shift in vegetative composition and encroachment of trees and shrubs into grassland ecosystems. In the shortgrass prairie, it is believed that fire-dependent or fire-tolerant species have been replaced by less fire-tolerant species (Brockway et al. 2002). As a result, fires are likely to play a different role than they have in the past in these ecosystems, making restoration efforts challenging.

3.3.3 RECENT FIRE OCCURRENCE IN THE CWPP PLANNING AREA

Lightning ignitions are accountable for nearly half of the fires that are started in Quay County. New Mexico State Forestry Division (NMSF) compiled fire records from 1987 to 2006 show that 43% of the fires were ignited by lightning, which is widespread throughout monsoon season and usually takes place from June through August. Human-caused ignitions were also significant in the County and accounted for approximately 57% of the fires during the period of state fire records. A primary concern of residents in the WUI is the growing number of human ignitions, particularly with the development and improvement of roads, residences, and recreational opportunities into wildland areas. Human-caused fires increase the probability of fire occurrence throughout the year including the winter months (Figure 3.2) (see Appendix C).

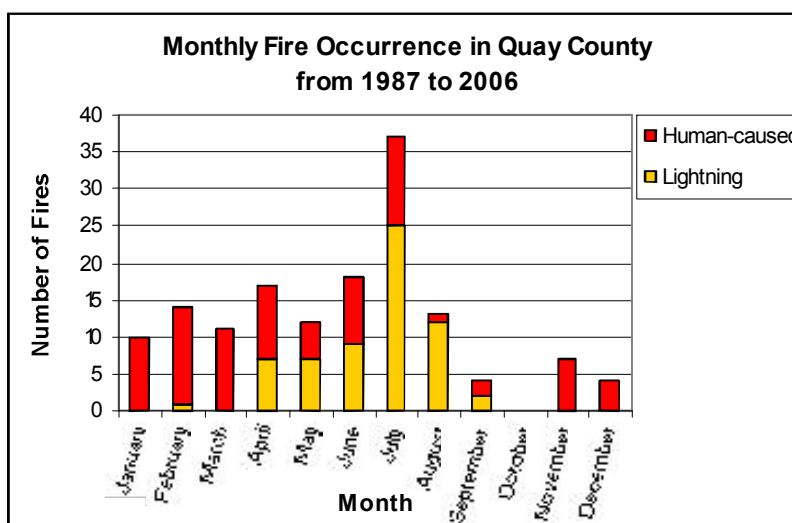


Figure 3.2. Number of fires per month from 1987 to 2006 (New Mexico State Fire Records).

Multi-agency or mutual aid fires are reported to NMSF, where they record and compile fire-related data. However, many fires are not reported, and in Quay County the number of fires that have occurred is higher than the recorded number of fires listed in NMSF's records. The Core Team estimates that approximately 130 to 150 fires occur per year in Quay County. According to the NMSF's records, from 1987 to 2006, 147 fires were recorded in all fuel types throughout the planning area with 92% of the fires occurring in grasslands. The fires that occur in grassland fuels, which are characteristic of the majority of the County's land cover, have the ability to spread quickly. Grassland fuels are light and flashy and can carry a fire rapidly, especially in the presence of wind. As a result, many of the fires in the County grow to sizes larger than 10 acres. The majority of fires over the course of the period of fire records have reached a size class of 10 to 100 acres, with very few fires that burn less than 0.5 acres in size (Figure 3.3).

A total of 13 fires are on record that grew to greater than 1,000 acres. Table 3.1 lists the large fires over 1,000 acres that have occurred within the planning area during the period of record. Many of those fires resulted from human causes.

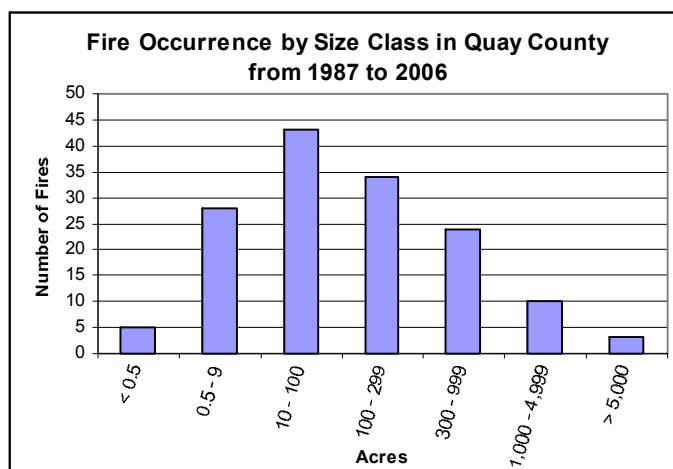


Figure 3.3. Number of fires by size class from 1987 to 2006 (New Mexico State Fire Records).

Table 3.1. Fires over 1,000 Acres in Size on Record within Quay County (1993to 2007)

Fire Name	Start Date	Acres	Cover Type	Cause
Porter	November 30, 1993	2,500	Grass	Smoking
Woods	January 5, 1994	7,000	Grass	Miscellaneous
Shoenail	June 28, 1994	1,300	Grass	Lightning
Stoner	April 9, 1995	2,200	Grass	Debris Burning
Frost	June 14, 1995	2,000	Grass	Lightning
Cain	March 15, 1997	2,500	Grass	Miscellaneous
Heather	July 14, 1998	5,000	Grass	Lightning
Golf	March 15, 2000	1,500	Grass	Debris Burning
Bugg	September 11, 2000	1,000	Grass	Debris Burning
Porter	April 15, 2003	1,000	Grass	Lightning
Lumpee	November 30, 2005	1,800	Grass	Equipment Use
Walker	February 16, 2006	2,000	Grass	Miscellaneous
Hudson	March 11, 2006	8,000	Grass	Miscellaneous

3.4 CHALLENGES FOR FUTURE RESTORATION EFFORTS

In addition to all of the human-made impacts that have degraded natural fire regimes, climate change has also played an extensive role in altering fire occurrence and severity. Climate change has influenced the vegetative cover and available burnable fuel across the western landscape. Fires in the past few years have grown to record sizes, are burning earlier and longer, and are burning hotter and more intensively than they have in the past (Westerling et al. 2006).

According to the National Interagency Fire Center (NIFC), the occurrence of catastrophic wildfires has greatly increased over the last 20 years. Within just the last seven years, a record number of acreages have burned and the number is continually growing (NIFC 2006). Climate change, combined with other past land management impacts, is likely to make the restoration of natural systems to their historic conditions difficult, if not potentially impossible, and should be taken into account when planning fuels treatments and other general fire management practices.

Although fire suppression is still aggressively practiced in many areas, fire management techniques are continually adapting and improving. Using prescribed fire and wildland fire use combined with effective fuels management techniques will help re-establish natural fire regimes and reduce the potential for catastrophic wildfires.

An ecosystem restoration approach in grassland communities is also likely to be the most effective fuel treatment as well. Studies have found that depending on the season of burning, fires can either have a positive or a negative effect on shortgrass prairie ecosystems. Overall, dormant-season fires were the most effective at reducing the build-up of fine fuels, increasing productivity of native grasses and inhibiting the encroachment of woody vegetation such as broom snakeweed (*Gutierrezia sarothrae*) (Brockway et al. 2002; Ford and Johnson 2006; McDaniel et al. 1997).

3.5 FIRE REGIMES AND FIRE REGIME CONDITION CLASSES

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

3.5.1 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, but including 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- to 35-year frequency and low (mostly surface fires) to mixed severity (less than 75% of the dominant overstory vegetation is replaced)
- II 0- to 35-year frequency and high severity (more than 75% of the dominant overstory vegetation is replaced)
- III 35- to 200+-year fire frequency and mixed severity (less than 75% of the dominant overstory vegetation is replaced)
- IV 35- to 200+-year fire frequency and high severity (more than 75% of the dominant overstory vegetation is replaced)
- V 200+-year frequency and high severity (more than 75% of the dominant overstory vegetation is replaced)

3.5.2 FIRE REGIME CONDITION CLASS

The Fire Regime Condition Class (FRCC) is a measure of the degree of departure from vegetative 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). Three condition classes describe the departure from reference conditions: no or low departure (FRCC I), moderate departure (FRCC II), and high departure (FRCC III) (Hann and Bunnell 2001; Hardy et al. 2001 and Schmidt et al. 2002 in Hann et al. 2003). Several factors, such as fire suppression, timber harvesting, livestock overgrazing, introduction and establishment of non-native species, introduced disease and insects, and other management activities, are all possible causes of this departure from historic conditions (Hann et al. 2003; Schmidt et al. 2002).

Quay County has an FRCC II throughout the majority of the County within grasslands and shrublands. Depending on the location (in sections of the northern panhandle of the County and the south-central portion of the County), some areas of western Great Plains sandhill steppe and shortgrass prairie have an FRCC I. Southern Rocky Mountain piñon-juniper woodlands in the County are an FRCC III. Please see Appendix C for the map of FRCCs throughout the County.

4.0 RISK ASSESSMENT

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

Although many definitions exist for hazard and risk, for the purpose of this document these terms follow the definitions used by the firefighting community. *Hazard* is defined as a fuel complex, defined by kind, arrangement, volume, condition, and location, forming 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). A risk assessment uses geographic information system (GIS) technology to provide spatial information about the level of risk associated with wildfire in relation to particular WUI areas and consequences of wildfire for residents and built structures within a WUI.

From this assessment, land use managers, fire officials, planners, and others can begin to prepare strategies and methods for reducing the threat of wildfire while working 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.

4.1 DESCRIPTION OF THE MODELING PROCESS

As discussed in Section 3.2, the wildland fire environment consists of three factors that influence fire behavior: fuels, topography, and weather. Furthermore, fire can spread across an area as a surface fire, a crown fire, or by spotting. The wildland fire environment and fire spread characteristics need to be considered during the risk assessment phase of fire behavior modeling.

4.1.1 FIRE BEHAVIOR MODELING

For this plan, an assessment of fire behavior was carried out using well-established fire behavior models—FlamMap, FARSITE, BehavePlus, and FireFamily Plus, as well as ArcGIS Desktop Spatial Analyst tools. Data used in the risk assessment were 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 country 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) that 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. Detailed information on fire behavior models can be obtained from <http://www.fire.org>.

BehavePlus

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

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.

4.1.2 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 Quay County planning area. These herbaceous fuels have a dynamic fuel moisture component that affects the intensity to which they would burn based on the degree of pre-fire curing. The Scott and Burgan 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 description of the fuel types present in the planning area is outlined in Table 4.1.

Table 4.1. Fuel Model Classification for the Quay County CWPP Planning Area

1. Nearly pure grass and/or forb type (Grass)	
i.	GR1: Grass is short, patchy, and possibly heavily grazed. Spread rate is moderate (5–20 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).
v.	SH6: Dense shrubs, little or no herb fuel, depth about 2 feet. Spread rate high (20–50 ch/h); flame lengths high (8–12 feet) (<i>only occurring in uplands beyond CWPP boundary</i>); fine fuel load 4.3 (t/ac).
4. 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 Models 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.

Please see Appendix C for a Fuels Model map.

Western Great Plains Shortgrass Prairie

Western Great Plains Shortgrass Prairie is by far the most abundant vegetation type in Quay County. It occurs throughout the County, but is especially evident in the area around Ragland, west of New Mexico State Route 209 (NM 209), and the northeast corner of the County. The soils within this community are typical of a semiarid ecosystem including a mixture of loam sand and clay. As the name implies, shortgrass prairies are dominated by low growing grasses. In most areas this means the grass level vegetation will rarely grow taller than 1 foot, excluding inflorescences. There are often herbaceous and/or shrub level components to this vegetation type, but they will occur in low proportions. The most dominant grass is blue grama (*Bouteloua gracilis*), but this species forms a complex matrix with many other grass species including but not limited to: sideoats grama (*B. curtipendula*), hairy grama (*B. hirsuta*), buffalograss (*Buchloe dactyloides*), and alkali sacaton (*Sporobolus airoides*). At the herbaceous level, common species

include buckwheat (*Eriogonum effusum*) and broom snakeweed (*Gutierrezia sarothrae*). Patches of shrub species are not uncommon and will include various sage species (*Artemisia* spp.) and four-winged saltbush (*Atriplex canescens*). These species are more likely to occur on ridges and rocky areas.

The fire behavior that can be expected in the shortgrass prairie ecosystem is described by Scott and Burgan (2005) as GR2, which is a grass-type fuel model. In this FBFM, fires spread across the ground surface and tend to move rapidly through light and flashy fuels. Fires in this fuel model are completely dependent upon fuel moisture levels that vary by life stage and hourly changes in ambient weather conditions. The low structural height of the grasses implies that the fuel load is light; however, these light and flashy fuels along with the lack of wind breaks or cover means the fire can move very quickly in the presence of wind.

Western Great Plains Sandhill Steppe

Western Great Plains Sandhill Steppe is the second most abundant vegetation type in Quay County. It occurs mostly in the central and eastern part of the County, especially in the area between Interstate 40 and U.S. 54. Nationwide, it is found throughout the interior west on well-drained sandy soils and includes sand dunes in some areas. This system is of a similar structure to Western Great Plains Shortgrass Prairie, in that it is characterized by dominant grass-level vegetation with interspersed herbaceous and shrubby patches. The difference is in the dominant species. In the grassland areas, blue grama is still very common, but is accompanied by dropseed (*Sporobolus* spp.), little bluestem (*Schizachyrium scoparium*), and needle and thread (*Hesperostipa comata*). The herbaceous layer can contain broom snakeweed and soap weed yucca (*Yucca glauca*). It is important to note that the herbaceous layer is highly variable in this vegetation type and depends on a multitude of factors including precipitation, disturbance, and topography. The shrub layer will contain predominantly sand sagebrush (*Artemisia filifolia*) with honey mesquite (*Prosopis glandulosa*) and sand shinnery oak (*Quercus havardii*) components. Fire and grazing are the most important dynamic processes for this vegetation type and determine the species that will be present at a specific location.

This vegetation type is characterized in Quay County by Scott and Burgan (2005) FBFM GS2. The fuel load is relatively light and the fire spread primarily takes place through the cured or dead fine herbaceous fuels on the ground surface. However, dense patches of woody vegetation may also catch fire and increase flame lengths and fire intensity in some areas. Fire behavior in this fuel model is dependent on seasonal moisture changes. During wetter periods, the fire tends to remain on the ground surface and will burn litter with low intensity as a result of high fuel moistures, especially early in the growing season and during spring green-up. However, during drier periods and near the end of the growing season, the fire can move into the shrub canopy and burn with longer flame lengths and higher intensity. This type of fire can move quickly and increase spotting potential, making it more difficult to suppress and, as a result, may pose a threat to human-made structures that it comes into contact with.

Western Great Plains Mesquite Woodland and Shrubland

Western Great Plains Mesquite Woodlands and Shrublands cover approximately 14% of Quay County, mostly in the central area around Tucumcari and the Ute Lake basin. The soil type is variable, and can go from sandy to clayey, dry to semiarid. Honey mesquite dominates this vegetation type, but co-dominant shrub species, such as four-winged saltbush and cholla

(*Opuntia* spp.), may also occur. The grassy understory component typically includes blue grama and buffalograss.

Scott and Burgan (2005) FBFM GS2 is the fuel type that best describes this vegetation type. These shrubland communities may have expanded in their range across the County as a result of historic land use practices. For example, mesquite's range was historically controlled by fire, but as a result of suppression, it has spread out of its original range significantly (Wells 1970). This means that in the areas where mesquite is dominant, a significant departure exists from the historical fire regime. As a result, higher fuel loadings and more continuous fuels may occur within areas of this habitat type and will result in increased fire intensity.

Central Mixed-grass Prairie

The Central Mixed-grass Prairie vegetation type is a minor component of Quay County. It exists almost exclusively on top of the caprock in the southeastern portion of the County. Characteristics of this vegetation type are in between tallgrass prairie and shortgrass prairie, and contain species components of both communities. Grass species such as blue and sideoats grama, needle and thread, little bluestem, and western wheatgrass (*Pascopyrum smithii*) are most common. Herbaceous species commonly present include coneflower (*Echinacea angustifolia*) and ragweed (*Ambrosia psilostachya*). This vegetation type may exhibit longer flame lengths in taller herbaceous vegetation but still can be classified in GR2 since it exhibits similar fire behavior to that of the shortgrass prairie described above.

Non-burnable fuels are also present throughout the planning area, with urban fuels (NB1) dominant throughout communities and agricultural fuels (cultivated crops and pasture) (NB3) scattered throughout the County. Some areas of open water are also present (NB8). These fuel types are considered non-combustible when input into the fire behavior model. This is important to note when determining risk in more rural areas where pasture land and cured crops could pose fire danger during certain times of the year, particularly prior to harvest. Land managers should pay close attention to these agricultural fuels in areas where crop burning is a common vegetation management practice.

Plains-Mesa Grassland

In general, fuels within the Plains-Mesa Grassland of Quay County are characteristic of Scott and Burgan's (2005) FBFM GR 2 and are primarily composed of semiarid, shortgrass prairie vegetation, which consists almost entirely of native grasses. Shrubs represent only a very small percentage of the vegetative cover within this ecosystem.

Fire behavior in the Plains-Mesa Grassland could exhibit a rapid rate of spread during dry conditions with short to moderate flame lengths. 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 because 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 treatments in this fuel type is to reduce fuels in areas where they have accumulated to allow engines and firefighters to be able to safely suppress the fire.

Wheeping Lovegrass

Wheeping lovegrass (*Eragrostis curvula*) is native to South Africa and was first introduced into the United States in 1932. The grass is now prevalent throughout much of eastern New Mexico and is particularly dominant in CRP grasslands. Wheeping lovegrass was originally planted for soil conservation and has been described as providing excellent protection for soils particularly in the high plains of New Mexico (Garcia 1993). Despite its value in soil conservation, like other lovegrasses it is allelopathic—able to inhibit the germination and growth of neighboring plants by releasing chemical substances into the soil (Global Invasive Species Program [GISP] 2008). As a result it inhibits the growth of native grasses and reduces overall biodiversity and structure. Although considered fair forage for livestock (Cox 1992), lovegrass is considered poor for wildlife (Stubbenieck et al. 1986), which is why many are concerned by its dominance on CRP lands set aside for wildlife value.

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, and rate of spread of wildfire. The topography in the planning area is relatively uniform but ranges in some areas from flat open plains to higher elevation caprock. 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.

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 timber 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 with often 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](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 (8-mile RAW station) was selected and data was downloaded from the web site. The weather station was selected based on period of record, location within the planning area, reliability of the data, and how representative the data would be for weather in the planning area.

Using an additional fire program (i.e., 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.

4.1.3 FIRE BEHAVIOR MODEL OUTPUTS

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

Flame Length

The Flame Length map in Appendix C illustrates the flame length classifications for the County. Flame length, determined by fuels, weather, and topography, is a particularly important component of the risk assessment because it relates to 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.

The highest predicted flame lengths (>11 feet) are found dotted in the central portion of the County, northeast of Quay, southwest of San Jon, and northwest and southeast of Tucumcari largely around Highways 104 and 278. Additionally, high flame lengths are predicted west of Logan in the riparian fuels in and around the Canadian River and Ute Creek Confluence. The remainder of the County is predicted to experience moderate (4- to 8-foot) and low (0- to 4-foot) flame lengths, largely a consequence of the short grass steppe fuel types that dominate the landscape. Moderate flame lengths are predicted to occur in the moderate fuel loading of CRP grasslands scattered throughout the County. Greater flame lengths are predicted in areas dominated by shrub steppe fuels found in very isolated patches of high flame length on the map in the southern portion of the County and towards the southeast boundary of the County. These areas are slightly more evident in the map of fireline intensity.

Fireline Intensity

Fireline intensity describes the rate of energy released by the flaming front and is measured in British Thermal Units (BTU) per foot, per second. This measure helps responders plan suppression activities. The expected fireline intensity throughout the County is similar in pattern to the predicted flame length, as fire line intensity is a function of flame length. High fireline intensity is predicted to occur in the shrubland communities (GS2). This would be most apparent in the transition zone from grassland (low flame length) to juniper (longer flame length), which occurs along the Caprock region of the County (Figure 4.1). Please see the Fireline Intensity map in Appendix C.



Figure 4.1. Transition from grassland to juniper in Caprock region of the County.

Rate of Spread

The Rate of Spread map in Appendix C illustrates the rate of spread classifications for the planning area. As requested by the Core Team, FlamMap was run using extreme weather parameters to represent the strong winds experienced in these plains ecosystems. The greatest rates of spread are predicted to occur in the northern half of the County, north of the caprock region. In these areas, rate of spread is predicted to be greater than 40 feet per minute. These spread rates are consistent with rates observed in the grass/shrub model GS2. The transition in rate of spread coincides with the topographic gradient surrounding the caprock and spread rates are greater on areas of steepest slope around this zone due to greater convection on steep slopes. Agricultural and urban areas are clearly delineated in this model by their low rate of spread.

Fire Occurrence/Density of Starts

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 these points showed the areas of fire starts within the project area over the last 30 years (1970 to 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. The Fire Occurrence map in Appendix C illustrates the fire occurrence in the area. The highest density (0.2–1 fire/square mile) of past fires has occurred around Porter; the remainder of the County experienced moderate fire densities of 0–0.2 fire per square mile over the recording period.

It may be argued that areas that have burned previously are less likely to burn in the future due to lowered fuel loads, but re-growth in grassland is more rapid than in timber fuels and these grass and shrub fuels therefore quickly rebound to pre-fire levels. Furthermore, the fire occurrence maps are used to provide information on areas where human-ignited and lightning-ignited fires are prevalent. Quay County experiences most of its lightning-ignited fires along the Caprock, (Figure 4.2) but human-ignited fires are more prevalent along major highways and around communities as observed in the Fire Occurrence map.



Figure 4.2. Caprock region.

4.2 RISK ASSESSMENT MODEL

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.

4.2.1 GIS OVERLAY PROCESS

All parameter data sets 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 98 x 98 feet (2,953 feet). 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 data sets, 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 data set and evaluates an output value derived from each cell value of the overlaid data set in combination with the weighted assessment. The resulting data set contains only values 1 through 4 (1=low, 2=medium, 3=high, 4=extreme) denoting 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. Model Outputs and Weightings

Layer	Source	Year	Weight (%)	Ranks
Fireline Intensity	Landfire: Elevation, Aspect, Slope, Scott and Bergan 40 Fuel Model, Forest Canopy Base Height (CBH), Forest Canopy Bulk Density (CBD), Forest Canopy Cover, Forest Canopy Height RAWs Station - 8 Mile (Weather)	2007	15	1: 0–100 BTU/ft/sec = 1 2: 100–500 BTU/ft/sec = 2 3: 500–1000 BTU/ft/sec = 3 4: Greater than 1000 BTU/ft/sec = 4
Flame Length	RAWs Station - 8 Mile (Weather)	1992–2006	20	2: 4–8 feet 3: 8–11 feet 4 Greater than 11 feet 4 Greater than 11 feet
Fire Occurrence	New Mexico State Forestry	1987–2007	10	1: No Fires/Mile squared 2: 0–0.2 Fires/Mile squared 3: 0.2–1 Fires/Mile squared 4 Greater than 1 Fires/Mile squared
Rate of Spread	Landfire: Elevation, Aspect, Slope, Scott and Bergan 40 Fuel Model, Forest Canopy Base Height (CBH), Forest Canopy Bulk Density (CBD), Forest Canopy Cover, Forest Canopy Height	2007	55	1: 0–5 feet/minute

4.3 RISK ASSESSMENT RESULTS

Figure 4.3 is the risk assessment for the planning area combining all the fire behavior parameters described above. The risk assessment classifies the planning area into low, moderate, high, and extreme risk categories.

Figure 4.4 is the risk assessment for the planning area combining all the fire behavior parameters described above, plus the WUI areas.

The final risk assessment reflects closely the fire behavior predicted by the flame length, fireline intensity, and rate of spread maps. The greatest risk is predicted to be in the north and central portions of the County. A number of the communities are shown as low risk in the risk assessment map because of urban and adjacent agricultural fuels. A limitation of fire behavior models is that these areas are considered non-combustible because urban fuels cannot be classified into a wildland fuel type and agricultural fuels are assumed to be irrigated. It is important to note, therefore, that these low risk areas at certain times of the year could become high risk as some agricultural fuels become cured prior to harvest, and some areas receive limited irrigation. Tucumcari and Lesbia are two examples of this low risk rating; however, these communities are surrounded by high risk areas with patches of extreme risk to their southwest; conditions such as these put life and property at severe risk in the event of a fire because of the

southwest winds that are very strong and consistent in these plains ecosystems. Fire brands can travel up to 1 mile ahead of a grassland fire, threatening municipal areas that are otherwise shown to be at low risk.

The fire behavior models help identify these wildland conditions and prioritize treatment in the vicinity of a community. Very few areas of the wildland are considered to be at low risk of severe fire behavior, with the majority of the landscape classified either as moderate or high risk with some patches of extreme. This classification supports the concerns of community members from Core Team meetings and public outreach. Particular focus for treatment needs to be on those communities that have a limited buffer by agricultural or urban development and that are situated in or adjacent to areas of dense shrubland, CRP lands, or continuous grassland. Quay, San Jon, Montoya, Logan, Bard, Endee, and Porter are some examples of smaller communities that would benefit greatly from increased adjacent fuels mitigation. Tucumcari and Lesbia have denser urban development and agricultural lands are still at high risk of human and structural losses particularly in the WUI because of the potential spread of fire from the wildlands into the structural fire setting. Some of the more southern communities that are surrounded by areas of moderate and low risk would benefit from treatment of fuels to the southwest of their boundaries, to prevent fire spread from the wildland areas. High classified areas are found around House and in the southwest corner of the County, so these more agricultural communities could still be at risk from fire spread from the south, particularly seasonally when agricultural fuels are in a cured state.

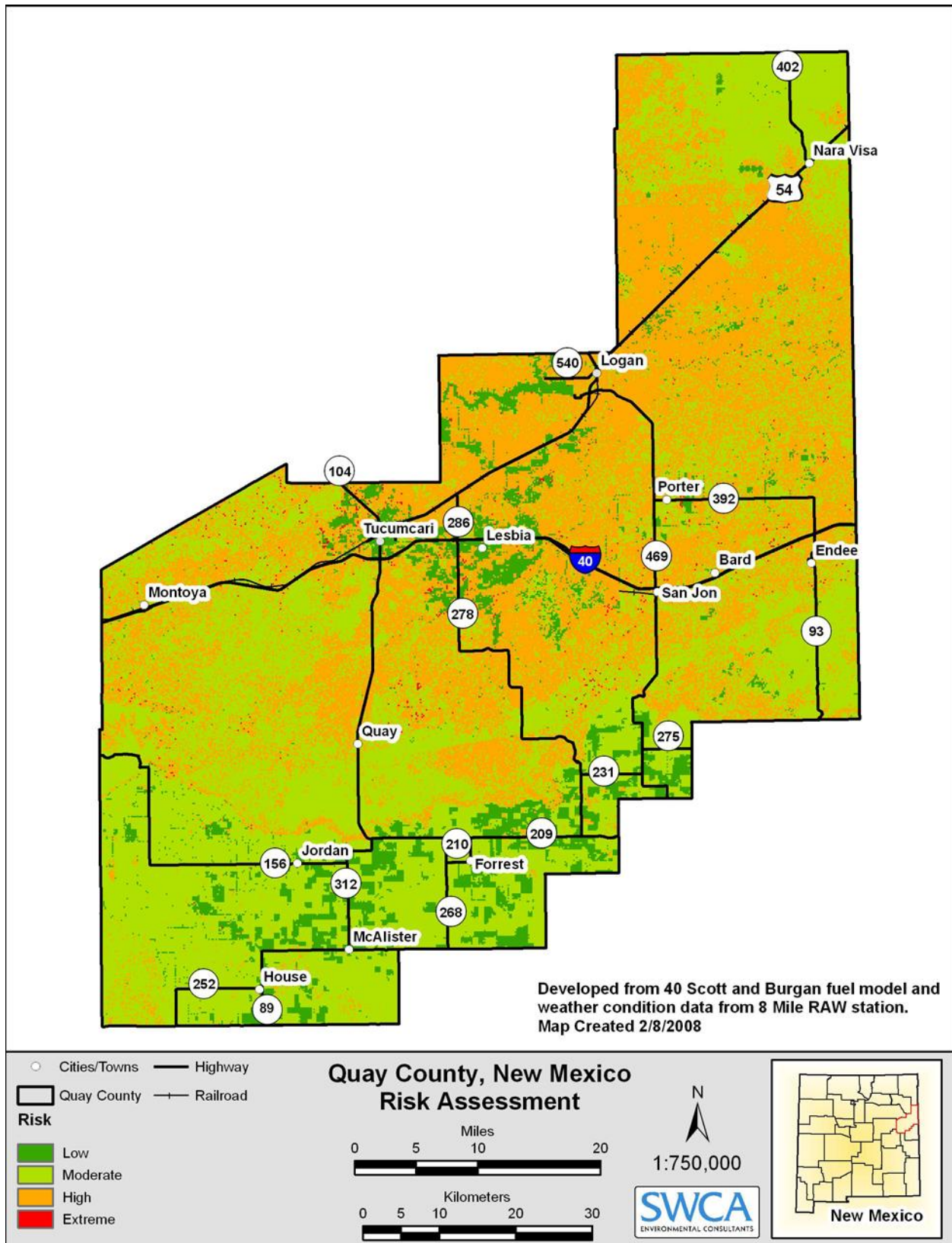


Figure 4.3. Quay County risk assessment map.

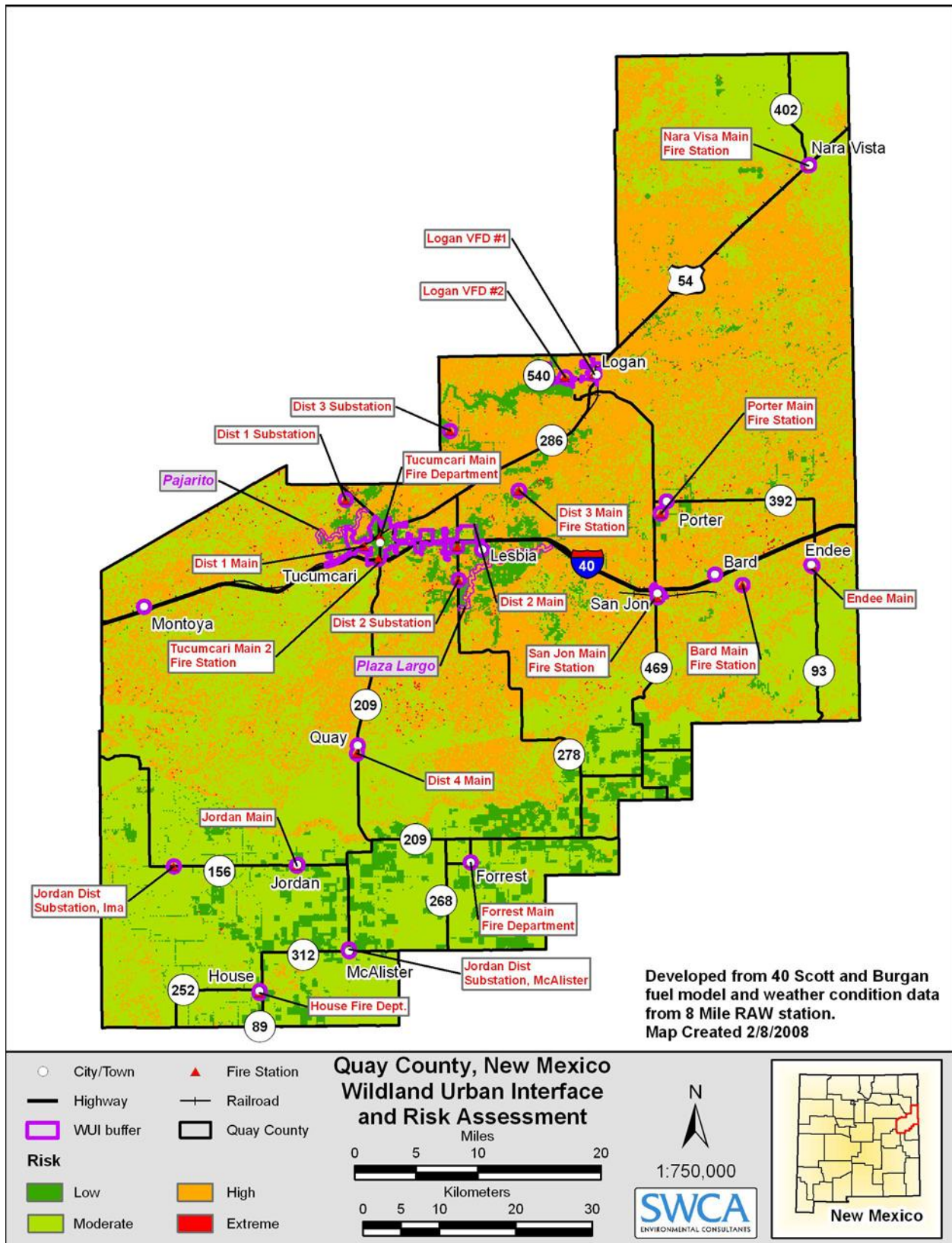


Figure 4.4. WUI and risk assessment map.

4.4 COMMUNITY VALUES AT RISK

CVAR provide a measure of people, property, and natural and other resources that could suffer losses in a wildfire event. Examples of CVAR may include, but are not limited to, housing, business and infrastructure (including utilities, trails, and roads), natural resources (including wildlife and water resources), cultural resources, tribal concerns, recreation areas and open space, and scenic resources (including significant landscapes). CVARs identified by community members help guide the risk assessment and the recommendations.

The public meeting process and community surveys were used to compile information identifying community values that the public deems to be at risk from wildland fire and values that they would like to see protected. This information helped to drive the treatment recommendations outlined in Section 5.0. In addition, with Core Team collaboration, additional CVARs were identified; the WUI boundary was developed to encompass the majority of these CVARs.

4.4.1 NATURAL CVARS

The public outreach process has emphasized the importance of bosque natural/ecological values to the general public. Treatment recommendations often target reduction of bosque fuels in an attempt to improve overall ecosystem health through prevention of intense wildfire. Examples of natural values identified by the public and the Core Team include:

- Grasslands
- Pajarita Creek area
- Wildlife habitat/wildlife preserve
- Water resources
- Plaza Largo

4.4.2 SOCIAL CVARS

Social values include population, recreation, infrastructure, agriculture, and the built environment. Much of the built environment associated with the bosque fell within the WUI zone. Examples include the following:

- Residential housing
- Hospitals
- Businesses
- Utilities (i.e., gas and electric distribution lines)
- Farms and ranches
- Livestock
- Crops
- Water supply

4.4.3 CULTURAL CVARS

Land-based activities, such as agriculture and ranching, have shaped the culture of Quay County. Resources contributing to this livelihood or traditional lifestyle would be considered cultural values at risk. Many of these landscapes maintain their use and purpose and have been productive agricultural and ranching areas for generations. Examples of cultural CVARs include the following:

- Traditional irrigated agricultural lands
- Large open space used for livestock grazing

4.5 COMMUNITIES AT RISK IDENTIFIED

The Core Team, the Local Knowledge Risk Assessment and Prioritization matrix, and the Risk Assessment guided the rankings assigned to the communities listed in Table 4.3. The community at risk table (Table 4.3) is required by the New Mexico Fire Planning Task Force.

Table 4.3. Communities at Risk Identified

Community	Risk Rating
Logan	High
Plaza Largo	High
Pajarito	High
San Jon	High
House	High
Tucumcari	High
Montoya	Medium
Endee Truckstop	Medium
Lesbia	Medium
Ute Lake Ranch	Medium
Nara Visa	Medium
Porter	Medium
Ima	Low
Glenrio	Low
McAlister	Low
Forrest	Low
Jordan	Low
Quay	Low
Endee	Low
Bard	Low
Ute Lake State Park	Low

5.0 RECOMMENDATIONS

5.1 OVERVIEW OF RECOMMENDATIONS, ACTION ITEMS, AND MONITORING

This section addresses recommendations, action plans, and monitoring. Four different types of recommendations have been addressed: fuels reduction projects, public education and outreach, reduction of structural ignitability, and improved fire response capabilities. These recommendations are based on Core Team input, public outreach, and the GIS risk assessment. The recommendations are general in nature to provide maximum flexibility in implementation.

General action plans are incorporated into recommendation tables and address timeframes, contacts, and prioritization. However, developing a specific action plan and 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 any of the recommendations. The action plan would also include monitoring and evaluating completed fuels reduction projects.

An important 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 each 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, percent 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 Effects Monitoring and Inventory System (FIREMON) plots.

5.2 QUAY COUNTY LOCAL KNOWLEDGE RISK ASSESSMENT / PRIORITIZED LIST

The Core Team's collective local and intimate knowledge of the area directed an assessment of risk along with the levels of prioritization for the recommendations. Local knowledge is critical to any CWPP, and particularly to Quay County's CWPP, as natural resource and other County data are not abundant. Determining a process for identifying the level of risk, the types of recommendations needed, and the process for prioritization involved assigning quantitative values to concerns that are more qualitative in nature. Much discussion was generated as the Core Team collaboratively worked to create a matrix. Clarifying the meaning of the headings in the columns matrix was important for all to gain a mutual understanding of the process. The Core Team determined loose definitions of the following terms:

Fuels: risk of fire based on fuel types and density

Starts: likelihood of fire igniting

Values at risk: potential loss of critical infrastructure, homes, businesses, historical sites and cultural sites

Water availability: accessibility to water supplies

Local preparedness: level of preparedness or ability to respond to fire

The results of the discussions are captured in Table 5.1. These assessments guided the subsequent recommendations discussed in this section.

Table 5.1. Local Knowledge Risk and Priorities Table (fire scale follows table)

Location	Fuels ¹	Starts ²	Values at Risk ³	Water Availability ⁴	Local Preparedness ⁵	Average	Priority-Fuels	Priority-Education	Priority-Preparedness
Logan	4.5	4	5	3	4	4.1	H	H	H
Montoya	5	3	2	5	5	4	H	H	H
Plaza Largo	5	3	4	4	4	4	H	H	H
Tucumcari	4	4	5	3	3	3.8	M	H	H
House	4	4	5	3	3	3.8	M	H	H
San Jon	4	4	5	3	3	3.8	M	H	H
Lesbia	5	4	3	4	3	3.8	H	H	H
Pajarito	5	3	4	4	3	3.8	H	H	H
Endee Truckstop	5	3.5	3.5	4	3	3.8	H	H	H
Porter	5	3	2	4	4	3.6	H	H	H
Quay	5	2	2	5	4	3.6	H	H	H
Jordan	5	3	3	4	3	3.6	H	H	H
Forrest	5	3	3	4	3	3.6	H	H	H
McAlister	5	3	3	4	3	3.6	H	H	H
Ima	5	3	3	4	3	3.6	H	H	H
Glenrio	5	3.5	3.5	3	3	3.6	H	H	H
Nara Visa	5	3	3	2	4	3.4	H	H	H
Bard	5	3	2	4	3	3.4	H	H	H
Endee	5	3	2	4	3	3.4	H	H	H
Ute Lake State Park	4	2	3	2	4	3	M	H	H
Ute Lake Ranch	5	2	3	3	4	3.4	H	H	H

¹ Fuels: risk of fire based on fuel types and density

² Starts: likelihood of fire starting in this area

³ Values at Risk: critical infrastructure, homes, businesses, historical sites, cultural sites

⁴ Water Availability: accessibility to water supplies

⁵ Local Preparedness: the level of preparedness or ability to respond to fire

Scale	Fuels	Starts	Values at Risk	Water Availability	Local Preparedness
1	no / little risk	no / little risk	least risk for potential loss of values	no / little risk due to greatest water availability	no / little risk due to very high level of preparedness
2	low risk	low risk	low risk for potential loss of values	low risk due to moderate water available	low risk due to high level of preparedness
3	moderate risk	moderate risk	moderate risk for potential loss of values	moderate risk due to some water available	moderate risk due to moderate level of preparedness
4	high risk	high risk	high risk for potential loss of values	high risk due to little water available	high risk due to low level of preparedness
5	extreme risk	extreme risk	extreme risk for potential loss of values	extreme risk due to least water available	extreme risk due to very low level of preparedness

The Core Team agreed that the four largest municipalities, Logan, Tucumcari, House, and San Jon, (all highlighted on Table 5.1) needed to be identified as the highest priorities for protection in the event of a wildfire and that efforts to reduce risk and prevent the loss of life and property need to be focused on these communities. While other locations (Montoya and Plaza Largo) received a numerical rating indicating that they were at higher risk, the Core Team collectively agreed that the four major municipalities need to be the highest priority for risk reduction regardless of the numerical rankings.

5.3 RECOMMENDATIONS FOR FUELS REDUCTION PROJECTS

The fuels reduction recommendations are addressed on a landscape level, and many of the recommendations fall within WUI areas. Site specific implementation plans will need to be developed for each project and at that time the exact number of treatments within the WUI will be determined. The majority of the recommended fuel breaks surrounding medium and small towns and villages fall within the WUI, as do the recommendations for roads that intersect WUI areas. Approximately 50% or more of the recommendations fall within the WUI. Recommendations specifically for CRP lands, as well as the entire County are described below.

5.3.1 CONSERVATION RESERVE PROGRAM LANDS

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, improve water quality, and provide financial incentives for participants.

Core Team members raised concern about the risk of fire in CRP lands, as they are common in the County. Heavy fuel loads accumulate in these locations due to reduced production of crops. Strict management practices associated with these lands are usually outlined in CRP contracts, which is why recommendations for possible treatments on CRP lands are included in this plan.

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 highly erodible, which is why the CRP was originally initiated. The eastern counties of New Mexico are prone to high wind conditions; therefore, soil erosion is of paramount concern. Burning and wildfire also contribute to erosion with the removal of surface vegetation, which then accelerates soil losses. The Core Team and public are concerned that current mid-management practices, such as shredding, that are required under some CRP contracts are expensive and difficult to implement. 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 Farm Service Agency (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 a 10-year contract 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 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) (USDA FSA 2008) 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

<p>Create Fuel Break (reduce fuel loading and fuel bed depth)</p> <p>Mowing must meet practice standard 528.</p> <ul style="list-style-type: none"> • 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.
<p>Create Fire Break (reduce fuels to mineral soil)</p> <p>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).</p> <p>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.</p> <ul style="list-style-type: none"> • 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 exposed. • In all cases the designated conservationist shall document in the contract support document that no erosion hazard results 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.
<p>Remove Invasive Species</p> <p>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.</p>
<p>Prescribed Grazing</p> <p>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.</p> <ul style="list-style-type: none"> • 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

<p>Convert CRP to Native Grasslands</p> <p>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.</p> <ul style="list-style-type: none"> • 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 producers' chances of successfully re-enrolling in the program at the end of the 10-year contract. If the landowner is unsuccessful in re-enrolling 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 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.
<p>Reduce Lovegrass</p> <p>To reduce lovegrass landowners would need to use pesticides and reseed using drill seeding and water. It is important for Quay County to continue to stay apprised of research on how to control lovegrass, as this species is abundant on CRP lands. Some current research, presented at the "Fire in the Southwest" conference hosted by the Fire Ecology Association, stated that prescribed fire can reduce lovegrass for one to two years. However, if rainfall is above average, this timeframe can be reduced.</p>
<p>Spot Treatment</p> <p>Although there is a treatment ban from March 1 to July 1 because of 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 can't treat 100% of the acres.</p>
<p>Emergency Grazing</p> <p>There have been provisions in the past 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.</p>
<p>Prescribed Burning</p> <p>Should comply with standard practice 643.</p> <ul style="list-style-type: none"> • 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>)

Although wheeping lovegrass has soil conservation benefits, its dominance in Quay County may cause difficulties for producers attempting to mitigate fire risk in identified vegetation. CRP lands throughout the County have been identified as areas of significant fire risk because of increased lovegrass fuel loading relative to neighboring grazed pastures. Wheeping lovegrass is fire adapted and generally increases or remains stable following fire (Wright et al. 1978) even under extreme fire behavior (Pase and Knipe 1977). The grass also responds positively to continuous grazing (Ethridge et al. 1987), however when the land is not grazed, the lovegrass becomes coarse and is unattractive to livestock. When CRP lands are not actively managed, the lovegrass is not used by wildlife due to inadequate habitat structure or by the producer for fodder, and it presents a fire risk to communities because of heavy fuel loading.

In areas where monocultures of lovegrass could constitute fire risk to neighboring communities, it is suggested that the producer implement management to control or limit the density of the stands. Suggested mechanical control methods include hand digging out the root system in late winter or early spring, followed (where possible) by a prescribed fire to kill remaining seeds. Chemical control measures include application of Glyphosate herbicides during spring months, after the new foliage is in full growth, but before blossom heads have formed (GISP 2008). Treatment options are limited however on CRP lands, so the producer or agency should contact their local FSA representative for specific guidance.

5.3.2 FUEL REDUCTION PROJECTS

Fuels treatments will vary depending on each specific targeted area. Figure 5.1 identifies some of the areas for fuel reduction projects. When projects are being implemented, a site-specific map for each project should be created.

Fuel breaks are instrumental in preventative fire planning in grasslands. In general, mowing and prescribed fire should be implemented to create fuel breaks. Fuel breaks that are at least two times as wide as the expected flame lengths or wider should be placed along roads surrounding the WUI or at-risk areas. The topography is primarily flat throughout the County, meaning the placement and width of the fuel breaks should remain relatively consistent across the CWPP area.

Table 5.3 identifies the recommendations for fuels reduction projects for Quay County when funding becomes available. In addition to the risks and prioritized recommendations outlined in the table, other considerations including appropriateness of treatment, landownership constraints, locations of ongoing projects, available resources, and other physical or ecological barriers to treatment, need to be considered when implementing any recommendations.

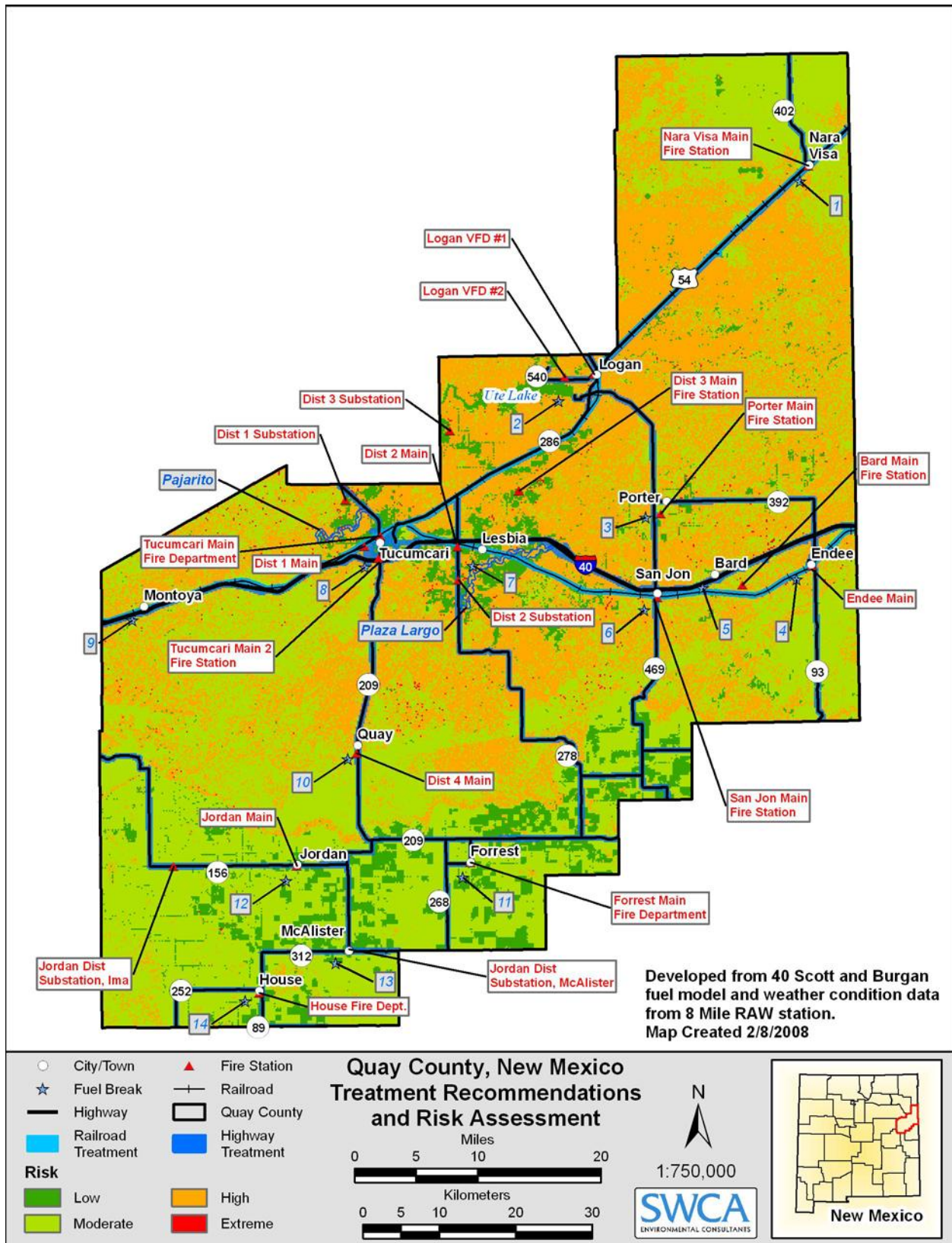


Figure 5.1. Location of treatment areas.

Table 5.3. Recommendations for Fuels Reduction Projects for Quay County

Project	Location	Land Ownership or Management	Method	Serves To	Target Date for Beginning Implementation	Priority (H,M,L)	Monitoring
Salt Cedar Reduction	Riparian areas, including Pajarito and Plaza Largo, Bosque Area near Norton, Tucumcari and Rural 1 substation, Tucam, and the Canadian River and all its tributaries.	Public or private	<ol style="list-style-type: none"> 1. Traditional mechanical and chemical treatments. 2. Introduce physiological stress, such as diorhabda beetle in spring. Implement a prescribed burn in the summer when salt cedar is experiencing stress and a significant understory of fuel loading exists. Prescribed burn must create intensity in the fire, which will burn into the root crown. This will prevent it from re-sprouting post burn. 	Serves to protect community and infrastructure by reducing potential high severity fires.	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 Section 5.1 levels 1-4.
Ditch Clean Up	Ditches located in agricultural land.	Private	Remove debris by hand or with mechanical equipment if necessary.	Serves to protect community and infrastructure by reducing potential high severity fires and loss of crops and livestock.	Summer 2009	M	Annual maintenance.
Manage Goats Grazing for Fuels Reductions	Small areas of dense shrub and undergrowth, areas where goats can be easily managed and contained.	Public or private	Controlled / managed grazing with goats to create fuel breaks or reduce fuel loading. Goats are used to eat undergrowth or "hot fuels" that allow fire to spread quickly. A temporary electric fence can be used to contain goats to a certain area. This temporary practice would be used to clear non-natives, and goats need to be removed from land in timely manner. This practice needs to be closely observed to ensure that goats are not creating negative impacts.	Serves to protect community and infrastructure by reducing fuel loads neighboring structures.	Summer 2009	M	Practice adaptive management practice. Monitor regularly for impact to native vegetation and soil erosion. Monitor every month.

Table 5.3. Recommendations for Fuels Reduction Projects for Quay County, continued

Project	Location	Land Ownership or Management	Method	Serves To	Target Date for Beginning Implementation	Priority (H,M,L)	Monitoring
Create Fuel Breaks	Southwest boundaries of municipalities and recognized subdivisions including Leonard Estates, Transcon, Best Western Estates, and around critical infrastructure.	Public or private	Mowing	Serves to protect community and infrastructure by reducing fuel loads.	Summer 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 Section 5.1 levels 1–4. Monitor twice a year, prior to fire season and at end of growing season.
Create Fuel Breaks	Southwest boundaries of unincorporated population areas or small communities.	Public or private	Mowing	Serves to protect community and infrastructure by reducing fuel loads.	Fall 2009	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 Section 5.1 levels 1–4. Monitor twice a year, prior to fire season and at end of growing season.
Create Fuel Breaks	Create 70-foot buffers adjacent to all County Roads, particularly 209, 278, and 469, and railroads.	Public or private	Mowing	Serves to protect community and infrastructure by reducing fuel loads.	Continue ongoing work	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 Section 5.1 levels 1–4. Monitor twice a year, prior to fire season and at end of growing season.

Table 5.3. Recommendations for Fuels Reduction Projects for Quay County, continued

Project	Location	Land Ownership or Management	Method	Serves To	Target Date for Beginning Implementation	Priority (H,M,L)	Monitoring
Plan Fuels Reduction in Conjunction with Publicly Managed Lands	Landscape scale.	Public	Create partnerships that will enable Quay to obtain funding opportunities through collaborative fuels reduction planning.	Serves to protect community and infrastructure by reducing fuel loads.	Summer 2009	M	Site specific monitoring required.
Defensible Space Cost-Sharing Programs	All private land within CWPP planning area would be eligible.	Private	Selective thinning of trees to lower density around homes; crown spacing adjusted for slope; pruning (to about 25% of tree/shrub ht); chip and/or remove debris; provide adequate defensible space.	Reduces crown fire potential, improve vehicle access, increase tree health/vigor, and gives firefighters margin of safety.	Spring 2010	H	Conduct on-site inspections with owners; consider photo documentation pre- and post-treatment; apply adaptive management from best available information; determine if Firewise techniques are being applied.
Defensible Space Assessments	All private land within CWPP planning area would be eligible.	Private	Firewise-based assessments of individual homes. The professional assessment would help to identify the most critical actions that an individual could take. Assessments could also include marking of trees suggested for removal.	Reduces risk of home ignitions. Empower homeowners to make the most effective actions. Allows funding to address a larger number of homes.	Fall 2009	H	Conduct on-site inspections with owners; identify and mark trees for removal within the 100 foot safety zone.
Mesquite Treatment and Removal	Landscape scale (Figure 5.2).	Public or private	Mechanical clearance of mesquite and pile burning to remove residual slash. In areas of potential soils erosion, some residual slash should remain on the ground to reduce wind erosion.	Serves to protect community and infrastructure by reducing fuel loading.	Summer 2009	H	Monitor for soil erosion. Pre- and post-treatment monitoring needed. Continued monitoring twice a year is needed.
Create Defensible Space around Homes	Create a mowed buffer up to 200 feet around home. Increased buffer is needed in strong wind, 30-foot will not be sufficient in strong winds.	Private	Mowing	Serves to protect community and infrastructure by reducing fuel loading.	Summer 2009	H	Conduct on-site inspections with owners; consider photo documentation pre- and post-treatment; apply adaptive management from best available information; determine if Firewise techniques are being applied and effective.

Table 5.3. Recommendations for Fuels Reduction Projects for Quay County, continued

Project	Location	Land Ownership or Management	Method	Serves To	Target Date for Beginning Implementation	Priority (H,M,L)	Monitoring
Blade around Perimeter of Property	Perimeter of property.	Public or private	Mow around perimeter of property.	Serves to protect community and infrastructure by reducing fuel loading.	Summer 2009	H	Monitor for soil erosion. Refer to Section 5.1 to levels 1 and 2. Monitor annually using photo points. Maintenance to retain clearance twice a year.
Create Continuous Fuel Breaks across Landscape	Landscape scale.	Public or private	Mowing	Serves to protect community and infrastructure by empowering local residents in the protection of their local property.	Fall 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 Section 5.1 levels 1–4. Monitor twice a year, prior to fire season and at end of growing season.
Create Local Fire Task Force where Locals Volunteer to Illustrate how to Implement Treatments on Their Property. Local person is available to guide others.	Landscape scale.	Private	Demonstration sites and workshops from local community leaders developing skill sets. Look to the Malpais Borderlands group as an example of a collaborative planning effort led by ranchers.	Serves to protect community and infrastructure by reducing fuel loading and providing an area from which firefighters can suppress a fire and use as an escape route.	Summer 2009	H	Site specific monitoring required. Use levels 1 and 2 to conduct photo points.
Implement Weed Control	Landscape level.	Public or private	Annual shredding of invasive species.	Serves to protect community and infrastructure by reducing fuel loading and providing an area from which firefighters can suppress a fire and use as an escape route.	Summer 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 Section 5.1 levels 1–4. Monitor twice a year, prior to fire season and at end of growing season.

Table 5.3. Recommendations for Fuels Reduction Projects for Quay County, continued

Project	Location	Land Ownership or Management	Method	Serves To	Target Date for Beginning Implementation	Priority (H,M,L)	Monitoring
Reduce Dominance of Cheatgrass	Areas invaded by cheatgrass.	Public or private	Chemical treatment. Research has shown imazapic to be successful in reducing cheatgrass with fall application after a burn.	Serves to protect community and infrastructure by reducing fuel loading.	Fall 2009	H	Monitor for dominance of cheatgrass. Refer to Section 5.1 level 4 for monitoring to determine if species composition has changed.
Pre-planned Fire Breaks	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, such as caprock. (Figure 5.3)	Public or private	Chisel the soil, cut a swath, and fold over, to retain the root structure and prevent soil erosion.	Serves to protect community and infrastructure by reducing fuel loading.	Fall 2009	M	Monitor for soil erosion twice a year. Refer to Section 5.1 levels 1 and 2.



Figure 5.2. Mesquite in the area.



Figure 5.3. Caprock, Quay County.

5.4 FUELS REDUCTION TREATMENT METHODS

Strategic timing and placement of mowing and planned fire 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*).

5.4.1 MOWING

The Core Team has stated that mowing is one of the County's priorities and funding is needed to accomplish this goal. Mowing should take place at least once every growing season and possibly more than once every year, depending on the regrowth of vegetation over the course of the fire season. Areas with cheatgrass and/or other exotic 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 cheatgrass, limiting the production of seedheads will help to control the density and spread of cheatgrass over time.

In areas where there is an encroachment of 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.

5.4.2 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 into the grasslands, such as broom snakeweed (*Gutierrezia sarothrae*), piñon pine (*Pinus* spp.), juniper (*Juniperus* spp.), and other woody species. Similar to mowing, prescribed fires should be conducted along roads surrounding the WUI and around the particular areas at risk, but should take place on a larger scale beyond the road and WUI corridors 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. Cheatgrass is adapted to fire and will easily regenerate at the site following a fire. Other methods to control cheatgrass will be necessary if a large amount of cheatgrass is present at the site. Prescribed fires within the grassland ecosystem should be implemented when the conditions are dry enough for the fine fuels to carry a fire, but not so dry that the fire containment is difficult.

Using prescribed burns can initiate regeneration of grasslands and rangelands, as it facilitates natural ecosystem dynamics such as nutrient and water cycling, which increases variability in vegetation composition and density. Grasslands 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 to periodically 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 treatments, 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.

5.4.3 MANAGEMENT OF SALT CEDAR

The bosque areas, Plaza Largo and Pajarito, in Quay County, similar to many riparian areas in the arid Southwest, support a large infestation of saltcedar (*Tamarix* spp.). Saltcedar is on the state's list of noxious weed species. Saltcedar not only alters the native vegetation and habitat within the riparian ecosystem, but it also reduces stream water levels, changes stream flow, and increases the fire danger within the riparian zone. The eradication and control of saltcedar are not without challenges. Long-term commitment and multiple techniques are required in order to reduce the extent and minimize the spread of saltcedar. Techniques used for the management of saltcedar include mechanical, chemical, and biological methods.

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. Root-cutting and bulldozing can be effective, but the benefits may not exceed the problems resulting from soil damage and the expensive cost of this method. Fire has been used with some success, but because saltcedars are fire-adapted, they readily resprout after fire. Flooding can also be used to control saltcedar if root crowns remain submerged for at least three months. Resprouting is likely to occur following any of these methods, so it is highly recommended to utilize combined methods and follow-up treatments to continue control of this species.

Chemical control is typically the most effective method used to control saltcedar, but it is important to only use herbicides that are approved for application near water. The combination of cutting and chemical application to cut stumps is one of the most common management techniques used for saltcedar. The methods used will depend on the size of the saltcedar stand and characteristics of the riparian area.

Biological control methods have also shown some success, but are still in the experimental stage at this time. One such method is the use of salt cedar leaf beetle (*Diorhabda elongate*) that asserts physiological stress on the tree through defoliation. This treatment coupled with burning in the summer months under intense prescribed fire prescription has been found to be 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.

5.5 RECOMMENDATIONS FOR PUBLIC EDUCATION AND OUTREACH

Public education and outreach is a major focus of the CWPP planning process. Table 5.4 provides a list of recommendations for Quay County (when funding becomes available). These recommendations are valuable because Core Team representatives and members of the public have expressed the need for greater education regarding wildfire in all communities throughout the planning area.

Although many residents are familiar with Firewise, many others could benefit from greater exposure to this program. Workshops demonstrating and explaining Firewise principles provide homeowners with a greater awareness and understanding of home protection from wildfire. 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/USA 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; improving awareness about fire department response and fire department resource needs; distributing fire evacuation plans; providing workshops at demonstration sites showing Firewise landscaping techniques or fuels treatment projects; organizing community clean-ups; 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 5.4. Public Education and Outreach Recommendations

Project	Description	Possible Contact for More Information	Target Date	Resources Needed	Serves To
Volunteer Fire Department (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.
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.	Quay County Sun Newspaper	Weekly column year-round	Columnists, information, and articles to be provided by VFDs, NMSF, BLM, State Land Office, FSA, NRCS, Quay 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.	Burlington Northern-Santa Fe Railroad (BNSF), County, state and federal agencies	Summer 2009	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 railroad.
Increase Signage, particularly fire risk signs	Increase fire prevention signage along highways to reduce human ignitions. Also, post more signs with County Road numbers.	New Mexico Department of Transportation	Summer 2009	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.
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 2009	Prescribed burn prescription, type 6 engines, handcrews, equipment	Protect communities and infrastructure by reducing fuel loads.

Table 5.4. Public Education and Outreach Recommendations, continued

Project	Description	Presented By	Target Date	Resources Needed	Serves To
Increase Landowner Awareness of Methodology to Reduce Invasive Species	Wheeping Lovegrass research. Encourage sharing of success stories and demonstration sites on local landowners' properties. Look to Malpais Borderland Group as an example.	BLM, range scientists, private landowners, Malpais Borderlands Group	Ongoing	Informational handouts, workshop	Protect communities and infrastructure by reducing fuel loads.
Distribute Homeowner Guide to Communities	Provide homeowners with guide through mail or at events where people can pick up.	VFD, Quay County	Summer 2009	Homeowner Guide	Protect communities and infrastructure through increasing public awareness and providing a channel for information for homeowners.
Increase Recruitment of VFDs	Increase awareness and recruitment to VFDs through greater recruiting efforts at public events, in schools, and community planning.	VFD, Quay County, Schools	Summer 2009	Information about VFD and requirements for becoming a volunteer	Protect communities and infrastructure through increased number of able volunteers.
Improve 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 2009	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 Management officials	Fall 2009	GIS software or maps	Protect communities and infrastructure through increased awareness.
Implement Firewise USA Programs	Work with communities to participate in Firewise USA and prepare for fire events.	NMSF	Fall 2009	Firewise educational materials	Protect communities and infrastructure through increased awareness and defensible space.

Table 5.4. Public Education and Outreach Recommendations, continued

Project	Description	Presented By	Target Date	Resources Needed	Serves To
Community Clean-up Days	Promote community activity to remove litter and debris and provide service for removal.	County, City, Towns	Summer 2009	Tools, service to remove waste, volunteers	Protect communities and infrastructure through fuels reduction and defensible space.
Educate Students from Kindergarten through 12th Grade	Increase awareness about fire preparedness through school age appropriate educational programs.	Schools	Fall 2009	Educational Curriculum	Protect communities and infrastructure through increased awareness.
Make Property Owners Aware of the Need for Them to Take Responsibility for Their Own Property	Increase awareness of homeowner's ability to prepare for fire and the limitations of the fire departments.	VFD, County, State and Federal Agencies	Summer 2008	Educational materials, public meetings and site visits.	Protect communities and infrastructure through increased awareness.
Improved Communication among VFDs and Dispatchers when Responding to Fires	Improve communication, provide training to dispatchers, improve response and suppression in the WUI.	VFD	Summer 2009	Training	Protect communities and infrastructure through improved communication and response.
Information on Actions to Take in the Event of Fire	Provide information about who to contact, and phone number, safety zones that people can evacuate to, evacuation routes, how to help fire departments.	Emergency Management officials, municipal governments, VFD	Summer 2009	Contact list, evacuation routes and locations of safety zones	Protect communities and infrastructure through increased awareness.
Plan for People who are in Need of Assistance	Pre-planning for those who will need assistance in the event of a fire will decrease the risk of someone getting hurt.	Emergency Management officials, municipal governments, VFD, neighbors	Summer 2009	Contact list of those who need assistance provided to VFDs	Protect communities and infrastructure through increased awareness and planning.

5.6 RECOMMENDATIONS TO REDUCE STRUCTURAL IGNITABILITY

Table 5.5 provides a list of recommendations for reducing structural ignitability in Quay County. Reduction of structural ignitability depends on public education that provides homeowners the information they need to take responsibility for protecting their own property. Preparing for wildland fire by creating defensible space around the home is an effective strategy for reducing structural ignitability. Education about managing the landscape around a structure, such as removing weeds and debris within a 30-foot radius and keeping the roof and gutters of a home clean, are two methods for creating defensible space. Raising awareness among community members about the benefits of cutting grass and trees on their property is also essential for successful household protection. Shared information and communication among neighbors strengthens a community's ability to reduce the likelihood of structural ignitability. An increased network of people prepared for fire helps increase safety. More detailed information is provided in Appendix E.

While individual actions are necessary to reduce structural ignitability, actions taken on the County level are another important consideration. The International Code Council (ICC) published the International Wildland Urban Interface Code, which provides minimum regulations for land use and the built environment in the designated WUI areas. The standards for the codes are based on data collected from tests and incidents, technical reports, and mitigation strategies from various countries around the world. These codes address the mitigation of fire in the WUI (ICC 2006). At this time, the Core Team does not recommend Quay County adopting the ICC WUI codes. The primary reason for not recommending adoption of the ICC codes is due to a lack of resources to provide enforcement of the code. Presently the County relies on the state to enforce codes and does not have the resources to enforce codes at the County level.

5.7 RECOMMENDATIONS FOR IMPROVED FIRE RESPONSE CAPABILITIES

Volunteer fire departments (VFDs) are the primary source of assistance for fire protection and response in Quay County. (Figure 5.4) Community involvement, along with financial support, is imperative to maintain operations in the fire departments. Securing adequate water supply, continued training, and equipment maintenance are among some of the foremost concerns for improving fire response capabilities. Table 5.6 provides recommendations that will help improve VFD fire response capabilities in Quay County.

Table 5.5. Recommendations to Reduce Structural Ignitability

Location	Project	Goals and Objectives	Priority	Potential Agencies and Groups to Carry Out Education
Fire departments throughout the planning area should provide information to or organize workshops for homeowners to teach them techniques to reduce structural ignitability. The following recommendations should be followed by homeowners (Source: Firewise, USFWS, NMSF):				
Quay County	Defensible space	Educate homeowners on defensible space practices: 1. Remove all but scattered trees within 30 feet of structures. 2. Keep grass green and mowed 100 feet from structures. 3. Keep flammable materials (woodpiles, etc.) at least 30 feet from structures. 4. Surround foundations with rocks or gravel to a width of 1 foot.	High	Homeowners, NMSF, fire departments
Quay County	Accessibility	Inform homeowners about the importance of keeping driveways clear and accessible for fire engines.	High	Fire departments, NMSF
Quay County	Green waste	Inform homeowners about the importance of cleaning up green waste and clearing debris from around structures, in gutters, and under decks.	High	Fire departments, NMSF
Quay County	Install screens	Inform homeowners about the importance of installing metal screens on all openings and around decks to prevent embers entering/collecting.	High	Fire departments
Quay County	Replace roofs with fire resistant materials	It may be costly, but replacement of old roof construction to roofing made of inflammable material can lower ignitability.	Low	Fire departments
Quay County	Propane tanks	While this activity can be cost prohibitive, it is still important to inform homeowners about the importance of relocating propane tanks underground or removing surrounding flammable materials to distance of 10 feet.	Moderate	Fire departments, CID propane
Quay County	Windows	Inform homeowners about the importance of replacing single-pane glass and plastic skylights with tempered double-pane glass.	Low	Fire departments
Quay County	Create a streamlined procedure for obtaining permits for pile burning, broadcast burning and burning trash. Include information about fire prevention to those receiving permits.	Create a more manageable system for tracking the intentional fires in the County.	Medium	Quay County

Table 5.6. Recommendations for Improved Fire Response Capabilities

Project	Fire Department	Possible Solution	Target Date	Contact
Provide Adequate Water Supplies at Fire Stations	All VFDs	Obtain funding to improve water supply systems at fire stations	Summer 2009 (this is an on-going process)	VFDs and Quay County
Increase Water Sources and Water Delivery Systems, particularly in areas adjacent to CRP lands	All VFDs	Obtain funding to purchase equipment	Summer 2009 (this is an on-going process)	VFDs and Quay County
Need a Better Water Refill Station for Fire Engines	All VFDs	Obtain funding to purchase water refill station	Summer 2009 (this is an on-going process)	VFDs and Quay County
Improve Road Accessibility, particularly on "track" or undeveloped roads	All VFDs	Obtain funding for road improvements	Fall 2009 (this is an on-going process)	Quay County
Provide Maps with Accurate Information about Road Access and Water Supply	All VFDs	Quay County GIS may be able to provide	Fall 2009 (this is an on-going process)	Quay County
Provide Training to Dispatchers to Communicate Clearly and Understand the Areas Served by the Various Districts, to improve response and suppression in the WUI	All VFDs	VFDs provide training	Summer 2009 (this is an on-going process)	VFDs and Quay County
Purchase Improved Equipment	All VFDs	Obtain funding to purchase equipment or make trade agreement with other fire stations	Fall 2009 (this is an on-going process)	Funding Agencies
Provide Funding and Training for VFD to Obtain Red Cards and other Trainings	All VFDs	Obtain funding for training, organize training in Quay County so more people can participate	Summer 2009 (this is an on-going process)	Funding Agencies and State Forestry
Training to Understand Addressing System in the County	All VFDs	Work with County to improve understanding	Summer 2009	Quay County



Figure 5.4. San Jon volunteer fire department.

5.8 IDENTIFY TIMELINE AND PROCESS FOR UPDATING THE CWPP

The CWPP is a living document and should be revised as environmental conditions change or social issues arise. As the needs of communities and community members shift or environmental conditions change, the CWPP will need to be modified. The Core Team has determined that they should reconvene annually to update and modify the plan as needed. The plan should be modified to reflect changing conditions and priorities in the County, and those involved will review and update the recommendations to reflect which projects have been accomplished, as well as list new projects. Members of the Core Team communicate regularly about fire response and operations in the County, meaning continued communication regarding the CWPP should be feasible.

5.9 CONCLUSION

This document is designed to aid the communities and individuals of Quay County in wildfire protection planning. Quay County's CWPP describes the conditions in the fire environment, along with the community structure, and addresses the risks of wildland fire to communities in the County. The risks and hazards have been clarified through public involvement, collaborative planning, Core Team participation, and GIS data and modeling. Once the risks and hazards were identified, the planning process turned to finding solutions to reduce the risk of wildland fire. Recommendations falling into the categories of fuels reduction, public outreach and education, reducing structural ignitability, and improving fire response capabilities were outlined and will potentially be implemented. The CWPP alone does not require implementation of any of the

recommendations; however, the support and momentum driving the planning process will hopefully lead to active implementation. Securing funding will aid in the completion of many of the project goals. Please see Appendix F for a list of funding opportunities that may be appropriate for implementing these types of projects. Yet, many of the recommendations for public outreach and education can be accomplished with little or no funding. Community planning and grass roots organizing have proven to be very effective in terms of reducing the risk of life and property in many Firewise communities throughout the country. Some of these communities offer positive examples of how rural communities can prepare for wildland fire.

The development of this document has required multi-party collaboration across a region almost 3,000 square miles in size. The Core Team meetings were attended by a wide cross section of people, which enabled the plan to consider various suggestions, concerns, and recommendations. With the limits of government support for fire suppression, environmental conditions that lead to fuels being highly prone to ignition, and the increasing WUI and unpredictable events in nature, it is important for individuals and communities to take actions to prepare for wildland fire events. This document provides tools and information that should be widely shared with community members throughout the County and practiced in an effort to protect community values, landscapes, and land-based heritage.

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**APPENDIX A
CONTACT LIST**

Quay County Community Wildfire Protection Plan

Quay County Core Team			
Agency or Organization	Name	Position	Office Phone
Local Organizations and Municipal Governments			
Quay County	Richard Primrose	Quay County Manager	505-461-2112
Quay County Fire Marshal	Donald Adams	Quay County Fire Marshal	505-461-3645
Quay County Representative for local emergency planning	Paula O'Steen		505-461-1671
Quay County Sheriff's Office	Mark Dahlsten	Patrol Corporal	505-461-2720
Local Governments Law Enforcement	Joe Schallert	Quay County Sheriff	505-461-2170
Union Pacific	Leo Marquez		505-461-8630
Union Pacific	Rubin Rivas	Manager of Track Maintenance Engineering	806-249-5722
Federal Agencies			
BLM Roswell Field Office	Chuck Schmidt		505- 627-0272
New Mexico Environment Department (NMED)	Paula O'Steen		505-760-7961
USDA - NRCS	Jim Norris	District Conservationist	505-461-3612 x.3
State Agencies			
Canadian River Soil and Water Conservation Districts	Tommy Wallace		505-357-8652
Southwest Quay Soil and Water Conservation Districts	Jimmy Joe Jester		
EMNRD Forestry Division, Las Vegas	Ernesto Hurtado	District Forester	505-425-7472
EMNRD Forestry Division, Albuquerque	Terrell Treat	Wildland/ Urban Interface Specialist	505-345-2200
EMNRD Forestry Division	Eugene Pino	Fire Management Officer (FMO)	
EMNRD State Parks Division, Ute Lake State Park	Jared Langenegger	Region II Manager	505-461-6049
EMNRD State Parks Division, Ute Lake State Park	James Gurule	Park Manager, Ute Lake State Park	505-487-2284
Environment Department	Carlos Romero		505-461-1671
NM Game and Fish	Jan Ward	Assistant Chief Conservation Services Division	505-476-8114
NM Game and Fish	George Farmer		
New Mexico Department of Transportation (NMDOT)	Ed Lafferty		505-461-0414
City and Village Managers			
Tucumcari	John Sutherland Jr.		505-461-3451
	Scot Jayne	Information Systems Specialist	505-461-2143
Logan	Larry Wallin		505-487-2239
San Jon	Bobbie Rose		505-576-2922
	Ben Gates	Police / Fire Dept	505-576-9611
House	Linda Lavendar		505-279-7372
Quay County Fire Districts			
Tucumcari	Mike Cherry	Fire Chief / Emergency Manager	505-461-4400
	Kalon Lafferty	Deputy Chief	505-461-4400
	Larry Rigdon	Deputy Chief / EMS Director	505-461-2558

Quay County Core Team			
San Jon	Jonathan Brashear	Chief	505-576-2567
	Rodney Stoner	A. Chief	505-576-2567
	Ronnie Stoner	Dir. Ambulance	505-576-2567
	Debbie Stoner	A. Dir. Ambulance	505-576-2567
Logan	Rex Stall	Chief	505-487-2666
	Manuel Trujillo	A. Chief	505-487-2666
	Annette Shivers	Ambulance	
House	Mike Morrow	Chief	505-279-7777
	Judy Morrow		
	Hilous Hargrove	A. Chief	505-279-7777
	Sherman Martin	Ambulance	
Rural 1	Mark Preciado	Chief	505-461-2760
	Clint Brockman	A. Chief	505-461-2760
Rural 2	Pete Tatschl		505-576-2953
	Shane Jennings	Chief	505-461-1653
	Danny Wallace	A. Chief	505-461-1653
	Tommy Wallace	Rural 2 & CRSWCD	505-760-5675
Rural 3	Del Choate	Chief	
	Dallas Dowell	A Chief	
Bard-Endee	Donald Adams	Chief / County Fire Marshal	505-576-2233
	Don McCoy	A. Chief	505-576-2233
Porter	Nathan Wallace	Chief	505-576-1911
	Tim Foster	A. Chief	505-576-1911
Nara Visa	Gary Girard	Chief	505-633-2888
	Gary Earle	A. Chief	
	Jimmy Valentine		505-633-9125
Quay	Gerald Hight	Chief	505-487-2002
	Paula O'Steen	Amb. Dir.	505-487-2202
Jordan	Jack Akin	Chief	505-458-7621
	Bill Noland	A. Chief	505-458-7621
Forrest	Ray Rush	Chief	505-458-6532
	Joe Garrett	A. Chief	505-458-6532

APPENDIX B
PUBLIC COMMENTS

QUAY COUNTY WILDFIRE QUESTIONNAIRE
Responses to Community Comment Form

What areas (man-made and/or natural) are the most important to protect from wildfire?
Housing & heavier populated areas including areas around fire houses.
Electric distribution, gas distribution, heaviest populated areas, fire protection sites.
House & structures with H.
Houses surrounded by wildfire fuel.
Areas full of wildlife & people.
Homes, other structures, grasslands.
Man-made - understand the US Forestry people & others realize that burning is natural & healthy however years of protection has created a hotter burn. Control burns and clean up.
Man-made and natural - Homes-animals contained in man-made fences.
Our homes and schools.
Houses, water sources, livestock, personal life
Homes, grasslands.
Grasslands, homes
Homes, livestock & facilities, crops
Habitat for homes & wildlife
Homes
Hospitals, homes, daily use businesses
Homes
Pajarita Creek area
Canal
Creek on property - fire hazard
Pajarita Creek
grass/forest lands
West Torer Road I
All
Houses, grass, all property
Houses or other dwellings
Home
grass, fence, house, and other buildings
My home.
My home and barns.

Responses to Community Comment Form, continued

What areas (man-made and/or natural) are the most at risk in the event of wildfire?
The creek choked with salt cedar.
Farm & ranch along major highways.
Areas with high vegetation
Homes, barns, & grasslands.
High vegetation areas. Agricultural storage
Grass areas, entire state of New Mexico because of dry climate.
Grasslands & structures
Man-made areas should be prepared for such an event - clear brush (have a safe-zone) natural is more at risk - more vulnerable.
Man-made living areas and/or natural wildlife habitats.
Junk around house.
Homes
Homes, pastures.
Both
Grasslands and cattle or crops.
Salt cedar river along creek
Rangeland, Riparian, woodland.
Camping areas.
Open grassland & Poor kept properties.
Brushy areas.
Same (Pajarita Creek area)
Creek on property - fire hazard
Pajarita creek
grasslands
All
All
House, grass, crop, all property
grass pastures
Dry grass, crops.
Grasslands.
Grass - wheat fields

Responses to Community Comment Form, continued

What information would you like to have to be more prepared for fire in the community?
Road access points to fires
Access & possible water supply.
Weather situation, wind, hot dry
Good maps for firefighters.
Communication.
Reassurances available.
General, common sense information on the actions to take - who to contact & evacuation routes from a house or community.
Escape routes.
Why a siren truck has to burn to ground before dispatched sends correct fire department to scene.
How to get to fires.
Where is the best place to help - or what can we do to help in case of wildfires.
Locations of nearest water supply. Phone numbers.
Warnings by phone.
Community education/prevention
Public safety classes, training, evacuation plans.
Water sources (rural).
Remove salt cedars
How to prepare surrounding land & limit danger of wildfire.
911 & I-40.
Better equipment & More communication.
Better dispatchers, where water is.
County road numbers.
Good or better dispatchers
Better trained dispatchers are needed.
Dispatcher needs to speak clear and slow to make it better to understand them.

Responses to Community Comment Form, continued

What actions could the community take to protect homes and the community in the event of wildfire?
Community needs to keep weeds & grass mowed down around houses.
Keep weeds & debris away from homes. Make sure to notify county if doing any controlled burns.
Keep areas clear of high weeds and flammable material.
Good water reserves to fill trucks.
Community education.
We have a strong volunteer fire department.
Keep trash & weeds & brush away from structure.
Good communication, well trained fire fighters, clean-up ordinances. Community needs to support & be reasonable in their actions & attitudes.
Escape plans, H2O hook-ups, hoses to wet roof-tops. Prevent fire hazards.
Old trees & houses.
Keep grass short.
Have a green belt ground structures, have an escape route. Have water available.
Careful of man-made fires - keep weeds & trash mowed down & picked up.
Resource phone calls.
Have evacuation.
Fire drills. Community education.
Community education.
Mowing, brush suppression.
Plan for people who are in need of assistance.
Need firewall.
Clear out salt cedar.
More fire fighter
Call the homing as wildfire.
Clear all dry brush around property.
Mow grass down close to homes and other buildings.
Be a supporting member of your local f. d..
Mow around your place.
Volunteer for local fire dept. service clean up trash and obstacles from around buildings.
Clean up around homes and community building.

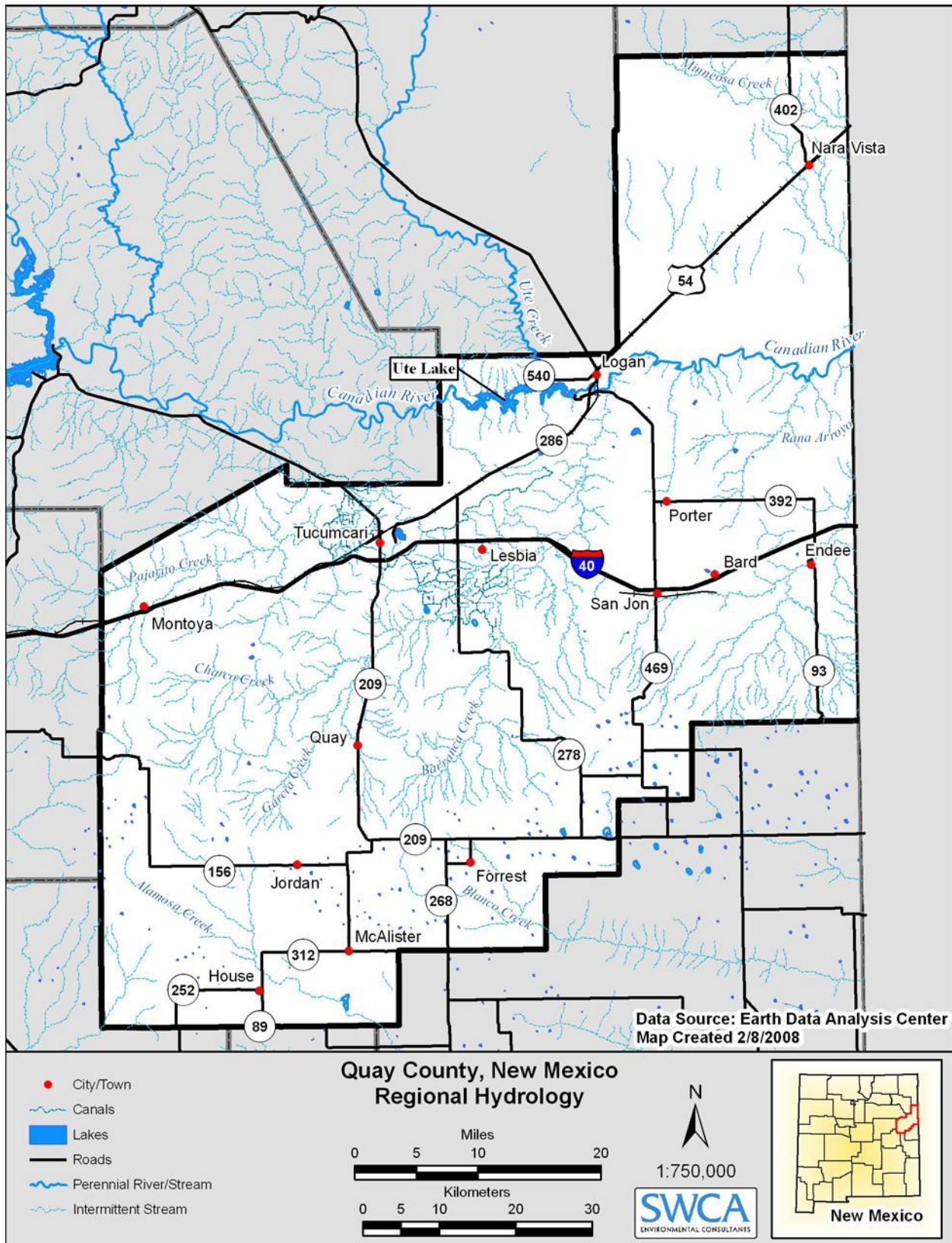
Responses to Community Comment Form, continued

What would you like fire emergency service agencies and personnel to know about protecting your community from wildfire?
We need a better water refill station for the fire trucks.
The exact location of an emergency, like the name of the person that has the emergency.
Where all homes are located to population of homes.
We need better water delivery systems.
Not sure.
What ever they need that I have is theirs.
Well aware of the mapping of an area & have well informed dispatch. Well maintained equipment.
I feel they do a very good job. Thanks.
For dispatch to learn correct areas for local fire departments.
I don't really know - special care in dry areas.
How to fight wildfires & homes! More training.
About preexisting hazards.
How to get help from mayor, entities as USFS, NMSF to provide air suppression equipment.
Wildland certified classes.
Water sources, roads.
It would be impossible to fight fire if it got started.
E911
Fire planner.
Where every body lives.
Understand addressing system better.

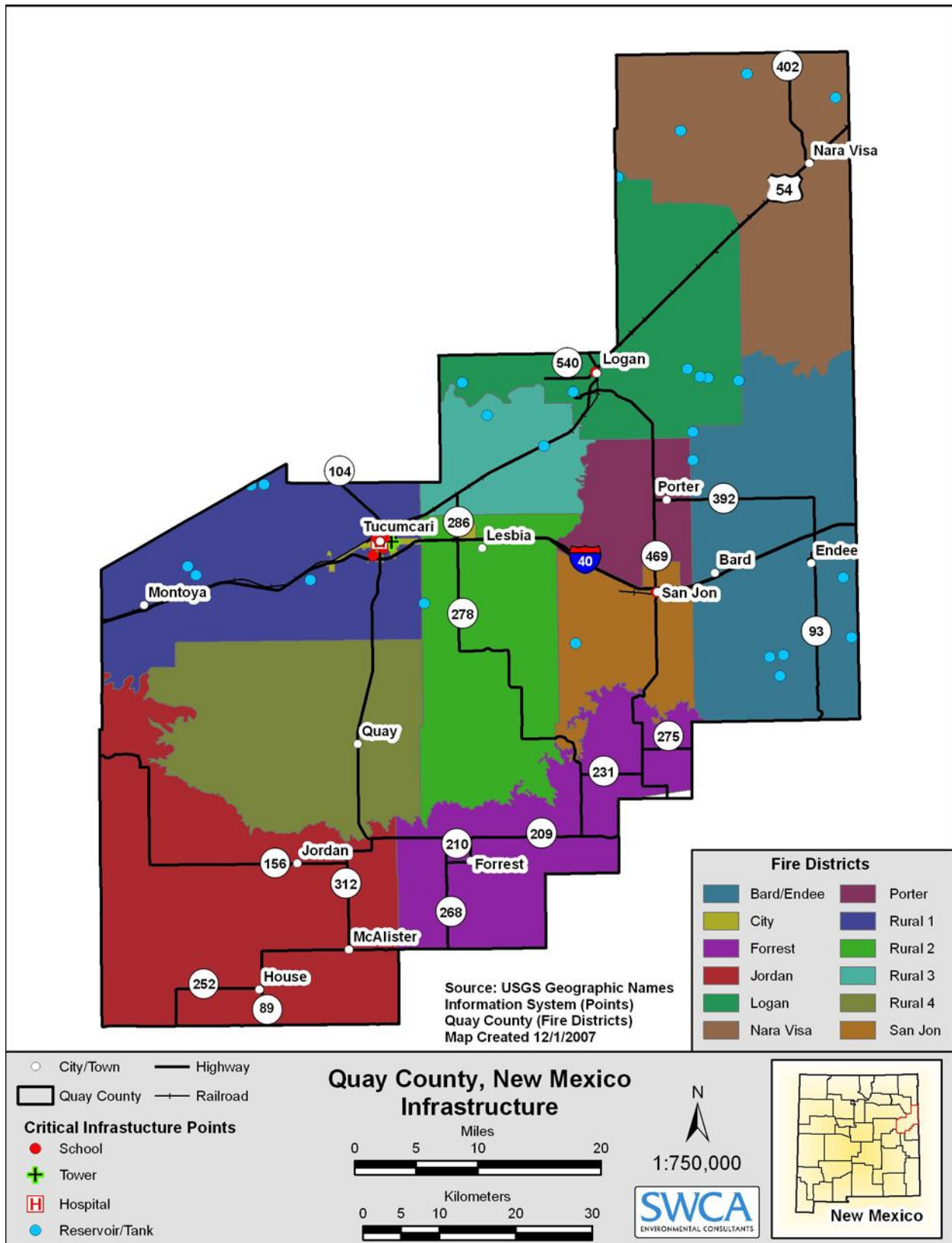
Responses to Community Comment Form, continued

Other Questions and Comments:
Need a major refill tank for initial contact.
Need more water filling facilities.
We need more water to fight fires.
Cell service - not good in many areas to report fires. Faster road graders big asset in high winds to have fire guard.
Clear area.
More community education.
More funds, tech. Equipment.
We have great districts they work hard they just need more support.

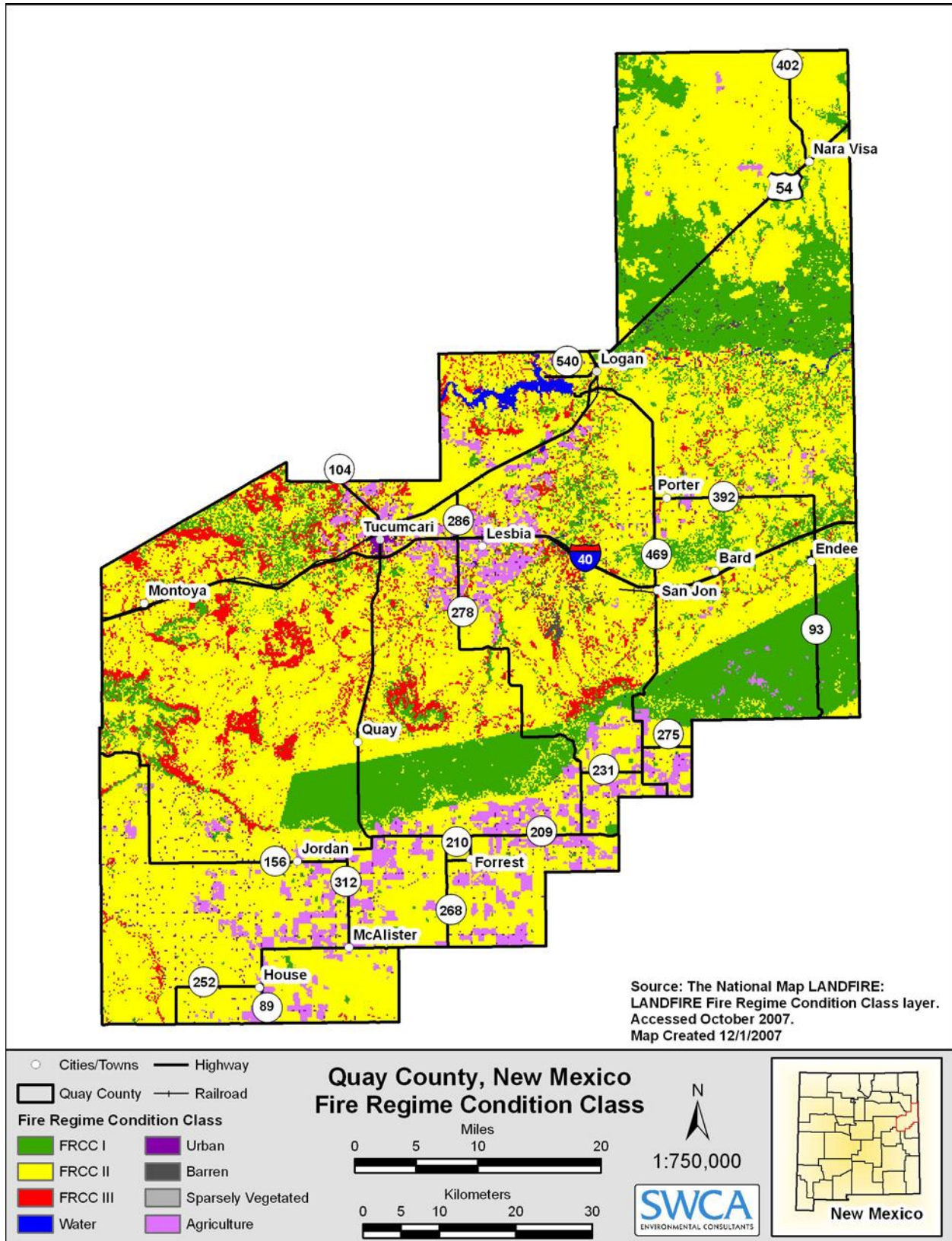
APPENDIX C
MAPS



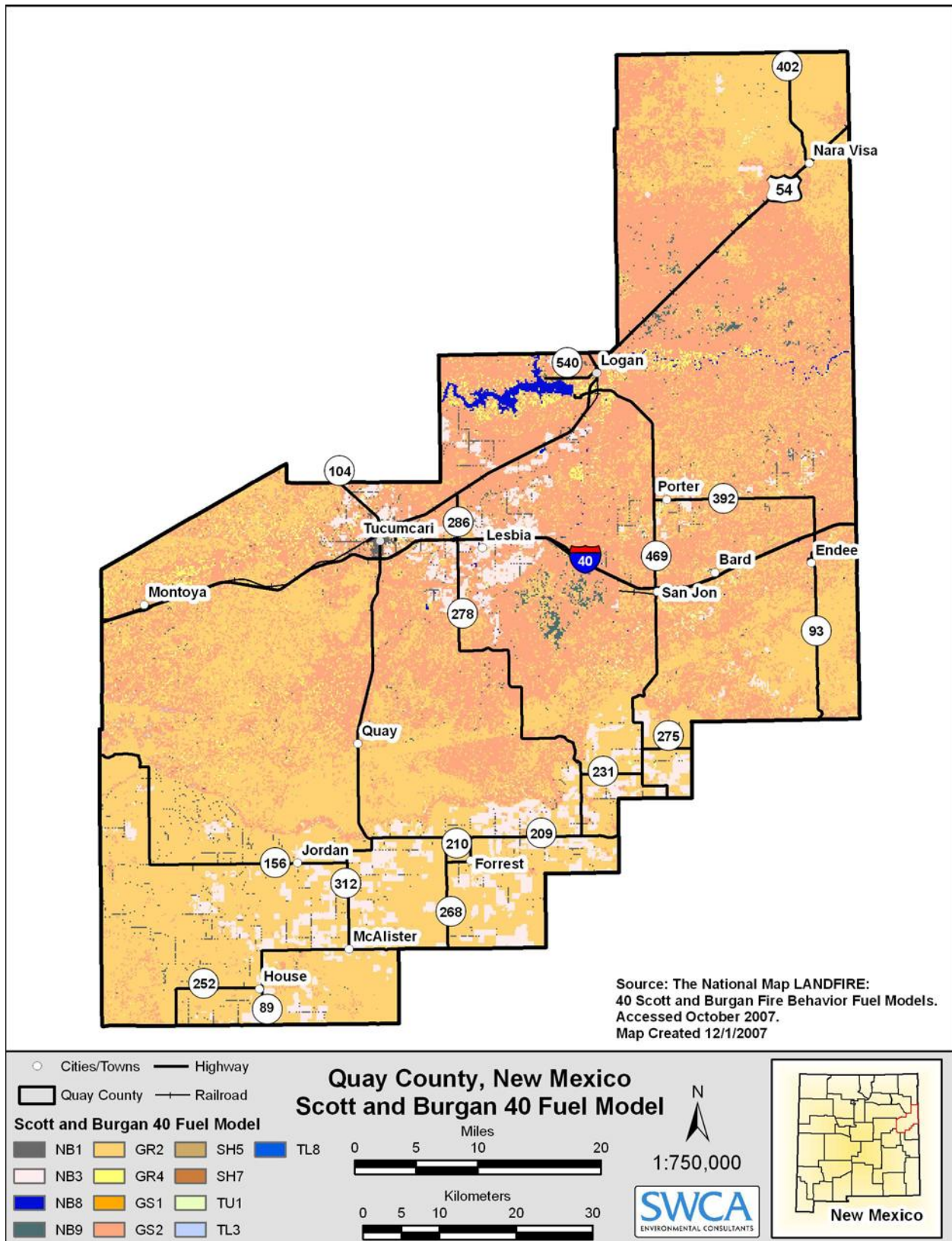
Map 1. Quay County hydrology.



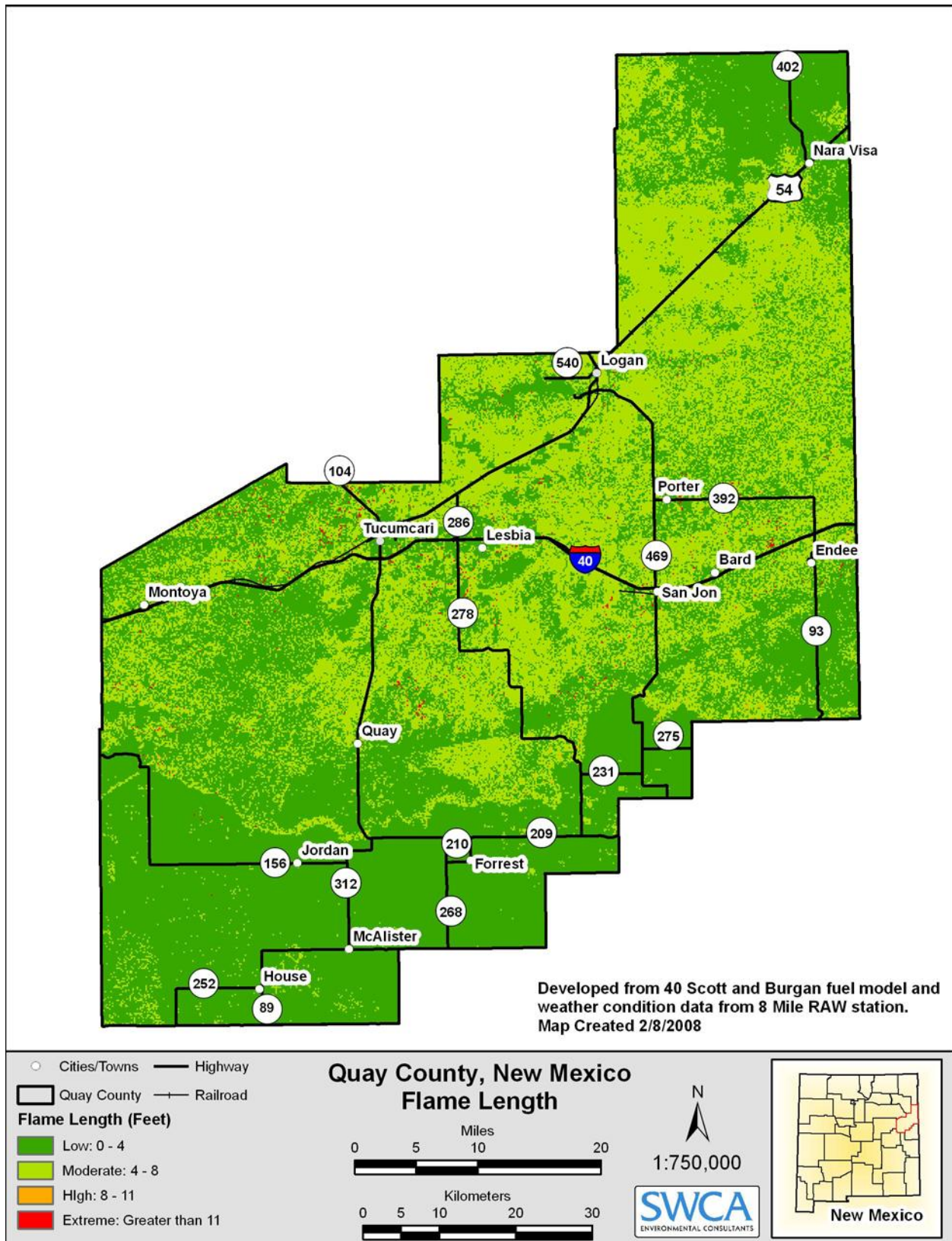
Map 2. Quay County infrastructure.



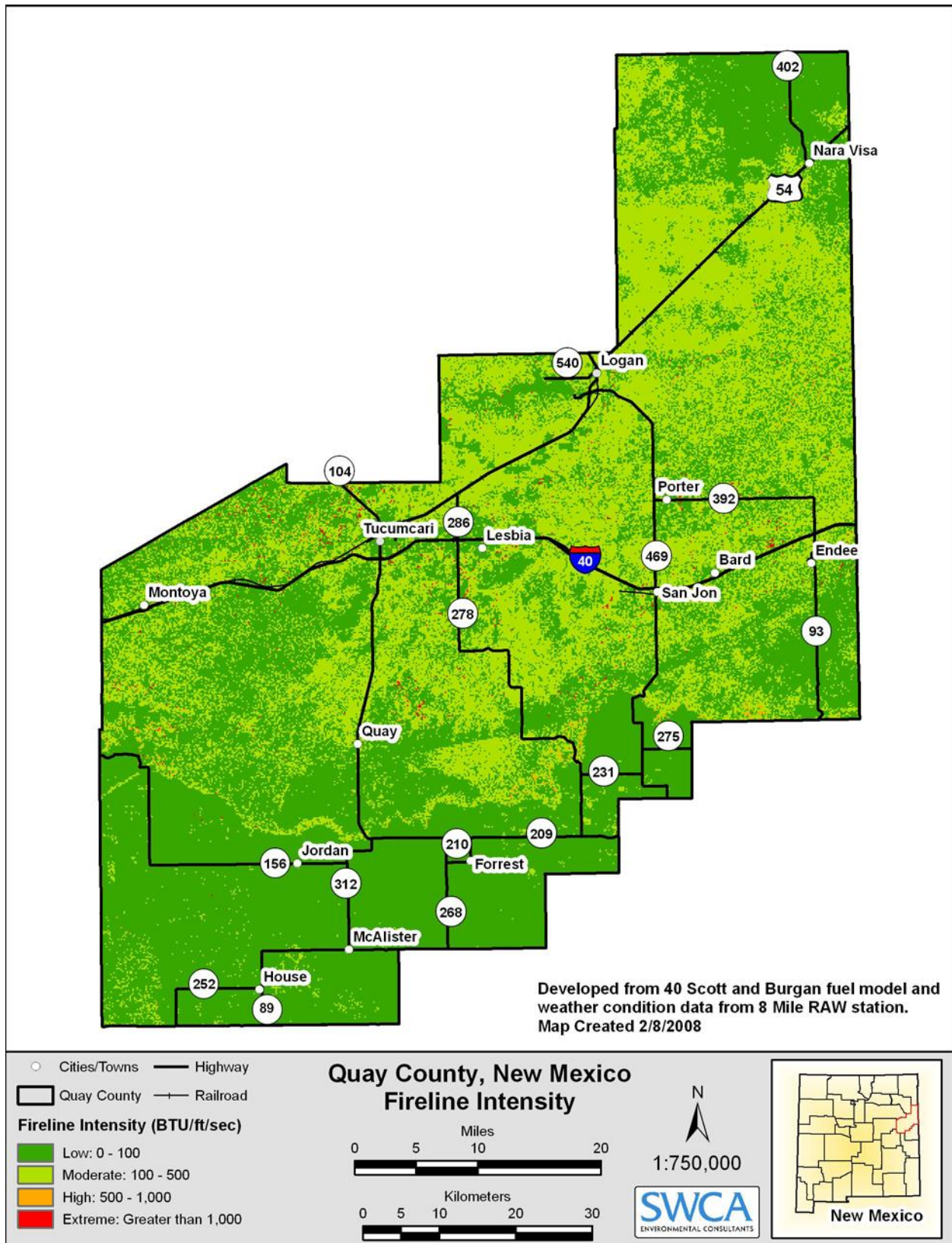
Map 3. Quay County fire regime condition class.



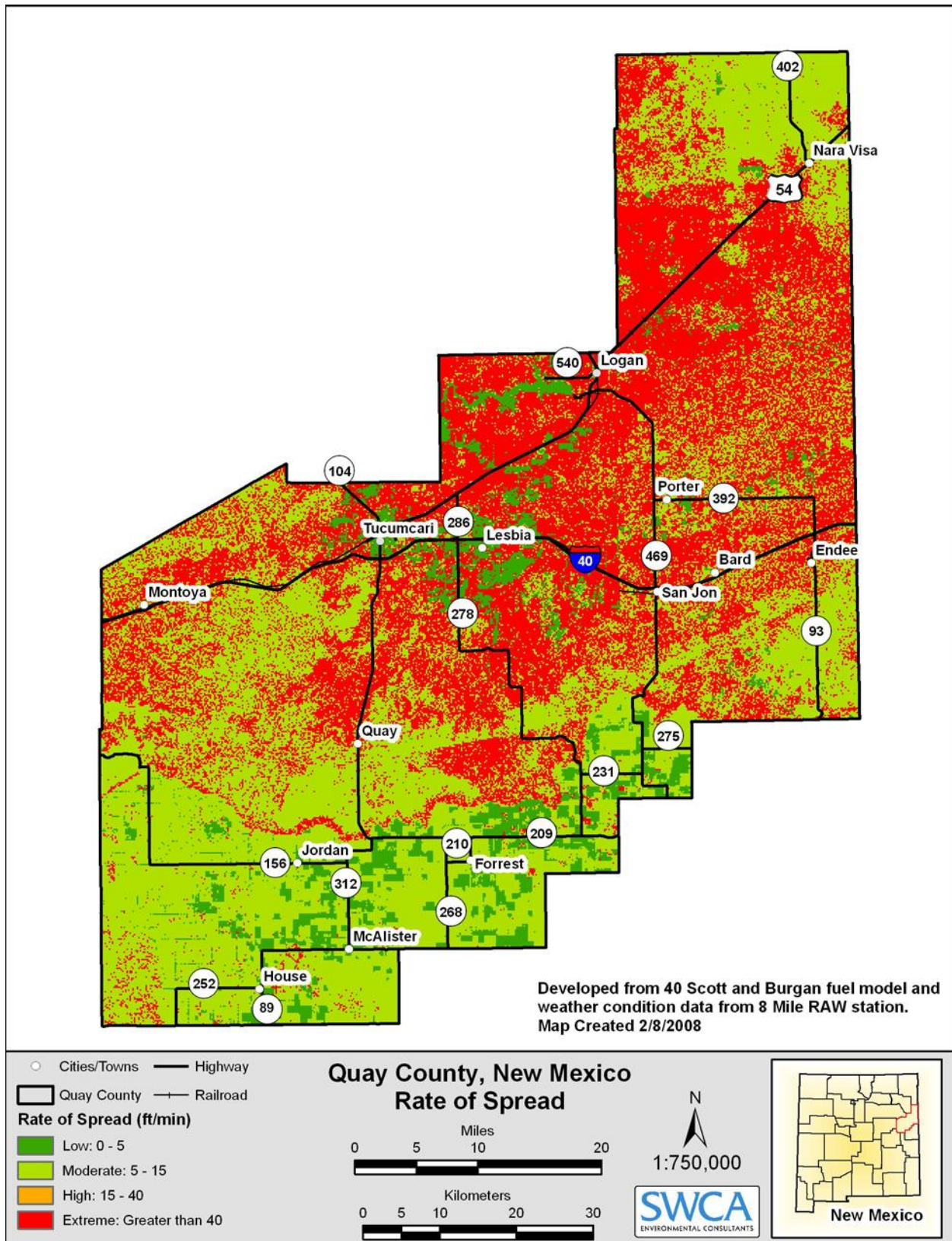
Map 4. Quay County fuel model.



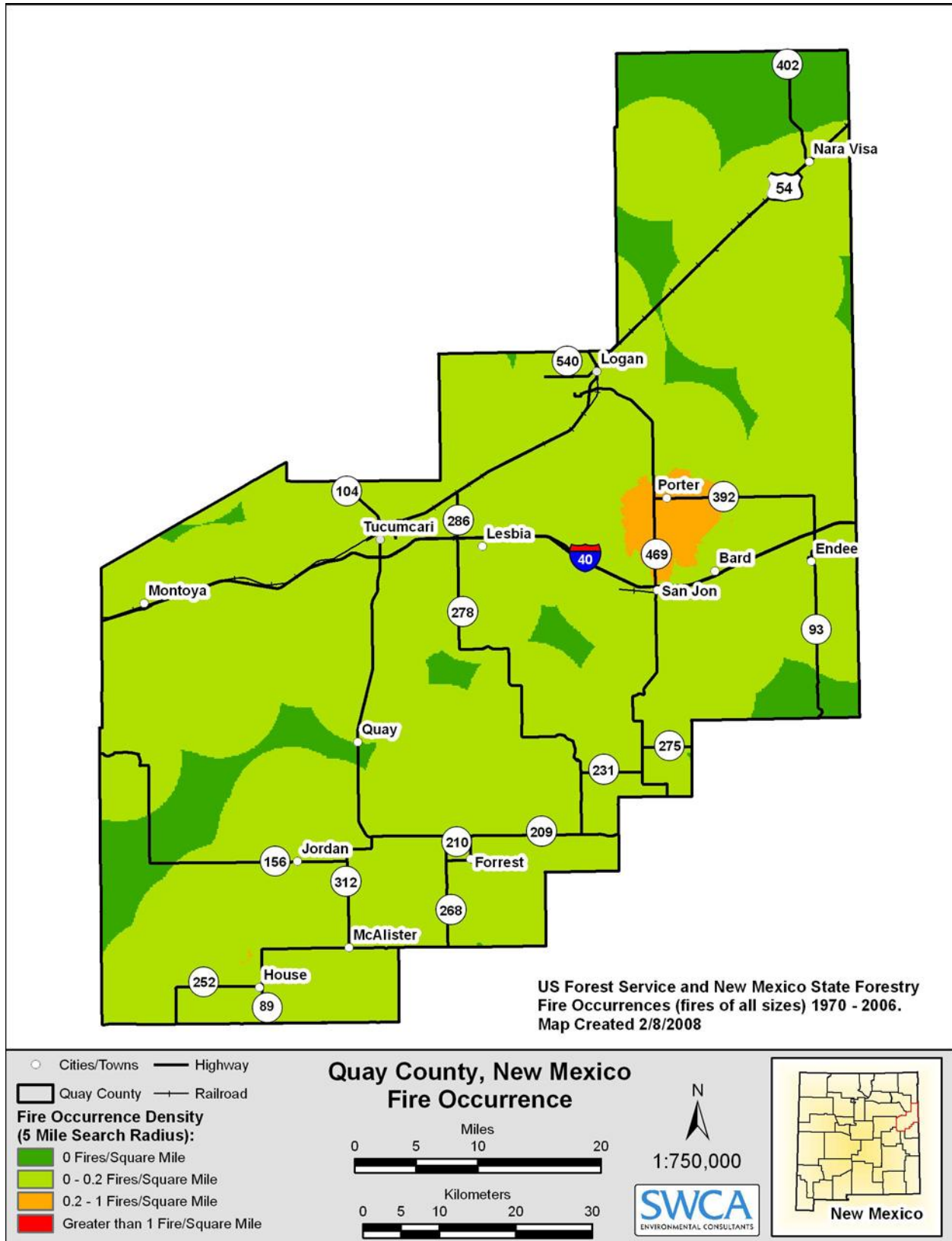
Map 5. Quay County flame length.



Map 6. Quay County fireline intensity.



Map 7. Quay County rate of spread.



Map 8. Quay County fire occurrence.

APPENDIX D
FIREFIGHTING RESOURCES

Quay County Fire Districts and Physical Addresses

Fire District	Physical Address
Fire District 1, Main	1100 Camino del Coronado, Tucumcari
Fire District 1, Substation	6649 Quay Road AR, Tucumcari
Fire District 2, Main	3303 State Highway 278, Tucumcari
Fire District 2, Substation	3032 State Highway 278, Tucumcari
Fire District 3, Main	3450 Quay Road 72, Tucumcari
Fire District 3, Substation	2901 Quay Road 67, Tucumcari
Fire District 3, Substation	6702 Quay Road AD, Tucumcari
Fire District 4, Quay	4209 Quay Road 46, Quay
Forrest Fire District	209 State Highway 210, Forrest
Jordan Fire District, Main	5613 State Highway 156, Jordan
Jordan Fire District, Substation	3699 Quay Rd BH, Ima
Jordan Fire District, Substation	3229 State Highway 252, McAlister
Porter District, Main	1751 Quay Road 65, Porter
Bard-Endee, Main	1097 Route 66, Bard
Bard-Endee, Main	325 State Highway 93, Endee
Nara Visa, Main	380 Bell Street, Nara Visa
Tucumcari, Main	206 E. Center, Tucumcari
Logan, Main	108 B Highway 54, Logan
Logan, 2nd station	303 Carp, Logan
San Jon, Main	416 Elm, San Jon
House, Main	Box 674, House, phone 505-760-0771

					Phone	
NAME OF DEPARTMENT			Bard-Endee Fire District		Office 576-2233	
DIRECTOR OR CHIEF			Donald Adams		Home 576-2210	
ADDRESS			1097 Route 66			
CITY			Bard N.M.	ZIP	88411	cell 403-7911
OFFICERS	TITLE			RADIO CALL NUMBER		
Don McCoy	A. Chief			6		
Linda Adams	Sec.			2		
Louis Brown	Batt. Chief			5		
Donald Carter	Batt. Chief			24		
EQUIPMENT						
VEHICLE TYPE	TANK SIZE		GPM	4X4	UNIT CALL NUMBER	
CLASS A PUMPER	1000		1000		# 2	
CLASS A PUMPER	500		500		# 7	
TANKER	6,500		350		# 18	
TANKER	2,000		300		# 5	
BRUSH	1000		250	YES	# 3	
BRUSH	1650		350	YES	# 6	
BRUSH	500		250		# 1	
RESCUE/BRUSH	300		250	YES	# 4	
RESCUE/SERVICE	500		350		# 8	
AIR TRAILER	5 4,500 PSI AIR CYLINDERS		E SIZE		A.T.	

					Phone	
NAME OF DEPARTMENT Forrest					OFFICE _____	
DIRECTOR OR CHIEF Ray Rush					HOME : 505-458-7184 _____	
ADDRESS 4143 Quay Road 36						
CITY McAlister, N.M.					ZIP 88427	CELL : 505-760-1521 _____
OFFICERS						
		TITLE	RADIO CALL NUMBER			
Joe Garrett		Assistant Chief				
Diana Rush		Secretary				
David Rush		Training Officer				
Teke Gunn		Captain				
EQUIPMENT						
VEHICLE TYPE		TANK SIZE		GPM	4X4	UNIT CALL NUMBER
Class A / 1986 Ford		1,500 gal.		750		# 3
Class A / 1992 International		1,500 gal.		750		# 4
Class A / 2005 International		1,250 gal.		1,000		# 5
CAFS						

					Phone
NAME OF DEPARTMENT				House Fire Department	
					OFFICE 505-279-7777
					HOME 505-279-6192
CHIEF	Mike Morrow				
ADDRESS	Box 674				
CITY	House	ZIP	88121		CELL 505-760-0771
OFFICERS	TITLE	RADIO CALL NUMBER			
Mike Morrow	Chief	18			
Hilous Hargrove	Asst. Chief				
Oscar Lerma	Captain				
Judy Morrow	Secretary	17			
Wayne Harris	Treasurer/ EMS Dir.				
EQUIPMENT					
VEHICLE TYPE	TANK SIZE		GPM	4X4	UNIT CALL NUMBER
Rolling Pumper	1000 g		1000	Yes	5
Rolling Pumper	1250 g		750	Yes	4
Brush Truck	850 g				2
Stationary Pumper	500 g		500		1
Pickup	N/A		N/A		Rescue/Service 1
Suburban	N/A		N/A	Yes	Utility 1
Ambulance	N/A		N/A		Ambulance

					Phone	
NAME OF DEPARTMENT Jordan					Office: 505-458-7621	
DIRECTOR OR CHIEF Jack Akin					Home: 505-458-6491	
ADDRESS 4735 B Quay Road 36.						
CITY McAlister N.M. ZIP 88427					Cell: 505-799-0030	
OFFICERS						
	OFFICERS	TITLE	RADIO CALL NUMBER			
	Bill Noland	Bat. Chief				
	Randy Jennings	Bat. Chief				
	Eddie Shoemaker	Bat. Chief				
	Cora Jester	Secretary				
	Jim Jester	Truck Maintance				
EQUIPMENT						
	VEHICLE TYPE	TANK SIZE	GPM	4X4	UNIT CALL NUMBER	
	Class A /Tanker-CAFS	2,000 gal.	750		# 1	
	Tanker	2,000 gal.	500		# 8	
	Tanker/Pumper	1,500 gal.	500		# 7	
	Wildland/Pumper	1,100 gal.	300	yes	# 5	
	Wildland/Pumper	1,000 gal.	250	yes	# 6	
	Mini-Pumper	300 gal.	250		# 2	
	Brush Truck	100 gal.	HP 15		# 4	
	Van Rescue CAFS	30 gal.	20		# 3	

					Phone	
NAME OF DEPARTMENT			Logan Fire Department			OFFICE <u>487-2284</u>
DIRECTOR OR CHIEF			Rex Stall	801		HOME <u>487-5454</u>
ADDRESS			P.O. Box 128			
CITY			Logan, New Mexico	ZIP	88426	CELL <u>487-7540/403-8233</u>
OFFICERS	TITLE	RADIO CALL NUMBER				
Rodney Paris	A.Chief					
© 403-7044						
Chet Gurule						
© 403-5381	Training Officer					
EQUIPMENT						
VEHICLE TYPE	TANK SIZE		GPM	4X4	UNIT CALL NUMBER	
Command Unit	n/a		n/a	yes	801	
Rescue	n/a		n/a		Rescue 81	
Class A Pumper	1250		1250		Engine 82	
Class A Pumper	750		750		Engine 83	
Class A Pumper	500		1250		Engine 88	
Class A Pumper	1000		1250	yes	Engine 89	
Type 6 Brush	250		150	yes	Brush 84	
Type 6 Brush	250		150	yes	Brush 85	
Type 6 Brush	250		150	yes	Brush 86	
Type 4 Brush	700		150	yes	Brush 81	

				Phone	
NAME OF DEPARTMENT			Nara Visa		
			OFFICE <u>575-633-2888</u>		
DIRECTOR OR CHIEF			Gary Girard		
ADDRESS			380 Bell		
CITY			Nara Visa N.M.		ZIP <u>88430</u>
			CELL <u>575-487-7084</u>		
OFFICERS		TITLE	RADIO CALL NUMBER		
Gary Earle		Asst. Chief			
EQUIPMENT					
VEHICLE TYPE	TANK SIZE		GPM	4X4	UNIT CALL NUMBER
1987 GMC Class A	750		500		# 4
1976 Ford Class A	750		250		# 2
1959 GMC Class A	700		250		# 1
1980 Dodge Power Wagon	250		100	yes	# 3
1984 AM General	1,000		200	yes	# 6
Army Truck	5,000		400	yes	# 5
Semi-Truck					

				Phone		
NAME OF DEPARTMENT			Porter			
			OFFICE <u>576-1911</u>			
DIRECTOR OR CHIEF			Nathan Wallace			
ADDRESS			6587 Quay Road Q			
CITY			ZIP	88434		
			CELL <u>403-7683</u>			
OFFICERS						
OFFICERS		TITLE		RADIO CALL NUMBER		
Jamie Burton		Assistance Chief		35		
Dan Rindt		Training Officer		37		
Evelyn Wallin		Treasure		34		
Stacy Kent		Secretary		23		
EQUIPMENT						
EQUIPMENT						
VEHICLE TYPE		TANK SIZE		GPM	4X4	UNIT CALL NUMBER
Class A Pumper		300 gpm.		200		# 2
Class A Pumper		1,100 gpm.		750		# 6
Tanker		2,400 gpm.		218		# 3
Brush Truck		1,200 gpm.		50	yes	# 4
Mini-Pumper		200 gpm.		50	yes	# 5

RESOURCE LIST

NAME OF DEPARTMENT Quay Fire Department #4		Phone	
DIRECTOR OR CHIEF Gerald Hight		OFFICE (505) 487-2002	
ADDRESS 4314 Quay Road 50.4		HOME (505) 487-9514	
CITY Tucumcari, NM	ZIP 88401	CELL (505) 487-6076	

OFFICERS	TITLE	RADIO CALL NUMBER
Don "Doc" Buck	Asst. Chief	
Paula O'Steen	Sec/Tres	

EQUIPMENT					
VEHICLE TYPE	TANK SIZE		GPM	4X4	UNIT CALL NUMBER
2004 Class A Pumper	1,250			YES	5
1996 Dodge Brush Truck	300			YES	1
1985 Chevy Brush Truck	250			YES	2
1971 Diamond Rio Tender	3,400				4
1964 Pumper	1,150				3
1991 Medical Rescue					6

					Phone
NAME OF DEPARTMENT Conservancy Fire District # 1				OFFICE	
DIRECTOR OR CHIEF Clint Brockman R110				HOME 505-403-8807	
ADDRESS 10522 State Hwy 104					
CITY Tucumcari		ZIP	88401	CELL 505-403-6796	
csbrockman@plateautel.net					
OFFICERS	TITLE	RADIO CALL NUMBER			
Shelly Brockman	Asst Chief	R111			
Scot Jaynes	2nd Asst. Chief	R112			
Michelle Jaynes	Sec/Treas	R118			
<i>Members: Carlos Valverde (R112), Eric Cashman (R115), Phillip Dominguez (R116), Scot Jaynes (R117) Catherine Bugg (R119)</i>					
<i>Mark Preciado (R120), Becky Griggs(R121)</i>					
EQUIPMENT					
VEHICLE TYPE	TANK SIZE	GPM	4X4	UNIT CALL NUMBER	
2004 Freightliner Yellow Class A	2000 gal			R141	
1972 Ford Brushtruck Green	200 Gal		x	R163	
1999 Chevy Brushtruck Red	250 Gal		x	R167	
1986 Ford Yellow Class A	1750 Gal			R144	
1977 Dodge Brushtruck White	250 Gal		x	R165	
1996 Ford Brushtruck White	200 Gal		x	R166	

					Phone	
NAME OF DEPARTMENT				Conservancy Fire District 2		OFFICE 575-461-1653
DIRECTOR OR CHIEF				Shane Jennings		Home 575-461-1484
ADDRESS				3311 Quay Rd. 62		
CITY				Tucumcari, NM	ZIP	88401
						Cell 575-403-6960
OFFICERS						
		TITLE			RADIO CALL NUMBER	
Danny Wallace		Assistant Chief			two eleven	
Elton(Wally) Wallace		Treasurer			two twelve	
Edgar Shipley		Secretary			two thirteen	
EQUIPMENT						
VEHICLE TYPE		TANK SIZE		GPM	4X4	UNIT CALL NUMBER
CLASS A		2000 GAL		150	NO	UNIT 9
TANKER		1600 GAL		75	NO	UNIT 4
BRUSH TRUCK		1000 GAL		35	YES	UNIT 6
BRUSH TRUCK		400 GAL		35	YES	UNIT 7
BRUSH TRUCK		300 GAL		35	YES	UNIT 5
BRUSH TRUCK		300 GAL		35	YES	UNIT 3
CLASS A		1100 GAL		75	NO	UNIT 2
CLASS A		750 GAL		75	NO	UNIT 1
BRUSH TRUCK		350 GAL		35	NO	UNIT 10
BRUSH TRUCK		3000 GAL		75	YES	UNIT 11
SERVICE VEHICLE		NONE		NONE	YES	UNIT 8
NOTE: UNITS 8,11,6 ARE MILITARY TYPE VEHICLES						

					Phone	
NAME OF DEPARTMENT Conservancy Fire District # 3					OFFICE _____	
DIRECTOR OR CHIEF Del Choate					HOME <u>576-2307</u>	
ADDRESS 6697 Quay Rd. AD						
CITY Tucumcari, N.M.			ZIP	<u>88401</u>	CELL <u>487-6557</u>	
OFFICERS						
	OFFICERS	TITLE	RADIO CALL NUMBER			
	Dallas Dowell	Assistant Chief				
	Beverly Choate	Secretary				
	Rance Ford	Training Officer				
EQUIPMENT						
	VEHICLE TYPE	TANK SIZE		GPM	4X4	UNIT CALL NUMBER
	Class A Pumper (Auto Car)	3,000 gal		750	yes	# 34
	Tanker/Pumper (Ford)	2,500 gal.		750	yes	# 31
	Class A Pumper (GMC)	2,000 gal.		750	yes	# 33
	Class A Pumper (IHC)	1,000 gal.		750	yes	# 32
	Brush Truck	300 gal.		20	yes	# 35

					Phone	
NAME OF DEPARTMENT				San Jon Fire Dept.		OFFICE <u>576-2567</u>
DIRECTOR OR CHIEF				Jonathan Brasher	1201	HOME _____
ADDRESS						
CITY				San Jon, New Mexico	ZIP 88434	Cell 403-6522
OFFICERS						
	OFFICERS	TITLE	RADIO CALL NUMBER			
	Jonathan Brasher	Assist. Chief	1203			
	Andy Tillman		1215			
	LaQuanna Adams	Training Officer				
	Toni Emilio	Secretary and Treasurer				
EQUIPMENT						
VEHICLE TYPE	TANK SIZE		GPM	4X4	UNIT CALL NUMBER	
Mini Pumper GMC	750		250	X	1 2	
Class A 81 Chevy	1000		750		3 4	
Tanker 96 GMC	2000				5 6	
Maintainer JD Brush Truck 81	1000		250		7 8	
Class A Freightliner Excursion (Ford)	1000		1000	X	9 10	
Class A Freightliner	1250		1250		11	

RESOURCE LIST

NAME OF DEPARTMENT	Tucumcari Fire Dept.	PHONE	461-1924
DIRECTOR OR CHIEF	Mike Cherry Chief	PHONE	461-4400
ADDRESS	P.O. Box 1188		
CITY	Tucumcari, NM	ZIP	88401

OFFICERS	TITLE	RADIO CALL NUMBER		
Mike Cherry	Chief	551	cell	403-7331
Kalon Lafferty	Deputy Chief	552	cell	403-8871
Mike Hicklin	Sec/Treas	553		
	Bat Chief	554		
	Bat Chief	555		

EQUIPMENT

VEHICLE TYPE	TANK SIZE		GPM	4X4	UNIT CALL NUMBER	
1999 Freightliner Smeal	1000		1250		E-51	
1974 Ford C-900	750		750		522	
1980 Ford C-900	750		1000		523	
1963 GMC Telesquirt	250		750		524	
1989 Ford C-9000	750		1250		525	
2005 Ford 550 Brush	500		250	yes	B56	
1996 Dodge 3500 Brush	300		180	yes	B57	
2005 Ford 550 WUI (Brush)	300		250	yes	B58	
1983 Ford F-250 Hose	1250 3" hose				529	
1984 Chevy P30 van	Equipment				531	
2007 Chevy Suburban	Command				532	
1987 Chev. Rescue					533	
2002 Chevy Tahoe	Command				Unit 1	
LDV Command	Command				C65	

APPENDIX E
HOMEOWNER'S GUIDE

This guide has been developed to address site-specific information on wildfire for Quay 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 non-combustible, and Class-A asphalt shingles are recommended as well. The most dangerous type of roofing material is wood shingles. Removing debris from roof gutters and downspouts at least twice a year will help to prevent fire, along with keeping them functioning properly.

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

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

Fencing and trellises—Any structure attached to the house should be considered part of the house. A wood fence or trellis can carry fire to your home siding or roof. Consider using non-flammable 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 non-flammable or fire-resistant materials and have the exterior wood treated with Underwriter Laboratories approved fire-retardant chemicals. More information on fire-resistant construction is available 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, non-flammable 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 is 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 3 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 Quay 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 actually are 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 percent. 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 turn around 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. Do not 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 often are 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 wood pile 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. Planning an established meeting site helps to ensure that family members know where to meet, even if they cannot 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 percent of pets left behind in an emergency do not survive.

Do not 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 photograph 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 fire-safe storage box within your home.

IN THE EVENT OF A FIRE

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 Quay County are too narrow for two-way traffic, especially with fire engines. Fire trucks often cannot get into an area until the residents are out. Also, arguably the most important tool in the wildland urban interface 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. Do not start any repairs or rebuilding without the approval of your claims adjuster. Beware of predatory contractors looking to take advantage of anxious homeowners wanting to rebuild as quickly as possible. Consider all contracts very carefully, take your time to decide, and contact your insurance agent with any questions.

POST-FIRE REHABILITATION

Homes that may have been saved in the fire may still be at risk from flooding and debris flows. Burned Area Emergency Rehabilitation (BAER) teams are inter-disciplinary teams of professionals who work to mitigate the effects of post-fire flooding and erosion. 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.

APPENDIX F
FUNDING OPPORTUNITIES

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

I. Federal Funding Information

Source: Pre-Disaster Mitigation Grant Program
Agency: Department of Homeland Security 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 pre-disaster 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 pre-disaster 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 multi-hazard 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 non-competitive 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 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 non-governmental organizations, tribes, or individuals. CIG enables the Natural Resources Conservation Service (NRCS) to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address some of the nation's most pressing natural resource concerns. CIG will benefit agricultural producers by providing more options for environmental enhancement and compliance with federal, state, and local regulations. The NRCS administers the CIG program. The CIG requires a 50–50 match between the agency and the applicant. The CIG has two funding components: national and state. Funding sources are available for water resources, soil resources, atmospheric resources, and grazing land and forest health.

Source: Volunteer Fire Assistance

Agency: U.S. Department of Agriculture (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 web site.

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 under-utilized wood products and to expand the utilization of wood removed through hazardous fuel-reduction treatments. Information, demonstrations, application development, and training will be made available to participating communities. For more information, contact a Forest Service Regional Representative.

Source: Collaborative Forest Restoration Program (CFRP)

Agency: 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; re-establishment of historical 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/>
- Pre-Disaster 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, U.S. Department of the Interior (USDI) Bureau of Indian Affairs, USDI Bureau of Land Management, 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 activities are available to help homes and whole neighborhoods become safer from wildfire without significant expense. Community clean-up 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/USA 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 web sites and e-mail contacts.

Source: The National Fire Plan
Website: <http://www.forestsandrangelands.gov/>

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

Source: 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-process_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 pre-requisite 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 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 web site includes an online project submittal system and a Request for Proposals page.

Source: The Public Entity Risk Institute (PERI)

Website: <http://www.riskinstitute.org>

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

IV. Other Funding information

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

- National Agricultural Library Rural Information Center:
http://www.nal.usda.gov/ric/ricpubs/fire_department_resources.htm
- Forest Service Fire Management web site: <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>
- U.S. Department of Agriculture "How to Get Information" (contacts):
http://www.usda.gov/wps/portal/!ut/p/_s.7_0_A/7_0_1OB/.cmd/ad/.ar/sa.retrievecontent/.c/6_2_1UH/.ce/7_2_5JN/.p/5_2_4TR/.d/0/_th/J_2_9D/_s.7_0_A/7_0_1OB?PC_7_2_5JN_navid=NEW_NOTEWORTHY&PC_7_2_5JN_navtype=RT&PC_7_2_5JN_parentnav=NEWSROOM#7_2_5JN
- Department of Homeland Security U.S. Fire Administration:
<http://www.usfa.dhs.gov/fireservice/grants/rfff/>