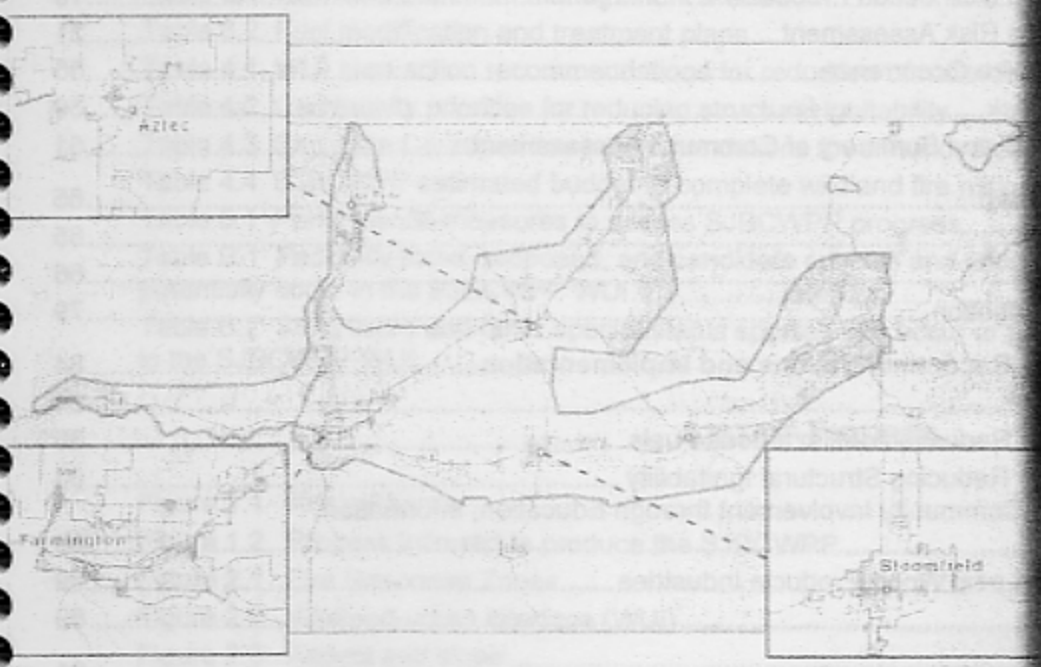
San Juan Basin Community Wildfire Protection Plan

Aztec • Farmington • Bloomfield • Blanco • La Plata
Cedar Hill • Center Point • Navajo Dam • Lee Acres
Sullivan Road • Flora Vista • Hart Valley
Fruitland • Waterflow • Kirtland



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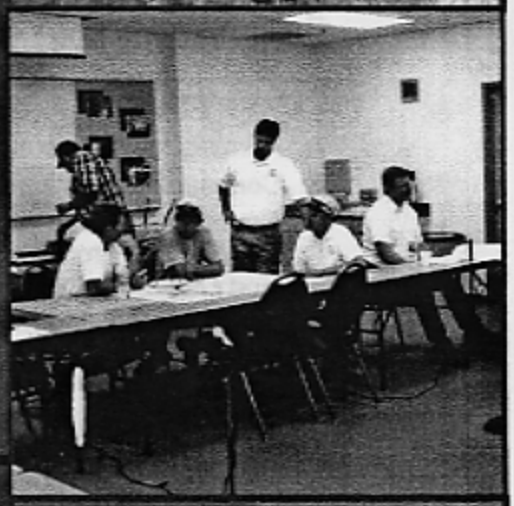

New Mexico Energy, Minerals and Natural Resources Department, State Forestry Division

New Mexico Energy, Minerals and Natural Resources Department, State Parks Division

San Juan County, New Mexico

San Juan County Fire Department

City of Farmington

Farmington Fire Department

City of Bloomfield

Bloomfield Fire Department

City of Aztec

Aztec Fire Department

San Juan Watershed Group

San Juan Basin Russian Olive Saltcedar Taskforce

San Juan Watershed Woody Invasive Initiative Taskforce

San Juan Soil and Water Conservation District

Bureau of Land Management, Farmington Field Office

United States Forest Service, Carson National Forest, Jicarilla Ranger District

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ACRONYMS AND ABBREVIATIONS

ACEC	areas of critical environmental concern
SJBCWPP	San Juan Basin Community Wildfire Protection Plan
BA	basal area
BLM	Bureau of Land Management
CAG	Community Action Group
CWPP	Community Wildfire Protection Plan
ESA	Endangered Species Act
dbh	diameter at breast height
drc	diameter at root collar
FFO	Farmington Field Office
FMU	Fire Management Use
FONSI	Finding of No Significant Impact
FRCC	Fire Regime Condition Class
FS	Forest Service
GIS	geographic information system
HFRA	Healthy Forests Restoration Act of 2003
IGA	Intergovernmental Agreement
ISO	Insurance Services Office
LMP	Land Management Plan
NEPA	National Environmental Policy Act
NFP	National Fire Plan
NMFPTF	New Mexico Fire Planning Task Force
NMSFD	New Mexico Energy, Minerals and Natural Resources Department, State Forestry Division
NMSPD	New Mexico Energy, Minerals and Natural Resources Department, State Parks Division
NGOs	Nongovernmental organizations
OHV	off-highway vehicle
PAC	spotted owl protected activity center
PFA	goshawk postfledgling family area
RFA	Rural Fire Assistance
RT	recommended treatment
SFA	State Fire Assistance
SR	State Route
TES	threatened, endangered, and sensitive species
TNC	The Nature Conservancy
US	United States Route
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFWS	United States Fish and Wildlife Service
VFA	Volunteer Fire Assistance
WUI	wildland-urban interface

EXECUTIVE SUMMARY:
SAN JUAN BASIN COMMUNITY WILDFIRE PROTECTION PLAN

For a community to take full advantage of the opportunities provided in the Healthy Forests Restoration Act (HFRA), it must first prepare a community wildfire protection plan (CWPP). A CWPP developed in accordance with HFRA is the most effective way to acquire funding for wildland fuels mitigation and fire preparedness and planning. San Juan County wishes to adopt a CWPP to better protect its communities from wildfire risk, to better prepare citizens, and to become eligible to apply for and receive federal and other grant monies to implement projects. At the state level, San Juan County is interested in adopting a CWPP to help implement *The New Mexico Forest and Watershed Health Plan*.

In 2005 San Juan County and the Cities of Aztec, Bloomfield, and Farmington were awarded a grant by the New Mexico Association of Counties in cooperation with the Bureau of Land management (BLM) for the purpose of developing a CWPP. In December 2005 San Juan County issued a request for proposal to firms who have experience in developing CWPPs consistent with the guidelines delineated by the New Mexico Energy, Minerals and Natural Resources Department, State Forestry Division and HFRA. In March 2006 San Juan County contracted with Logan Simpson Design Inc. and Nelson Consulting Inc. to assist in the development of the San Juan Basin Community Wildfire Protection Plan (SJBCWPP).

During March 2006 a community action group (CAG) was formed to implement the collaborative process necessary to develop a CWPP compliant with HFRA. The CAG agreed on the process to be followed during the CWPP development (see Figure 1.2).

Section I: Introduction

A primary objective of a CWPP is to help local governments, fire departments, and residents identify at-risk public and private lands and to develop programs that better protect those lands from severe wildfire threat. Additional functions of a CWPP are to improve fire prevention and suppression activities, as well as to identify funding needs and opportunities. Identifying at-risk areas and improving fire protection capabilities help the communities to prioritize areas of high-risk from wildland vegetative fuels and to expedite overall project planning. The SJBCWPP was created to meet these objectives at a local level while integrating with overall federal- and state-level wildfire planning.

In an effort to promote community involvement and education, a CAG composed of participating government officials, planners, natural resources specialists, and other interested parties from throughout the SJBCWPP area was formed.[a] The CAG identified natural values at risk, such as watersheds, as well as community values at risk. The CAG also identified strategies that would improve watershed, rangeland, and community health through fuels reduction projects. Economic development and stability, as well as protection of the riparian and rangeland ecosystems, were encouraged. Additional fuels reduction projects that support local industry and economies while improving public and firefighter safety were identified.

[a] For a list of participants in the CAG, see Acknowledgments at the end of this section.

Section II: Community Assessment

Section II identifies and analyzes wildland fire risk within the wildland-urban interface (WUI) and depicts the at-risk areas in a series of maps. Several environmental components, including slope, aspect, vegetative type, vegetative density, ground-fuel loads, and treated areas, were used to make fuel hazard determinations. These environmental factors were coupled with community-based characteristics and values, such as local fire resource preparedness, housing density, infrastructure, evacuation routes, and desired municipal watershed protection. An external element, the Fire Insurance Service Organization ratings, was also used in identifying areas of higher risk within the WUI boundary. These elements were all identified and combined using spatial analysis within a geographic information system (GIS). As a result of the GIS analysis, a hazard area map was created. Hazard areas were divided into groups according to high, moderate, and low risk based on the level of overall risk of wildland fire. The CAG determined the WUI for the at-risk cities, communities, and watersheds and also recommended measures to reduce structural ignitability in the SJBCWPP area to protect natural and community values from catastrophic wildland fire.

The WUI boundary identified by the CAG surrounds the at-risk interface cities of Farmington, Bloomfield, and Aztec; the intermix communities of Kirtland, La Plata, Flora Vista, Cedar Hill, Center Point, Blanco, Lee Acres, Hart Valley, Sullivan Road, and Navajo Dam; and the river corridors of the Animas, San Juan, and La Plata rivers. These areas were broken into a total of six zones, which are described further in Section II of the SJBCWPP. Total acreage determined for the WUI is 282,972 acres of private, state, and federal lands. A map of the established WUI is illustrated in Figure 2.2.

For each community, housing, businesses, essential infrastructure, evacuation routes, recreation areas, wildlife habitat, and watersheds were analyzed for wildland fire risk. Areas with compromised local preparedness and protection capability were also identified. Table 2.6 outlines the cumulative risk levels, by percentage of the WUI area. The analysis showed the City of Aztec to include 1,582 high-risk acres primarily along the Animas River corridor due to heavy infestations of saltcedar and Russian olive. The analysis showed the City of Bloomfield to include 2,085 high-risk acres primarily within the San Juan River corridor also due to heavy saltcedar and Russian olive infestations, as well as from woody and herbaceous invasive species encroachment in upland areas. The City of Farmington was found to contain 23,019 high-risk acres again primarily due to the heavy woody species invasion within the river corridors. Within the WUI but outside the municipalities boundaries, over 45,880 acres were identified to be at high risk from wildland fire (see Figure 2.17).

Section III: Community Mitigation Plan

Section III prioritizes the areas in need of wildland fuel mitigation and recommends the types and methods of treatment and management necessary to mitigate the potential for catastrophic wildland fire in the WUI. Also presented in this section are the SJBCWPP communities' recommendations for enhanced wildland fire protection capabilities; public education, information, and outreach; and support for wildland vegetative fuel management businesses and industries. Recommendations were also made for land treatments that were developed to reduce the threat of catastrophic wildland fire and to promote watershed and rangeland health.

As part of the community mitigation plan, the CAG identified the fire chiefs of the cities of Farmington, Bloomfield, and Aztec, as well as the San Juan County fire chief, as the administrators of the SJBCWPP. SJBCWPP administrators are responsible for ensuring implementation of the SJBCWPP, preparing an annual report and annual work plan, and developing community bulletins and public service announcements that inform residents of wildfire dangers and preventive measures. Additional tasks include assisting federal and state agencies and private landowners to identify appropriate funding sources to implement action recommendations of the SJBCWPP, as well as continued coordination with communities outside the analysis area. SJBCWPP administrators are also responsible for coordinating effectiveness monitoring efforts. Monitoring and reporting of implementation actions will allow for enhanced coordination of management programs and will reduce inconsistencies among local, state, and federal agencies.

To prioritize treatments, the WUI has been identified, analyzed, and categorized according to potential risk for wildfire. In the SJBCWPP, 30 site-specific areas were identified and given overall risk values. Treatment management areas are illustrated in Figure 3.1. Each area was also ranked and described along with a recommendation for its preferred treatment type and method. Table 3.1 identifies and describes treatment management areas by zone. Treatment recommendations are described and consider commercial opportunities for utilizing small-diameter trees and woody material by-products from the treatments. These treatments are designed to meet the fuel reduction and modification objectives of the SJBCWPP. Table 3.2 outlines fuel modification and recommended treatments to reduce hazardous wildland fuels across the WUI landscape.

Section IV: CWPP Priorities—Action Recommendations and Implementation

During the development of the CWPP, the CAG identified four action recommendations necessary to achieve the goals outlined in the plan. The first action recommendation was to identify priority treatment areas for fuel reduction projects. Treatment areas were identified and prioritized within the WUI to create defensible space and to enhance public and firefighter safety. The objective of a fuels reduction project is to create an acceptable vegetation condition class for community and infrastructure protection. Priority treatment management areas were designated in areas identified as high risk. Table 4.1 lists the action recommendations for the reduction of hazardous fuels within the CWPP area.

The second action recommendation identified by the CAG was to reduce structural ignitability. Reduction of structural ignitability is achieved through evaluation; maintenance; and, at times, upgrades to community response facilities, capabilities, and equipment. Table 4.2 outlines the community priorities for reducing structural ignitability.

The third action recommendation described is the promotion of community involvement. Action items include community education, information, and outreach. The priority recommendations and project descriptions are listed in Table 4.3.

The final action recommendation is to assist in the development of a local wood-products industry. The CAG plans to increase support for the SJBCWPP by seeking opportunities for local contractors to start new businesses or to expand existing businesses in the fire prevention and fuels reduction arena.

These action recommendations all require funding for implementation. A budget was developed to help the communities secure funding for the implementation of these projects. Table 4.4 summarizes the total costs to implement the SJBCWPP action recommendations that are to be completed over the life of the plan.

Section V. Monitoring Plan

The monitoring plan, outlined in Section V, describes how implementation monitoring of the SJBCWPP will occur and what information is to be collected by the administrators. The SJBCWPP establishes the Aztec, Bloomfield, Farmington, and San Juan County fire chiefs as the administrators who are responsible for implementation monitoring and reporting. Implementation begins by securing grants and other funding necessary to execute the action items described in Section IV. A list of potential grant-funding sites can be found in Section V, as well as in Appendix E.

The SJBCWPP administrators will provide an annual report of successful grant awards and projects implemented as a result of those awards. The administrators will also update work plans based on projects completed in the previous years. Performance measures used by the SJBCWPP administrators to monitor project completion against target goals can be found in Table 5.1.

Acknowledgments

The following communities and agencies were involved in the preparation of the SJBCWPP. Signatures of representatives from the agencies involved with the planning and execution of the SJBCWPP can be found in Section VI, Declaration of Agreement and Concurrence.

New Mexico Energy, Minerals and Natural Resources Department, State Forestry Division

New Mexico Energy, Minerals and Natural Resources Department, State Parks Division

San Juan County

Municipal and county fire departments

Cities (and communities) of Farmington, Bloomfield, and Aztec

San Juan Watershed Group

San Juan Basin Russian Olive Salt Cedar Task Force

San Juan Watershed Woody Invasive Initiative Task Force

San Juan Soil and Water Conservation District

Bureau of Land Management, Farmington Field Office

United States Forest Service, Carson National Forest, Jicarilla Ranger District

I. INTRODUCTION

The San Juan Basin Community Wildfire Protection Plan (SJBCWPP) for the at-risk cities and unincorporated areas located in and around public lands administered by the US Department of the Interior (USDI) Bureau of Land Management (BLM) Farmington Field Office (FFO) in San Juan County, New Mexico, was developed in response to the Healthy Forests Restoration Act of 2003 (HFRA) and *The New Mexico Forest and Watershed Health Plan* (New Mexico Forest and Watershed Health Planning Committee 2004). Both HFRA and *The New Mexico Forest and Watershed Health Plan* establish unprecedented incentives for communities to develop comprehensive wildfire protection plans in a collaborative, inclusive process. Furthermore, HFRA gives direction to the USDI to address local community priorities in fuel reduction treatments, even on nonfederal lands.

HFRA represents the legislative component of the Healthy Forests Initiative introduced by President Bush in 2003. Congress passed HFRA in November 2003, and the president signed it into law that December. When certain conditions are met, Title I of HFRA authorizes the Secretaries of Agriculture and the Interior to expedite the development and implementation of hazardous fuel reduction projects on lands managed by the US Department of Agriculture Forest Service (USDA FS) and the BLM.

HFRA emphasizes the need for federal agencies to collaborate with communities in developing hazardous fuel reduction projects and places priority on treatment areas identified by communities themselves through the development of a community wildfire protection plan (CWPP). Priority areas include the wildland-urban interface (WUI), municipal watersheds, areas affected by windthrow or insect or disease epidemics, and critical wildlife habitat that would be negatively affected by a catastrophic wildfire.

In compliance with Title 1 of HFRA, the CWPP requires agreement among local governments, local fire departments, and the state agency responsible for forest management. For the SJBCWPP, this agency is the New Mexico Energy, Minerals and Natural Resources Department, State Forestry Division (NMSFD). The CWPP must also be developed in consultation with interested parties and the applicable federal agency managing the land surrounding the at-risk communities. The majority of lands surrounding the at-risk communities of Farmington, Bloomfield, and Aztec, as well as the unincorporated intermixed community zones within San Juan County, are located adjacent to “public lands,” as defined in HFRA Section 3.1.A and B; Navajo Nation Indian lands, as defined in HFRA Section 3.2; and New Mexico state lands.

The SJBCWPP has been developed to assist local governments, fire departments, and residents to identify lands—including federal lands—at-risk from severe wildfire threat and to identify strategies for reducing fuels on wildlands while improving watershed and rangeland health, supporting local industry and local economies, and improving public and firefighter safety and response capabilities. The SJBCWPP is based on the *Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Lands in New Mexico and Texas* (USDI BLM 2004a), the *Farmington Field Office Fire Management Plan* (USDI BLM 2004b), and *The Healthy Forests Initiative and Healthy Forests Restoration Act: Interim Field Guide* (USDA FS and USDI BLM 2004). It has also been developed in consultation with the BLM FFO to assist San Juan County and the State of New Mexico to implement the recommendations of *The New Mexico Forest and Watershed Health Plan* and *The Strategy for Long-Term Management of Exotic Trees in Riparian Areas for New Mexico’s Five River Systems, 2005–2014* (USDA FS and NMSFD 2005), as well

as the *San Juan Basin Watershed Management Plan* (San Juan County Watershed Group 2005). General guidance for development of the SJBCWPP is based on *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities* (Communities Committee et al. 2004). In addition, a community action group (CAG) was formed to ensure that local, state, and federal management recommendations for wildland fire protection, watershed, and riparian health were addressed in the SJBCWPP (Photo 1.1). As additional guidance documents become available, changes or amendments will be incorporated into the SJBCWPP as necessary.

The following sections detail the background information and process used to develop the SJBCWPP. The following also includes the definition of the WUI in context of the SJBCWPP; the desired future condition of lands covered by the plan; and current fire policies, programs, and projects designed to reduce the risk of wildland fire. Finally, the goals of the SJBCWPP are presented along with an outline of strategic and prescriptive methods that the CAG has identified to achieve those goals.

A. Background

The process for developing this CWPP included evaluation of San Juan County, excluding the Navajo Indian Reservation, to identify communities and remote private lands at risk from catastrophic wildland fire. During this analysis the County solicited federal, state, and local governments; fire chiefs; and interested individuals to participate in a CAG. The CAG was created to define and locate interface and intermix communities in which significant community values and infrastructure are at risk because of the potential of wildland fire.[1] To complete this task, the CAG developed a three-tiered approach, which constitutes the SJBCWPP:

Tier 1. Determination of analysis area

- 2,206 square miles of nontribal lands of San Juan County (see Figure 1.1)

Tier 2. Determination of at-risk communities

- Interface communities of Farmington, Bloomfield, and Aztec
- Intermix unincorporated areas of San Juan County within five zones:
    - Northeast San Juan County
    - Southeast San Juan County
    - Central San Juan County
    - Northern San Juan County
    - Western San Juan County
- Infrastructure and evacuation routes

Tier 3. Determination of at-risk remote private lands

- Areas containing one or more private residences

[1]Interface communities exist “where structures directly abut wildland fuels”; intermix communities exist “where structures are scattered throughout a wildland area” (*Federal Register* 2001a:753).

- Areas with risk of wildfire from the following:
    - Continuous fuels near structures
    - Ineffective firefighting due to lack of sufficient response time
    - High vegetative fuel loads and geographic features

The CAG reviewed the *Federal Register* (2001a) to determine categories of at-risk communities and risk factors to be considered in analyzing the private lands throughout the county. The CAG also reviewed the definition of a WUI in HFRA to help them identify their WUI boundary and better understand that areas requiring hazardous fuel reduction along evacuation routes can also constitute the WUI. Once the CAG had a handle on what could constitute the WUI, they selected the following definition for use in this plan: "the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel" (Glossary of Wildland Fire Terminology 1996; see Section VIII in this CWPP). Any interface community or intermix community that fell within the WUI boundary was analyzed for "risk" in accordance with HFRA and *The New Mexico Forest and Watershed Health Plan*. Evacuation/resource response routes and significant infrastructures were also identified within the analysis area to provide for firefighter safety and to ensure the protection of life and property. The riparian corridors of the La Plata, Animas, and San Juan rivers were also considered at risk in the SJBCWPP. Inclusion of these river corridors in the analysis assists the County and State of New Mexico in implementing *The New Mexico Forest and Watershed Health Plan*. The SJBCWPP identifies current wildfire at-risk communities, intermix areas, and river corridors. Recommendations for mitigating catastrophic wildland fire potential in these at-risk areas have been developed in this CWPP. The CWPP also provides recommendations for areas outside the WUI that have been identified for further analysis, such as rangeland health or watershed enhancing treatments. Watershed concerns have been a high priority throughout San Juan County since the 74,000-acre Missionary Ridge Fire in 2002, which had significant impacts on the water supplies to the cities of Aztec and Farmington.

Photo 1.1 Community action group

Within the five San Juan County fire response zones, the CAG identified the following at-risk intermix communities and established a WUI boundary that includes these unincorporated communities:

- Northeast San Juan County Zone includes portions of the Animas River and San Juan River corridors and the intermix communities of Cedar Hill, Center Point, and Navajo Dam.
- Southeast San Juan County Zone includes portions of the San Juan River corridor and the intermix communities of Lee Acres, Sullivan Road, and Blanco.
- Central San Juan County Zone consists of significant private lands associated with the Animas River corridor and includes the intermix communities of Flora Vista and Hart Valley.
- Northern San Juan County Zone consists of significant private lands associated with the La Plata River corridor and the intermix community of La Plata.
- Western San Juan County Zone consists of significant private lands within the San Juan River corridor and the intermix communities of Fruitland, Waterflow, and Kirtland.

The Southwest is known for its diverse landscapes and semiarid climates. The frequent occurrence of extreme hot and dry conditions, such as drought, is a normal part of the region's climate. Following several years of below-average precipitation, northwest New Mexico has been suffering from prolonged drought. Precipitation during the winter and early spring of 2005 produced an abnormal abundance of one-hour fuels (e.g., cheat grass), which has exacerbated current wildland fire potential.

Historically, the majority of serious fires within San Juan County have occurred within the WUI. Although landscape-scale fires have not been prevalent, hundreds of natural and human fire starts do occur and are suppressed and contained each year. Because of the region's continued drought and fuel conditions, local fire departments and local governments are initiating fire preparedness enhancements and land treatment efforts to recognize and act on the current conditions that result in the accumulation of unacceptable levels and types of wildland fuels significantly threatening the communities with catastrophic wildfire.

Continued extreme weather conditions, dry fuels, and increasing fuel loading on federal and nonfederal lands have contributed to the potential for catastrophic wildland fires in and around the SJBCWPP communities. These communities have developed this CWPP to

- increase preparedness for wildland fire response through training and coordination of firefighting responses;
- reduce structural ignitability throughout the CWPP area;
- increase communication with local, county, state, and federal emergency response personnel by determining areas of high risk from catastrophic wildland fire;
- develop mitigation measures to reduce hazardous wildland fuels in areas of highest risk;
- enhance watershed health through wildfire control and fuel mitigation;
- educate citizens regarding the need for reduction of hazardous wildland fuels.

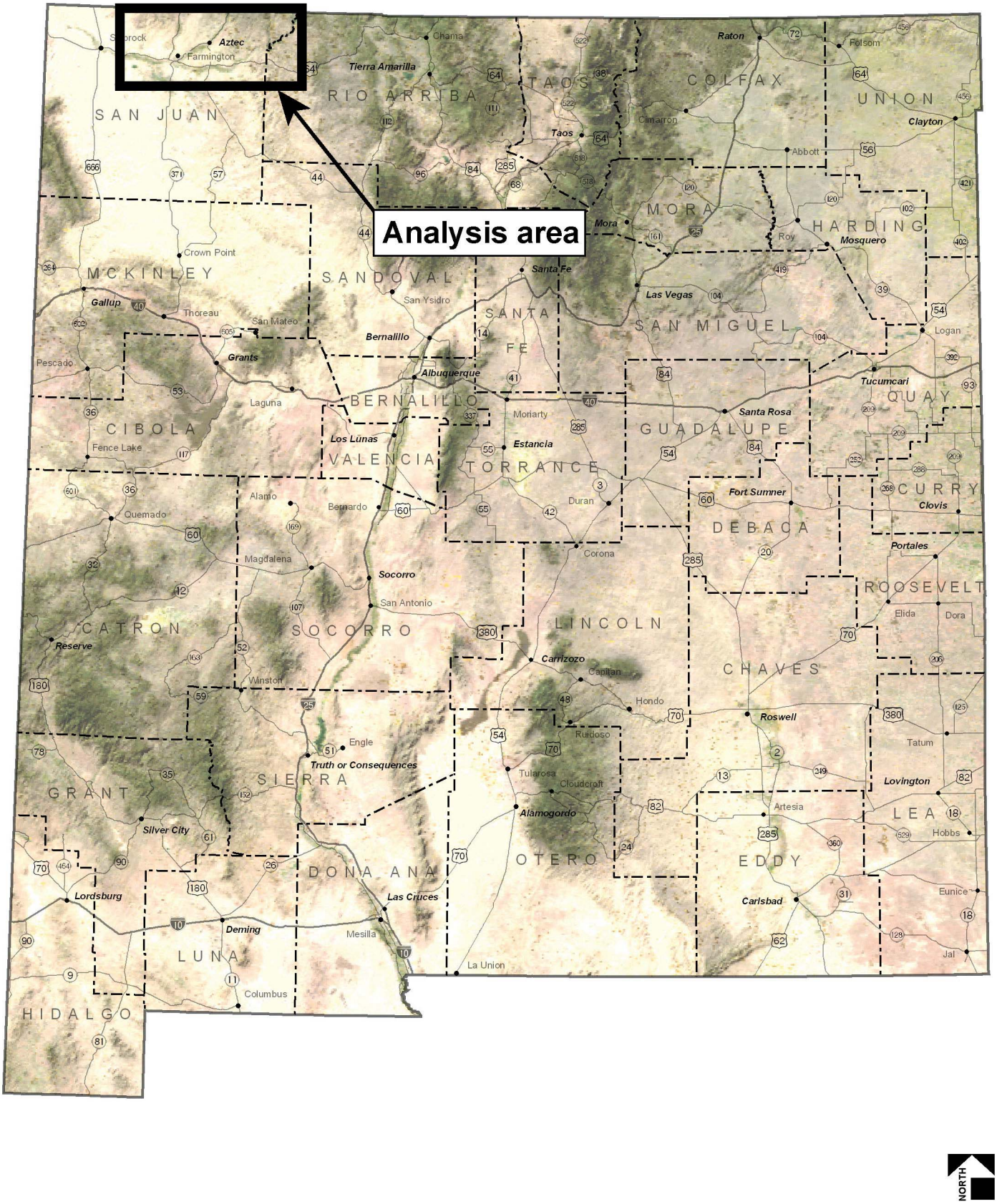

Figure 1.1. Analysis area

In addition to the primary objective of developing this CWPP, San Juan County formed the CAG to share information on existing wildfire risk conditions, fire history, and current efforts to mitigate wildfire risk and to recommend strategies needed to mitigate risk to the communities and the watersheds of the county. The CAG meets all criteria of the collaborative guidance established by the Wildland Fire Leadership Council and is the core mechanism of the public involvement process for the SJBCWPP. During deliberations, the CAG reviewed and discussed contributions from technical experts and reviewed pertinent references and guidance documents.

B. Need for the Community Wildfire Protection Plan

SJBCWPP communities exist adjacent to wildlands, and as growth occurs, more citizens and property will be at risk from wildland fire. The city governments in the WUI, San Juan County, and the BLM FFO recognize that community risk from wildland fuels is not static; the communities will continue to grow and expand into previously undeveloped lands. For community wildfire protection planning and implementation to succeed, hazardous wildland fuel mitigation must reach a balance with community growth and the enhancement of quality-of-life values that exist in the county. However, ecological circumstances may exist within some areas of the WUI that warrant innovative management practices, such as those recommended in *The New Mexico Forest and Watershed Health Plan*. The SJBCWPP intends to implement concepts as described in *The New Mexico Forest and Watershed Health Plan* through assisting in "expanding the focus of the planning effort to include entire watersheds, from high elevation forested areas to lower elevation rangeland and riparian areas" (Photo 1.2). These areas of "extraordinary circumstances" (USDA FS and USDI BLM 2004) must be individually analyzed and evaluated for specific enhancements that meet all SJBCWPP community objectives, including community wildfire protection and maintenance or enhancement of watersheds, wildlife habitat, and other community values (New Mexico Forest and Watershed Health Planning Committee 2004).

HFRA provides for community-based decision making and empowers local governments to determine the boundaries of the wildland fuels that are found within the WUI of their communities. The communities in the SJBCWPP have compared the costs of restoration treatments; the costs of suppressing catastrophic wildfire; and the accompanying direct property and income losses, as well as the indirect community income loss, from evacuation, closing of transportation routes during wildfires, and other disruptions. Wildland fires, such as the Missionary Ridge Fire, Crawford Fire, and the Shiprock #5 Fire, have disrupted travel, closed recreation opportunities, disrupted economics, and threatened communities from potential flood and debris flows in the wake of a landscape fire on watersheds above the SJBCWPP communities. In an effort to better prepare and protect their communities and to mitigate the losses associated with large fire incidents, the communities of Farmington, Bloomfield, and Aztec have proposed the development of the SJBCWPP.

Photo 1.2. Riparian vegetation zone in community

C. Wildland-Urban Interface (developed lands near wildlands and forests)

The WUI is commonly described as the zone where structures and other features of human development meet and intermingle with undeveloped wildland or vegetative fuels. Communities in the SJBCWPP WUI face substantial risk to life, property, and infrastructure. Wildland fire in the WUI is one of the most dangerous and complicated situations firefighters face. Both the National Fire Plan (NFP) (see www.fireplan.gov)—a response to catastrophic wildfires—and *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan* (2001) stress a priority on working collaboratively with communities in the WUI to reduce their risk from large-scale wildfire. HFRA builds on existing efforts to restore healthy riparian conditions in the WUI by empowering local communities and by authorizing expedited environmental assessment, administrative appeal, and legal review for qualifying projects on federal land.

The majority of lands surrounding these communities, defined in HFRA as “federal land,” in this SJBCWPP are managed under the jurisdiction of the BLM FFO. Tribal lands are adjacent to the western and southern boundary of the WUI and are not included within the SJBCWPP planning area. There are scattered sections of State Trust lands adjacent to the communities throughout the WUI. The municipalities of Farmington, Bloomfield, and Aztec are the only incorporated cities located in the planning area. All other communities within the planning area are under the jurisdiction of San Juan County. Private ownership of

land is located mainly within the cities of Farmington, Bloomfield, and Aztec, although there are numerous private lands throughout the SJBCWPP analysis area.

The WUI described in the SJBCWPP includes 163,402 acres of private, county, and state lands and 119,570 acres of federal lands, for a total of 282,972 acres. Additional information on the process used to delineate the WUI boundaries and a description of the communities included within the WUI is found in Section II, Community Assessment, of this CWPP.

D. Desired Future Condition and Relevant Fire Policies

The CAG recommends that the overall desired future conditions for public lands are as follows:

> Semidesert grassland and desert scrub communities desired future conditions include perennial grass cover within its historic range of variability, reduction of annual grass cover, and an adequate cover and mix of natural plant species that have good vigor and are dominant. In terms of fire management and fire ecology, the desired future condition is for fire to control or reduce exotic annual weeds, such as cheat grass, and to limit woody vegetation, such as juniper, to nonhazardous levels.
>
> Riparian vegetation community desired future conditions include controlled annual weed cover and density and limited or nonexistent ladder fuels and downed woody debris. Disturbances, such as livestock grazing and mining and off-road vehicle travel that can potentially reduce natural vegetation cover and vigor, are managed to maintain adequate cover and mix of natural plant species.

The desired future condition for each vegetation type on public and private lands within the WUI include the potential natural vegetation groups as described in the Fire Regime Condition Class (FRCC) Potential Natural Vegetation Group (BpS) Descriptions (FRCC Interagency Working Group 2005a), which are recommended within the *Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Lands in New Mexico and Texas* and can be found in Appendix A.

The New Mexico Forest and Watershed Health Plan was developed “in response to the conclusion that many of New Mexico’s ecosystems are in an unhealthy state, as demonstrated by overly-dense woody vegetation, a degradation of biodiversity, and fragmentation and deterioration of wildlife habitat. As a result, New Mexico faces greater susceptibility to catastrophic wildfire and drought, compromised watersheds and decreased water supply, accelerated erosion and desertification.” In accordance with *The New Mexico Forest and Watershed Health Plan*, the CAG also recommends that the desired future conditions for the major riparian corridors in the WUI be restored to exhibit

> ecological processes that are self-regulating; disturbance regimes that function within their normal range of variation; watersheds that are characterized by recharged aquifers, good water quality, optimum stream flow, and stable soils; and the presence of a high proportion of native species and an infrequent occurrence of exotic species.

The desired future condition of public land is a return to Condition Class I status. Public lands in this condition class can carry wildfire without significant impacts on vegetative components. Once in this condition class, natural processes such as fire can be incorporated into long-term management practices to

sustain riparian and rangeland health. The desired future condition of nonfederal lands in the WUI is for private landowners to comply with fire-safe standards recommended by local fire departments and local communities. Residential and other structures that comply with these standards significantly reduce the risk of fire igniting in the community and spreading to the surrounding wildland habitats. Additionally, structures that comply with fire-safe recommendations are much more likely to survive wildland fires that spread into the community.

Local governments, the San Juan Water Commission, San Juan Watershed Group, San Juan Basin Russian Olive Salt Cedar Task Force, San Juan Soil and Water Conservation District, the River Reach Foundation, the governments and fire agencies of San Juan County, BLM FFO, and the New Mexico Energy, Minerals and Natural Resources Department, State Parks Division (NMSPD), along with the NMSFD, have supported innovative and active riparian and rangeland management initiatives. Public education and private property treatment projects in the communities, coupled with planned efforts of local fire departments and state and federal agency programs, will create safer and better-informed communities that are increasingly willing to comply with the intent and spirit of such programs.

1. Federal Policies

Several existing federal wildfire policies have been developed in recent years; one of the more significant is the 1995 Federal Wildland Fire Management Policy. This was the first single comprehensive federal fire policy for the USDI and USDA that, for the first time, formally recognized the essential role of fire in maintaining natural systems. The 1995 Federal Wildland Fire Management Policy was later reviewed and updated by the Interagency Federal Wildland Fire Policy Review Working Group in 2001 (USDI et al. 2001). The Working Group found the 1995 policy to be sound and appropriate; however, it made additional recommendations to address ecosystem sustainability, science, education, and communication and to provide for adequate program evaluation.

Among the most prominent recent national policies is the NFP. The NFP incorporates *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan*, whose primary goals are to

- improve prevention and suppression,
- reduce hazardous fuels,
- restore fire-adapted ecosystems,
- promote community assistance.

Federal wildfire reduction policy on public lands administered by the BLM are planned and administrated locally through the BLM FFO, which is the governing agency for the federal lands associated with the SJBCWPP planning area. Under the Proposed Action described in the *Farmington Field Office Fire Management Plan* (2004b), BLM-administered public lands are assigned one of three major land use categories for fire management: Category A includes areas where fire is not desired at all. This category includes areas where mitigation and suppression are required to prevent direct threats to life or property. It also includes areas where fire never played a large role historically in the development and maintenance of the ecosystem. Category A lands in the SJBCWPP analysis area principally include the Great Basin desert

scrub, agricultural and urban vegetative associations, and some riverine/lacustrine community types. Category B includes areas where fire played a role in the function of the ecosystem; however, these are areas where unplanned wildfire ignitions could have negative effects unless mitigation occurs. Category B lands include the grassland, riparian, and coniferous vegetative associations. Category C includes areas where wildland fire is desired, but significant constraints must be considered before its use. Category C constraints could include air quality; threatened and endangered species habitats; cultural, archaeological, or historic resources; or wildlife habitat considerations. The incident commander or line officer determines case-by-case, the appropriate management response in the context of ecological and other resource constraints, along with human health and safety factors. Category C lands generally receive lower suppression priority in multiple wildland fire situations than Category B lands. Prescribed fire (Rx) and nonfire fuels treatments may be used to ensure that these constraints are met and may be used to reduce any hazardous effects of an unwanted wildfire. Treatments may consist of multiple entries of Rx or nonfire treatments jointly or separately before the use of fire is considered (USDI BLM 2004b). Category D lands defined as “areas where wildland fire is desired and there are few or no constraints for its use” (USDI BLM 2004a) are not found within the SJBCWPP WUI.

Firewise is a national program that helps communities reduce the risk of wildfires and provides them with information about organizing to protect themselves against catastrophic wildfires and mitigating losses from such fires (see www.firewise.org). Local communities and fire departments in the SJBCWPP analysis area have made this information available to their citizens and have encouraged its application.

2. State Policies

New Mexico has been proactive in assessing wildfire risk on a regional level. The list of wildland interface communities published in the *Federal Register* (2001a:754–777) on January 4, 2001, was compiled from information by state and local governments and reflects the relationship between federal lands and the WUI problem in the western United States. After an updated list of at-risk communities was published in the *Federal Register* (2001b:43385–43435) on August 17, 2001, the process by which the states will update the list of at-risk communities was outlined in the *Field Guidance: Identifying and Prioritizing Communities at Risk* (National Association of State Foresters 2003).

The CAG has also reviewed *The New Mexico Forest and Watershed Health Plan* to ensure consistency with the goals and objectives of the State of New Mexico and with local implementation recommendations made within the SJBCWPP. The CAG affirms that “New Mexico’s ecological and community health depends on the recognition of the inseparability of ecological, social and economic sustainability.” The CAG further concurs with the three-part vision of the New Mexico Forest and Watershed Health Planning Committee (2004):

- Diverse ecosystems are characterized by integrity and resiliency
- Diverse human communities are sustained by ecologically healthy landscapes that provide resources and amenities
- Economies thrive by using the inherent productivity of healthy ecosystems

The Forest and Watershed Health Planning Committee also developed guiding principles to shape how ecological restoration efforts should take place in New Mexico. These principles embody its three-part vision:

1. Ecological: Promoting ecological integrity, natural processes, and long-term resiliency is the primary goal of the New Mexico Forest and Watershed Health Plan

2. Socio-Cultural: The values of New Mexico's diverse human communities will be supported

and sustained by ecological restoration

3. Economic: Economic productivity is dependent on healthy ecosystems, and will be leveraged to full advantage in support of long-term ecological health.

The SJBCWPP is consistent with the *Forest and Watershed Health Plan's* recommendations in the State-Level Action in Support of Local On-the-Ground Efforts (I) section:

I.A. Support Local Collaborative Projects

I.B. Develop Incentives for Ecological Restoration and Long-term Maintenance

I.E. Create Comprehensive Information Clearinghouse

I.F. Develop Ecological Restoration Practices

I.G. Develop Ecological Restoration Monitoring

I.H. Develop Public Outreach

The SJBCWPP also indirectly supports the following:

I.C. Promote Sustainable Utilization Businesses and Markets

I.D. Develop Labor Force

The CAG additionally supports all the recommendations in the State-Level Strategic Planning and Coordination (II) and State-Level Management and Administration (III) recommendation sections of the *Forest and Watershed Health Plan.* The CAG also suggests that San Juan County participate in the State Advisory Group by appointing a representative from the SJBCWPP communities to the State Advisory Group.

The CAG also reviewed the *2005 New Mexico Communities At Risk Assessment Plan* (NMSFD 2005a) to ensure consistency within the SJBCWPP. The New Mexico Fire Planning Task Force (NMFPTF), created by the 2003 New Mexico Legislature, "annually reviews the Communities at risk list, whether for the inclusion of new communities or the reduction of adjective ratings or the ultimate removal of communities from the list." After agreement of the SJBCWPP by local governments and fire departments and with concurrence from the BLM FFO, San Juan County will submit the SJBCWPP and a list of at-risk communities within the planning area to the NMFPTF so that those San Juan Basin communities can be added to the state's revised list of at-risk communities, which will be published on December 15, 2006, and presented to the governor and the New Mexico Legislature. The approved SJBCWPP will assist the State of New Mexico in meeting the primary goals of planning for and implementing wildland fire mitigation

treatments within fire-prone areas and in matching complementary projects on private and adjacent federal lands.

3. Local Policies

The SJBCWPP communities are aware that traditional approaches to riparian invasive species exclusion, wildland fire management, and community growth in the WUI have produced extensive areas at high risk from catastrophic wildland fire. These communities aspire to restore self-sustaining, biologically diverse riparian and rangeland habitats, which contribute to a quality of life demanded by local citizens and expected by community visitors. Current riparian and rangeland enhancement and treatment prescriptions that will result in an acceptable mix of managed natural and mechanized processes that will lead to the restoration of natural ecosystems must be developed, accepted by the community, and then implemented. San Juan County residents who participated in the CAG and developed the SJBCWPP recognize that protection from catastrophic wildland fire requires collaboration and implementation through all levels of government by way of an informed and motivated public. The CAG considered ecosystem restoration, community protection, economic development, protection of significant infrastructure, public and firefighter safety, and protection of remote at-risk private lands throughout the San Juan Basin while developing this CWPP.

To enhance public and firefighter safety, the CAG recommends that San Juan County develop a Basic Evacuation Plan under the authority of the County's All Hazard Risk Analysis and Emergency Operations Center. This basic plan would outline emergency procedures in case of evacuation, essential items to take when evacuating, registration/reception centers, transportation planning, home security, family communication, Homeland Security, and animal and pet evacuation suggestions. The basic plan could then be revised by local fire departments and emergency services personnel within each community for specific evacuation routing and other community-specific needs during a catastrophic wildland fire.

The appearance and health of the riparian systems and rangelands in and around the SJBCWPP communities provide not only an economic base (recreation, agriculture, water supplies) for the communities but also a quality of life that citizens appreciate and expect. The communities recognize the need to inform and educate local citizens and visitors about needed restoration treatments on private properties and to work with the BLM FFO in determining community-based and accepted land management practices that restore and enhance riparian and rangeland habitats while providing protection from wildland fire threats and fire spread within these communities. Community organizations that were involved in the development of the SJBCWPP include the following: the San Juan Watershed Group, a multidisciplinary work group whose mission is to enhance the Animas, La Plata, and San Juan watersheds; the San Juan Basin Russian Olive Salt Cedar Task Force, a partnership of agencies, industry, citizen groups, and private landowners working cooperatively for watershed restoration and the control of Russian olive and saltcedar, which includes fuel reduction in the San Juan Basin; and the San Juan Soil and Water Conservation District that works with landowners, ranchers, and farmers to enhance their land use, including watershed restoration and the control of Russian olive and saltcedar, which would assist in the reduction of vegetation fuel loading in riparian areas caused by heavy infestations of Russian olive and saltcedar. These groups, in addition to the local cities and communities, support land treatments that

reduce understory fuels; diminish invasive species; increase herbaceous forage production; and enhance riparian, rangeland, and watershed health.

E. Grants/Current Projects

Financial commitments required to reduce the risk of catastrophic wildfire can be extensive for the BLM, as well as for the small rural communities surrounded by federal lands. Since 2001, the NFP includes an annual funding process through which Congress provides grant monies to help reduce the vulnerability of WUI communities and to help fire departments improve their fire protection services for wildland fire suppression. According to the NMSFD (2005b), hazard mitigation and WUI hazardous fuel treatment grants awarded for private landowners for the 2002 through 2005 fiscal years was approximately $3,693,219.00. Table 1.1 shows grants received by the SJBCWPP fire departments for enhancement of fire response capabilities.

The NMSFD administers annual grants such as the Volunteer Fire Assistance (VFA) Grant Program**,** USDI Rural Fire Assistance (RFA) Grant Program, and State Fire Assistance (SFA) Grant Program. Distribution of these grant monies has been on a competitive basis.

Table 1.1. Grants submitted for the SJBCWPP planning area, 2002–2005

Grant recipient	Project/ treatment	Description
SFA grant, Environmental Economic Communities Organization for San Juan County	Hazardous fuels reduction	Hazardous fuels treatments in the WUI
Governor Wildland grant, Bloomfield Fire	Enhanced wildland fire response	2,000-gallon water tender; received $120,000.00
RFA grant, County Fire (3 separate grants)	Firefighter safety	Wildland fire training and equipment; received $60,000 (combined total for 3 grants)
RFA grant, Bloomfield Fire 2003	Fire equipment	Wildland firefighting equipment; received $22,000.00
RFA grant, Bloomfield Fire 2004	Fire equipment	Wildland firefighting equipment; received $13,600.00
RFA grant, Bloomfield Fire 2005	Fire equipment	Wildland firefighting equipment

Source: San Juan County Fire Department and the State Forestry Division of the New Mexico Energy, Minerals and Natural Resources Department, 2005.

The SJBCWPP communities have been involved with, and supportive of, programs designed to significantly reduce hazardous wildland fuels in the WUI. Communities located in the WUI endorse and support fuel reduction programs that encourage local economic and community-related small business and local industry growth through productive use of wildland treatment by-products. The CAG recognizes that implementing fuel reduction treatments throughout the basin could stimulate private local businesses to perform this work. Table 1.2 identifies treatment areas located in and around the SJBCWPP WUI

boundary. In accordance with Section 103.d.2.B of HFRA, the CAG also recognizes that in allocating funding ". . . the Secretary should, to the maximum extent practicable, give priority to communities that have adopted a community wildfire protection plan or have taken proactive measures to encourage willing property owners to reduce fire risk on private property." The combination of enhanced wildland fire response by local fire departments and wildland fuel mitigation treatments by the BLM FFO will continue to reduce fire risk to the communities within the SJBCWPP.

Table 1.2. Farmington Field Office fuels treatments

Project area location	Treatment name[a]	FY 2003, no. of projects/acre	FY 2004, no. of project/acres	FY 2005, no. of project/acres
Fuels treatment projects in San Juan County	Prescribed fire non-WUI	3/474	4/655	4/900
	Mechanical non-WUI	8/1564	1/1800	5/2845
	Chemical non-WUI	3/6319	1/8032	2/4500
	Prescribed fire WUI	0	0	0
	Mechanical WUI	0	2/80	2/107
	Chemical	0	1/20	1/67
	Contract mechanical	2/260	2/220	1/67
	By-product utilized	2/788	3/887	3/910

Source: Farmington Field Office, 2005.
[a]Mechanical acres implemented by contractors are listed twice, under mechanical WUI (or mechanical non-WUI) and contract mechanical. By-products used are firewood.

F. Goals

The CAG has agreed on 10 primary goals of the SJBCWPP:

- Improve fire prevention and suppression
- Reduce hazardous riparian and rangeland fuels
- Restore watershed health
- Promote community involvement and education
- Recommend measures to reduce structural ignitability in the SJBCWPP area
- Encourage economic development and stability in the community through protection of the ecosystem and riparian values
- Identify watersheds at-risk and potential impacts on downstream communities
- Identify funding needs and opportunities
- Expedite project planning
- Prioritize high-risk projects

These goals are mostly strategic; however, the action recommendations developed by the CAG to reach these goals are prescriptive, that is, designed to be implemented in specific time frames and with measurable outcomes. In developing this CWPP, it was not intended that each action recommendation meet each goal; some action recommendations are specific to a single or few goals. The CAG believes

that the synergistic effect of implementing all action recommendations will achieve the stated goals of the SJBCWPP over time. The SJBCWPP goals were reviewed for consistency in implementing the guiding principles and recommendations of *The New Mexico Forest and Watershed Health Plan*.

The SJBCWPP meets all HFRA criteria, and it has been collaboratively developed and agreed to by the applicable local governments and fire departments, the BLM FFO (the primary relevant federal entity), and other interested parties. The SJBCWPP establishes a coordinated, collaborative, performance-based framework of recommendations to meet its outlined goals.

G. Planning Process

Several county, municipal, and BLM FFO planning documents and studies have incorporated wildfire management guidelines and standards for riparian and rangeland enhancement in the SJBCWPP planning area. The goals, policies, and guidelines outlined in these local documents, in addition to the interagency state and national plans and the public involvement process represented by the CAG, all critically informed the development of the SJBCWPP. The local studies, plans, and documents reviewed by the CAG include the following:

- *San Juan Basin Watershed Management Plan* (2005)
- *San Juan County Strategic Plan* (2005)
- *The New Mexico Forest and Watershed Health Plan* (2004)
- *Farmington Field Office Resource Management Plan* (2004c)
- *Fire and Fuels Management Plan Amendment and Environmental Assessment for Pubic Lands in New Mexico and Texas* (2004a)
- *Farmington Field Office Fire Management Plan* (2004b)
- *San Juan County Interagency Operating Agreement* (2005)
- *San Juan County Operating Plan* (2005)
- *City of Aztec 2002 Comprehensive Plan* (2002)

Successful implementation of the SJBCWPP will require a collaborative effort among multiple layers of government and a broad range of special-interest groups. The CAG recognizes that processes and systems which ensure recommended treatments and actions of the SJBCWPP comply with HFRA; the National Environmental Policy Act (NEPA); the Endangered Species Act; the National Historic Preservation Act; and other applicable federal, state, and local environmental regulations must developed.

Upon approval of this SJBCWPP by the Cities of Farmington, Bloomfield, and Aztec; municipal and county fire departments; and San Juan County and after concurrence by the BLM FFO and the NMSFD, it will be submitted to all appropriate agencies for implementation funding of the priority action recommendations.

San Juan County and these cities are committed to the successful implementation of the SJBCWPP and will cooperate in developing any formal agreements necessary to ensure the plan's timely execution, monitoring, and reporting. It is the intent of San Juan County and the Cities of Farmington, Bloomfield, and

Aztec, to develop an administrative oversight procedure to be responsible for the implementation, monitoring, and reporting of this SJBCWPP. The SJBCWPP administrators will coordinate with interested parties—industry, federal, state, and local agencies and nongovernmental organizations (NGOs)—accept grants, implement priority projects, and monitor and update the SJBCWPP as necessary.

The CAG recommends that the San Juan County Fire Department chief coordinates and monitors the implementation of the SJBCWPP through the County Fire Department office for the unincorporated communities within the county. The CAG further recommends that the fire chiefs of Farmington, Bloomfield, and Aztec administer the SJBCWPP within their respective municipalities. Figure 1.2 summarizes the process that the local CAG followed to produce the SJBCWPP. At the far right of each tier is the “product” resulting from the activities in that tier. These tiers correspond to the sections in the SJBCWPP and serve as a process guide for the rest of this document.

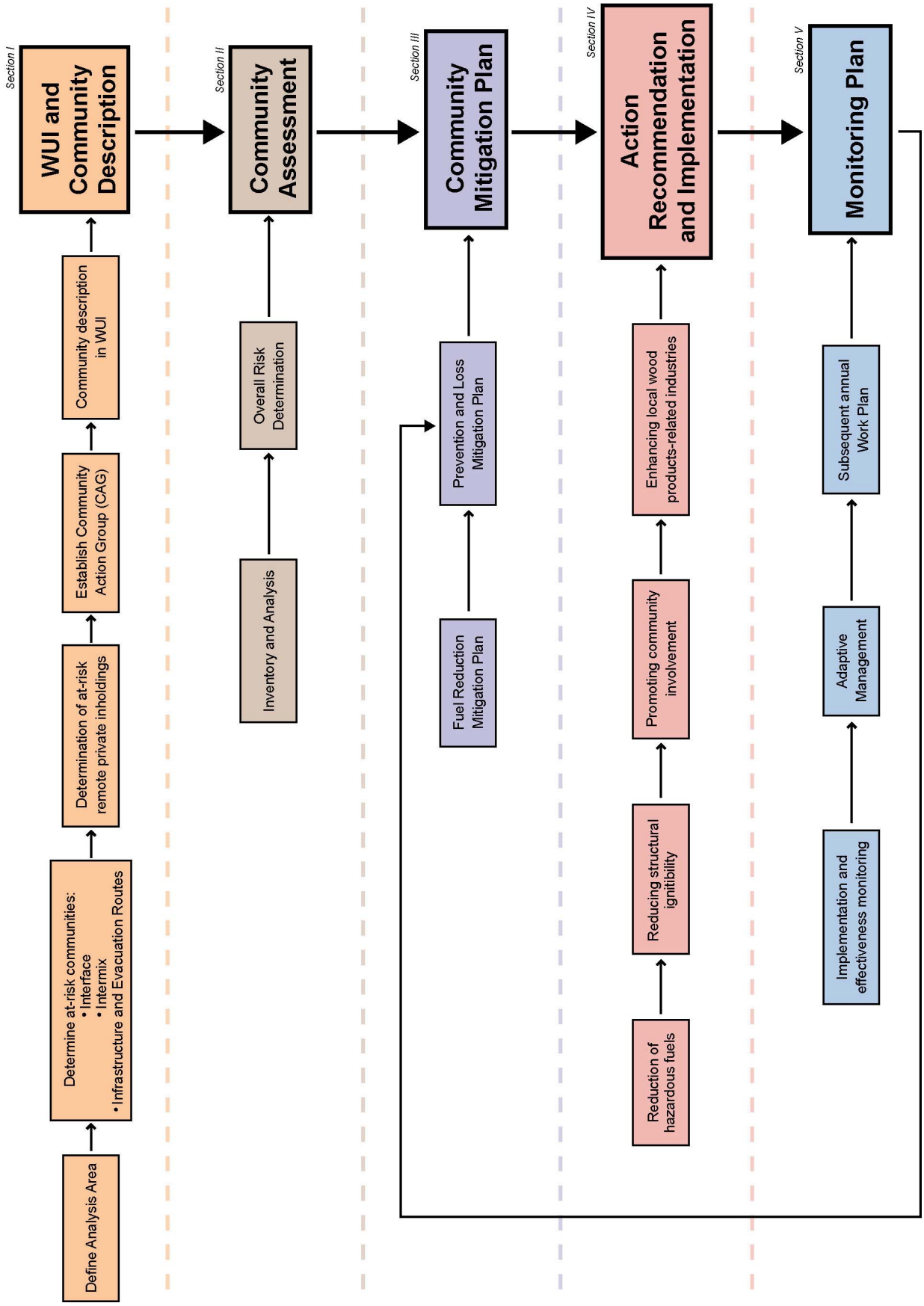

Figure 1.2. Process followed to produce the SJBCWPP

II. COMMUNITY ASSESSMENT

A. Wildland-Urban Interface Delineation Process

The SJBCWPP incorporates the Fire Response Zones within the WUI (Figure 2.1). Intermix communities located within the WUI (Figure 2.2) included in the analysis consist of the following (by Fire Response Zone):

- Northeast San Juan County Zone includes portions of the Animas River and San Juan River corridors and the intermix communities of Cedar Hill, Center Point, and Navajo Dam
- Southeast San Juan County Zone includes portions of the San Juan River corridor and the intermix communities of Lee Acres, Sullivan Road, and Blanco.
- Central San Juan County Zone consists of significant private lands associated with the Animas River corridor and includes the intermix communities of Flora Vista and Hart Valley.
- Northern San Juan County Zone consists of significant private lands associated with the La Plata River corridor and the intermix community of La Plata.
- Western San Juan County Zone consists of significant private lands within the San Juan River corridor and the intermix communities of Fruitland, Waterflow, and Kirtland.

The analysis area also includes the wildland area around at-risk remote private lands, significant community infrastructures, and necessary evacuation routes located in the San Juan Basin within the WUI. All of the intermix and interface communities are in the vicinity of federal lands and, using HFRA criteria and guidance published in the *Federal Register* (2001a) and the *2005 New Mexico Communities At Risk Assessment Plan* (NMSFD 2005a), are considered to be at risk from wildland fire. The lands that surround these communities and private lands are so removed from the natural fire regime and potential natural vegetation that they are conducive to a large-scale wildland fire, and such a wildfire in their vicinity could threaten human life and property. The SJBCWPP process of identifying WUI boundaries involved collaboration with the local, state, and federal governments; fire chiefs and the CAG. The CAG represented the public interest through participating government officials, planners, natural resource specialists, and other interested parties from throughout the analysis area.

Within the analysis area, the CAG delineated a WUI boundary that includes 282,972 acres of private, state, and federal lands and that surrounds the cities of Farmington, Bloomfield, and Aztec and the communities of Fruitland, Waterflow, Kirtland, La Plata, Flora Vista, Cedar Hill, Center Point, Blanco, Lee Acres, Hart Valley, Sullivan Road, and Navajo Dam; significant community infrastructures; and roadways used as evacuation/firefighting resource distribution routes. This WUI (Figure 2.2) is the minimum area needed to provide protection to the extensive watersheds, adequate evacuation routes, and cities and communities from catastrophic wildland fire. The CAG also identified fuel mitigation treatments for the areas around at-risk remote private lands where continuous wildland fuels exist in proximity to structures. The watershed in the WUI consists of both federal and nonfederal lands in the riparian corridors of the San Juan, La Plata, and Animas rivers. Navajo Lake is the only reservoir found on these rivers and is located in the northeastern area of the WUI.

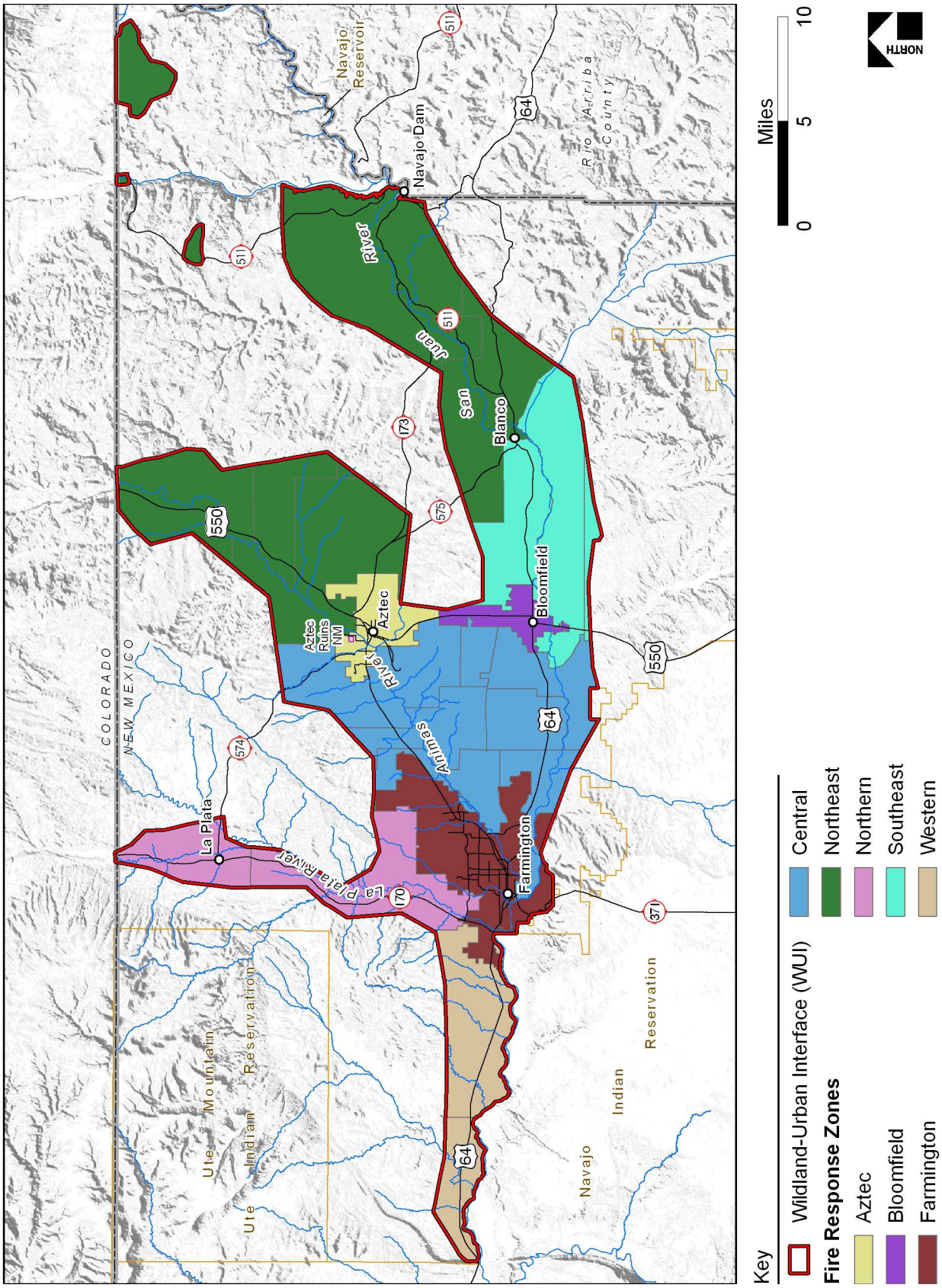

Figure 2.1. Fire Response Zones

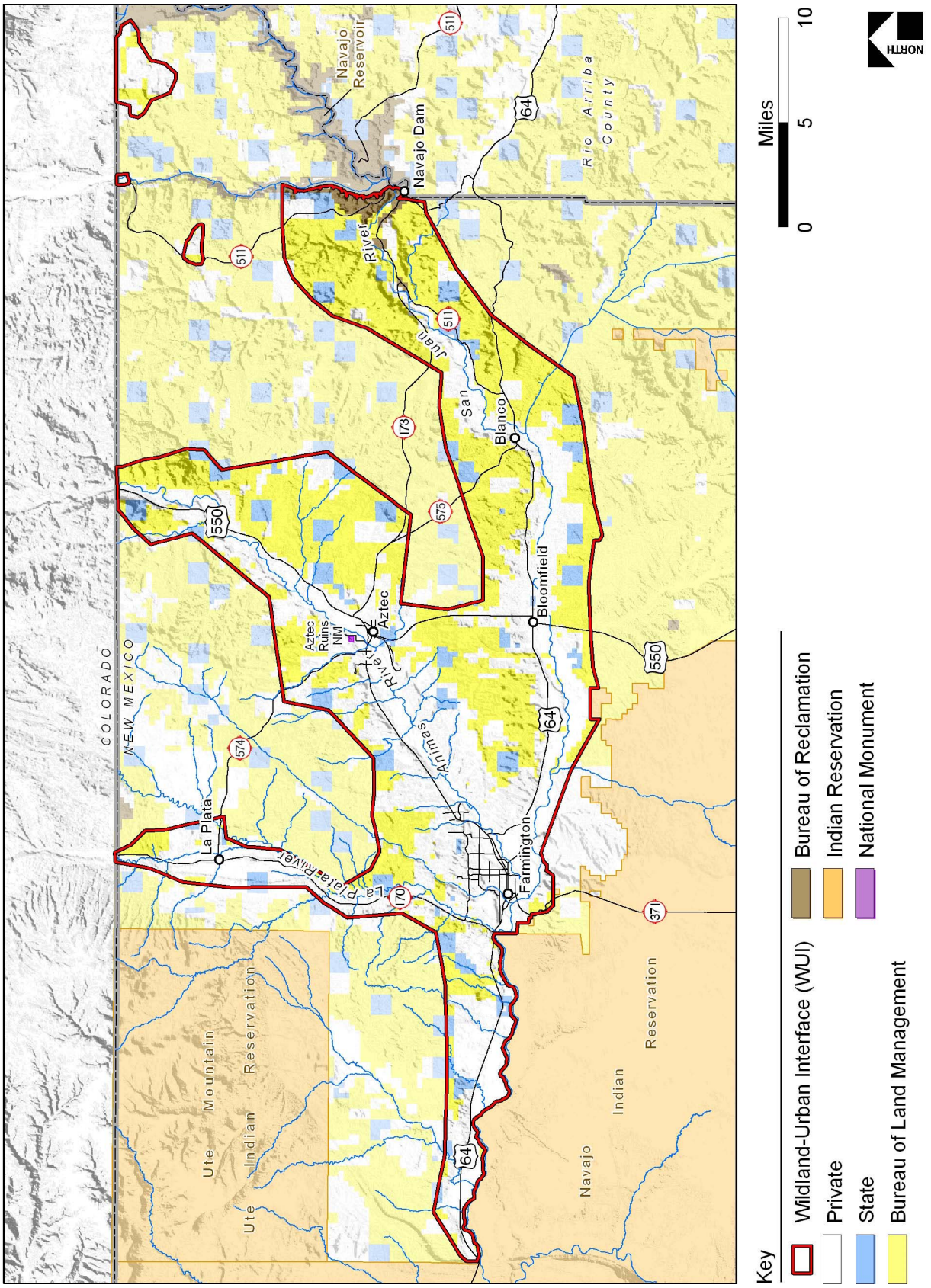

Figure 2.2. Wildland-urban interface (WUI)

These river systems, with associated tributaries, are considered critical or suitable habitat for many threatened, endangered, and sensitive species (see Tables B.1 and B.2. in Appendix B); have remarkable scenic, recreational, fish and wildlife, historic, and cultural values; and have significant watersheds that provide domestic water supplies to the communities. The WUI also includes the critical local and federal agency communication facilities that are found on Knickerbocker Peak.

General elements used in creating the WUI for the communities include the following:

- Wildland vegetative fuel hazards with consideration of local topography
- Historical fire occurrence
- Community development characteristics
- Local firefighting preparedness by Insurance Services Office (ISO) rating review
- Municipal watershed protection
- Infrastructure and evacuation routes

The communities within the WUI lie in areas where the alignment of vegetation and topography could encourage wildfire to spread so rapidly that, without treatments, facilities and homes might be burned through before suppression measures would be available. Some areas within these communities have poor ingress and egress, limited communication capabilities, and limited effective evacuation/firefighting response access. The CAG reviewed Section 101.16.B.iii of HFRA to determine "an area adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuel reduction to provide safer evacuation from the at-risk community." The combination of fuel load, topography, poor access, and noneffective communication increases the potential severity of wildland fire to both property and public/firefighter safety in some areas within the WUI. Therefore, the CAG considered it to be increasingly important for private land treatments to be specifically identified and coordinated with fuel mitigation treatments on adjacent federal lands. Such wildland fuel mitigation treatments will also help in meeting watershed/riparian goals as outlined within *The New Mexico Forest and Watershed Health Plan*.

B. Wildland-Urban Interface Risk Assessment

The community assessment is a risk analysis of potential catastrophic wildland fire to the cities and communities identified in the SJBCWPP. This risk analysis incorporates the current condition class, wildfire fuel hazards, risk of ignition, historical wildfire occurrence, and at-risk community values. Local preparedness and protection capabilities are also factors that contribute to the delineation of areas of concern. The areas of concern for wildfire fuel hazards, risk of ignition and wildfire occurrence, and community values were evaluated and mapped, and then each area was given relative and qualitative ratings of "high," "moderate," or "low." A composite of these ratings, representing the cumulative risk from wildfires for the communities, was then mapped.

1. Fire Regime and Condition Class

Fire has always played a natural (historical) role in maintaining landscape vegetative features. HFRA recognizes the role and function of wildland fire across natural landscapes by encouraging authorized

projects (see HFRA, Sec. 102.a) in the WUI and in habitats that have been altered from their historic fire regime. A natural fire regime is a general classification of the role a fire would play across a landscape in the absence of human intervention. There are five categories of natural fire regimes that have been defined based on the number of years between fires (fire frequency) combined with the severity of fire on dominant overstory vegetation (Schmidt et al. 2002). The national database (*Coarse-scale Spatial Data for Wildland Fire and Fuel Management* version 2000, www.fs.fed.us/fire/fuelman) suggests that the majority of WUI lands within the SJBCWPP are included within natural Fire Regime 1 (80%), with 17,000 acres within Fire Regime 2 (6%) and 33,670 acres within Fire Regime 3 (12%). The remainder of the WUI is composed of Fire Regime 4 and open water. The current state of vegetation in the existing wildland fire complex has been further compromised through the total suppression of all fires. As an example, the present composition of plant communities within New Mexico has been influenced by many factors, including climate, drought, insects, disease, wind, domestic livestock grazing, cultivation, browsing by wildlife, and fire. Competition with invasive plant species has also had a profound effect on the naturally occurring influence of fire on the vegetation associations in the San Juan Basin. Within SJBCWPP lands, there has been an extensive advance of juniper into grasslands accompanied by encroaching sagebrush and invasive grasses, converting previous juniper grassland habitats to juniper-sagebrush woodland with a heavy understory of fine fuels. Much of San Juan County today is actually composed of dense brush lands where wildland fires have occurred at a high frequency and burn severity.

In compliance with HFRA, federal lands in the WUI were evaluated for fire regime and current condition class. The condition class of wildland habitats describes the degree to which the current fire regime has been altered from its historic range, the risk of losing key ecosystem components, and the vegetative attribute changes from historical conditions. For example, a habitat in Condition Class 1 is a habitat system in its natural fire range and at low risk for losing ecosystem components from wildland fire. Condition Class 2 habitats are moderately departed from the historic fire-occurrence range with a moderate risk of losing habitat components. Condition Class 3 habitats have significantly departed from their historic fire-regime range, and their risk of losing key habitat components is high. The majority of the lands analyzed within the WUI are considered Condition Class 2 (approximately 55%).

Because condition class categories are based on coarse-scale data that is intended to support national-level planning, any interpolation of this data for localized conditions may not be valid. Therefore, local agencies were asked to provide data for localized conditions. The amount of saltcedar/Russian olive invasion within the WUI riparian areas, proliferation of nonnative grasses, elimination of historic wildland fire return cycles, and increasing woody species invasion indicate that the riparian areas and upland habitats of the WUI no longer conform to components of Condition Class 1 lands. As a result, local conditions as reported within the *Farmington Field Office Fire Management Plan* (USDI BLM 2004b) indicate that the riparian areas of the WUI actually fall within Condition Class 3, with most upland areas classified as Condition Class 2.

2. Fuel Hazards

The arrangement of fuel types, fuel models, relative flammability, and fire potential of vegetation varies greatly within the WUI (see Table 2.1). Fuel hazards depend on a specific composition, type, arrangement, and condition of vegetation such that if the fuel were ignited, an at-risk community or its community

infrastructure would be threatened. However, in some areas, the existing topography can actually create a natural firebreak that would help to reduce fuel hazards. Delineation of favorable and unfavorable fuel and topographic conditions is essential to community wildland fire planning.

Table 2.1. Fuel model, fire danger ratings, and intensity level on vegetative associations within the WUI

Fuel type	Vegetative Association	Fuel model	Fire danger rating model[a]	Flame length (ft)	Fire Intensity Level (FIL)	Rate of spread ft/hr (ch/hr)
Grassland types	Mid-short grass prairie-steppe grasslands	1	L and N	4–7	3	3,950–13,200 (60–200)
	Great Basin grasslands	3	L and N	12–20	6	5,950–16,500 (90–250)
Shrublands	Great Basin microphyllous desert scrub	3	S	6	4	2,300 (35)
	Great Basin broadleaf deciduous desert scrub	1 and 3	T	6	3	2,100 (32)
Forests	Rocky Mountain/Great Basin closed conifer woodland	2 and 9	E and T	6–19	4–6	400 (6)–4,950 (75)
Deciduous Southwest riparian	Deciduous riparian	9	E and T	6	4	2,300 (35)
	Heavily infested saltcedar/Russian Olive[b]	4	G and T	19	6	4950 (75)
	Agricultural, urban, and riverine	1	E and T	19	6	4,950 (75)
Pinyon-Juniper Woodlands	Rocky Mountain/Great Basin open conifer woodland	6	F and T	6	5	2,100 (32)

Source: The National Fire Danger Rating System—1978 USDA Forest Service GTR INT-39 (USDA 1978).
[a]See Appendix C for the National Fire Danger Rating System definitions.
[b]Areas identified by San Juan County Extension.

Evaluation of the vegetative fuels on federal and nonfederal land in the WUI was conducted through a spatial analysis using geographic information system (GIS) technology in a series of overlays that helped the CAG to identify high, moderate, and low fuel-hazards risk areas. For each area of the WUI, the fuel and vegetation density, type, and distribution, as well as slope and aspect analyses, were conducted to assist in the categorization of areas of highest risk of fire ignition and spread from wildland fuels. Table 2.2 identifies the total amount of lands in the WUI that were evaluated in overall wildland risk because of increased fuel hazards.

Table 2.2. Fuel hazards

SJBCWPP communities	Total land area (acres)	Treated and untreated lands (acres)	Deciduous Riparian[a] >100 trees/ acre (untreated acreage)	Slopes ≥ 20%[b] (untreated acreage)	South-, southwest-, or west-facing slopes[b] (untreated acreage)
Farmington	23,019	*Treated:* 21 *Untreated:* 22,998	333	1,324	7,496
Aztec	8,558	*Treated:* 11 *Untreated:* 8,547	469	686	3,110
Bloomfield	4,904	*Treated:* 0 *Untreated:* 4,904	1,308	207	1,773
Northeast San Juan County Zone	108,746	*Treated:*15,701 *Untreated:* 93,045	7,950	20,930	35,281
Southeast San Juan County Zone	31,756	*Treated:* 439 *Untreated:* 31,317	6,048	3,526	8,657
Central San Juan County Zone	58,659	*Treated:* 1,303 *Untreated:* 57,356	13,266	5,361	20,127
Northern San Juan County Zone	25,417	*Treated:* 963 *Untreated:* 24,454	4,240	2,220	7,731
Western San Juan County Zone	21,913	*Treated:* 0 *Untreated:* 21,913	6,065	1,679	8,386
Total WUI	**282,972**	*Treated:* 18,438 *Untreated:* 264,534	39,679	35,933	92,561

Source: Logan Simpson Design Inc. and BLM FFO (2004).

[a] Deciduous Riparian biotic community including areas heavily infested with saltcedar and Russian olive as identified by San Juan County Extension.

[b] When aspect is south, southwest, or west, or when slope is ≥ 20 percent in areas of pinyon-juniper woodland or grassland, the fuel hazards risk rises to high.

Several fuel hazards components, including vegetation type and density, slope and aspect, and treated areas, were analyzed for degree of risk from wildland fire. Table 2.3 identifies the different values given to these various fuel hazards components. Visual representations of these fuel components are mapped in Figures 2.3–2.6. The influences the components carry were then compiled to designate areas of high, moderate, and low fuel hazards. This compilation of fuel hazards is shown in Figure 2.7. The major vegetation types used for analysis are based on the vegetation communities found in the Colorado Plateau Semidesert ecoregion province. These vegetation communities were grouped in the analysis into agriculture, grasslands, desert scrub, open conifer, closed conifer, riverine/lacustrine and forest/scrub. More in-depth descriptions of the different vegetation communities follow Table 2.3.

Table 2.3. Fuel hazard components

Fuel Hazards Components	Influence[a]
Vegetation type and density	
• Deciduous riparian, >100/acre	H
• Pinyon-juniper vegetation in fuel model 6, Grasslands in fuel model 3; Forest vegetation in fuel model 9	M
• Pinyon-juniper woodland and semidesert vegetation	L
Burned areas	L
Slopes ≥ 20 percent	M
Aspect (south-, southwest-, or west-facing slopes)	M
Treated areas	L

Source: Logan Simpson Design Inc.
[a] H = High, M = Moderate, L = Low

The 5 major vegetation communities and 12 vegetative associations of the Colorado Plateau Semidesert ecoregion province consist of the following:

- Great Basin Desert Grassland (Photo 2.1) dominated by galleta (*Hilaria jamesii*), Indian ricegrass (*Oryzopsis hymenoides*), and alkali sacaton (*Sporobolus flexuosus*):
    - Great Basin Foothill-Piedmont Grasslands
    - Great Basin Lowland/swale Grasslands
    - Short Grass Steppe
    - Mid-Grass Prairie

Photo 2.1. Grassland vegetation community

- Shrublands including the Great Basin Desert Scrub (Photo 2.2) dominated by big sagebrush (*Artemisia tridentata*) replacing some historic grasslands and grassland savannas areas with an overstory canopy greater than 25 percent cover:
    - Great Basin Broadleaf Deciduous Desert Scrub
    - Great Basin Microphyllous Desert Scrub

Photo 2.2. Shrubland vegetation community

- Riparian (Photo 2.3) dominated by Fremont cottonwood (*Populus fremontii*), willows (*Salix* spp.) and New Mexican Privet (*Forestiera neomexicana*). Riparian communities are not fire adapted; however, in some areas exotic cover types now dominate including Russian olive (*Elaeagnus angustifolia*) and saltcedar (*Tamarix* spp.) An additional component of this vegetation community is the associated upland component, which consists of intermittent and ephemeral washes dominated by deciduous trees and shrubs:
    - Southwest and Plains Forested/Shrub Wetlands
    - Riverine/Lacustrine
    - Agriculture
    - Urban Vegetation

Photo 2.3. Riparian vegetation community

- Woodlands, including diverse plant communities consisting of trees less than 33 feet tall forming canopies with generally 25 to 50 percent cover, occur primarily in elevations ranging between 4,000 and 7,000 feet. This type includes moderate stands of juniper (*Juniperus* spp.) with an understory consisting of warm-season grasses and shrub species, such as snakeweed (*Gutierrezia sarothe*) and rabbitbrush (*Chrysothamnus* spp.):
    - Rocky Mountain Basin Open Conifer Stands (Photo 2.4)

Photo 2.4. Woodland vegetation community

- Forests dominated by coniferous trees greater than 33 feet tall usually with a canopy exceeding 60 percent with some areas of open canopy with 25 to 60 percent cover. This vegetation community is poorly represented within the SJBCWPP WUI. These are warm and dry forests occurring at elevations greater than 6,500 feet consisting primarily of ponderosa pine (*Pinus ponderosa*) and oak (*Quercus* spp.) series with a grass understory:
    - Rocky Mountain Basin Closed Conifer Woodlands (Photo 2.5)

Photo 2.5. Conifer forest vegetation community

Knowledge of the desired future conditions of these vegetative associations is needed to develop specific resource goals and to serve as a standard by which to measure the success of the SJBCWPP. Defining *desired future conditions* would answer the question what would the resource look like if we achieve the SJBCWPP goals and objectives. The desired future conditions of these vegetative associations are the same as those described in the Fire Regime Condition Class (FRCC) Interagency Handbook Reference Conditions describing the vegetation that would exist without human interference and if plant succession were projected to its climax condition while allowing for natural disturbance processes such as wildland fire (FRCC Interagency Working Group 2005a). The potential natural vegetation group and reference conditions for these vegetative associations are found in Appendix A.

Wildland fuels have generally been categorized into four groups: grasses, brush, timber, and slash. The differences in fire behavior between these groups are related to fuel load and its distribution. The fuel load is a significant factor that determines fire ignitability, rate of spread, and fire intensity:

> Fuel load and depth are significant fuel properties for predicting whether a fire will be ignited, its rate of spread and intensity . . . Grasses and brush are vertically oriented fuels groups, which rapidly increase in depth with increasing load. Timber litter and slash are horizontally positioned and slowly increase in depth as the load is increased . . . The criteria for choosing a fuel model includes the fact that the fire burns in the fuel stratum best conditioned to support the fire . . . Fuel models are simply tools to help the user realistically estimate fire behavior . . . Therefore, the selection options and modifications for fuel models are limited to maintain a reasonably simple procedure to use with fire behavior nomograms, moisture content adjustment charts and wind reduction procedures. (Anderson 1982:1–3)

Fuels hazards have been correlated with fuel load by vegetative type for this analysis. However, the configuration of live/dead fuels, moisture content, fuel load and type, and drought all influence fire danger and the effect of wildland fire. Semidesert shrub land vegetative types are estimated to support a total fuel load of less than 1 ton per acre of fuels and are mostly in Condition Class 1 (historical fire regime). Pinyon-juniper woodland is estimated to support a total fuel load of 6 tons per acre, while deciduous riparian vegetation associations with densities of 100 trees/acre are estimated to support a minimum total fuel load of 12 tons per acre. Resource damage potential is moderate in pinyon-juniper woodland associations and generally lower in semidesert vegetative types.

Stands of mature shrubs 6 feet or more in height and forming a continuous secondary overstory and containing a significant amount of dead woody material include chaparral, mixed gray oak, mountain mahogany, manzanita, pinyon and juniper vegetative types. Vegetative components of this fuel model are considered moderate risk. However, the most volatile fuel type in the uplands of the analysis area is Gambel's oak associations. Gambel's oak is combustible throughout most of the year because of the high amount of leaf litter and the overall configuration of fuels in this association.

Areas of the WUI adjacent to major stream channels are steep and heavily dissected, with many areas having slopes exceeding 20 percent. Slopes greater than or equal to 20 percent and areas with south-, southwest-, or west-facing slopes were identified as having greater risks because of the preheating and fuel ladder-fire effect associated with steep terrain and decreased humidity associated with the microclimates created by exposed aspects. Other untreated or unburned areas that fall under the category of moderate ground fuels and do not overlap areas with steep slopes or with south, southwest, or west aspects are considered moderate risk from fuel hazards. All other areas have a low risk from fuel hazards, including the areas that have been previously treated or burned.

Areas of deciduous riparian vegetation were differentiated from areas of pinyon-juniper woodland associations, and semidesert vegetative zones because of greater associated fire intensity, fire spread, and potential resource loss. Vegetated areas containing deciduous riparian species densities greater than 100 trees per acre create a greater risk for spread and intensity of wildfire because of the potential crown-fire effect, fuel loading, and fuel ladder-fire scenario. The potential for major conflagrations is high in heavily vegetated riparian areas, creating high resource damage potential. An overall estimate of vegetative ground fuels to be removed, ranging from litter to understory fuels consisting of 1-hour to 100-hour fuels and live standing fuels, may average 12 tons per acre across the deciduous riparian vegetative type. This fuel type was considered high in fuels risk due in large part to the invasion of saltcedar and Russian olive. Depending on vertical height, density, and understory components, deciduous riparian areas, including

stands of saltcedar and Russian olive, can be classified as Fuel Model 4 or considered a component within the deciduous riparian associations adding to fuel loading because of the amount of dead fuels maintained within the plant column of mature saltcedar. Locations of Russian olive and saltcedar within the WUI were mapped by the San Juan County Extension office and are included in Figure 2.4, vegetative types.

Planned and systematic fuel mitigation by mechanical or mechanical/chemical methods is the primary management tool to reduce vegetative fuel accumulation in the SJBCWPP riparian habitats; prescribed fire management opportunities exist in upland vegetative types within the WUI in areas where there are no conflicts with oil and gas industry structures. When considering wildland fire use or prescribed fire as described within the *Wildland Fire Use Implementation Procedures Reference Guide* (USDI et al. 2005), management actions for each fire will depend on forecasted weather, forecasted fire behavior, hazard and safety concerns, and availability of resources. The wildland fuel hazard components listed in Table 2.3 will increase depending on the predicted fire behavior based on vegetative and geographic conditions and immediate weather conditions at the wildland fire site. Areas with none of these fuel hazard characteristics and areas that have been treated, or are proposed for treatments, are identified as having less risk and will require little to no immediate treatment. See Section II.E for a fuel hazards summary for each community.

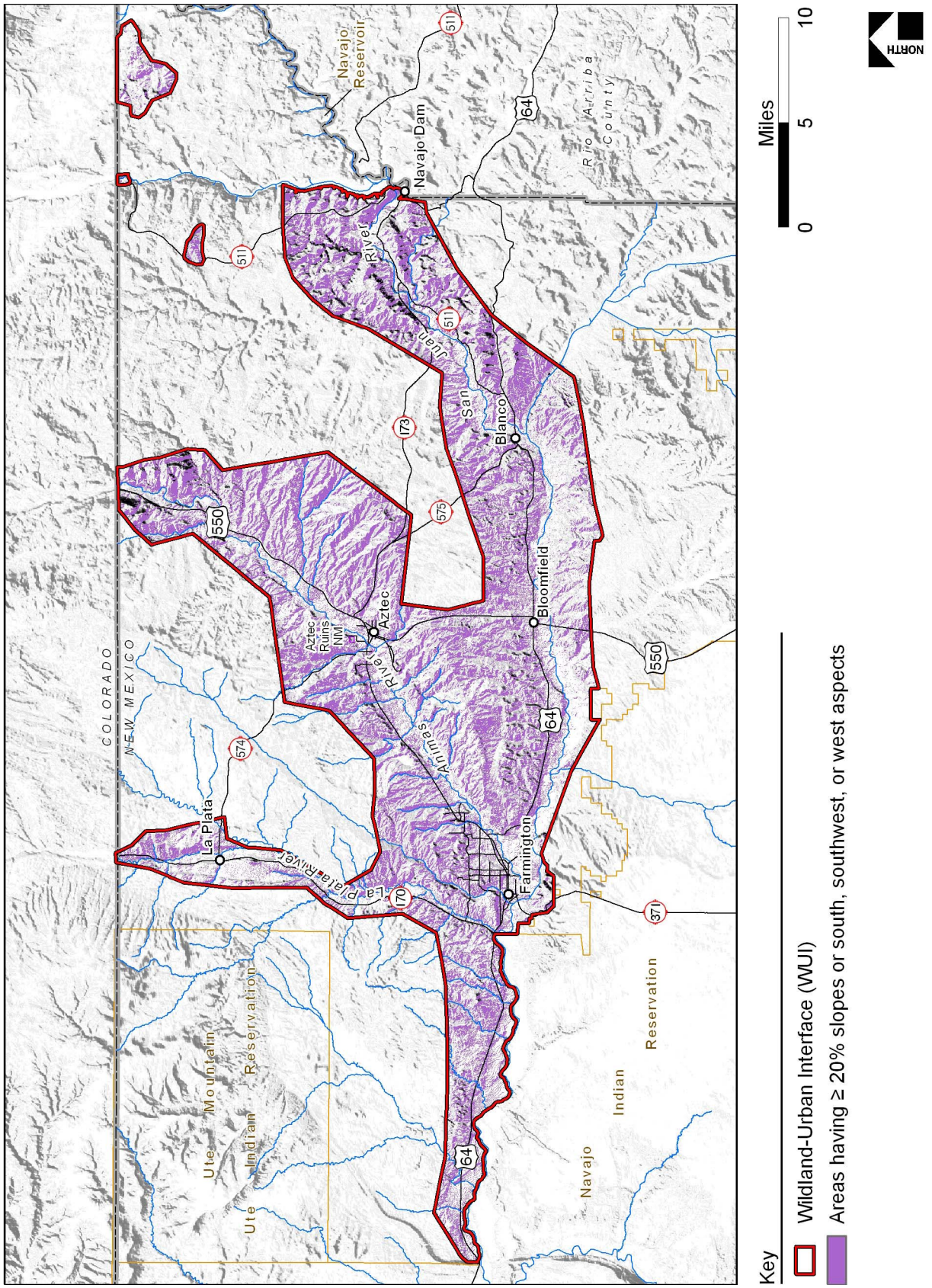

Figure 2.3. Aspect and slope

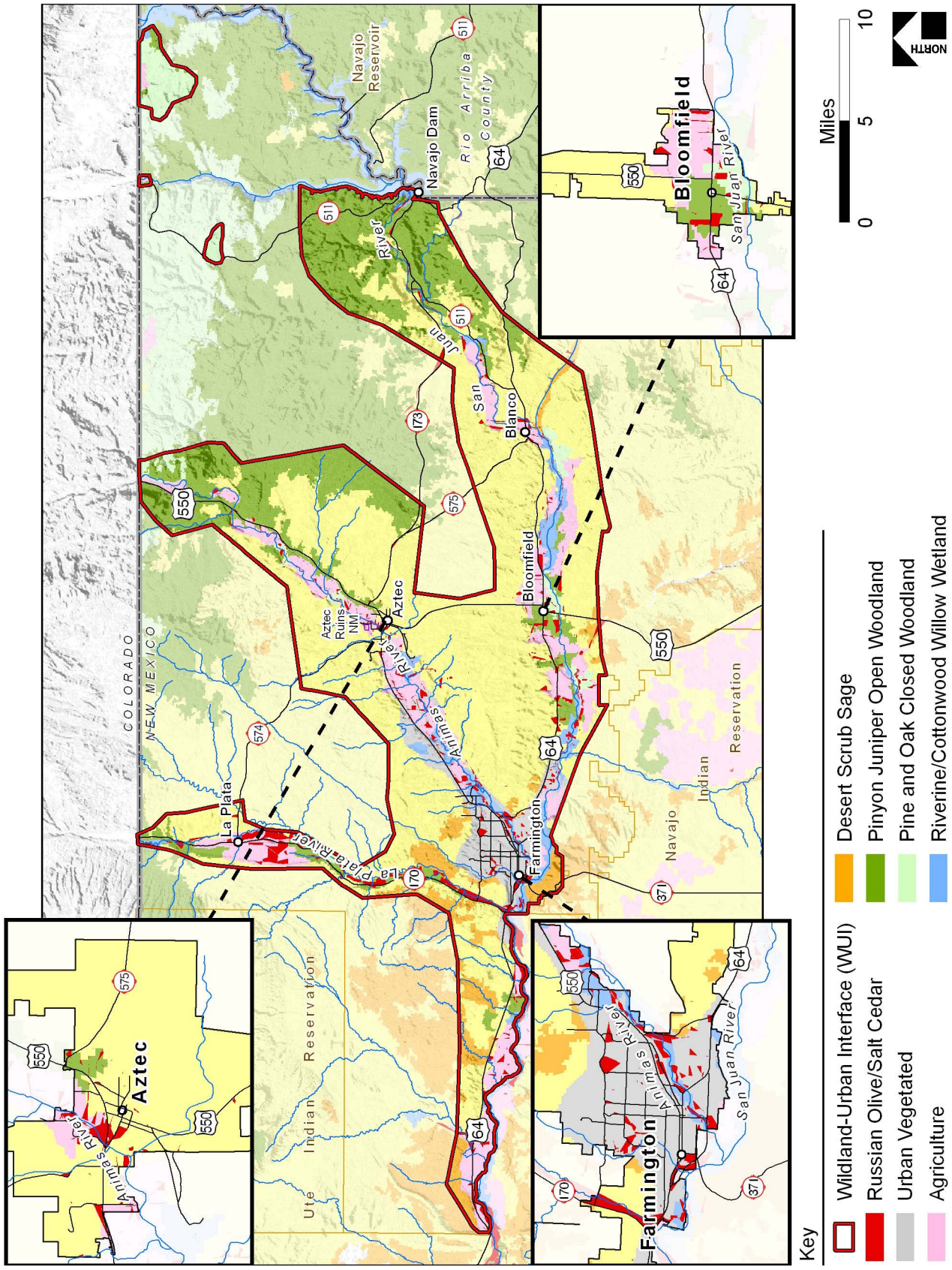

Figure 2.4. Vegetative type

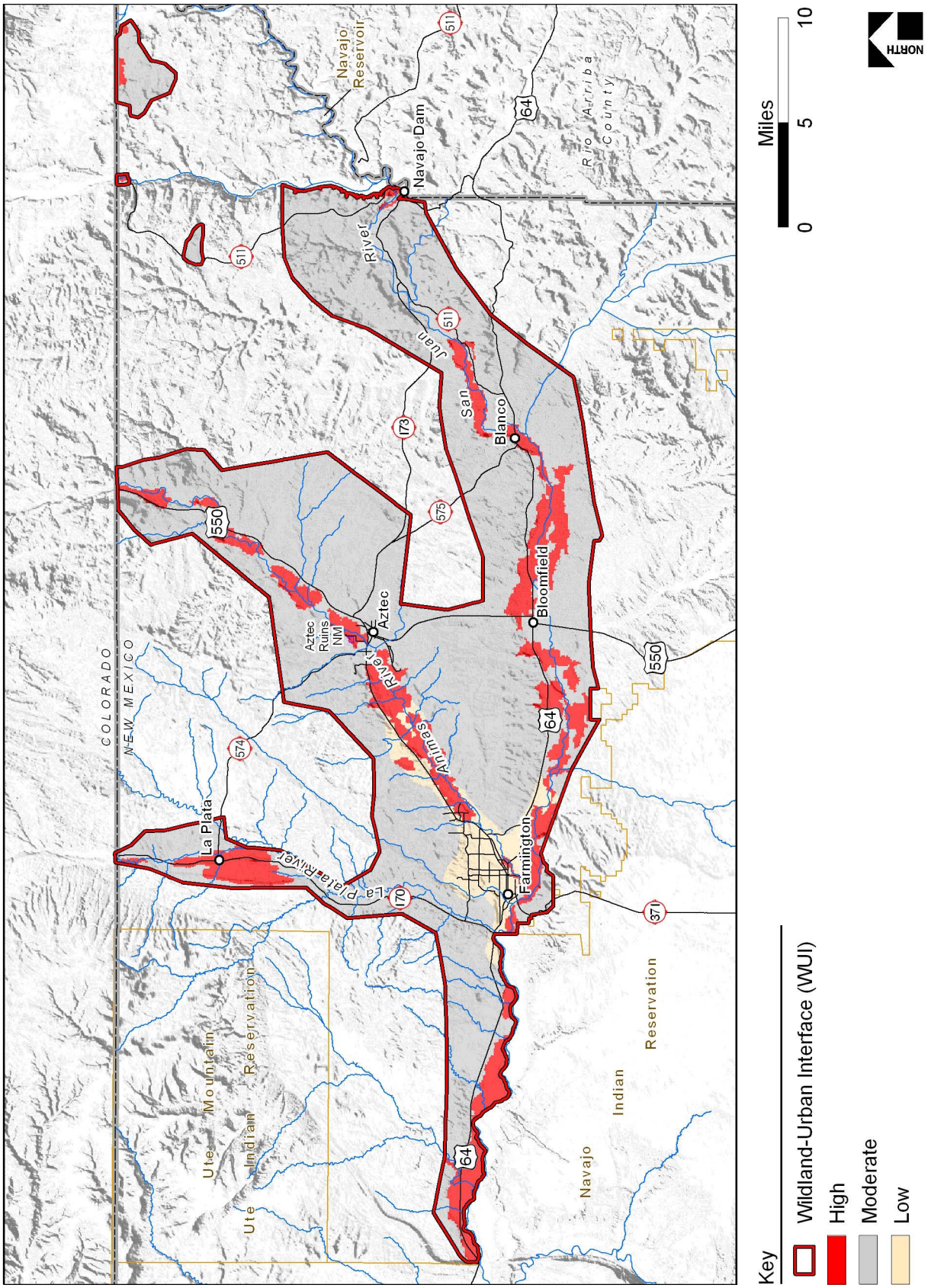

Figure 2.5. Vegetative type and density (flammability)

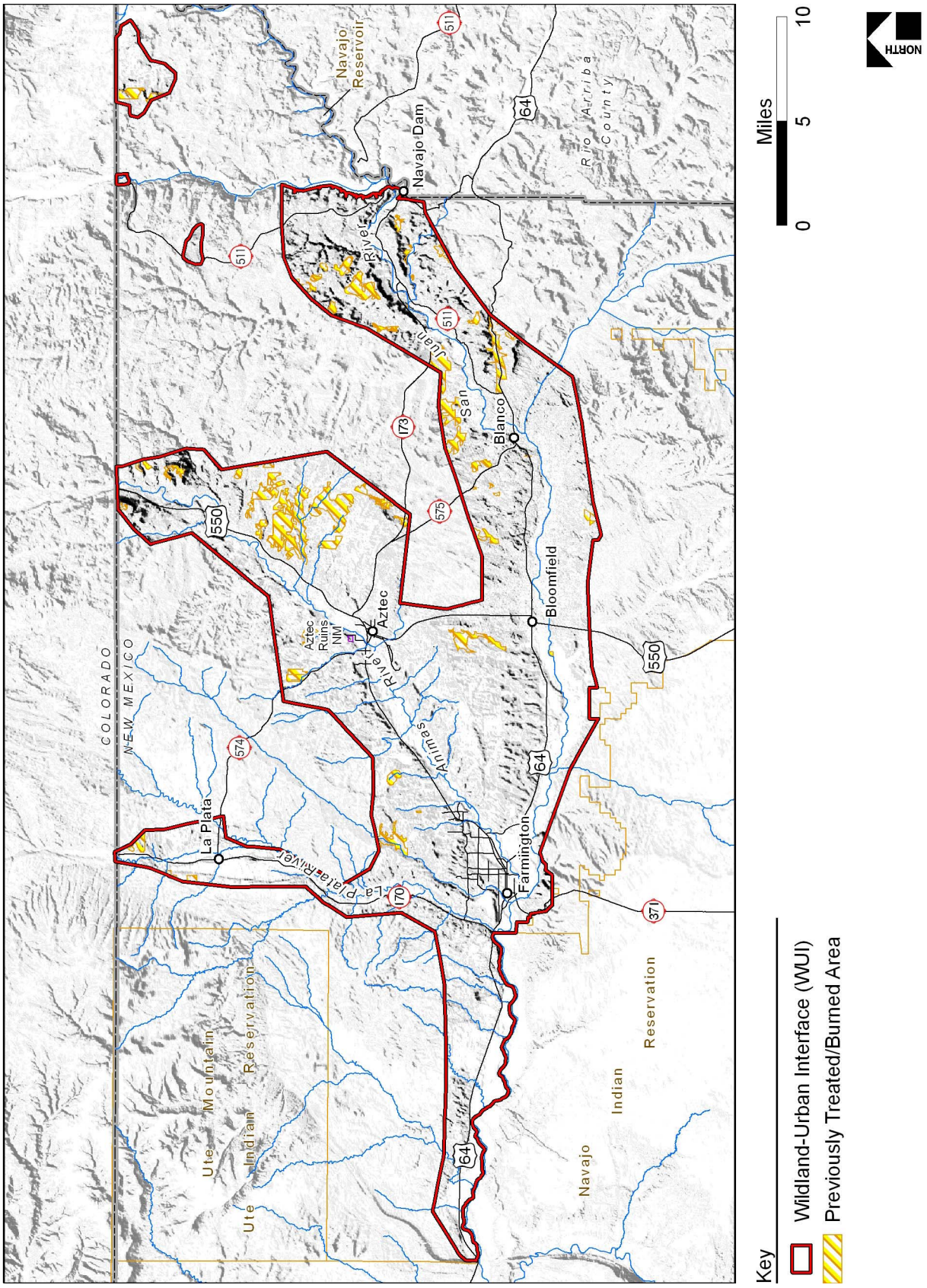

Figure 2.6. Treated and untreated areas

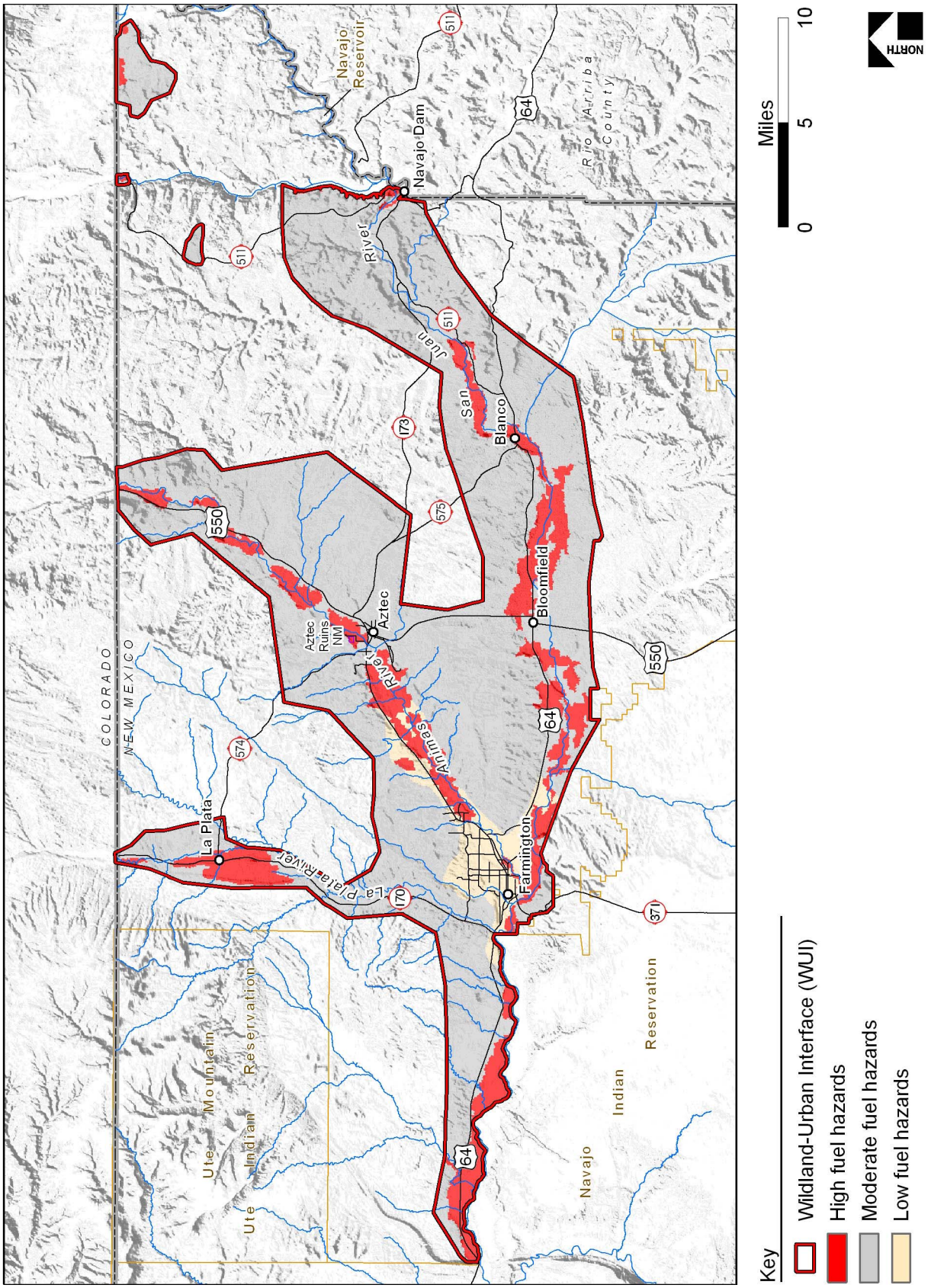

Figure 2.7. Compilation of fuel hazards by slope, aspect, and vegetative components

C. Risk of Ignition and Wildfire Occurrence

Because of the combination of current drought conditions, establishment of cheat grass, and heavy accumulations of fuel loading within riparian drainages from saltcedar and Russian olive, as well as increasing shrub densities within grassland communities, fires have increased in acreage and intensity within the past decade (BLM, FFO 2004b). Although not common, large wildfires, such as the Missionary Ridge Fire that burned approximately 74, 000 acres north of San Juan County in summer 2002, do occur, and the potential for such large conflagrations within San Juan County exist. Several named fires have occurred in San Juan County, including Well #1, Well #2, Dwelling, Shiprock 1 through 5, Black Ridge, and the Crawford Fire. Without the intervention of management, an increase in response capacity and mitigation of hazardous wildland fuels, the current increase in wildland fires within the WUI will continue.

Severe fire weather, high fuel loads, and drought are the common denominators for large, intense stand-replacing fires throughout the region. As reported by the FFO for the period 1994–2005, there have been 89 human-caused wildfires that have burned 388 acres and 629 natural fires that have burned approximately 800 acres on BLM lands. For this region, the lightning-fire season begins in spring and can continue until fall. The midsummer monsoon storms typically raise the humidity, reducing the risk of large catastrophic fires. However, many wildland fire ignitions within the WUI are human caused and not related to lightning efficiency by season. Human-caused fires occur when fuel conditions are most receptive and conducive to support wildland fire, typically during summer drought periods before the onset of the monsoon season.

Table 2.4 details the high, moderate, and low values assigned to fire start incidents on public lands administered by the BLM FFO. Each fire department has also delineated areas of highest fire history occurrence where applicable in each Fire Response Zone within the WUI. Figure 2.8 illustrates the data in Table 2.4. Fire ignition point data from the BLM FFO, and local fire history knowledge were used to show areas with higher frequencies of ignition points (Figure 2.8) Areas with a high frequency of ignition are areas of greater concern. These areas of greater concern include concentrated areas of lightning strikes overlaid with high public-use areas. High-risk areas have the greatest number of fire starts per 1,000 acres. Figure 2.9 details the extent of fires that have occurred within the past 12 years and the combined risk of ignition and wildfire occurrence. See Section II.E for a summary discussion of ignition risk and wildfire occurrence in each community.

Table 2.4. Ignition history and wildfire occurrence

Ignition history and wildfire occurrence components	Value
6.0–9.0 Fire starts/1,000 acres	H
3.0–5.0 Fire starts/1,000 acres	M
0–2.0 Fire starts/1,000 acres	L

Source: Logan Simpson Design Inc.; BLM FFO (2005).

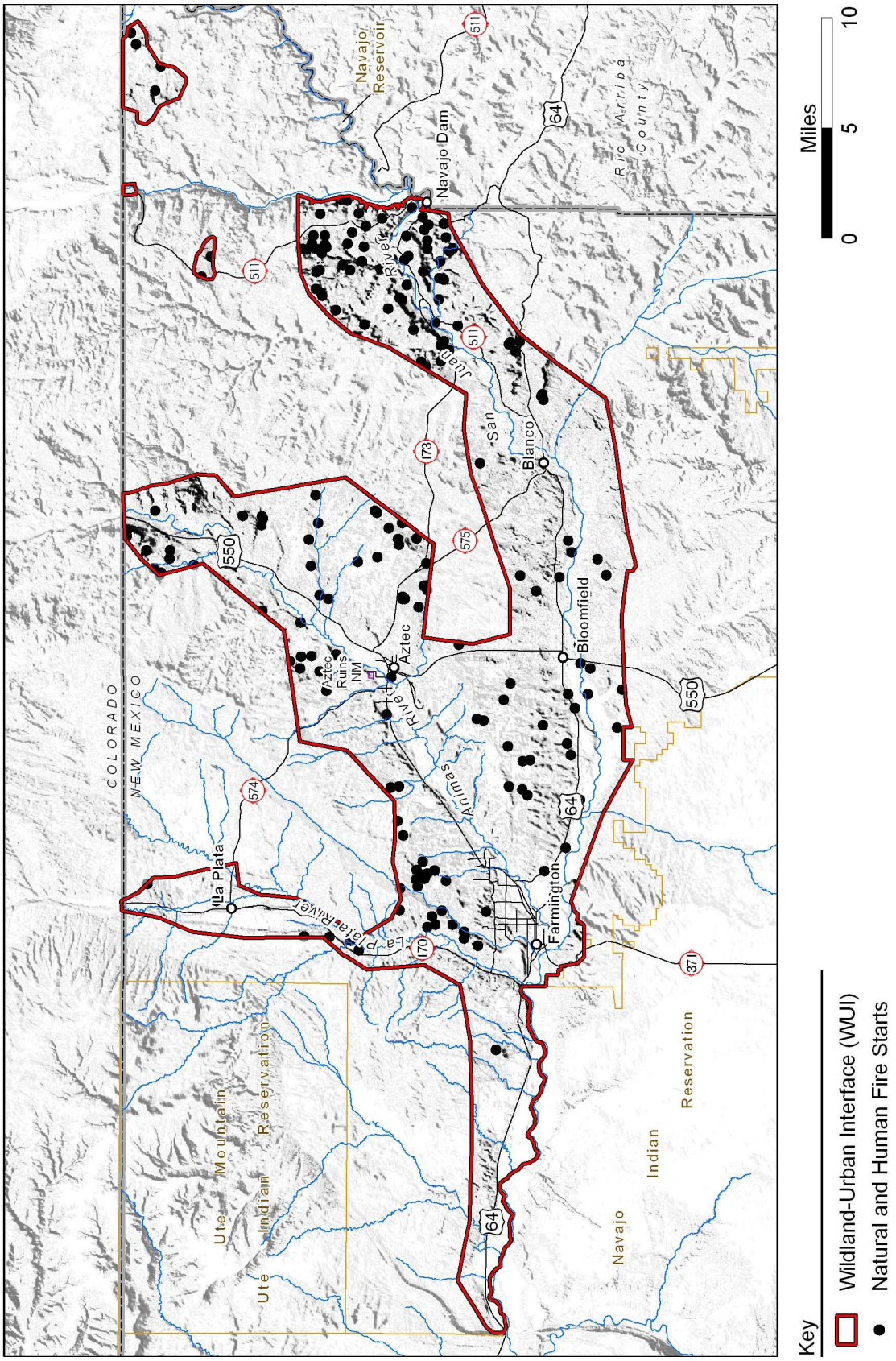

Figure 2.8. Natural and human fire starts

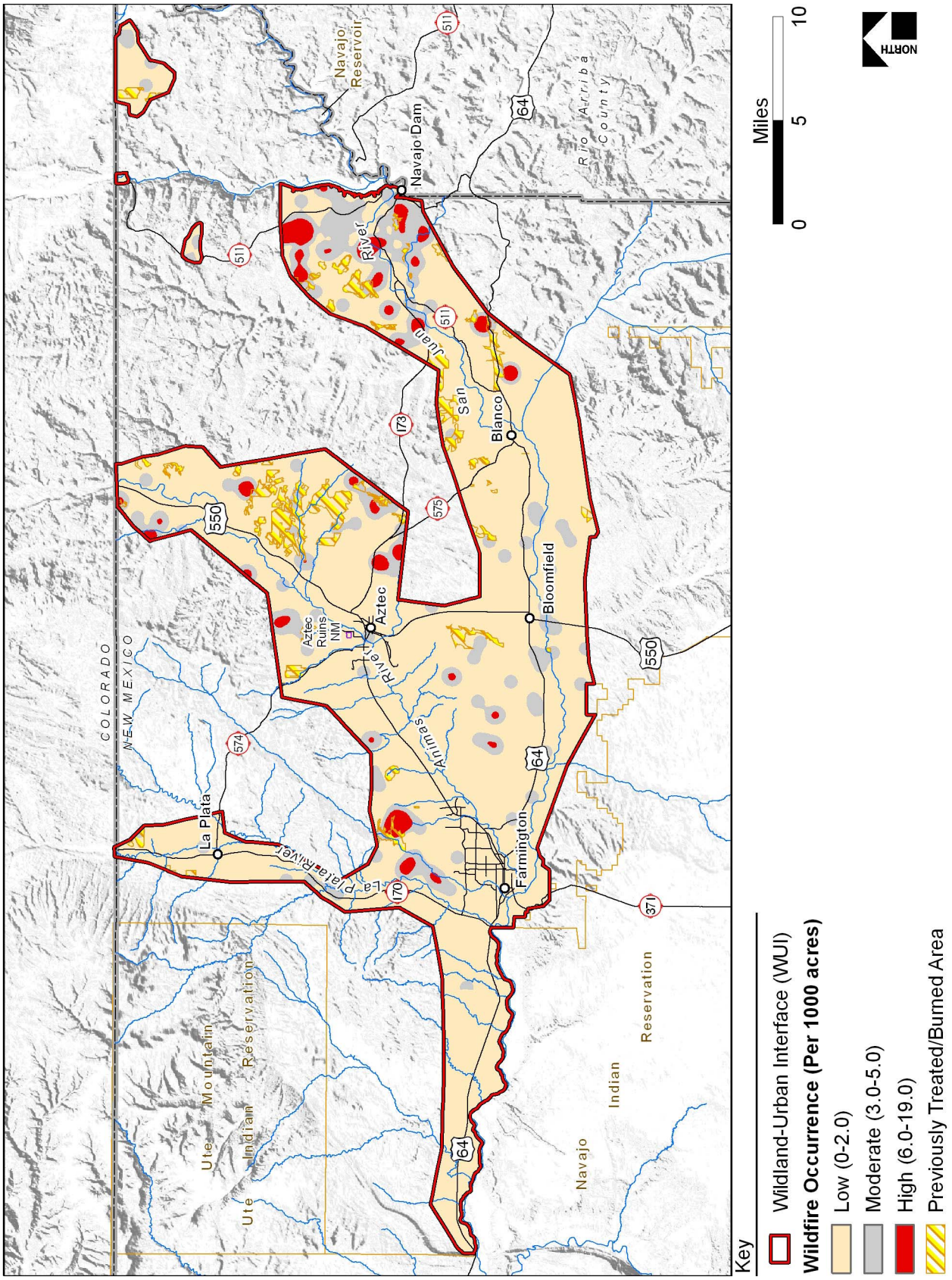

Figure 2.9. Wildfire occurrence (1994–2005) and treatment history

D. Community Values at Risk

Valued, at-risk community resources include community structures (e.g., schools, hospitals), economic centers, communication facilities, power lines, oil and gas infrastructure, recreation areas, cultural/historic areas, sensitive wildlife habitat, areas of critical environmental concern (ACEC), municipal watersheds, natural resources, and air quality.

Table 2.5. Community values

Community value components	Value
Housing and businesses structures, infrastructure in high risk >8 per 10 acres	H
Housing and business structures and infrastructure in medium risk 2.01-8 per 10 acres	M
Housing and business structures and infrastructure in low risk 0-2 per 10 acres	L
Recreation areas	M
Wildlife habitat	M
All other areas	L

Source: Logan Simpson Design Inc.

Community values identified in Table 2.5 are mapped in Figures 2.10 and 2.11 and include housing, business structures, and essential infrastructure. Figure 2.12 shows recreation areas and BLM special management areas. Figure 2.13 shows sensitive wildlife species habitats. Developed land in excess of 8 structures per 10 acres is considered the highest wildland fire risk. Structure density between 2 and 8 is considered medium risk, while structure density of < 2 per 10 acres is considered lower wildfire risk (see Figure 2.12). Developed land, infrastructure, campgrounds, parks and trail systems, ACECs, and wildlife habitat within medium and low wildfire risk areas were given a moderate value. These components were compiled into a single map (Figure 2.14), which identifies high, moderate, and low areas with respect to valued community elements. The following information further describes the community values in the SJBCWPP (see Section II.E for a summary of community values for each community).

1. Housing, Businesses, Essential Infrastructure, and Evacuation Routes

The CAG identified high-risk areas, including the economic corridors that line US 64, US 550, SR 170, SR 173, and SR 574 that have been and continue to be the focus of community development. Structures associated with housing and commercial development (Photo 2.6) located in isolated subdivisions and in more dispersed areas of the county are also at high risk. The CAG has identified significant infrastructures, such as communication facilities within the designated WUI, and recommends fuel modification treatments that will reduce the threat of wildland fire affecting these facilities. Transportation corridors between WUI communities that will serve as evacuation routes and resource distribution corridors during a wildland fire have been identified by the CAG. The CAG also recommends fuel modification treatments for evacuation corridors that will provide safe evacuation from WUI communities in the event of catastrophic wildland fire.

Photo 2.6. Clearing around oil industry facility to protect community value

2. Recreation Areas/Wildlife Habitat

Recreational features, including rivers, designated campgrounds, (Photo 2.7) parks, and trail systems—both motorized and nonmotorized—are located on federal, state, municipal, and private lands. These features are environmental, economic, and aesthetic resources for the surrounding communities. These areas have been analyzed as a community value because of the benefits that these recreation areas provide to the local citizens and community visitors. Fuel mitigation projects associated with trail systems will be evaluated for public use requirements, possibility of increased fire starts attributable to increased public use, and suitability of the trail system for inclusion in fire protection and response plans.

Photo 2.7. Recreation values at Navajo Lake State Park

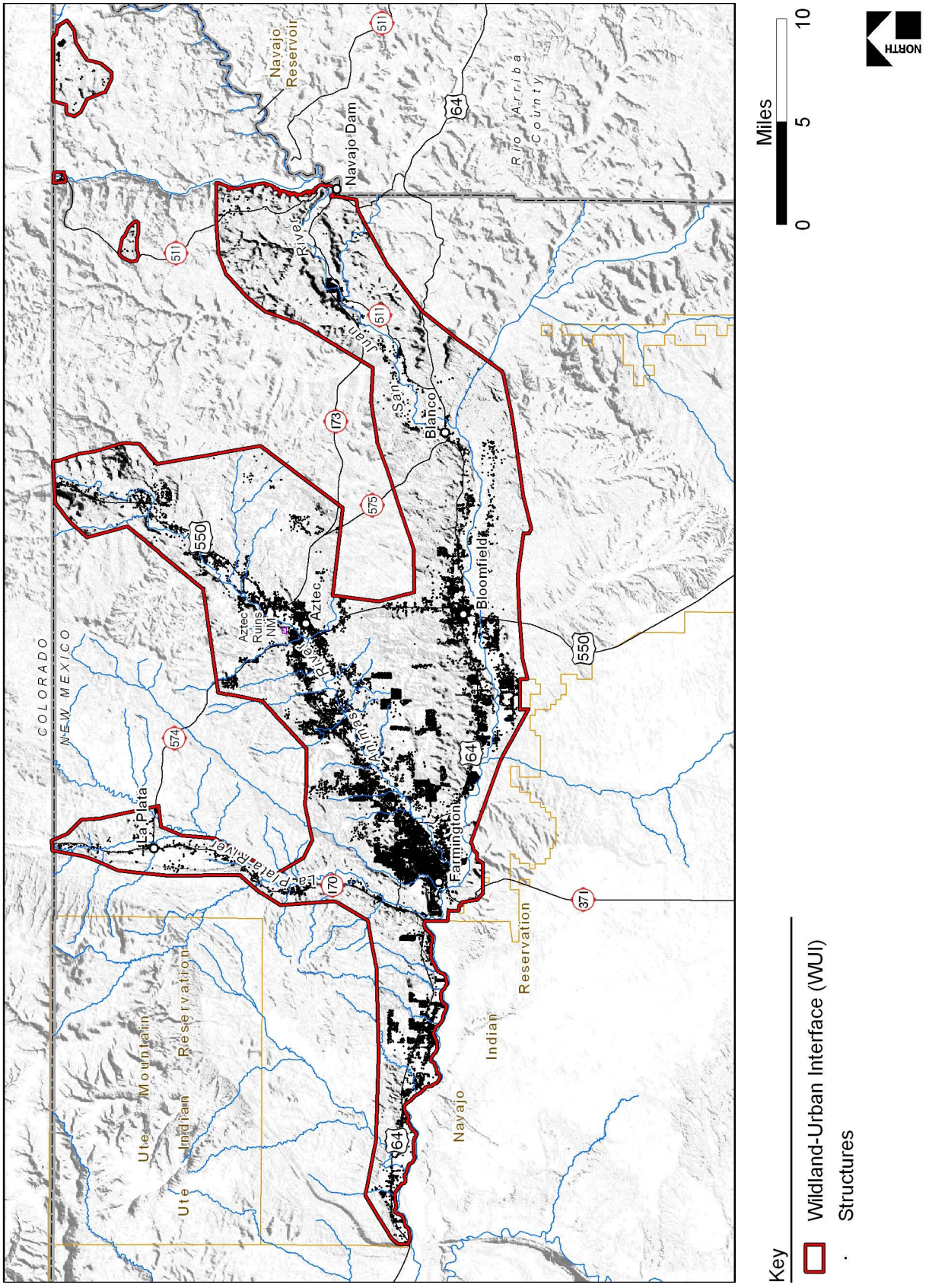

Figure 2.10. Structure distribution and abundance within the WUI

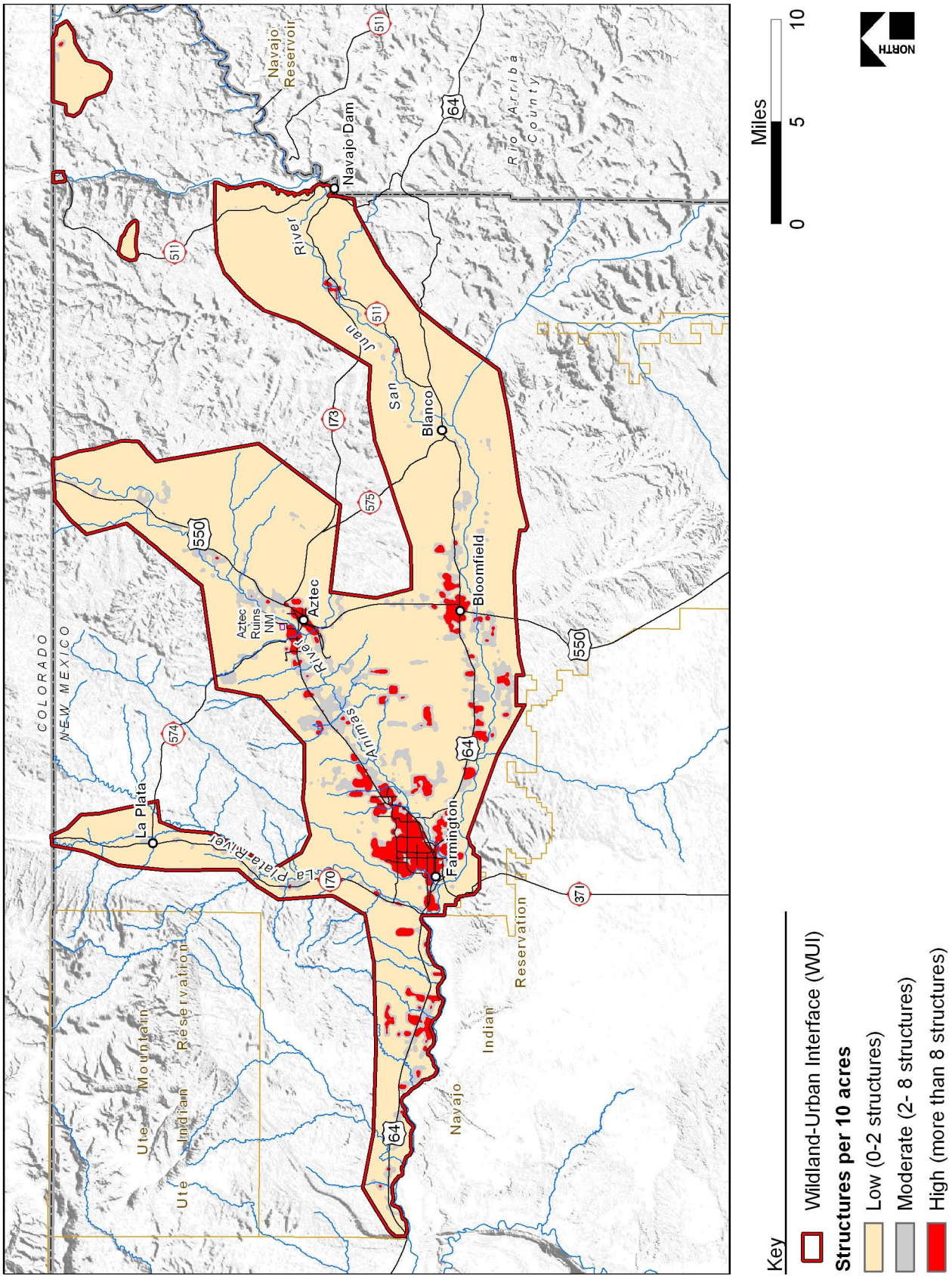

Figure 2.11. Housing density

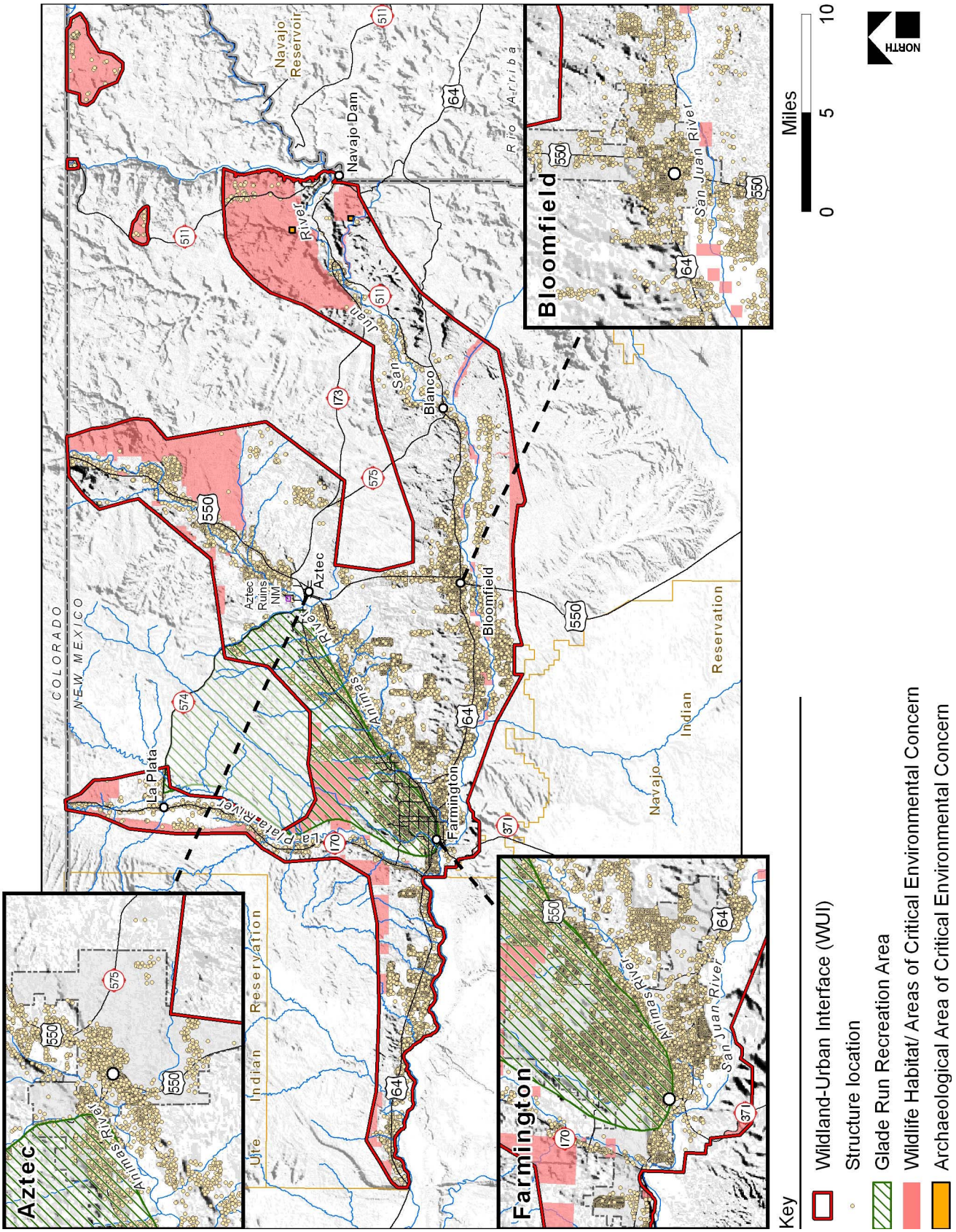

Figure 2.12. Developed land, infrastructure, and designated recreational areas

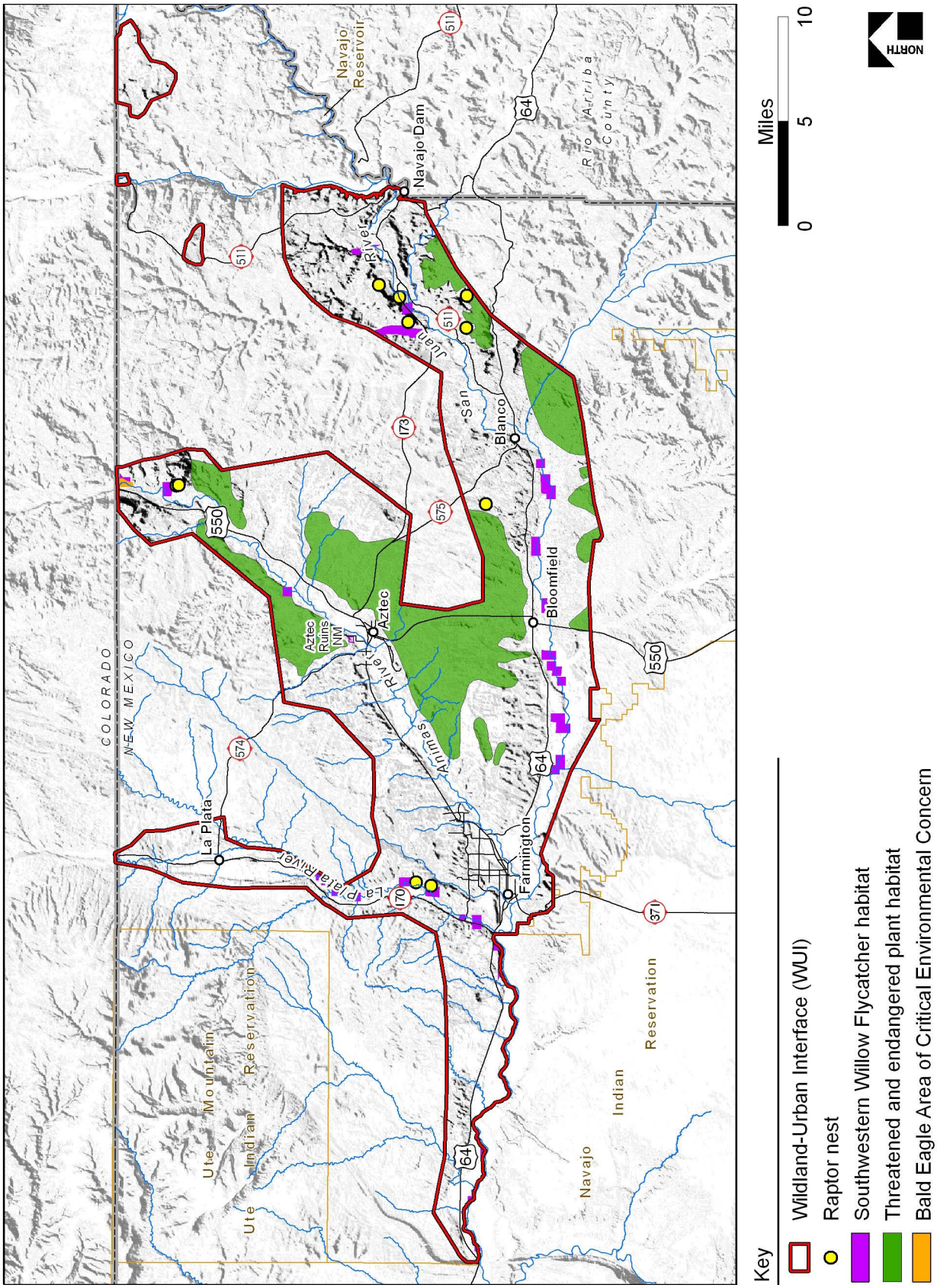

Figure 2.13. Sensitive wildlife habitat

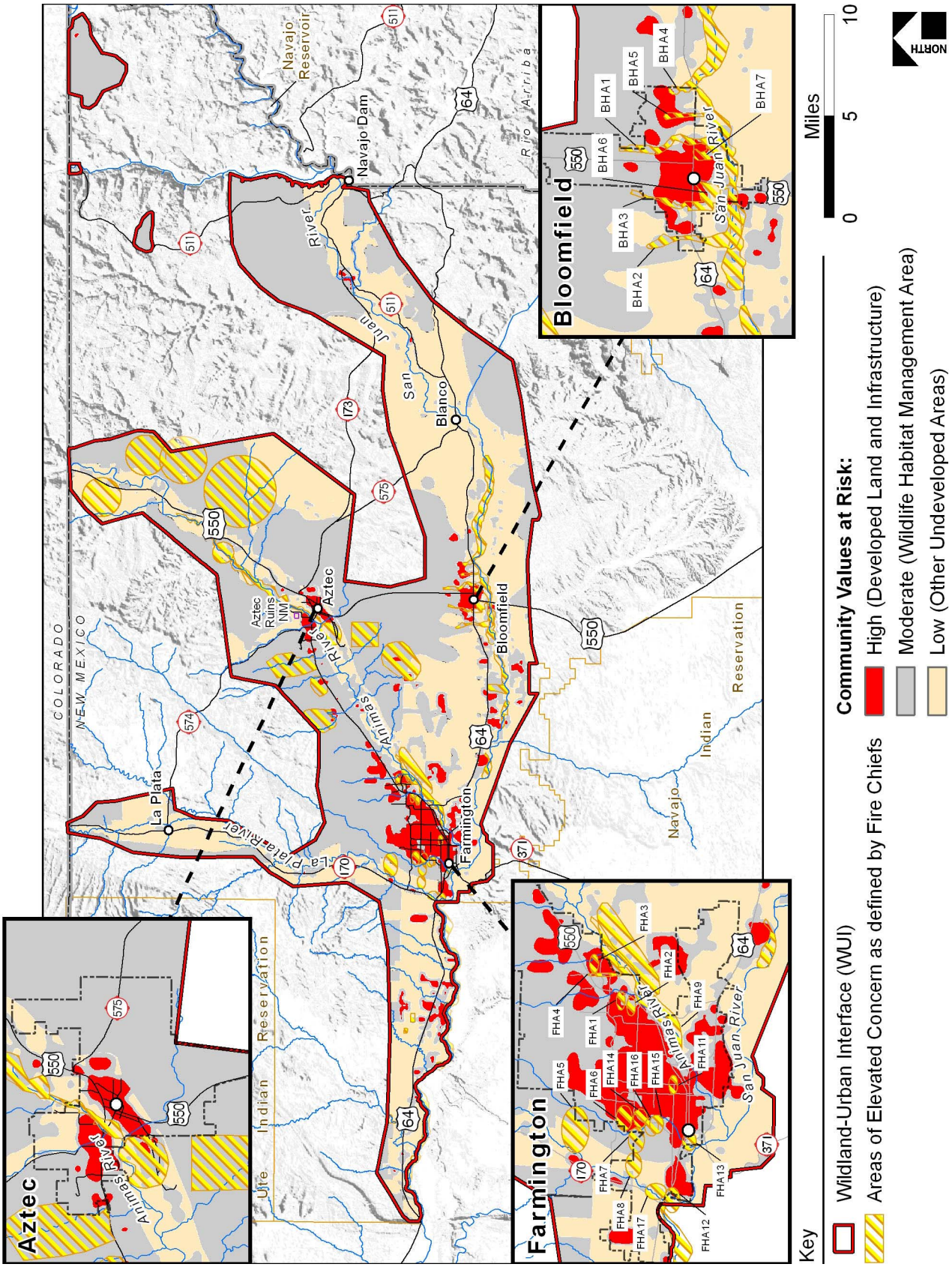

Figure 2.14. Community values

The WUI includes known and potential habitat areas for several wildlife species listed as threatened or endangered under the Endangered Species Act (ESA) and for species designated as sensitive by the BLM and the State of New Mexico (Appendix B). The San Juan, La Plata, and Animas river corridors contain several threatened, endangered, and sensitive (TES) species habitats, such as the Southwestern willow flycatcher and bald eagle, for which species-specific conservation measures have been identified by the BLM (USDI BLM 2004a). The CAG has determined that habitat-enhancing treatments for reducing wildland fuel and lessening the threat of catastrophic wildland fire in the river corridors would help preserve sensitive riparian habitat and wildlife species in accordance with Section 102.a.5.B of HFRA and would also protect recreational values associated with these river systems by local residents and visitors. If a proposed fuel treatment might potentially affect an ESA-listed species, or if other extraordinary circumstances might exist, site-specific consultation with the United States Fish and Wildlife Service (USFWS) would be required. The project may also require more extensive NEPA assessment, depending on the results of a site-specific analysis. Because not all potential occurrence sites for these species within the WUI are known, an evaluation of project-related effects on these species would need to be conducted during the planning of site-specific treatments. Generally, habitat areas for these species were identified in this analysis as having moderate risk because of their association with community values. A 300-foot buffer area was delineated along the riparian areas and habitats associated with special-status species for consistency in planning purposes with *Wildland Fire Suppression (Including Wildland Fire Use) and Rehabilitation in Riparian and Aquatic Habitats (RA)* (USDI BLM 2004d). In addition, any treatments in riparian habitats during the implementation of Rx or other vegetation manipulations will require further analysis in accordance with the BLM and State of New Mexico for site- and species-specific conservation measures.

3. Watersheds

The WUI includes several significant watersheds that supply irrigation and drinking water and that provide substantial outdoor recreation opportunities within and close to the communities. The watersheds in the WUI consist of both federal and nonfederal lands and include portions of the Upper San Juan River (Hydrologic Unit Code [HUC] 14080101), Blanco Canyon (HUC 14080103) Animas River (HUC 14080104), Middle San Juan River (HUC 14080105), and Chaco (HUC 14080106) as delineated by the United States Geologic Survey. In accordance with Section 101.12 and Section 102.a.2 of HFRA, authorized projects should consider protection to municipal watersheds by implementing hazardous fuel reduction projects on federal lands in proximity to municipal water systems and streams feeding those systems that are at risk of catastrophic wildfire. The La Plata, Animas, and San Juan rivers provide approximately 90 percent of the municipal water supply of the WUI communities, as well as significant surface waters to northern New Mexico communities. The majority of watersheds in the WUI, whether located on public lands or private lands, are at some level of risk for catastrophic wildland fire. Large-scale fire disturbance would have an adverse effect on the riparian corridors that support sensitive wildlife and native fish species, their habitats, and recreational sport fisheries in these rivers because of the inflows of sediment and ash. The downstream communities are also at greater risk after a catastrophic wildland fire in the watershed because of potential changes in peak stream flow frequency or magnitude, as well as flood and debris flows that could degrade water quality, reduce sustained quantity, and increase treatment and maintenance costs. A wildland fire that increases erosion and diminishes percolation abilities of the watershed would significantly affect the water supply to each downstream community. Hazardous fuel reduction projects in

the WUI would reduce wildland fuels, thus making the projects consistent with the community mitigation plan as identified in Section III of this CWPP. The fuel reduction treatments recommended in the SJBCWPP are consistent with direction in HFRA for the protection of municipal watersheds by significantly lowering the risk of a catastrophic wildland fire within municipal watersheds. The CAG additionally recommends that watershed enhancement treatments be initiated by the BLM FFO to provide a protection zone around the perimeter of the watersheds that extend into each community municipal watershed. Wildland vegetative fuel reduction treatments in these watersheds will lower the risk of significant loss of habitat components from wildland fire while protecting downstream communities and watersheds from potential devastating flood and debris flows.

Watershed conditions including unnaturally high densities of woody vegetation and increases of invasive species, such as cheat grass, saltcedar, and Russian olive, described within *The New Mexico Forest and Watershed Health Plan*, are present within the La Plata River, Animas River, and San Juan River riparian corridors. The CAG has long recognized that healthy watersheds provide significant community values, such as increased water supply, improved water quality, diverse aquatic and wildlife species, and vegetation that protects the soil and prevents erosion. The CAG recommends that in addition to the SJBCWPP, the collaborative planning effort initiated by the San Juan Basin Watershed Group, which spans all jurisdictions and ownerships, continues to appraise the impediments to ecological restoration of these riverine systems at a landscape level. In addition to the *San Juan Basin Watershed Management Plan*, the CAG recommends that a watershed health plan addressing recreational and other community values and amenities be initiated to include the entire Animas, La Plata, and San Juan riparian corridors within New Mexico, which would supplement the treatments identified in this CWPP. This recommendation is intended to assist the State in meeting the goals and objectives of *The New Mexico Forest and Watershed Health Plan*. The CAG has identified and recommends that the Upper San Juan, Blanco Canyon, Animas, Middle San Juan, and Chaco watersheds (see Figure 2.15) be included in the proposed watershed health plan and be prioritized by condition class and treatment status. Good stewardship activities can help maintain and enhance a healthy watershed that will “exhibit ecological processes that are largely self-regulating; disturbance regimes that function within their natural range of variation; watersheds that are characterized by recharged aquifers, good water quality, optimum stream flow, and stable soils; and the presence of a high proportion of native species and an infrequent occurrence of exotic species” (New Mexico Forest and Watershed Health Planning Committee 2004).

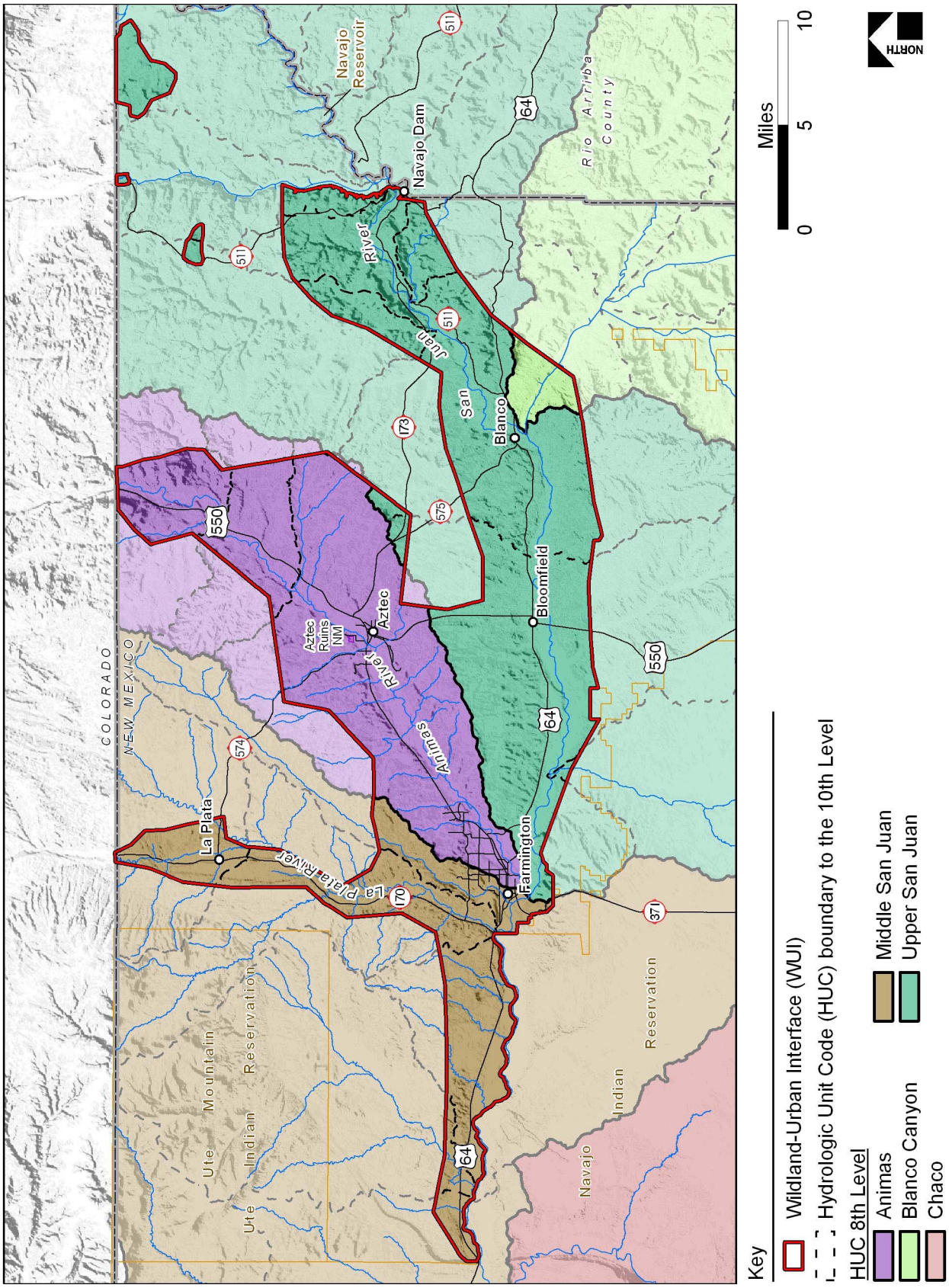

Figure 2.15. Watersheds

4. Local Preparedness and Protection Capability

For many years the ISO has conducted assessments and rated communities on the basis of available fire protection. The rating process grades each community's fire protection on a scale from 1 to 10 (1 being ideal and 10 being poor) based on the ISO's Fire Suppression Rating Schedule. There are five factors that make up the ISO fire rating. Water supply, the most important factor, accounts for 40 percent of the total rating. Type and availability of equipment, personnel, ongoing training, and the community's alarm and paging system account for the remaining 60 percent of the rating.

The major concern of county and municipal fire departments in the SJBCWPP communities is human-caused fires within the heavily infested saltcedar/Russian olive segments of the riparian corridors. Response can be slow because access to these riparian areas is limited to nonsurfaced sandy roadways in some areas. Surface-water supplies and hydrants are not available in all communities, so specific areas of limited water supply for wildfire response have been identified. Additionally, many community subdivisions and areas of denser development in the identified WUI were not designed with adequate ingress/egress or emergency vehicle access. Developments without adequate access and readily available water supplies increase the risk of greater habitat and structural losses from large wildland fires.

The county and municipal fire departments provide protection to over 34,000 housing structures in or close to the identified WUI, as well as adjacent rural areas within the fire department boundaries. Figures 2.16 displays the fire department boundaries and the ISO rating for each municipal and county fire department.

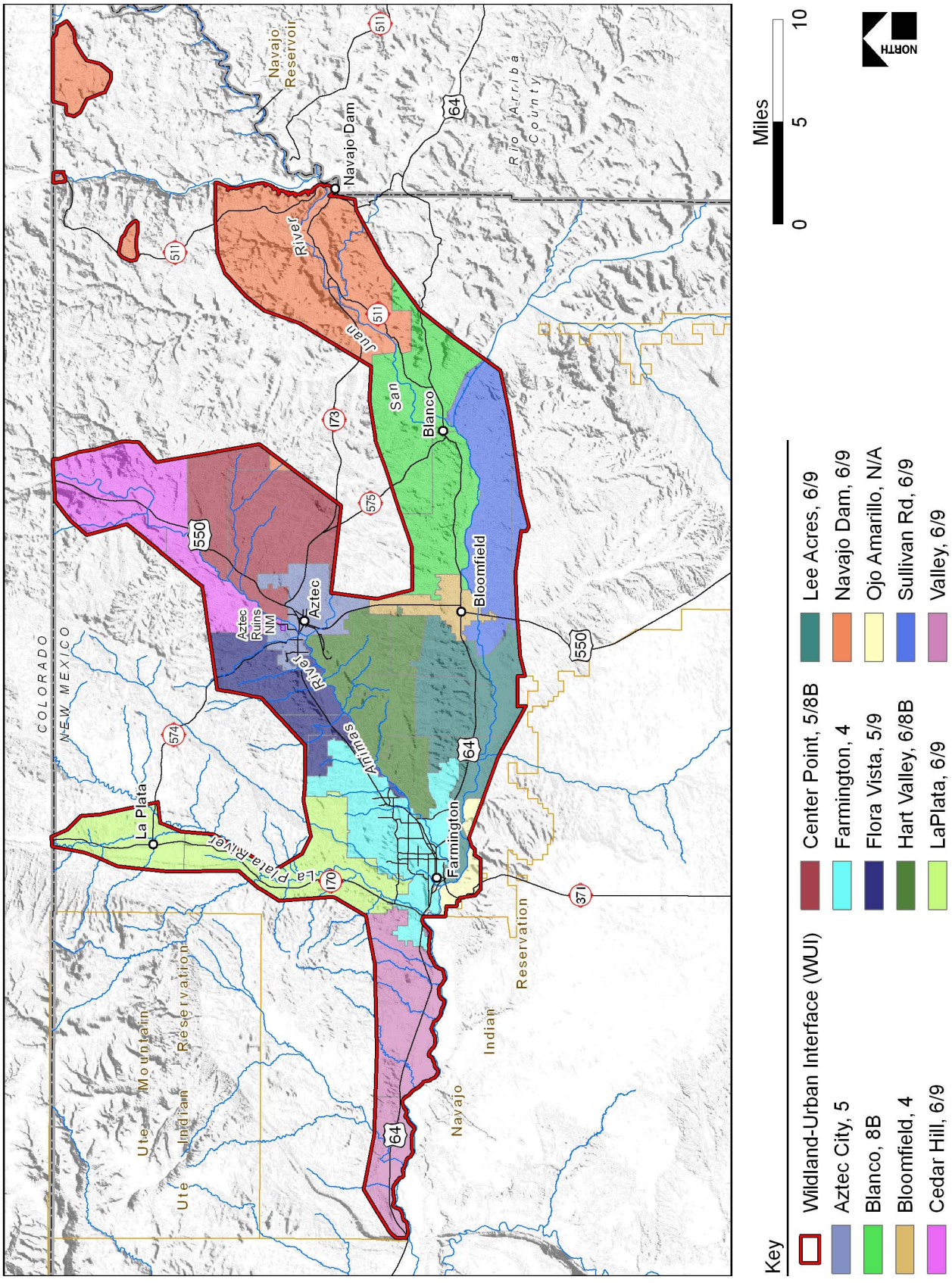

Figure 2.16. Fire department boundaries and ISO ratings

E. Cumulative Risk Analysis and Summary of Community Assessment

The cumulative risk analysis synthesizes the risk associated with fuel hazards, ignition and wildfire occurrence, and community values. These different components were analyzed spatially, and an overall cumulative risk for the WUI was calculated. Table 2.6 and Figure 2.17 display the results of the cumulative risk analyses, identifying the areas and relative percentages of WUI areas of high, moderate, and low risk.

Table 2.6. Cumulative risk levels, by percentage of the WUI area

SJBCWPP communities	**High risk** (%)	**Acres**	**Moderate risk** (%)	**Acres**	**Low risk** (%)	**Acres**	**Total acres**
Farmington Area	8.1	23,019	0.0	0	0.0	0	23,019
Aztec Area	0.5	1,582	2.5	6,976	0.0	0	8,558
Bloomfield Area	0.7	2,085	0.9	2,819	0.0	0	4,904
Northeast San Juan County Zone	4.9	13,959	29.7	84,030	3.8	10,757	108,746
Southeast San Juan County Zone	2.1	6,000	9.0	25,500	0.1	256	31,756
Central San Juan County Zone	4.8	13,443	15.0	42,500	1.0	2,716	58,659
Northern San Juan County Zone	2.0	5,455	6.7	19,012	0.3	950	25,417
Western San Juan County Zone	2.5	7,025	5.2	14,832	0.0	56	21,913
Total acres	25.6	72,568	69.0	195,669	5.2	14,735	282972

Source: Logan Simpson Design Inc.

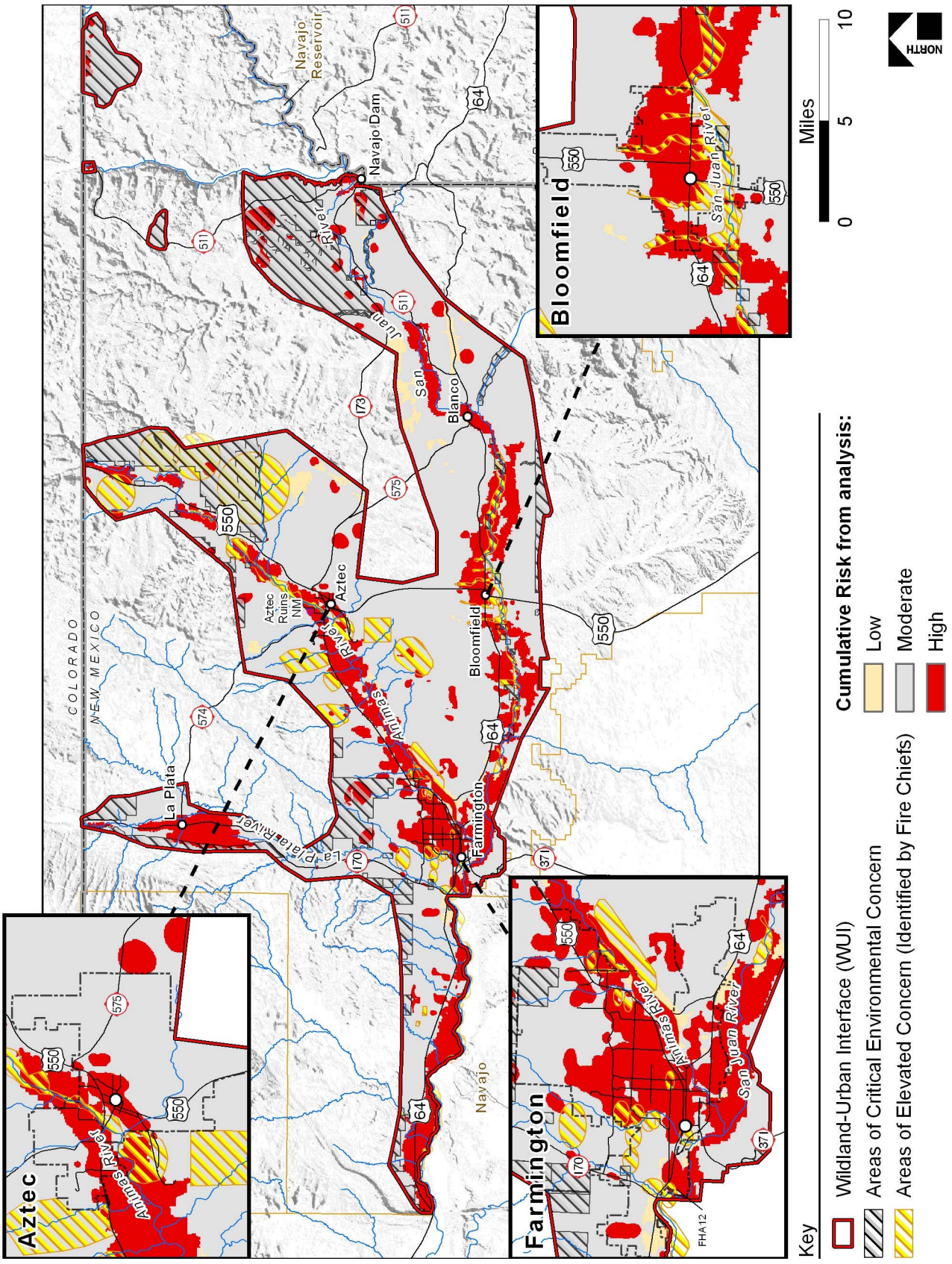

Figure 2.17 Cumulative risk analysis

The CAG was asked to identify community characteristics to summarize the overall community values contained within the WUI. All communities identified natural and cultural values as highly important. Of special interest were the river systems and associated tributaries that bisect the county from the north and from east to west, including the San Juan, La Plata, and Animas rivers. All three rivers enter the county from the north (from Colorado). The greatest acreage of private lands and densities of structures occur within these river drainages. These river corridors also contain significant cultural resources and provide TES wildlife species habitats and considerable recreational opportunities. Additional values include the transportation corridors of US 64 that pass through the county from east to west through Farmington and Bloomfield; New Mexico SR 491 and SR 371 and US 550 that traverse the county from north to south; and SR 511 that provides access to the Navajo Lake State Park. Navajo Lake State Park is a popular summer recreational area for hiking, mountain biking, camping, sightseeing, hunting, and fishing. The Navajo Lake area within San Juan County, receives an estimated 500,000 recreational visitors per year. All of these recreational visitors are significant to San Juan County's economy. In addition to Navajo Lake recreational activities, hunting, fishing, camping, and off-highway vehicle (OHV) recreation are also popular activities of residents and visitors and add significant revenue to the county. Any closure or limited access to public lands within the county because of catastrophic wildland fire would have a major impact on the local businesses that rely on the revenue associated with these recreational activities.

In addition to community values, the CAG provided a basic summary of county land distribution, ownership and economic interests. San Juan County encompasses an area measuring approximately 5,516 square miles: 60 percent is Navajo Nation Tribal Trust land, 29 percent is public land administered by the BLM, 5 percent is state land, and nearly 6 percent is individual- or corporate-owned land. Major contributors to the county's economy include agriculture, tourism (mostly outdoor recreation), and oil and gas production activities. There are approximately 19,000 natural gas wells on lands administered by the FFO. San Juan County is the largest natural-gas-producing county in New Mexico producing approximately 5 percent of the state's oil. The oil and gas industry has replaced agricultural pursuits as the dominant employer in San Juan County. The numerous gas and oil structures that occur across the planning area pose a threat to firefighters and special considerations must be made when fire operations are being conducted near these sites.

The population base for the WUI is located in the larger municipalities as well as in surrounding unincorporated properties. Farmington, Bloomfield, and Aztec are the only incorporated municipalities in the county, and collectively, these cities compose approximately 45 percent (50,639) of the county's 2000 census population (113,801): Farmington with 33 percent (37,844), Bloomfield with 6 percent (6,417), and Aztec with 5 percent (6,378). Residents residing within San Juan County outside the three municipalities make up the remaining 56 percent (63,162) of the county's 2000 census population. The challenge facing the municipal and county fire departments is the continuing population growth, with much of the growth occurring within the unincorporated areas of the county. For example, between 1990 and 2000, the city of Aztec grew by approximately 10 percent, while neighboring rural areas grew by almost 65 percent (City of Aztec 2002). Residential housing continues to grow throughout the WUI with the oil and gas industry replacing agricultural pursuits as the dominant employer. Large agricultural and ranchland parcels are being subdivided into increasingly smaller parcels to meet the demands of a growing community. While the population continues to grow within the WUI, fire departments are challenged with maintaining services, such as recruiting and retaining qualified firefighters, supplying and maintaining fire response equipment

and additional fire stations or substations, and providing fire-safe public outreach to a growing population not familiar with wildland fire and rural community risks. Through implementing the action recommendations of the SJBCWPP support for fire response, firefighter and public safety will be enhanced.

A summary of each community's WUI based on the overall community assessment is presented in the following subsections. General descriptions of the communities include land ownership, jurisdiction, development trends, population, infrastructure (e.g., roads, utilities, power lines, schools, hospitals, and community facilities), and existing emergency services. The WUI described for these communities includes significant watersheds and riparian corridors that provide irrigation and domestic water supplies to the communities; habitat for several threatened, endangered, and sensitive species; and some flood control and substantial outdoor recreational opportunities—all of great economic importance to the communities, county, and the BLM FFO. In addition, Farmington has recently undertaken a program to establish a city riverwalk recreational area along the Animas River to promote riparian habitat community education and the significance of having a river within the community, as well as to acknowledge the private and public land managers whose ownership and stewardship have increased public awareness and outdoor recreation. The continued interest and use of these rivers and watersheds ultimately enhances the economic value of these areas for the local communities. Such economic and ecological values are critically dependent on the health of the Animas, La Plata, and San Juan river watersheds. The emphasis in this plan on improving community wildfire protection, and thus improving the health of the three rivers and their associated watersheds, will help maintain these riverine systems and allow them to persist as high-quality wildlife and human habitat.

1. City of Aztec

Located along the Animas River, the interface city of Aztec consists of over 2,500 total housing units and has experienced an 8.3 percent resident population increase over the past 5 years, from 6,378 residents in 2000 to 6,906 residents estimated in 2004. Growth is expected to continue at a similar rate in the near future. There are currently 1,100 new residential developments planned within or adjacent to Aztec, and such continued growth is requiring Aztec to provide fire protection to meet the needs of this increasing resident population. This area of the WUI includes significant community assets, such as the Aztec Ruins, Aztec Municipal Airport, museum, library, and several historic sites and districts, as well as commercial businesses. The major areas of employment include education and social service (19.4%); retail trade (16.4%); agriculture, fishing, hunting, and mining (12.9%); and the service trade (12.9%). Aztec is accessible from SR 516 (east) and SR 173 (west) and from US 550 (north or south).

The CAG considered the threat of wildfire from within riparian and rangeland areas when delineating the extent of the WUI that extends from the community center. Aztec is mostly composed of Condition Class 2 lands, with Condition Class 3 lands associated with the Animas River corridor. Extensive private development associated with the Animas River corridor has complicated fire response to agricultural lands and structures with infestations of saltcedar and Russian olive. The fuel hazard rating is high for most of the deciduous riparian habitat in Aztec. The principal fuel hazard for this portion of the WUI includes thick stands of untreated small-diameter riparian vegetation found along the Animas River consisting of densely infested sites of saltcedar and Russian olive.

Because of the riparian vegetation, sensitive watersheds, community values, and high fire start occurrence, a defensible space for community wildfire protection is recommended for compatibility of land use designations of the riparian areas. The WUI includes power lines that supply electrical power to the city and provide power to the municipal water supply system. The CAG recommends wildland fuel reduction treatments adjacent to power-line easements and near critical municipal water-supply structures to ensure protection during a wildland fire. The CAG also recommends that power lines be marked or flagged to reduce potential strikes during aerial firefighting responses within the riparian corridor; however, marking power lines is not a high priority, since aerial firefighting response would rarely include "bucketing" from these rivers within the WUI due to human and environmental safety concerns.

Wildland fire and structural fire protection to the residents of Aztec is provided by the Aztec Municipal Fire Department (a volunteer fire department) with assistance from the San Juan County Fire Department. Much of the undeveloped lands within Aztec lie where the alignment of vegetation and topography could encourage wildland fires to spread so rapidly that, without treatment, facilities and homes might be burned through before any effective suppression measures would be available. Some residents in Aztec have poor ingress and egress routes, limited communication capabilities, and limited effective evacuation and firefighting response during daytime hours because of the limited availability of the department's volunteer staff.

Aztec includes a variety of vegetative types, such as pinyon-juniper/oak woodland, grassland and semidesert types, and deciduous riparian species in the Animas River corridor. Resource damage potential is high from wildland fire within the watershed where fire has not previously occurred or where wildland fuels have not been mitigated. Mechanical or mechanical/chemical treatments will be the primary tool for wildland fuel mitigation in Aztec, especially for the removal of saltcedar and Russian olive within the river corridor and associated side channels and drainages. The combination of fuel load, topography, and areas of poor access increases the potential severity of wildland fire, as well as the risk to property and public/firefighter safety. The current ISO rating for the Aztec Municipal Fire Department is 5.

2. City of Bloomfield

Bloomfield is located along the San Juan River within the central portion of the CWPP analysis. The city has over 2,400 housing units and has experienced a 12.8 percent resident population increase over the past five years, from 6,417 residents in 2000 to 7,240 residents estimated in 2004. Similar to Aztec, Bloomfield must be prepared to provide structural and wildland fire protection to a growing residential and commercial population. The major areas of employment within Bloomfield include retail trade (17.7%); education and social services (16.2%); agriculture, forestry, fishing, hunting, and mining (10.4%); and the service industry (10.4%). Bloomfield is accessible from US 64 (east or west) and from US 550 (north or south).

The interface city of Bloomfield is located within the riparian corridor of the San Juan River, which serves as a domestic and an irrigation water source. As opposed to the heavier-fueled vegetation communities in the northern portion of the WUI, the CAG is concerned primarily about wildfire threats from the riparian vegetation along the San Juan River, flashy grassland or agricultural fuels, and thick shrub–dominated fuels within associated lateral drainages of the San Juan River. Bloomfield is mostly composed of Condition Class 2 lands, with Condition Class 3 lands associated within riparian areas containing heavy

infestations of saltcedar and Russian olive. The fuel hazard rating is high for most of the deciduous riparian habitat in the Bloomfield area. The principal fuel hazard for this portion of the WUI includes thick stands of untreated small-diameter riparian vegetation found along the San Juan River and associated private land structures. Appendix D describes the specific areas of elevated concern for wildland fire as outlined by the Bloomfield Fire Department.

Water diversions and delivery systems transport water from the San Juan River to irrigated fields within private lands. These structures support agriculture within the community by providing both cropland and livestock water sources. The San Juan River also provides the municipal water supply to Bloomfield. The riparian corridors associated with the San Juan River contain habitat for TES species, including potential habitat for the Southwestern willow flycatcher. Bloomfield is known for its scenic beauty and historic, cultural, recreational, and wildlife values, which are significant economic assets to the community, county, and the BLM. Habitat-enhancing treatments for reducing wildland fuel and lessening the threat of catastrophic wildland fire would assist in preserving the sensitive riparian habitat and wildlife species in accordance with Section 102.a.5.B of HFRA, *The New Mexico Forest and Watershed Health Plan*, the *Strategy for Long-Term Management of Exotic Trees in Riparian Areas for New Mexico's Five River Systems, 2005-2014*, the *San Juan Basin Watershed Management Plan*, and the BLM FFO *Fire Management Plan* and would also protect the significant community values of Bloomfield and provide for enhanced riparian recreation/education opportunities.

With an estimated year-round population of slightly more than 7,200 residents, Bloomfield experiences seasonal visitation associated with the recreational opportunities located in the region. This includes increases in visitors during the summer months, and during the big- and small-game fall hunting seasons. The seasonal increase in visitations heightens the need for communication and rapid fire suppression response.

The WUI includes power lines supplying electrical power to portions of the city and the municipal water supply. The CAG recommends additional fuel reduction treatments adjacent to power line easements and near critical municipal water supply structures to ensure protection during wildland fire or a prescribed burn. The CAG has also recommended that power lines in Bloomfield be marked or flagged to reduce potential aircraft strikes during aerial firefighting responses within the riparian corridor; however, the San Juan River in Bloomfield is not currently used for aerial firefighting purposes due to human and environmental safety concerns.

Wildland fire and structural fire protection is provided to the residents of Bloomfield by the Bloomfield Municipal Fire Department with assistance from the San Juan County Fire Department. Bloomfield borders the Southeast Fire Response Zone to the east and the Central Fire Response Zone to the west. Most lands in Bloomfield lie where the alignment of vegetation and topography could allow wildland fires to spread so rapidly that, without treatment, facilities and homes might be burned through before any effective suppression measures would be available. Some residents in Bloomfield have poor ingress and egress routes, extremely limited communication capabilities, and limited effective evacuation and firefighting response.

Bloomfield includes a variety of vegetative types, such as grassland and semidesert types and deciduous riparian species, in the San Juan River corridor. Resource damage potential is high from wildland fire within the watershed where fire has not previously occurred or wildland fuels have not been mitigated.

Mechanical or mechanical/chemical treatments will be the primary tool for wildland fuel mitigation in Bloomfield, especially in the removal of saltcedar and Russian olive within the river drainage. The combination of fuel load, topography, and areas of poor access, increases the potential severity of wildland fire, as well as the risk to property and public/firefighter safety. The current ISO rating for the Bloomfield Municipal Fire Department is 4.

3. City of Farmington

Farmington is located at the confluence of the San Juan, Animas, and La Plata rivers and consists of over 15,000 total housing units. The city's resident population has increased by 12.1 percent over the past five years, from 37,844 residents in 2000 to 42,421 residents estimated in 2004. Similar to other communities within San Juan County, the Farmington Municipal Fire Department must provide structural and wildland firefighting response to a growing population. Oil and gas exploration and development have added to the growth, employment, and economy of the city and are expected to continue into the future. Farmington is mostly composed of Condition Class 2 lands, with Condition Class 3 lands in riparian habitats where heavy infestations of saltcedar and Russian olive can occur. The fuel hazard rating is high for most of the deciduous riparian habitat of Farmington. The principal fuel hazard for this portion of the WUI includes thick stands of untreated small-diameter riparian vegetation found along the river corridors. This small-diameter vegetation is associated with heavily infested areas of saltcedar and Russian olive intermixed with associated private agriculture and residential structures.

US 64 passes through Farmington and is the primary business center where most commercial development is located. Farmington provides the major retail center for San Juan County residents. Resident amenities within Farmington include the area hospital, San Juan College, public library, and several archaeological and historic sites and districts. The city has several parks, including the Riverwalk associated with the Animas River. The major areas of employment in Farmington include education and social services (21.5%); retail trade (14.6%); and agriculture, forestry, fishing, hunting, and mining (10.9%).

Fire response to the residents of Farmington is provided by the municipal fire department with assistance from the San Juan County Fire Department. The county fire department and the BLM provide wildland fire response to areas adjacent to the city within the WUI. In addition, the BLM-administered Head Canyon/Dunes and Glade Run Recreation areas are adjacent to the city of Farmington. These management areas are characterized by high numbers of off-highway recreational users and high frequencies of OHV trails. Several hundred visitors use these recreation areas each year, which may require additional emergency services personnel to evacuate visitors if a wildland fire occurs. The CAG considered threats to Farmington from human-caused fire starts within the riparian corridors and associated drainages in proximity to the private lands of the community, as well as within the high-use recreation areas. The Farmington Fire Department has identified 17 specific areas of concern from existing vegetative fuels, slope, water supplies, ingress/egress/response routes, and structural issues (see Appendix D). These are high-priority areas for wildland fuel mitigation and structural ignition planning for the city. The Farmington Fire Department has a current ISO rating of 4. Farmington is under review for updating the current ISO rating. The projection from the present evaluation is an anticipated revised ISO rating of 2.

4. Northeast San Juan County Zone

The Northeast San Juan County Zone consist of portions of the Animas River and San Juan River corridors and the intermix communities of Cedar Hill, Center Point, and Navajo Dam, including the unnamed private parcels located along the Animas River and San Juan River corridors. The Fire Departments in this response area provide fire protection to over 2,300 housing units. To the north, the WUI extends to the San Juan County–Colorado boundary along US 550 and SR 511. The Northeast San Juan County Fire Response Zone includes the Cedar Hill and Center Point response zones that abut Aztec to the south and the Navajo Dam Response Zone that abuts the Southeast Fire Response Zone to the west. US 550 connects the Northeast Zone to Aztec to the south of Center Point and Cedar Hill; it also connects this zone to the Durango, Colorado, area, with SR 173 leading east to Navajo Dam and SR 511 as the connecting corridor to the San Juan County Central Zone of Blanco and Sullivan Road communities. The communities of Cedar Hill, Center Point, and Navajo Dam are classified as "Category 2 intermix communities" (*Federal Register* 2001a). The Navajo Dam area provides extensive outdoor recreational opportunities, including Navajo Lake State Park, which receives over 500,000 visitors every year. The park has developed campground facilities and small businesses to support outdoor tourism, especially the tail water fishery below Navajo Dam and boating on Navajo Lake. The Navajo Lake area also contains some private lands with housing and other structures present. The BLM-administered bald eagle ACEC is located above Navajo Dam and occurs both in San Juan and Rio Arriba counties adjacent to Navajo Lake. The bald eagle ACEC consists of mature ponderosa pine and provides seasonal habitat for bald eagles. The Navajo Lake area of the San Juan County Northeast Zone experiences considerable growth in visitors during the summer vacation and fall hunting and fishing seasons, which creates significant wildland/structural fire response and management considerations. The state and federal highways within this zone not only provide connecting routes for the major outdoor recreational areas but also act as the emergency evacuation routes for wildland fire conflagrations in the Durango, Colorado, area and the campgrounds within the Navajo Lake vicinity. The CAG reviewed the *National Fire Plan La Plata County Community Fire Plan* (2002) and the *Montezuma County Community Fire Plan* (2002) to review the level of concern assigned to the border of the San Juan County Northeast Zone with these Colorado counties.

Land ownership along the riparian corridors of the Animas River and San Juan River, in the Northeast Zone, is a mix of private lands surrounded by BLM, Bureau of Reclamation, and state lands. These river corridors are known for their scenic beauty and historic, cultural, recreational, and wildlife values that are significant to the community, county, and the BLM. The Animas and San Juan rivers support extensive outdoor recreation opportunities and habitat for TES species, such as Southwestern willow flycatcher potential habitat. Habitat-enhancing treatments for reducing wildland fuels and lessening the threat of catastrophic wildland fire would protect the recreational and scenic values of these rivers and help preserve sensitive riparian habitat and wildlife species in accordance with Section 102.a.5.B of HFRA, *The New Mexico Forest and Watershed Health Plan*, the *Strategy for Long-Term Management of Exotic Trees in Riparian Areas for New Mexico's Five River Systems, 2005-2014*, the *San Juan Basin Watershed Management Plan,* and the BLM FFO *Fire Management Plan*.

The Northeast Zone encompasses a variety of vegetation types, such as pine forest, pinyon-juniper/oak woodland, grassland and semidesert types, and deciduous riparian species, in the Animas River and San Juan River corridors. Resource damage potential is high from wildland fire within the watershed where fire has not previously occurred, wildland fuels have not been mitigated, and heavy infestations of saltcedar

and Russian olive occur. A systematic program of wildfire suppression at minimum cost and acreage burned, with mechanical and chemical fuel-reducing treatments where applicable may be recommended to accomplish management area objectives. Mechanical and mechanical/chemical treatments will be the primary tool for wildland fuel mitigation in the riparian areas, especially for the removal of saltcedar and Russian olive within the river drainage. The combination of fuel load, topography, areas of poor access, and ineffective communication increases the potential severity of wildland fire as well as the risk to property and public/firefighter safety.

Structural and wildland fire protection is provided to area residents by the Navajo Dam, Cedar Hill, and Center Point fire districts, and in the Navajo Lake State Park, structural and wildland fire is provided by Navajo Dam Volunteer Fire Department. Navajo Lake State Park personnel are trained to assist as needed. The current ISO ratings for the Northeast Zone are 6/9 for Cedar Hill, 5/8B for Center Point, and 6/9 for Navajo Dam.

5. Southeast San Juan County Zone.

The Southeast San Juan County Zone includes portions of the San Juan River corridor and the intermix communities of Sullivan Road, Lee Acres, and Blanco. The San Juan County Southeast Zone lies between Navajo Dam and Bloomfield along SR 511 and consists of over 1,300 housing units. The communities within the San Juan County Southeast Zone are classified as “Category 2 intermix communities” (*Federal Register* 2001a). Land ownership in the Southeast Zone is a mix of private lands surrounded by BLM and state lands, and this zone contains the riparian area along the San Juan River. The San Juan River is known for its scenic beauty and historic, cultural, recreational, and wildlife values that are significant to the community, county, and the BLM. The San Juan River supports extensive outdoor recreation opportunities and habitat for TES species, including Southwestern willow flycatcher potential habitat. Habitat-enhancing treatments for reducing fuel and lessening the threat of catastrophic wildland fire would protect the recreational and scenic values of the river and would help preserve sensitive riparian habitat and wildlife species in accordance with Section 102.a.5.B of HFRA, *The New Mexico Forest and Watershed Health Plan*, the *Strategy for Long-Term Management of Exotic Trees in Riparian Areas for New Mexico’s Five River Systems, 2005-2014*, the *San Juan Basin Watershed Management Plan*, and the BLM FFO *Fire Management Plan*.

The communities in this zone were founded as livestock- and agricultural-producing communities and still consist of associated pasture and croplands. Access to private lands is restricted to unimproved, single-lane, dirt-surfaced roads in some areas. These single-lane dirt roads create a situation of a single escape route from some private lands during an evacuation from a catastrophic wildfire. The only response access for ground-based equipment would be from these unimproved roads that can become too soft to carry fire response equipment. This presents a significantly dangerous situation within many areas of the riparian corridor.

The Southeast Zone encompasses a variety of vegetative types primarily grassland and semidesert types, with deciduous riparian associations in the San Juan River corridor. Resource damage potential is high from wildland fire within the watershed where fire has not previously occurred, wildland fuels have not been mitigated, and heavy infestations of saltcedar and Russian olive occur. A systematic program of wildfire suppression at minimum cost and acreage burned, with mechanical and mechanical/chemical fuel-reducing

treatments where applicable, may be recommended to accomplish management area objectives. Mechanical and mechanical/chemical treatments will be the primary tool for wildland fuel mitigation in the riparian areas, especially for the removal of saltcedar and Russian olive within the river drainage. The combination of fuel load, topography, areas of poor access, and ineffective communication increases the potential severity of wildland fire as well as the risk to property and public/firefighter safety.

Initial wildland and structural fire response to area residents is provided by the Blanco, Lee Acres, and Sullivan Road county fire districts, with assistance from the Bloomfield City Fire Department and the BLM FFO. The BLM FFO does respond to wildland fire on public lands within the Southeast Zone and plans for complete wildland fire suppression to less than one acre within the riparian corridor. The current ISO ratings for the Southeast Zone are 8B for Blanco, 6/9 for Lee Acres, and 6/9 for Sullivan Road. As with Aztec, daytime staffing availability for each of the fire districts is a major response concern.

6. Central San Juan County Zone.

The Central San Juan County Zone consists of significant private lands associated with the Animas River and San Juan River corridors, including the intermix communities of Flora Vista, and Hart Valley. The communities of Flora Vista and Hart Valley lie between the cities of Aztec and Farmington, connected by SR 516, and consist of approximately 6700 housing units. The community of Lee Acres is located between the cities of Farmington and Bloomfield, connected by US 64. In addition, the BLM-administered Head Canyon/Dunes Recreation area is adjacent to the community of Lee Acres, and the BLM FFO-administered Glade Run Recreation Area is situated between Farmington and Aztec within the Central Zone. High numbers of OHV recreational users and high frequencies of OHV trails characterize these management areas. In addition, the Glade Run Recreation Area receives heavy visitor use in the form of mountain biking, horseback riding, jogging, and hiking. Several hundred visitors use the recreation areas each year, which creates increased potential for wildland fire ignitions and requires additional emergency services personnel to evacuate visitors if a wildland fire occurs.

The communities within the San Juan County Central Zone are classified as “Category 2 intermix communities” (*Federal Register* 2001a). Land ownership in the Central Zone is a mix of private lands surrounded by BLM and state lands, and this zone contains the riparian area along the San Juan and Animas rivers. The San Juan and Animas rivers and the Head Canyon/Dunes and Glade Run Recreation areas are significant outdoor recreation, scenic, and wildlife values to the community, county, and the BLM. Habitat-enhancing treatments for reducing fuel and lessening the threat of catastrophic wildland fire would protect the recreational and scenic values of these rivers and would help preserve sensitive riparian habitat and wildlife species in accordance with Section 102.a.5.B of HFRA, *The New Mexico Forest and Watershed Health Plan*, the *Strategy for Long-Term Management of Exotic Trees in Riparian Areas for New Mexico’s Five River Systems, 2005-2014*, the *San Juan Basin Watershed Management Plan*, and the BLM FFO *Fire Management Plan*.

Access to private lands is restricted to unimproved, single-lane, dirt-surfaced roads in some areas. This creates a situation of a single escape route from some private lands. These roads are often soft and cannot support large firefighting equipment. In a large wildland fire, this situation is ineffective for firefighting response and eventual containment of the fire.

The Central Zone encompasses a variety of vegetative types, primarily grassland and semidesert types, open juniper woodlands, and deciduous riparian species in the San Juan River and Animas River corridors. Resource damage potential is high from wildland fire within the watershed where fire has not previously occurred, wildland fuels have not been mitigated, and heavy infestations of saltcedar and Russian olive occur. A systematic program of wildfire suppression at minimum cost and acreage burned, with mechanical and chemical fuel-reducing treatments where applicable, may be recommended to accomplish management area objectives. Mechanical treatment will be the primary tool for wildland fuel mitigation in the riparian areas, especially for the removal of saltcedar and Russian olive within the river drainage. The combination of fuel load, topography, areas of poor access, and ineffective communication increases the potential severity of wildland fire as well as the risk to property and public/firefighter safety.

Initial wildland and structural fire response to area residents is provided by the Lee Acres, Flora Vista, and Hart Valley county fire departments, with assistance from the cities of Bloomfield, Aztec, and Farmington fire departments. The BLM FFO responds to wildland fire on public lands within the Central Zone and plans for complete wildland fire suppression to less than one acre within the riparian corridor and within the Head Canyon/Dunes Recreation Area and at less than 10 acres within the Glade Run Recreation Area. Fires will be suppressed to a minimum acreage for public safety, recreation, and oil and gas infrastructure concerns. The current ISO ratings for the Central Zone are 6/9 for Lee Acres, 5/9 for Flora Vista, and 6/8B for Hart Valley. Consistent with neighboring volunteer fire districts, daytime availability of firefighters is a major response concern.

7. Northern San Juan County Zone.

The Northern San Juan County Zone consists of significant private lands associated with the La Plata River corridor and includes the intermix community of La Plata. The community of La Plata lies between the city of Farmington and the New Mexico–Colorado border, connected by SR 170, and connects to the city of Aztec by SR 574. The Northern San Juan Zone contains slightly more than 900 housing units.

The community of La Plata is classified as a “Category 2 intermix community” (*Federal Register* 2001a). The land ownership in the Northern Zone is a mix of private lands surrounded by BLM and state lands, and this zone contains the riparian area along the La Plata River. The principal wildland fire threat to the community is from heavy riparian vegetation associated with the La Plata riparian corridor, especially where heavy infestations of saltcedar and Russian olive occur. Habitat-enhancing treatments for reducing fuel and lessening the threat of catastrophic wildland fire would also protect the recreational and scenic values of these rivers and would help to preserve sensitive riparian habitat and wildlife species in accordance with Section 102.a.5.B of HFRA, *The New Mexico Forest and Watershed Health Plan*, the *Strategy for Long-Term Management of Exotic Trees in Riparian Areas for New Mexico’s Five River Systems, 2005-2014*, the *San Juan Basin Watershed Management Plan*, and the BLM FFO *Fire Management Plan*.

Access to private lands is restricted to unimproved, single-lane, dirt-surfaced roads in some areas. This creates a situation of a single escape route from some private lands. These roads are often soft and cannot support large firefighting equipment. In a large wildland fire, this situation is ineffective for firefighting response and eventual containment of the fire.

The Northern Zone encompasses a variety of vegetation types, including areas of dense stands of pinyon-juniper woodlands with a brush understory, grasslands, desert scrub associations, and deciduous riparian species in the La Plata River corridor. Resource damage potential is high from wildland fire within the watershed where fire has not previously occurred, wildland fuels have not been mitigated, and heavy infestations of saltcedar and Russian olive occur. A systematic program of wildfire suppression at minimum cost and acreage burned, with mechanical and chemical fuel-reducing treatments where applicable, may be recommended to accomplish management area objectives. Mechanical treatment will be the primary tool for wildland fuel mitigation in the riparian areas, especially for the removal of saltcedar and Russian olive within the river drainage. Unplanned natural ignitions within public lands will be suppressed to protect private land and oil and gas infrastructure. Where these components are not an issue, unplanned wildfire will be monitored and allowed to burn up between 20 and 50 acres if the fire-danger rating at the time does not exceed a high severity rating. The combination of fuel load, topography, areas of poor access, and ineffective communication increases the potential severity of wildland fire and the risk to property and public/firefighter safety.

Initial wildland and structural fire response to area residents is provided by the La Plata fire department with assistance from the Farmington Fire Department. The BLM FFO responds to wildland fire on public lands within the Central Zone and plans for complete wildland fire suppression to less than one acre within the riparian corridor. The current ISO rating for the La Plata Fire Department in the Central Zone is 6/9. As with other communities with volunteer fire departments, the limited daytime availability of firefighters is a major response concern.

8. Western San Juan County Zone.

The Western San Juan County Zone includes the unincorporated communities of Fruitland, Waterflow, and Kirtland and associated lands along the San Juan River corridor and consists of over 2,900 housing units. This is the westernmost area of the WUI and is adjacent to Navajo Nation Tribal lands to the west and south and Farmington to the east. The San Juan River drainage of the Kirtland area was settled in the late nineteenth century as an agricultural community. Oil and gas exploration and development has added to the growth, employment, and, economy of the area. The Western Zone is mostly composed of Condition Class 2 lands, with Condition Class 3 lands occurring in some upland habitats and the riparian corridor of the San Juan River, especially where heavy infestations of saltcedar and Russian olive occur. The fuel hazard rating is high for most of the deciduous riparian habitat in the Western Zone. The principal fuel hazard for this portion of the WUI includes thick stands of untreated small-diameter riparian vegetation found along the San Juan River and associated private land, especially where heavy infestations of saltcedar and Russian olive occur.

US 64 passes through the Central Zone and is the primary business center where most commercial development is located. The Central Zone, as reported in the 2000 census, has a population of over 6,000 residents and 2,000 residential and business structures. The BLM-administered Hogback ACEC is adjacent to the community of Kirtland. This management area is characterized as Great Basin desert scrub community containing two endangered plant species: Mesa Verde cactus (*Sclerocactus mesae-verdae*) and Mancos milkvetch (*Astragalus humillimus*). The presence of TES species in proximity to oil and gas facilities and structures require an appropriate management response (AMR) of suppression of wildfires

with a fire intensity level (FIL) of 4 to 6, with firefighting response limited to existing roads. Natural fires with an FIL of 1 to 3 may be allowed to burn to a maximum allowable acreage of 50 acres in accordance with the *Farmington Fire Management Plan*.

The Western Zone is located within the riparian and associated uplands habitat of the San Juan River at an elevation of just over 5,000 feet. Vegetation ranges from deciduous riparian to Great Basin desert shrub in the uplands. The CAG considered threats to the Western Zone from human-caused fire starts within the riparian corridor and associated drainages in proximity to the private lands of the community.

Initial wildland and structural fire response to area residents is provided by the Ojo and Amarillo county fire districts, with additional fire protection provided by the Farmington Fire Department. The BLM does provide wildland fire response to areas within the Western Zone and plans for complete wildland fire suppression to less than one acre within the riparian corridor, with additional considerations as mentioned for the Hogback ACEC. The current ISO rating for the Western Zone is 6/9. The Ojo Amarillo Fire District is a new fire district and will not receive an ISO rating until after its first year of service is completed. Limited availability of firefighters is a major response concern for these volunteer fire departments as well.

9. Summary of Community Assessment

The major concerns of all fire departments within the SJBCWPP are similar across the WUI:

- Hiring and retaining qualified volunteer and full-time firefighters
- Elevated response time due to availability of volunteer firefighters during daytime working hours
- Vegetative conditions and incidence of human-caused fire within heavily vegetated areas of the riparian corridors
- Lack of fire-department-employed fuel mitigation crews for vegetative fuel mitigation within the WUI
- Need for additional public outreach, such as fire-safe brochures, included within utility statement mailings to residents
- Coordinated community involvement, such as annual community conference on current wildfire threats, remediation, and outreach
- Annual cross-training with federal, county, and municipal fire departments for structural and wildland fire response
- Improved access to the riparian corridor strategically located throughout the WUI

As previously mentioned, growth has occurred throughout the WUI and is anticipated to continue, especially outside the incorporated municipalities. This will create an increasing area in which “structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel” (*A Collaborative Approach for Reducing Wildland Fire Risk to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan* 2001) and an increased potential for human-caused wildland fire ignitions. As the WUI continues to grow, demands for fire response services must keep pace through aggressive firefighter recruitment efforts, as well as continual appropriate equipment supplies with additional fire stations.

Private land fuel-modification treatments are expected to increase throughout the WUI as landowners continue to introduce fire-safe conditions to their private parcels. Fuel reduction treatments are currently planned for public lands and within most communities within the river corridors. Farmington and Bloomfield have planned public development along the river corridors. The planned trail and linear parks will include outreach and education pertaining to riparian restoration, invasive-species management, and wildland fire within the riparian corridors. As private and public land fuel treatments are implemented within and adjacent to the communities, in conjunction with emergency response improvements, the risk of wildland fire spreading to or within the WUI will be reduced, and suppression will be enhanced during initial attack.

High fuel loads, along with thick riparian stands with heavy infestations of saltcedar and Russian olive create a higher risk of wildfire ignition in high-use areas. Historical lightning-caused fire starts in the riparian area are not infrequent; however, the greatest risk to the communities is human-caused fire ignitions within the extensive fuel loads of the riparian areas. Fire risk is increased because of south and southwest prevailing winds associated with slopes and lateral canyons.

The SJBCWPP is intended to help with community wildland fire protection by identifying, prioritizing, and recommending mitigation prescriptions for areas of high risk of wildland fire from vegetative fuels. The CAG recommends increased public awareness of wildland fire threat, effects of invasive-species infestations, and fire-safe private land treatments, and it also encourages business practices that provide for and conduct wildland fuels mitigation or the establishment of a fuels crew that is funded and shared by the county and municipal fire departments. Accomplishing the stated goals of the SJBCWPP will significantly increase public and firefighter safety, protect community values, improve watershed conditions, and enhance the riparian corridors within the WUI through an educated and motivated public, increased agency communication and preparedness, reduced wildland fuels, and reduced structural ignitability.

III. COMMUNITY MITIGATION PLAN

Section III prioritizes the areas in need of wildland fuel mitigation and recommends the types and methods of treatment and management necessary to mitigate the potential for catastrophic wildland fire in the WUI. Also presented in this section are the SJBCWPP communities' recommendations for enhanced wildland fire protection capabilities; public education, information, and outreach; and support for local wood product, woody biomass, and wildland vegetative fuel management businesses and industries.

A. Administrative Oversight

The CAG recognized the importance of implementing and monitoring action recommendations of the SJBCWPP. Such monitoring reports will allow San Juan County; the cities of Farmington, Bloomfield, and Aztec; the State of New Mexico; and the BLM FFO to assess movement toward meeting community wildfire protection and watershed restoration. Status assessments, coupled with adaptive management principles for the design and direction of future wildland fire and watershed restoration programs, will allow the Cities and the County and the state, and and federal agencies to continue to document achievements in meeting long-term SJBCWPP goals. Monitoring and reporting of implementation actions will allow for enhanced coordination of management programs and will reduce inconsistency among local, state, and federal agencies. Implementation of the SJBCWPP in a manner that ensures timely decision making at all levels of government and that provide for community protection and for watershed and riparian restoration is one of the highest SJBCWPP priorities. Therefore, the primary recommendation of the SJBCWPP is for the San Juan County fire chief to manage the implementation of this SJBCWPP within the areas of jurisdiction of the county fire chief and for the fire chiefs from the municipalities of Farmington, Bloomfield, and Aztec to manage the implementation of the SJBCWPP within their respective jurisdictions. Collectively, the San Juan County, Farmington, Bloomfield, and Aztec fire chiefs will be the administrators of the SJBCWPP and will encourage commercial and volunteer activities that promote watershed and rangeland health, reduce the risk of catastrophic wildland fire, and create the appropriate point of contact at the county and city levels for implementing the SJBCWPP. The SJBCWPP administrators should also assist federal and state agencies and private landowners in identifying appropriate grant and other funding mechanisms necessary to implement the action recommendations of the SJBCWPP. Grant information should be routinely searched for updated grant opportunities and application cycles. Homeowner educational and assistance references are included in Appendix E of this CWPP.

The SJBCWPP administrators will also be responsible for the development of community bulletins and other forms of public-service announcements informing residents of wildfire dangers and preventive measures. The SJBCWPP administrators will identify the responsibilities for coordinating, implementing, monitoring, and reporting the status of the current-year priority recommendations to the signatories of the SJBCWPP and will also detail the development of an annual work plan proposing priority action recommendations based on effectiveness monitoring of programs implemented in previous years. The annual report and annual work plan will be submitted to the signatories for review and approval each year. Once approved by the participating government entities and fire districts, the SJBCWPP will be presented to the NMSFD and the BLM FFO manager for concurrence and, subsequently, will be submitted for funding through HFRA and other grant or funding agencies.

The CAG also recommends that the SJBCWPP administrators' responsibilites include continued coordination with those communitites outside the analysis area (La Plata and Montezuma counties in Colorado; the Navajo Nation and Rio Ariba County, New Mexico) to ensure that any planning efforts concerning watersheds in those areas address the concerns of the downstream communities in San Juan County.

B. Fuel Reduction Priorities

To prioritize treatments, the WUI has been identified, analyzed, and categorized according to potential risk from wildfire. The analyses of community values, fuel hazards, and fire history were compiled into a single map that depicts areas of low, moderate, and high risk (Figure 2.17). The risk areas were further identified and categorized into manageable, site-specific areas in the WUI, with an overall risk value determined for each area. In addition, each site-specific area in the WUI has been labeled according to the community or response zone in which the management area is located (Figure 3.1; Table 3.1). The CAG recognizes the benefits of landscape-level treatments and suggests that they be implemented when consistent between treatment areas located within the WUI.

In the SJBCWPP, 30 site-specific areas were identified and given overall risk values. Each site-specific area was also ranked and described along with a recommendation for its preferred treatment type and method. Treatment recommendations are described in Section III.B.1.

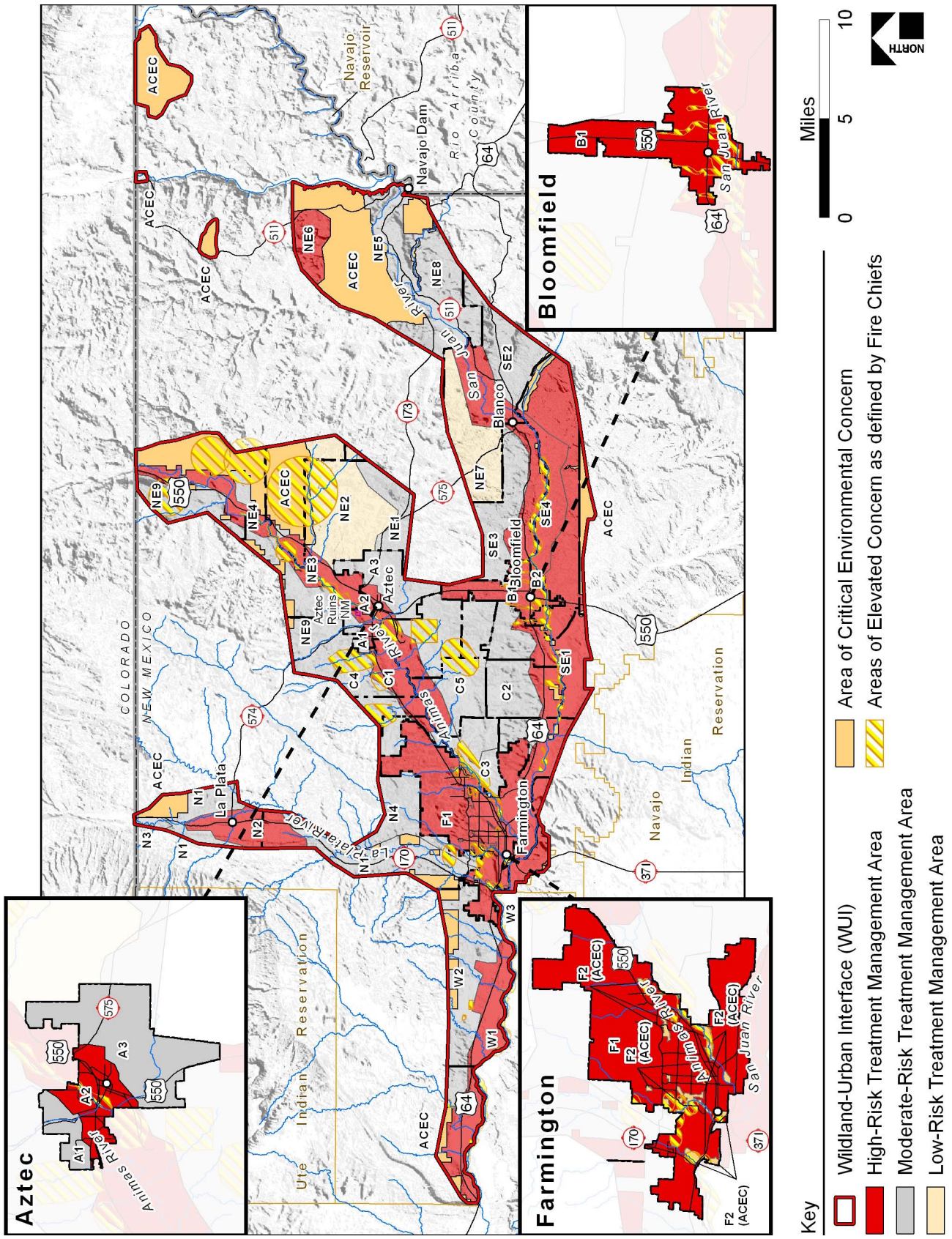

Figure 3.1. Treatment management areas

Table 3.1. Identified treatment management areas

Treatment management area	Map ID	Risk value	Location and description	Recommended treatment(s)[a]	Total acres	Federal acres	Nonfederal acres
Aztec	A1	Moderate	Land northwest of Aztec	1,2,6	1,046	214	832
Aztec	A2	High	Land north of Aztec	1,2,7,8,11	2,178	34	2,144
Aztec	A3	Moderate	Land surrounding south side of the City of Aztec	1,2,6	5,334	1,960	3,374
Bloomfield	B1	High	Public and private lands north of Bloomfield along US 550	1,2,3,7	3,742	750	2,992
Bloomfield	B2	High	Lands within and south and west of Bloomfield along the San Juan River corridor	1,2,8,11	1,162	83	1,079
Central Zone	C1	High	Land northeast of Farmington along the Animas River corridor	1,2,3,7,8,11	7,891	99	7,792
Central Zone	C2	Moderate	Land between westernmost boundary of Bloomfield city limits and beyond easternmost boundary of Farmington	1,2,3,4,6,8,10,11	9,530	6,000	3,540
Central Zone	C3	Moderate	Land northeast of Farmington along the Animas River corridor	1,2,6,8,11	2,899	57	2,842
Central Zone	C4	Moderate	Land north of the Animas River between Farmington and Aztec	1,2,3,6,8,10,11	8,299	2,796	5,503
Central Zone	C5	Moderate	Land between Farmington and Bloomfield to the north of C2	1,2,3,6,8,10,11	15,052	7,302	7,750
Farmington	F1	High	Land surrounding Farmington and extending north	1,2,3,6,7,8,11	19,134	1,202	17,932
Farmington	F2	High	Small urban parcels surrounding Farmington	1,2,8,11	1,055	0	1,055
Northern Zone	N1	Moderate	Land north of La Plata and south of N3	1,2,4,8,10,11	11,051	1,249	9,801
Northern Zone	N2	High	Land surrounding La Plata and extending south	1,2,7,8,11	5,339	11	5,328
Northern Zone	N3	Moderate	Land north of La Plata and north of N1 on the state line	1,2,4,8,11	538	51	487

Continued

Table 3.1. Identified treatment management areas

Treatment management area	Map ID	Risk value	Location and description	Recommended treatment(s)[a]	Total acres	Federal acres	Nonfederal acres
Northern Zone	N4	Moderate	Land north of Farmington and north of F1	1,2,3,4,6,7,8,10,11	5,522	4,011	1,511
Northeast Zone	NE1	Moderate	Land east of Aztec along the WUI boundary	1,2,3,4,6,10	3,944	2,831	1,113
Northeast Zone	NE2	Low	Land east of Aztec and north of NE1	4,6,10	12,232	7,589	4,643
Northeast Zone	NE3	High	Land north of Aztec along the Animas River corridor	1,2,3,7,8,11	4,456	204	4,251
Northeast Zone	NE4	High	Lands in far northeast of the WUI along the Animas River corridor	1,2,3,7,8,11	4,324	275	4,049
Northeast Zone	NE5	High	Land west of Navajo Dam	1,2,3,4,7,8,11	6,942	5,407	1,536
Northeast Zone	NE6	High	Land in far northeast of the WUI boundary and north of the San Juan River	3,4	3,369	3,045	324
Northeast Zone	NE7	Low	Uplands north of Blanco and north of the San Juan River corridor	4,6,10	7,926	5,705	2,221
Northeast Zone	NE8	Moderate	Federal and nonfederal lands south and west of Navajo Dam	1,2,3,6,7,10,11	15,260	10,332	4,928
Northeast Zone	NE9	Moderate	Land north of Aztec and west of N3 and NE4	1,2,3,4,6,11	12,051	5,318	6,733
Areas of Critical Environmental Concern	ACEC (Middle Mesa)	High	Different parcels of land throughout the WUI; these areas are specially designated as high risk	3,4,5,6,8,9,11	38,107	33,471	4,636
Southeast Zone	SE1	High	Land south of Bloomfield extending west toward Farmington	1,2,3,6,7,8,10,11	27,184	9,382	17,802
Southeast Zone	SE2	Moderate	Land due east of Blanco	1,2,3,6,10,11	7,027	6,380	647
Southeast Zone	SE3	Moderate	Land north of Bloomfield and north of SE4	1,2,3,6,10,11	6,712	5,224	1,488
Southeast Zone	SE4	High	Land east of Bloomfield including Blanco and extending east	1,2,3,7,8,10,11	14,600	2,378	12,222
Western Zone	W1	High	Southernmost portion of far western arm of the WUI	1,2,6,7,8,11	9,551	129	9,422
Western Zone	W2	Moderate	Northernmost portion of far western arm of the WUI	1,2,3,8,10,11	9,449	1,952	7,497
Western Zone	W3	Moderate	Small piece of land south and west of Farmington	1,2,3,8,10,11	65	11	54

[a]For recommended treatment codes, see Table 3.2.

1. Recommendations for Land Treatments in the WUI to Meet Fuel Reduction or Modification Objectives

In accordance with *The New Mexico Forest and Watershed Health Plan,* fuel reduction and modification treatments recommended in the SJBCWPP are designed to contribute toward the restoration of the structure and composition of riparian areas and also to enhance watershed function and protection. In addition, fuel reduction treatments are designed to be compliant with standards and guidelines established in the *Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Lands in New Mexico and Texas* and the *Farmington Field Office Fire Management Plan* and to complement recommendations within the *Strategy for Long-Term Management of Exotic Trees in Riparian Areas for New Mexico's Five River Systems, 2005-2014*, *Protecting People and Natural Resources: A Cohesive Fuels Treatment Strategy* (USDI and USDA FS 2006) and the *San Juan Basin Watershed Management Plan*. Table 3.2 identifies recommended prescriptions for lands located in the treatment management areas described in Table 3.1 and shown in Figure 3.1. These treatments are designed to meet the fuel reduction and modification objectives of the SJBCWPP. Figure 3.2 shows general areas of the recommended treatments in the WUI.

The SJBCWPP also focuses on the treatment and thinning of small-diameter wildland vegetative fuel to create defensible space (Photo 3.1), fuel breaks, and an acceptable condition class for community and significant infrastructure protection; to provide safer evacuation routes for communities; and to provide maximum firefighter and public safety through the development and implementation of a cohesive fuels treatment and wildland fire response strategy within the WUI. The primary component of SJBCWPP land treatments is to increase the likelihood that fire behavior will result in minimal flame lengths to maintain fire on the ground, to reduce ignition of ladder fuels, and, in turn, to minimize fire spread and intensity. The desired future conditions of the proposed treatment areas will enhance homeowner and firefighter safety, allow for a higher probability of suppression during the initial attack, and reduce loss of private structures. These treatment recommendations were also developed with consideration of wildlife biodiversity and riparian health and restoration, as well as watershed and groundwater enhancement. The CAG recognizes that in many cases it will be impossible to achieve the desired future conditions in a single entry. Multiple entries for multiple treatments, including periodic Rx, may be required.

Monitoring of natural wildland fire ignitions will be applied to areas if wildland fire use (WFU) is allowed in the future. Currently WFU is not used or recommended in the SJBCWPP area due to high risk to oil and gas infrastructure. Infrastructure risks and environmental conditions will be closely monitored to determine the feasibility of using WFU in the future for resource benefit. The CAG further recognizes that resource specialists will conduct site-specific analysis of proposed treatment areas and identify site-specific mitigation measures that will determine the actual footprint of fuel modification treatments across the WUI landscape. Within the WUI, the objectives of this CWPP will be achieved primarily through thinning, piling, and burning; mechanical and mechanical/chemical riparian treatments; and Rx under the authority of the *Farmington Field Office Fire Management Plan* and the municipal and county fire departments.

Table 3.2. Fuel modification and treatment plans

Treatment No.	1 Developed private parcels less than 2 acres			2 Undeveloped private parcels or single-structure parcels more than 2 acres		3 Federal or state lands within 0.5 mile of private land		4 Pinyon/juniper woodland within the WUI	5 Prescribed fire (Rx)
Treatment category	**Zone 1** (0–10 feet from structures)	**Zone 2** (10–30 feet from structures)	**Zone 3** (30–100 feet from structures)	**Slopes < 20**	**Stream beds, channels, and slopes ≥ 20**	**Slopes < 20**	**Slopes ≥20**	**All slopes**	**Federal state, or private lands**
Vegetation	Remove ladder fuels and reduce flammable vegetation. Remove and destroy all insect-infested, diseased, and dead trees.	Remove ladder fuels; remove and destroy all insect-infested, diseased, and dead trees. Create separation between trees, tree crowns, and other plants based on fuel type, density, slope, and other topographical features. Reduce continuity of fuels by creating a clear space around brush or planting groups.	Remove ladder fuels; remove and destroy all insect-infested, diseased, and dead trees. Maximum density of trees (whichever is greater: 60 BA at 80–100 trees/acre *or* average density of 100 trees/acre)	Remove ladder fuels; remove and destroy all insect-infested, diseased, and dead trees. Maximum density of trees (whichever is greater: 60 BA[a] at 80–100 trees/acre *or* average density of 100 trees/acre) See fuel modification plan (this section)developed to promote riparian health, prevent spread of fire to adjacent property, and to create defensible space with considerations for wildlife and groundwater protection. Single structure or structures on parcels in excess of 2 acres should include Treatment 1 in proximity of structures and Treatment 2 to remaining acres.	Remove all dead, diseased, and dying trees. Fell dead trees away from stream channels with defined bed and banks. Areas should be hand-thinned and piled, inaccessible areas may be treated with periodic Rx Develop fuel modification plan (this section) for treatments.	Follow BLM standards and guidelines within TES habitats. Trees more than 16-inches dbh[a] will be targeted for retention unless needed to promote fire-resilient stands. Target BA may be achieved through mechanical or chemical treatments, or Rx. See the fuel modification plan (this section) developed to promote riparian health, prevent spread of fire to adjacent property, and to create defensible space with considerations for wildlife and groundwater protection. Grassland vegetation types may include multiple entry burns to maintain stand structure and reduce fine fuels. All presettlement (PS) trees will be retained; other trees encroaching on grasslands may be cut.	Same as for slopes < 20 percent. Fuels treatments will primarily include hand-thinning and hand-piling; however, ignited prescribed fire will be primary tool to reduce unmanageable fire potential. See fuel modification plan (this section) developed to promote forest health, prevent spread of fire to adjacent property, and to create defensible space with considerations for wildlife and groundwater protection. NA for grassland types.	Pinyon-juniper woodlands will be thinned to a spacing of 20–35 feet between trees, or burned to achieve like results as necessary to promote fire-resilient stands. Spacing may be variable to promote wildlife habitat while breaking horizontal fuel loading, allowing for patches of closely spaced trees to provide adequate cover, and other habitat components while incorporating openings to promote herbaceous forage production and maximize edge effect. All trees > 12 inches drc will be targeted as leave trees unless necessary to achieve the desired spacing.	Rx will be used as a tool to accomplish specific resource management objectives in accordance with BLM Resource Management Plan standards and guides. Rx will be used as a treatment in areas designated for Rx by the BLM FFO. As additional areas within the WUI are identified, Rx may be used as a treatment tool provided a Wildland Fire Implementation Plan is in effect and all conditions set forth have been met. Rx can occur at low, moderate, and high intensity. High-intensity fire will be used to create openings by removing all aboveground vegetation
Slash	Remove all dead plant material from ground; prune tree limbs overhanging roof; remove branches within 10 feet of chimney; remove flammable debris from gutters and roof surfaces; and reduce natural flammable material 2–4 feet above the ground around improvements.	Control soil erosion from small water flow channels by use of rock or noncombustible velocity-reducing structures. Remove all leaf litter to a depth of 1 inch.	Same as Zone 2.	All slash, snags, and vegetation that may grow into overhead electrical lines; other ground fuels, ladder fuels, and dead trees; and the thinning from live trees must be removed, mechanically treated (chipped, etc.), or piled and burned along with existing fuels.	Clean dead and down debris in channels where debris may be mobilized in floods, thus creating downstream jams. Some slash and debris can be scattered and retained in small, ephemeral streambeds in which slash can help retain runoff and sediment and provide headcut stabilization.	Slash treatment may include lop, scatter, and burn and could include hand-piling and/or chipping and burning. Slash from grassland treatments may be burned, removed, masticated, or turned (disked).	Same as < 20 percent; however, slash will be hand-piled and ignited. Rx will be the primary slash reduction treatment. NA for grassland types.	Slash may be lopped and burned or piled and burned or chipped and removed.	Slash, jack piles, down logs when more than 600 feet from private property may be burned. Pile or Rx will be used to remove fuel when more than 600 feet from private land or as designated. Snags and down woody material may be retained in areas where fire resilience is not compromised.

Continued

Table 3.2. Fuel modification and treatment plans

Treatment No.	6 Pinyon juniper woodland type (federal and nonfederal lands)		7 Escape and resource transportation corridors (federal and nonfederal lands)	8 Riparian areas (federal and nonfederal lands)	9 Wildland fire use (WFU) for resource objectivities	10 Conditional suppression areas (federal and nonfederal lands)	11 Saltcedar/Russian Olive (federal and nonfederal lands)
Treatment category	**Federal or state lands ≤ 0.5 mile of private**	**Federal or state lands > 0.5 mile of private**	**Federal, state, or local government where designated as escape route**	**Federal or state lands**	**Federal lands**	**Federal, state, or private Lands**	**Federal, state, or private lands**
Vegetation	Mechanical treatments such as crushing, chipping, mastication, and Rx may be used to create open stands producing flame lengths of 4 feet or less to minimize crown fire potential with fuels conducive to suppression action.	Mechanical thinning and prescribed fire (see Treatment 5) to reduce vegetative fuels and move stands toward potential natural vegetation groups as described in the *FRCC Interagency Handbook*. Residual stands may be grouped, clumped, and unevenly spaced to produce open canopies that allow for the reproduction of grasses, scattered forbs, and shrubs.	Reduce fuel loading by thinning trees primarily in the 5–16 dbh range. All stands to achieve an average of 60 BA though some variability will occur across the landscape, such as retention of bands of higher BA with sufficient understory to maintain functionality of important wildlife movement corridors. Mechanical treatments may include chipping, piling and burning, or removal and Rx of the project area. Trees may be left in clumps with fuel ladders removed from below. Dead, diseased, and dying trees of all sizes will be emphasized for removal. Some trees over 16 inches dbh may be cut to reach projected BA, to reduce safety hazard, or when in direct competition with larger trees.	Riparian treatments will be limited in scope. The majority of riparian areas that fall in the WUI boundary will be avoided unless deemed a fuel hazard. Treatments may include some overstory removal of deciduous riparian trees and shrubs in areas where encroachment has increased heavy woody fuels (emphasizing removal and control of saltcedar and Russian olive). Treatments will emphasize nonnative species. Snags > 12 inches dbh may be retained. All PS trees including conifers will be targeted for retention. Private land treatment should use hand tools, chain saws, or mowers. Dead vegetation and slash should be removed. Ladder fuels including limbs and branches should be removed up to a maximum of 8 feet aboveground. All mechanized equipment must meet state and local fire department standards. Perform treatments October through March annually.	WFU is a fuels treatment alternative used to accomplish specific resource management objectives in accordance with BLM Resource Management Plan standards and guides. WFU can only be used when a Wildland Fire Implementation Plan is in effect. Although WFU is listed as a possible prescription for hazardous wildland fuels management in areas pre-designated by the BLM FFO fire management plan, WFU should not be used in areas with extensive oil and gas industry infrastructure. WFU is not currently used or recommended on BLM lands within the SJBCWPP area due to the high risk to oil and gas infrastructure community values.	This prescription includes lands currently in Condition Class 1 in which no fuel modification treatments have been identified as necessary to provide protection from wildland fire and the threat from catastrophic wildland fire is low or nonexistent, including areas where fire never played a historical role in developing and maintaining ecosystems and where fire return intervals were very long and areas in the WUI where fire could have negative effects unless fuel modifications take place (see Treatment 9). These include areas in which the use of fire may have ecological, social, or political constraints and areas in which mitigation and suppression are required to prevent direct threats to life or property. Wildland fire growth within these areas will be monitored for private property, ecological, and cultural threats before initiating suppression. Agency and fire department policy provisions will determine suppression response.	Areas of monotypic saltcedar or in mix with Russian Olive may be treated mechanically, chemically, or by controlled burning and reburning to reduce stem density, canopy, and excessive fuel loading. Mechanical removal by cutting below the root collar during November through January is preferred. Mechanical whole-tree extraction has achieved as high as 90 percent mortality on initial treatments and may be considered a preferred treatment. Low-volume oil-based herbicide applications in late spring to early fall would be considered for control of small plants (< 2 inches drc). Low-volume cut-stump herbicide applications will be considered in combination with mechanical treatment. Preferred phenological stage for burning is peak summer months and post avian breeding months. Black lines should be at least 700 feet wide, and headfire installed with temperatures 65 to 95°F, relative humidity of 25 to 40 percent, and wind speeds < 15mph. Maintenance, revegetation, restoration, and monitoring should follow as needed for each treatment area (see Appendix F).
Slash	Slash treatments may include piling, lop, and burn; piled and burned; or utilized for soil stabilization.	Same as ≤ 0.5 mile of private.	Snags, slash, and down logs will be removed within 600 feet of private land. When more than 600 feet from private property, pile burning or Rx will be used to remove fuel. Snags and down woody material may be retained in areas where fire resilience is not compromised. Vehicle pullouts should be planned in appropriate numbers and locations where vegetation, slope, and terrain permit.	Fuel treatments and woody material removal will occur on existing roads. After removal of heavy woody fuels to ensure low-intensity fire and cool-season low-intensity fires that move slowly downslope or into prevailing winds, mid-slope Rx may be used for stand maintenance and to minimize impacts. Pile or jackpot burning will not occur in ephemeral, intermittent, or perennial stream channels. Large down woody material and snags (12 inches or more) may be retained in riparian areas.	Slash, jack piles, down logs when more than 600 feet from private property may be burned. Pile or Rx will be used to remove fuel when more than 600 feet from private land or as designated. Snags and down woody material may be retained in areas where fire resilience is not compromised.	Response will be for full suppression when firefighter and public safety, property, improvements, or natural resources are threatened.	Created slash will be treated and piled with preexisting fuels and burned or otherwise used for soil stabilization. Disturbed areas should be immediately revegetated with a native plant community that contains no invasive species and meets other land use objectives, such as wildlife habitat enhancements or recreational use benefits.

Note: BA = basal area (in square feet); dbh = diameter breast height; drc = diameter root collar; NA = Not applicable.

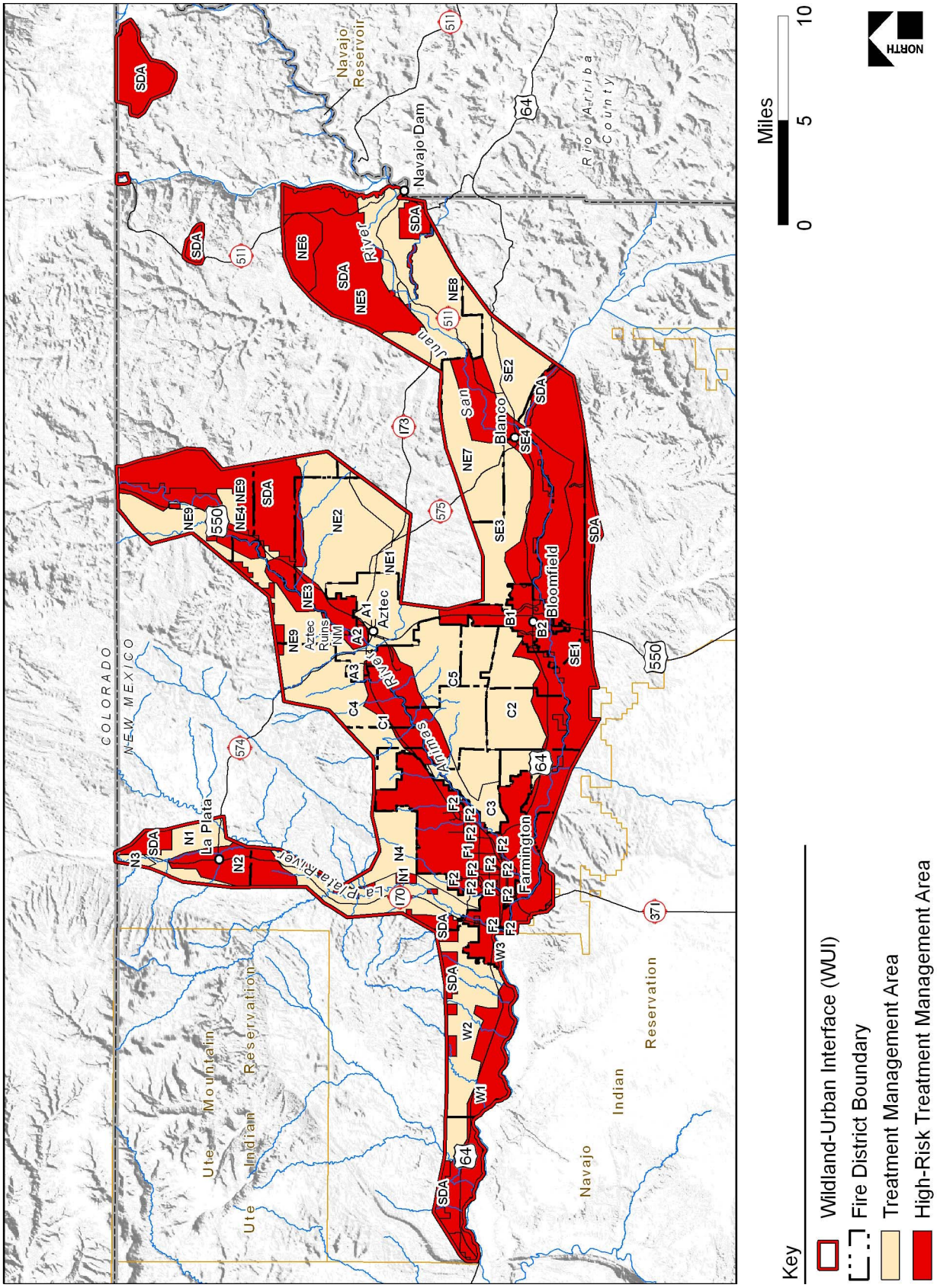

Figure 3.2. Treatment recommendations

Planning for needed mitigation measures will also provide for a diversity of treatments and, therefore, habitats across the landscape. In many treatment areas, a diversity of age classes, vegetation structural stages, and retention of some snags and down woody material will not only reduce fire hazard near the communities but also provide for irregular vegetative patterns of habitat, thus enhancing wildlife species biodiversity. The CAG recognizes that some areas may be deferred from treatment based on site-specific analysis, given wildlife and other resource requirements that allow for prescriptions to be modified for larger untreated areas while maintaining fire resiliency.

Large trees (deciduous riparian or conifers > 16 inches in diameter at breast height [dbh] and juniper > 12 inches in diameter at root collar [drc]) are not considered in fuel reduction and modification prescriptions unless they are diseased, dying, or dead trees on private property or on federal land and are in excess of recommendations for standing snags and down logs for enhanced wildlife species habitat. The exception to this standard applies to snags within one-half mile of private land, within designated fuel breaks adjacent to a significant community infrastructure, or within an evacuation corridor in which all snags may be removed if necessary for fire resiliency. Evacuation corridors, if delineated, are generally planned to extend one-half mile in width from the center of the corridor in similarity to designated fuel breaks. Wildlife habitat can also be enhanced in these evacuation corridors by maintaining diversity in age class and may include retention of snags and down logs located 600 feet or more from private land. The CAG recognizes and agrees that in some areas trees over 16 inches dbh or 12 inches drc may be removed if necessary to achieve comparably fire-resilient stands as appropriate for the vegetative type (HFRA, Sec. 102.f.1.B).

Photo 3.1. Hazard fuels in proximity to homes

The CAG recognizes and supports the integrated approach to vegetation management and hazardous fuels treatments put forth in *The New Mexico Forest and Watershed Health Plan* and the *Farmington Field Office Fire Management Plan*. The CAG also recognizes the importance of linking the small-scale urban interface treatments specific to hazardous fuels reduction landscape-level ecosystem treatments. Fuels mitigation projects that include areas with small-scale intensive treatments in high-risk areas can be linked to intensive treatments encompassed by larger project areas, where treatments will occur over a period of years to allow for broad-scale ecosystem restoration and landscape-level change in condition class and therefore wildfire behavior.

Wildland fuel treatments may include mechanical or hand thinning, broadcast or pile burning, chemical applications, or any combination of these treatments types. Broadcast Rx may be used as slash disposal, as wildland fuel maintenance, and as a habitat restoration tool where feasible and practical. Applicable BLM, New Mexico State, and local fire, fuels, and air quality standards and guidelines will be followed for fire management activities. Conservation measures as outlined in the *Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Lands in New Mexico and Texas* will be implemented during public land treatments. In addition, best management practices and minimum impacts suppression tactics (MIST) will be implemented during fire management activities within all areas in which known federally protected species or habitats exist.

Treatment of wildland fuels within the WUI is expected to generate considerable slash and vegetative waste material. Private individual use of wood products from fuel reduction treatments within the WUI is primarily for fuel wood. Commercial use of the woody material from fuel reduction treatments is also primarily limited to fuel wood, and any commercial value of treatment by-products will not affect cost of treatments. If silvicultural prescriptions require follow-up pile burning or herbicide application after vegetation treatment, the total cost/acre treated could be as high as $5,000.00/acre on small land parcels consisting mostly of individual plant treatments within the riparian corridor (USDA FS and NMSFD 2005) and as high as $580.00/acre in upland areas. Average land treatment costs, considering treatment and handling of slash, is approximately $600.00/acre within riparian WUI vegetative types when mechanical and chemical treatments are combined for large-scale treatments.

Moreover, in most land area estimates, not all acres are involved in treatment. As mentioned previously, site-specific analysis may exclude some acres from treatment because of topography, such as slope, and resource issues, such as riparian corridors or a sensitive wildlife area. In areas in which Rx is the proposed tool for fuel management, natural barriers and other existing control features will determine treatment boundaries, leaving some acres within an analysis area untreated. Therefore, for the purpose of estimating treatment costs, the CAG used an average treatment cost/acre on federal lands consisting of large-scale riparian and upland vegetation fuel modification treatments estimated at $600.00/acre, with an estimated footprint covering 80 percent of the management area proposed for fuel modification treatment.

In recent years, the number of diseased, dying, and dead large trees on public and private lands has increased primarily because of prolonged drought and insect infestations. In efforts to treat these areas, private land treatments in the WUI are typically identified on small land parcels and near power lines, structures, and other obstacles. In many cases, the owner of a small residential lot or the fire department will not allow cut trees and slash to be piled and burned on the property. Though in some cases, broadcast

Rx may be used for slash disposal and fuels maintenance and also as a restoration tool. This practice is only used where feasible and practical on private lands in or adjacent to communities in which the applicable fire department standards are followed. Chipping or removal and transportation of slash to a disposal site increases treatment costs but may be preferred within residential areas of the WUI. Treatments necessary to meet these recommendations on private land parcels within the WUI vary in cost from less than $40.00/acre to over $5,000.00/acre. Costs/acre will vary greatly for treatment of private parcels, depending on variables and landowner needs, including any revegetation costs. Site analysis shows that land applications will be appropriate for no more than 60 percent of each acre mapped for treatment. For example, in residential areas, home sites, streets, and other improvements are included within GIS-mapped acreage estimates, but will not require treatment. The CAG decided that for the purpose of estimating private land treatment costs an average cost of $1,200.00/acre would be modified by using a multiplier of 0.6.

The recovery cost of wood products from private parcels are comparable to that achieved with federal treatments; however, the treatment cost is much higher due to limited treatment areas, increasing personnel costs, and equipment transfer costs. Fuel mitigation treatments are also complicated by the proximity of structure and infrastructure (power lines to homes), and the cost of removing fuel from the site. Across all landscapes, the commercial uses of the woody material from fuel reduction treatments is limited and will not affect the cost of effective treatments on public or private land. Cost estimates for treatments in the WUI are based on these estimates for both federal and nonfederal land treatments. The CAG recommends that private landowners who wish to adopt fuel modification plans other than those described in Table 3.2 should have the plan prepared or certified by a professional forester, a certified arborist, or other qualified individuals. Fuel modification plans for federal and state lands within one-half mile of private land may be prepared for wildlife and watershed benefits, including the retention of large snags of high wildlife value, in areas more than 600 feet from private lands where fire resiliency is not impaired and will not compromise public or firefighter safety. A fuel modification plan must identify the actions necessary to promote forest/rangeland or wildlife/watershed health and to help prevent the spread of fire to adjacent property by establishing and maintaining defensible space. The plan should include considerations for wildlife and for surface and groundwater protection. The action identified by the fuel modification plan should be completed before development of the property or identified during project initiation on federal and state lands.

Alternate federal, state, or private land wildland fuel modification plan:

A fuel modification plan for federal and state lands will follow agency procedures, standards, and guides. Fuel modification treatment plans for private land parcels should at least include the following information:

- A copy of the site plan
- Methods and timetables for controlling, changing, or modifying fuels on the properties in a timely and effective manner
- Elements of removal of slash, snags, and vegetation that may grow into overhead electrical lines; the removal of other ground fuels, ladder fuels, and diseased, dying, and dead trees; and the thinning of live trees

- Methods and timetables for control and elimination of diseased or insect-infested vegetation
- A plan for the ongoing maintenance of the proposed fuel reduction and control measures for disease and insect infestations
- A proposed vegetation management plan for groupings of parcels under multiple ownership accepted by all individual owners (subject to compliance with this section)

HFRA was designed to expedite administrative procedures for conducting hazardous wildland fuel reduction and restoration projects on federal lands. Regardless of priority treatments selected for federal lands, an environmental assessment must be conducted for riparian health and fuel reduction projects. Although HFRA creates a streamlined and improved process for reviewing fuel reduction and restoration treatments, it still requires that appropriate environmental assessments be conducted and that collaboration be maintained. To meet conditions established by the Healthy Forest Initiative, the USDA and USDI adopted two new categorical exclusions from the normal review steps of an environmental assessment or the issuance of an environmental impact statement. These exclusions are for hazardous fuels reductions and for rehabilitation of resources and infrastructure damaged by wildfire. For a hazardous fuels reduction project on BLM lands to be categorically excluded from documentation of the results of an environmental assessment, the project must meet specific requirements (USDA FS 2000)

- It must have less than 4,500 acres to be treated, with mechanical slash treatment restricted to no more than 1,000 acres.
- Its lands must be within current Condition Classes 2 or 3.
- It must not be in a wilderness or wilderness study area.
- It must not include use of pesticides, herbicides, or new road or infrastructure construction.
- It may include sale of vegetative products if the primary purpose is to reduce hazardous fuels.

For a project to be categorically excluded, the proposal must be satisfactorily reviewed to determine that no "extraordinary circumstances" exist (USDA FS and USDI BLM 2004). Section 104 of HFRA describes procedures for federal agencies to employ when they conclude that an environmental assessment must be prepared because of such extraordinary circumstances. When extraordinary circumstances exist, fuel reduction projects are not categorically excluded from additional environmental analysis, and such analysis must comply with all land management plan requirements. For project proposals in the WUI, the BLM is not required to analyze any alternative to the proposed action if the proposed action implements the CWPP in regard to general location and treatment methods. If the proposed action does not implement treatments or action items identified within the SJBCWPP, the analysis must consider the SJBCWPP proposal as an alternative to be analyzed in addition to the proposed action. The CAG intends the SJBCWPP proposed vegetative treatments to be consistent with and implemented on public lands simultaneously with the BLM FFO proposed action.

For these reasons, the communities in the SJBCWPP have made every effort to identify and recommend treatments that comply with *The Fire and Fuels Management Plan Amendment and Environmental Assessment for Public Land in New Mexico and Texas*. For example, treatments in the FFO ACEC will be achieved under current authority of the *Farmington Field Office Fire Management Plan*. In federal land

management areas in which an environmental assessment would show that no additional documentation would be warranted, the priority areas identified for treatment in the SJBCWPP and treatments recommended to meet fuel reduction or modification objectives should be considered as the action alternative by the BLM FFO.

2. Watershed/Riparian Treatments

Initially, lands suitable for irrigation and crop production and with access to water promoted settlement along the major streams and rivers of San Juan County. The current condition of these same riparian areas in today's communities and cities, have changed such that the very area that attracted early settlers is now conducive to major wildland fire. Currently, significant reaches of the San Juan River, Animas River, and La Plata River corridors are in an unhealthy condition. Many areas of these rivers are overly dense; contain near monocultures of invasive woody and herbaceous vegetation species; and provide only fragmented wildlife habitats with decreasing water supplies, accelerated erosion, and impaired water quality (*Strategy for Long-Term Management of Exotic Trees in Riparian Areas for New Mexico's Five River Systems, 2005-2014*; *San Juan Basin Watershed Management Plan*; and *Low-Impact, Selective Herbicide Application for Control of Exotic Trees in Riparian Areas: Saltcedar, Russian Olive and Siberian Elm: A Preliminary Field Guide by Doug Parker and Max Williamson*). Though extensive areas of unhealthy vegetation species and density occur, the overall desired future condition is one of a primarily historical, naturally functioning landscape that provides an abundance of resources and amenities. Healthy river ecosystems are the economic drivers of the SJBCWPP communities through their inherent productivity. Therefore, the CAG has developed and recommends wildland fuel treatments that complement *The New Mexico Forest and Watershed Health Plan* by

- promoting ecological integrity of riparian systems within the WUI;
- soliciting the experience, knowledge, and needs of all the diverse communities and their diverse values of the communities in the development of this CWPP;
- supporting economic diversity and productive riparian systems within the WUI while maintaining or enhancing social and ecological values of riparian and riverine systems.

Treatments developed and recommended to reverse the downward trend of riparian systems by the CAG are both strategic (e.g., aimed at addressing general environmental conditions such as saltcedar and Russian olive control) and prescriptive (e.g., describing specific treatment methods that could be employed on both private and public lands within the WUI). Throughout the riparian corridors within the WUI, residences and associated structures can be located on several acres of agricultural or mostly undeveloped private land. The CAG recommends that landowners treat their residences to fire-safe standards by implementing Treatments 1 and 2 presented in Table 3.2. The CAG also recommends that landowners treat riparian areas within their private lands as described in Treatment 8 (Table 3.2). Understory removal of invading saltcedar and Russian olive, as well as limiting fine-fuel accumulation, will decrease wildfire spread and intensity and will protect riparian values during a wildfire event. The CAG recommends that limited riparian treatments, such as fuel breaks, be applied lightly with the use of hand tools and small mechanical equipment (see Treatment 8, Table 3.2). The CAG prefers that treatment

includes total slash removal rather than pile and burn to limit the spread of invasive species and the creation of intense heat spots under piles that can retard germination.

Risk to communities from catastrophic wildland fire is present not only in the riparian areas within the WUI but also in the upper watersheds. The CAG supports the recommendation of *The New Mexico Forest and Watershed Health Plan* to "expand the focus of the planning effort to include entire watersheds, from high elevation forested areas to lower elevation rangeland and riparian areas." The adverse effects of a wildland fire event in or adjacent to the watersheds within the WUI will create changes in peak flows, either by frequency or magnitude. Flood and debris flows resulting from catastrophic wildland fire in the watersheds will affect municipal watersheds and river and stream courses. Such flood and debris flows can degrade water quality and quantity, cause the release of harmful heavy metals, and create other effects from physical damage to property and habitats. The CAG recognizes the need to develop a CWPP necessary to protect and enhance the municipal watersheds. The CAG also recognizes that mitigating risk to the SJBCWPP WUI and adjacent lands must also include the application of fire-mitigating and watershed-enhancing treatments to the upper watersheds. Therefore, the CAG recommends that in addition to the SJBCWPP, a watershed health plan should be initiated to supplement the treatments identified in this CWPP. The CAG has identified and recommends that the watersheds in the WUI consisting of federal and nonfederal lands, including portions of the Upper San Juan (HUC 14080101), Blanco Canyon (HUC 14080103) Animas (HUC 14080104), Middle San Juan (HUC 14080105) and Chaco (HUC 14080106) watersheds as delineated by the United States Geologic Survey, should be included in the watershed health plan and be prioritized by current condition class and treatment status (see Figure 2.15).

3. Saltcedar/Russian olive

The CAG understands that exotic tree infestation is one of the most significant impediments to the long-term management of riparian corridors within the Southwest. The riparian corridors within the SJBCWPP are especially affected by saltcedar/Russian olive infestation. The CAG would like to point out the elevated importance and need to treat this condition. Within the main stem of the San Juan, Animas and La Plata rivers, saltcedar and Russian olive infestations continue to degrade native plant communities and are significant concerns to land managers and wildland firefighters. Saltcedar and Russian olive infestations reduce recreational use of parks and riparian areas for camping, hunting, fishing, and agriculture and continue to negatively affect community uses and values of the riparian corridors. Appendix F contains the CAG's recommendations for riparian restoration and wildfire protection by management of saltcedar and Russian olive.

C. Prevention and Loss Mitigation

The SJBCWPP is intended as a resource to help coordinate the long-term interagency mitigation of catastrophic wildfire events in the at-risk communities of the San Juan Basin and federal lands under the jurisdiction of the BLM FFO. The communities in the SJBCWPP area have agreed on 10 primary goals of the SJBCWPP (see Section I.F.) The SJBCWPP should be reviewed and updated as needed. Successful implementation of this plan will require a collaborative process among multiple layers of government, as well as a broad range of special-interest groups. Communities in the SJBCWPP area have established the following action recommendations:

1. Improved Protection Capability and Reduction in Structural Ignitability

The communities take the risks of wildland fire igniting and spreading in the WUI seriously. The performance of municipal fire departments, the BLM FFO, and the San Juan County Fire Department can be leveraged through combined responses. In the wake of a large fire or in the case of multiple fires; however, it may not be possible to protect every home and structure in the WUI. Community leaders as well as private landowners must take actions to reduce fire risks and promote effective responses to wildland fires. The following are recommendations to enhance protection capabilities in the SJBCWPP communities:

a. All communities: Recruit, train, and retain 100 new volunteer firefighters for the San Juan County Fire Department. This would be accomplished by using all media avenues (announcements in the local Allen Theaters, newspaper, Web sites, brochures, civic group presentations, and other promotional opportunities). This includes aggressive marketing for the development of the wildfire team. It is recommended that the new-member orientation and academy process be reviewed and enhanced to allow for completion of initial orientation and the basic academy within 12 months, under the supervision of the County Fire Department training coordinator.

b. Specific to Bloomfield: the Fire Department shall strive to recruit, train, and retain additional volunteer firefighters. Furthermore, they shall hire and train sufficient career personnel to staff engine company and other companies as may be required according to National Fire Protection Association 1720, 24 hours per day 7 days a week. Recruitment will follow current practices and shall include recruitment posters/calendars, Web sites, brochures, civic presentations, and other means to meet the staffing need of the department. All training will be in accordance with nationally recognized standards.

c. All communities: Provide for additional comprehensive and frequent training for firefighters. Training should be jointly conducted by the BLM FFO, San Juan County, and the municipal fire departments. Training will focus on firefighters achieving Firefighter I status. In addition, three academies focusing on hazardous materials, basic EMS, and basic wildland fire should be conducted annually. To implement this action recommendation, a cadre of qualified instructors, training materials, and equipment must be developed and maintained.

d. All communities: Conduct a yearly, preseason wildfire-readiness training activity, organized by region, before entry into the fire season for the purpose of emphasizing tactics of WUI suppression and interagency coordination. Communities should support San Juan College's training programs, such as Fire Science and Emergency Medical Technology. Continual WUI fire suppression training must be made available to volunteer and full-time firefighters in each fire department.

e. All communities: Expand the role of the wildfire team through fuels reduction grant programs, to include wildland fuels thinning and management. The wildfire team would be composed of trained volunteer firefighters from the San Juan County Fire Department. The wildfire team would be contracted to conduct wildland fuel mitigation projects on private and public lands outside the high fire-danger season. The wildfire team would also coordinate with and promote wildland fire safety outreach programs and other private land enhancement programs, such as those funded through the Soil and Water Conservation District. The wildfire team would be shared by the county and municipal

fire departments to address wildland fuel mitigation projects as prioritized by county and municipal fire chiefs as funding is available.

f. All communities: Develop an appropriate incentive system for volunteer firefighters based on performance and qualifications. Such incentives may include additional training for Firefighter II status and attendance at regional- and national-level wildland fire conferences funded by the San Juan County Fire Department. In addition, an annual ceremony could be conducted to recognize outstanding individual and team service to the community sponsored by the mayors, board of supervisors, business officials, and other stakeholders in the WUI.

g. All communities: Implement and monitor the newly adopted International Fire Code and provide data to Farmington, Bloomfield, Aztec, and San Juan County for use in the adoption of an Urban-Wildland Interface Code or Fire Prevention Code. Such codes would describe specific land standards that apply to vegetation and would describe which conditions are acceptable. These codes would also depend on housing density and community values at-risk within the WUI, such as watersheds, archaeological resources, recreational resources, wildlife, grazing, and other resources. Local land use policies could include incentives for private landowners to address defensible space and fuels management on their properties and to implement fire-sensitive land use planning and subdivision requirements. In addition, Farmington, Bloomfield, Aztec, and San Juan County propose to develop and refine jurisdictional agreements needed for seamless land treatment policies; the development of ordinances and codes designed to reduce ignitability for both structural and wildland points of ignition; and the application and administration of grants and programs needed for the oversight, management, and implementation of the SJBCWPP. Decision making will also include development of systems needed for evacuation, specific exigent circumstances mitigation, and firefighting resource distribution.

h. All communities: The fire departments recommend adoption of a consistent preparedness planning model—one that analyzes cost-effective fire protection within all administrative boundaries, such as the Risk Assessment and Mitigation Strategies (RAMS) or any subsequent models from the National Interagency Fire Center Wildland Fire Management Information (www.nifc.blm.gov). The preparedness model will include mutual aid agreements between federal, state, and municipal fire response agencies. In developing this model, county and local protection needs and resources must be considered. The model must produce refined, common references and coordinated suppression efforts among the county and municipal fire departments, NMSFD, and the BLM FFO.

i. All communities: The CAG recommends that fire departments continue to map specific areas of elevated risk within their jurisdictions (see Appendix D). These maps would depict resource needs and specific firefighting descriptions that narrowly focus on suppressing fires occurring in high-risk areas. For example, within a specific neighborhood, some residents with special needs might be identified (e.g., nursing-home residents or campsite visitors) who would require specialized personnel to be notified during evacuations. Other specialized situations would be a propane distribution center within the high-risk area, inadequate or limited access areas, or a limited firefighting water source requiring the use of specialized equipment. Furthermore, specific subdivisions that currently have only one-way ingress/egress routes would also need to be evaluated for evacuation and fire response.

j. All communities: The BLM FFO, the New Mexico Environment Department Air Quality Bureau, and local fire departments will develop a Rx management plan for the entire WUI. Specific burn plans could be produced consistent with the Rx management plan and submitted to the USFWS for programmatic consultation necessary to implement saltcedar and Russian olive treatments. Fire departments and the BLM will enhance regulatory and control policies, such as open burning, campfires, smoking restrictions, and other fire use within their boundaries and will enhance relationships with local law enforcement to ensure compliance with any adopted regulations.

k. All communities: Communities will incorporate trails, recreational areas, and facilities into fire protection and response plans.

l. All communities: Construct a series of 5,000-gallon (minimum) water storage facilities strategically located in each community to improve water availability to firefighting resources.

m. All communities: The County and Cities and state, and federal agencies will investigate ways to improve communication to residents of the county. This may include enhanced radio, telephone, and Internet communications to residents and the development and implementation of emergency notification and evacuation systems. The CAG also recommends the development of a communication center for enhanced notification and coordination of emergency response to catastrophic wildland fire.

n. All communities: Complete the multihazard mitigation plan for remote at-risk private lands, including removing and maintaining hazardous fuels and identifying and obtaining GIS coordinates for additional safety zones and helispots, including lighted areas for emergency medical services night landings.

o. All communities: The CAG further recommends that basic wildland firefighter equipment be acquired and distributed to fire department personnel sufficient to meet the recruiting goals of each district.

2. Promote Community Involvement and Improved Public Education, Information, and Outreach

The County and communities in the SJBCWPP will develop and implement pubic outreach programs to help create an informed and motivated citizenry. The goal is to have residents support concepts of fire-safe landscaping and naturally functioning riparian systems through restoration management and rapid response to wildland fire. The SJBCWPP is intended to be a long-term strategic instrument containing prescriptive recommendations to address hazardous wildland fuels and to enhance riparian and rangeland health. To effectively achieve these goals, a grassroots collaborative structure of individual citizens, supported by local governments as full partners, will provide the most effective long-term means to maintain community momentum. The components of such a structure include the following recommendations:

a. Expand the use of current public information tools for fire-safe residential treatments as an immediate action step. This will be accomplished through information mailers to homeowners, presentations by local fire departments, and development of specific promotional materials. The SJBCWPP administrators will coordinate outreach throughout the WUI with state and federal cooperators with each community assuming a lead role in Firewise community outreach programs. Community

bulletins for specific county residential areas and other public service announcements concerning wildfire threat and preparedness should be developed.

b. Develop a video presentation describing treatments a homeowner can undertake to reduce ignitability through structural and land treatment improvements.

c. Develop an open-house approach to community education by conducting tours of both residences that are fire-safe and of federal lands in the WUI that have been treated to meet Condition Class 1 standards.

d. The municipal fire departments and the county fire department will each schedule a series of three community awareness seminars to inform and educate the citizenry regarding the need for fire-safe treatments to public and private lands. These seminars will be scheduled annually to best accommodate year-round and part-time residents.

e. Fire department personnel will act as goodwill ambassadors by passing on wildland fire and residential preparedness information at community activities and events. Information will be made available in both printed and oral formats to explain the need for fire awareness and the benefits of preparing private property for potential fire ignition.

3. Enhance Local Wood-Products Industries

The SJBCWPP communities will continue to support and promote private contractors who perform fire-safe mitigation and fuel extraction work. The communities will support new businesses or expansion of existing businesses involved in the fuel reduction market. The communities are committed to employing all appropriate means to stimulate local small businesses that will utilize all size classes of wood products resulting from hazardous-fuel reduction activities. Recommendations include the following:

a. Support and promote landscape contractors that treat private land parcels.

b. Support the development of markets and industries that extract salable material from fuel reduction management projects (e.g., biomass, pulpwood, firewood, fuel pellets).

c. Support and promote local college programs designed to help businesses develop sound wildland fuel mitigation practices and a diversity of skills and abilities. The SJBCWPP communities would like to support a trained and ready workforce for wildland-fuel-related industries. The communities hope to maintain a private work force and support the local small businesses necessary to complete fuel reduction treatments within the analysis area.

IV. CWPP PRIORITIES: ACTION RECOMMENDATIONS AND IMPLEMENTATION

The SJBCWPP communities have developed a community mitigation plan (Section III) necessary to meet the goals of the SJBCWPP. A precise set of land-management prescriptions has been adopted for fuel reduction treatments and restoration of riparian and rangeland health on federal and nonfederal lands. A series of recommendations that will reduce structural ignitability and improve fire prevention and suppression have been developed. The SJBCWPP communities want to support and enhance the local wood-products industries and would like to see additional local wildland fuel mitigation contractors within San Juan County. The SJBCWPP must be implemented to ensure (1) that action is taken on the highest-priority recommendations and (2) that communities can handle the logistical demands of meeting the goals of each recommendation. The SJBCWPP communities recognize the WUI as a wildfire management zone that must be managed through public acceptance based on the best science to promote quality of life for residents and visitors and to reduce the threat of catastrophic wildland fire. Moreover, there must be accountability for measuring and monitoring the performance and outcomes of each action recommendation. In response to monitoring the implementation of each action recommendation in the WUI, the Farmington, Bloomfield, Aztec, and San Juan County fire chiefs will draft an annual report and forward the report to the SJBCWPP signatories. The signatories will use the annual report to adjust their annual action recommendations to further implement the community mitigation plan of the SJBCWPP.

To implement SJBCWPP objectives beginning in fiscal year 2006/07, the CAG developed and prioritized the following action recommendations. At the end of each fiscal year, projects initiated or completed as outlined within these action recommendations will be monitored for effectiveness of meeting SJBCWPP community mitigation plan objectives. For the life of the SJBCWPP, recommendations for additional projects or completion of ongoing projects will be made for each fiscal year on the basis of project performance in the preceding fiscal year.

A. Administrative Oversight

As stated previously, the communities concur that the most efficient way of implementing the action recommendations of the SJBCWPP is through the delegation of accountability to county and municipal fire chiefs as the administrators of the SJBCWPP. Establishing a unified effort to collaboratively implement the SJBCWPP embraces adaptive management principles that enhance decision making at all levels of government. Therefore, assigning the oversight and responsibility of implementing this CWPP to the San Juan County, Farmington, Bloomfield, and Aztec fire chiefs is the primary action recommendation of the SJBCWPP communities. The SJBCWPP administrators will be the point of contact at the municipal and county levels for implementing the SJBCWPP. To meet funding needs and identify possible funding sources, the SJBCWPP administrators will assist federal and state agencies and private landowners in identifying appropriate grant and other funding mechanisms necessary to implement the action recommendations of the SJBCWPP. Grant information from federal, state, and nongovernmental sources should be routinely searched for updated grant application cycles (see Appendix E).

B. Community Priorities for Reduction of Hazardous Fuels

The priority treatment areas and projects recommended by the CAG will decrease hazardous vegetative fuels and thereby reduce wildfire spread and intensity, which, in turn, will reduce the potential impact of wildland fire on the communities and surrounding BLM lands. The recommended projects have high valuations for reducing wildfire risk within riparian and adjacent upland habitats. The identified treatment areas will create fuel breaks adjacent to private property boundaries in the riparian areas. These fuel breaks are necessary to limit wildfire spread and to provide a safe area for back burning by fire management staff. Fuel break locations will be designed to protect private land from rapid-fire spread. Installation of fuel breaks allow for additional response time to help alleviate the lack of timely response from organized wildfire suppression resources. Successfully installed fuel breaks will help preserve riparian values by minimizing habitat component loss. Specific recommendations in priority ranking are presented in Table 4.1.

Table 4.1. WUI area action recommendations for reduction of hazardous fuels

Treatment management area	Location and description	RT[a]	Project partners	Estimated initial treatment cost
Aztec (A2)	Mostly private land not identified for treatment within the city of Aztec in dense riparian fuels not identified for treatment	1,2,7,8,11	BLM and San Juan County	*Federal*: 34 acres, $16,320 *Nonfederal*: 2,144 acres, $1,543,680
Bloomfield (B1)	Public and private lands north of Bloomfield along US 550	1,2,3,7	BLM and San Juan County	*Federal*: 894 acres, $429,120 *Nonfederal*: 4,010 acres, $2,887,200
Bloomfield (B2)	Lands within and south and west of Bloomfield along the San Juan River corridor	1,2,8,11	BLM and San Juan County	*Federal*: 83 acres, $39,840 *Nonfederal*: 1,079 acres, $776,880
Central (C1)	Land northeast of Farmington along the Animas River corridor	1,2,3,7,8,11	BLM and San Juan County	*Federal*: 99 acres, $47,520 *Nonfederal*: 7,705 acres, $5,547,600
Farmington (F1)	Land surrounding Farmington and extending north	1,2,3,6,7,8,10, 11	BLM and San Juan County	*Federal*: 1,202 acres, $576,960 *Nonfederal*: 18,951 acres, $13,644,720
Farmington (F2)	Small urban parcels surrounding Farmington	1,2,8,11	San Juan County	*Federal*: 0 acres, $0 *Nonfederal*: 850 acres, $612,000
Northern Zone (N2)	Land surrounding La Plata and extending south	1,2,7,8,11	BLM and San Juan County	*Federal*: 11 acres, $5,280 *Nonfederal*: 5,321 acres, $3,831,120

Continued

Table 4.1. WUI area action recommendations for reduction of hazardous fuels

Treatment management area	Location and description	RT[a]	Project partners	Estimated initial treatment cost
Northeast Zone (NE3)	Land north of Aztec along the Animas River corridor	1,2,3,7,8,11	BLM and San Juan County	*Federal*: 204 acres, $97,920 *Nonfederal*: 4,247 acres, $3,057,840
Northeast Zone (NE4)	Land in far northeast of the WUI along the Animas River corridor	1,2,7,8,11	BLM and San Juan County	*Federal*: 275 acres, $132,000 *Nonfederal*: 4,045 acres, $2,912,400
Northeast Zone (NE5)	Land west of Navajo Dam	1,2,3,4,7,8,11	BLM and San Juan County	*Federal*: 5,407 acres, $2,595,360 *Nonfederal*: 1,624 acres, $1,169,280
Northeast Zone (NE6)	Land in far northeast of the WUI boundary north of the San Juan River	3,4	BLM and San Juan County	*Federal*: 3,045 acres, $1,461,600 *Nonfederal*: 322 acres, $231,840
Areas of Critical Environmental Concern (ACEC)	Land north of Aztec and west of N3	1,2,3,4,5,6,8,11	BLM and San Juan County	*Federal*: 29,699 acres, $14,255,520 *Nonfederal*: 10,563 acres, $7,605,360
Southeast Zone (SE1)	Different parcels of land throughout the WUI; these areas are specially designated as high risk by the SJBCWPP fire chiefs	1,2,3,6,7,8,10,11	BLM and San Juan County	*Federal*: 9,382 acres, $4,503,360 *Nonfederal*: 16,717 acres, $12,036,240
Southeast Zone (SE4)	Land south of Bloomfield extending west toward Farmington	1,2,3,7,8,10,11	BLM and San Juan County	*Federal*: 2,378 acres, $1,141,440 *Nonfederal*: 12,209 acres, $8,790,480
Western Zone (W1)	Southernmost portion of far western arm of the WUI	1,2,6,7,8,11	BLM and San Juan County	*Federal*: 129 acres, $61,920 *Nonfederal*: 9,407 acres, $6,773,040

[a]Recommended Treatment (see Table 3.2).

C. Community Priorities for Reducing Structural Ignitability

The SJBCWPP communities will evaluate, maintain and, where necessary, upgrade community wildfire preparation and response facilities, capabilities, and equipment. The CAG also recommends that San Juan County initiate a dialogue with the BLM for programmatic consultation to implement fuel reduction treatments in areas of high wildland fire risk from thick stands of saltcedar and Russian olive. Table 4.2 lists the priority action recommendations to be implemented beginning in fiscal year 2005/06 that are applicable to all of San Juan County.

Table 4.2. Community priorities for reducing structural ignitability

Partner	Project	Equipment/Expenses	Timeline
Farmington, Bloomfield, Aztec, San Juan County, and BLM	Recruit, train, and retain 100 new firefighters throughout San Juan Basin	Recruitment outreach and marketing through theaters, advertisements, newspapers, brochures: $1,200 for 3 years Basic academy training and support to the County Fire Department training coordinator: $5,000 for 3 years	Begin recruitment in 2006, complete by 2009, and then maintain
	Firefighter training for structural and wildland fire	Joint annual multiagency training program: $1,200 annually Three academies conducted annually for basic wildland firefighter, hazmat, EMS: $3,600 annually Instructor certification for training program: $2,400 annually Common preseason readiness training activity among municipal, county, state, and federal wildland fire responding authorities: $2,500 annually	Begin academies and instructor training in 2007 and maintain annually; conduct common readiness training in spring 2007
	Construct a series of 5,000-gallon (minimum) water storage facilities strategically located throughout he WUI	Install one water storage facility: $5,000 annually	Begin construction in 2007/08
	Farmington FD to obtain a 2,000-gallon water tender/tanker for engine support in and adjacent to Farmington	2,000-gallon water tender: one-time $150,000 expense	Obtain in calendar year 2007
	Expand role of the wildfire team	Establish a grant-supported wildland fuels crew of firefighters that will treat elevated risk areas throughout the WUI	Begin grant and implementation planning in 2007; acquire personnel and equipment by fall 2007 and maintain annually
	Firefighter incentive program	Additional individual training opportunities: $1,200 annually Individual attendance at national-level wildland fire conferences: $1,200 annually	Initiate the awards/recognition program in spring 2007

Continued

Table 4.2. Community priorities for reducing structural ignitability

Partner	Project	Equipment/Expenses	Timeline
Farmington, Bloomfield, Aztec, San Juan County, and BLM	Initiate a public involvement program in all SJBCWPP communities to develop an integrated, consistent land use code	Public involvement program materials and meeting facilitation: $20,000 Technical assistance code and ordinance development: $45,000	Begin 2007; complete 2009
	Develop and implement a comprehensive emergency response plan; appropriate communications, coordination, and infrastructure development; and appropriate mutual aid agreements for all San Juan County communities	Risk assessment by specific community areas: $45,000 Technical assistance: $20,000	Begin 2007; complete 2012
	Approve, obtain, and provide training in consistent wildland fire management model	Obtain fire management model, ensure compatible software and hardware among fire districts, and train personnel: $2,000	Acquire and provide training in 2007; provide annual training as necessary
	Educate citizens on the role of county-level organization for dealing with catastrophic wildfire including communication and emergency services	Develop and distribute informational material including communications and other emergency services: $10,000	Develop and print 1,000 brochures and initiate distribution in 2007; provide information annually to fire departments within the WUI

D. Priorities for Promoting Community Involvement through Education, Information, and Outreach

The SJBCWPP communities will implement public outreach and education programs, for residents and community visitors alike, to heighten awareness and understanding of the threats and other issues that wildland fire and invasive riparian species pose to San Juan County. Table 4.3 displays the SJBCWPP communities' priority recommendations to promote community involvement. The NMSFD, BLM, and CAG support public education of wildland fire danger and preparedness in the SJBCWPP through programs such as Fire Science, Defensible Landscaping, Firewise, and Riparian Health Workshops.

Table 4.3. San Juan County action recommendations for enhanced community involvement

Partner	Project	Equipment/expenses	Timeline
Farmington, Bloomfield, Aztec, San Juan County, and BLM	Develop and distribute seasonal community bulletins and public service announcements informing residents of current wildfire threat and preparedness needs	Scripting and production of public service announcement and community-specific bulletins: $5,000 annually	Begin 2007; conduct continually
	Initiate open-house fire-safe awareness seminars to encourage residents to implement fire-safe landscaping on private property	Technical assistance for seminar sponsorship, outreach, and "take-home" materials: $5,000 annually	Begin 2007; conduct continually
	Create and distribute a series of free video tapes or DVDs to WUI residents to encourage compliance with community policies and an Urban-Wildland Interface Code	Script preparation and production costs: $25,000 Video duplication and distribution costs: $10,000	Develop for use in 2007; distribute continually

E. Priorities for Enhancing Local Wood-Products Industries

The SJBCWPP communities will continue to support and promote private contractors who perform fire-safe mitigation work (e.g., fuel hazards reduction). The communities will also support and seek opportunities for local contractors to start new businesses or to expand existing businesses in the fire prevention/fuels reduction arena as well as for the use of vegetative material removed during wildland fuel mitigation projects. The development of local businesses to support harvesting, transporting, or processing of woody by-products from wildland fuel mitigation projects is consistent with the goals of the SJBCWPP:

- Support and assist development of biomass opportunities in San Juan County
- Support and assist development of transportation of woody by-products from fuels mitigation products to end users in San Juan County or neighboring New Mexico and Colorado counties
- Coordinate and cooperate with neighboring Navajo Nation in the development of a local small-wood-products market

F. Requested Funding

Table 4.4 summarizes the estimated total costs of wildland fire mitigation programs within high-risk areas and communities of the SJBCWPP that are necessary to complete priority action recommendations. The budget includes the following considerations:

- An expedited environmental assessment process, according to HFRA stipulations, that is compliant with BLM requirements
- Estimates of possible riparian product and slash production and of treatment/prescription costs based on federal and nonfederal land assessments/calculations
- SJBCWPP communities support for the development of local wood-products industries
- Identification of site-specific treatment areas and requirements for determining "extraordinary circumstances" for increased level of environmental evaluations

- Cost and time requirements for recommended public involvement processes (e.g., adoption of codes and ordinances)
- Establishment of San Juan County, Farmington, Bloomfield, and Aztec fire chiefs as administrators of the SJBCWPP

Table 4.4. SJBCWPP estimated budget to complete wildland fire mitigation programs

	Estimated Cost ($)	
SJBCWPP objective	**Federal (BLM)**	**Private (State Forester)**
Administrative oversight		
Support of San Juan County, Farmington, Bloomfield, and Aztec fire chiefs	2,500	2,500
Reduction of fuel hazards		
Aztec (A2)	16,320	1,543,680
Bloomfield (B1)	429,120	2,887,200
Bloomfield (B2)	39,840	776,880
Central Zone (C1)	47,520	5,547,600
Farmington (F1)	576,960	13,644,720
Farmington (F2)	0	612,000
Northern Zone (N2)	5,280	3,831,120
Northeast Zone (NE3)	97,920	3,057,840
Northeast Zone (NE4)	132,000	2,912,400
Northeast Zone (NE5)	2,595,360	1,169,280
Northeast Zone (NE6)	1,461,600	231,840
Specially Designated Areas (SDAs)	14,255,520	7,605,360
Southeast Zone (SE1)	4,503,360	12,036,240
Southeast Zone (SE4)	1,141,440	8,790,480
Western Zone (W1)	61,920	6,773,040
	25,364,160	70,336,080
Wildland fire protection and reduced ignitability		
Firefighter recruitment	6,600	12,000
Firefighter training	4,850	4,850
2,000-gal water tender/tanker for Farmington Fire Department	150,000	
Develop a 5,000-gal water facility near Kirtland	0	5,000
Expand role of wildfire team	25,000	75,000
Firefighter Incentive Program	0	2,400
Public involvement plan for consistent wildland fire code	0	65,000
Develop and implement an emergency response plan	20,000	45,000
Approve, obtain, and provide training in consistent wildland fire management model	0	2,000
Educate citizens on the role of county-level organization for dealing with catastrophic wildfire, including communication and emergency services	0	10,000
Public education, information, and outreach		
Video description of compliant private lands	17,500	17,500
Open-house fire-safe seminars	2,500	2,500
Seasonal community fire-safe and fire-conditions bulletins	2,500	2,500
Total requested funds ($)	25,595,610	70,582,330

V. MONITORING PLAN

Monitoring is essential to ensure that SJBCWPP goals are met. The fire chiefs of Farmington, Bloomfield, Aztec, and San Juan County will actively monitor the progress of the SJBCWPP communities' action recommendations to determine the effectiveness of ongoing and completed projects in meeting SJBCWPP objectives and to recommend future projects necessary to meet SJBCWPP goals.

In accordance with Section 102.g.5 of HFRA, the SJBCWPP communities will participate in any multiparty monitoring program established by the BLM FFO, or other interested parties, to assess progress toward meeting SJBCWPP objectives. The authority to participate in multiparty monitoring will be vested in the San Juan County, Farmington, Bloomfield, and Aztec fire chiefs, as the administrators responsible for implementing and monitoring the SJBCWPP. The SJBCWPP communities believe that participation in multiparty monitoring will provide effective and meaningful ecological and socioeconomic feedback on landscape and site-specific fuel reduction projects and watershed enhancements and will assist the BLM FFO in land-management planning.

This section details the performance measures that will be used to assess the effectiveness of SJBCWPP projects. Monitoring will include assessing and evaluating the success of an individual SJBCWPP project's implementation and of a given project's effectiveness in furthering SJBCWPP objectives.

A. Administrative Oversight, Monitoring, and SJBCWPP Reporting

The SJBCWPP administrators will be mutually responsible for implementing and monitoring the SJBCWPP action recommendations. The SJBCWPP administrators should also assist federal and state agencies and private landowners in identifying appropriate grant and other funding mechanisms necessary to implement the action recommendations of the SJBCWPP. Grant information should be routinely searched to identify updated grant application cycles. In addition to Appendix E, the following is a list of federal, state, and nongovernmental Web sites that can be monitored to obtain updated grant application cycle information:

Federal

- www.fs.fed.us/r3
- www.fs.fed.us/r3/partnerships
- www.fireplan.gov
- www.nm.nrcs.usda.gov
- www.nm.blm.gov

State

- www.emnrd.state.nm.us
- www.nmstatelands.org
- www.wildlife.state.nm.us

Nongovernmental

- www.iwjv.org
- www.sonoran.org

Annual reporting by the administrators should include successful grant awards received for implementing the action recommendations of the SJBCWPP. At the end of each year's fire season, the administrators will produce an annual report detailing the success of SJBCWPP project implementation and overall progress toward meeting SJBCWPP goals. The administrators will also make recommendations to the signatories on needed updating of the Community Mitigation Plan and the Prevention and Loss Mitigation Plan sections of the SJBCWPP, using adaptive management principles. This information will ensure timely decision making at all levels of government and will provide input necessary for the development of the next year's work plan and for prioritization of project implementation recommendations, both annually and for the life of the SJBCWPP. The administrators will present the annual work plan to the SJBCWPP signatories for their agreement and approval. Once signed, the updated plan will be submitted to the NMSFD and BLM for their concurrence. Once concurrence is achieved, the action recommendations of the current annual work plan will be forwarded for funding through HFRA and other appropriate sources.

B. Effectiveness Monitoring

Table 5.1 shows the performance measures the administrators will use to assess SJBCWPP performance, against goals for the current fiscal year. In addition to monitoring the performance measures each year, the administrators should assess the current status of wildland fuel hazards and look for any new or developing issues not covered by the SJBCWPP. As new issues arise, such as insect, disease, or invasive species infestations, further identification of risks and recommendations for treatment should be developed to update the existing SJBCWPP. As part of effectiveness monitoring, the administrators should review the Fire Department Hazard Assessments (Appendix D) and make recommendations to include new areas of concern and to remove any areas that have met objectives. These recommendations are to be included in the annual report. To help track wildland fuel treatments being planned and completed through New Mexico Fire Assistance grants and other state and federal programs, the administrators will cooperate by providing detailed mapping information as requested.

Table 5.1. Performance measures to assess SJBCWPP progress

Goal	Performance measure
Improve fire prevention and suppression	Reduced wildland fire occurrence and acres burned (unplanned) in the WUI: • Fire departments have recruited and trained 100 new firefighters during 2007 • Effectiveness monitoring of fire prevention and suppression will include – acres burned and degree of severity of wildland fire – percentage of wildland fire controlled on initial attack – number of homes and structures lost to wildland fire • Adoption of and training in RAMS or other adopted model by all fire departments • New water sources developed in key ISO areas • Firefighter incentive program initiated • New role for wildfire team, including wildland fuels management crew implemented • Emergency Response Plan developed and in use
Reduce hazardous forest fuels	High-risk areas effectively treated by acre: • Number of treated acres of nonfederal WUI lands that are in Condition Class 2 or 3, are identified as high priority by the SJBCWPP communities, and are moved to Condition Class 1 or acceptable level of wildland fuel • Total acres treated through any fuel reduction measures, including RX, that are conducted in the WUI. The change of condition class should be determined for small projects and/or treatment areas through use of the *Fire Regime Condition Class Guidebook* (FRCC Interagency Working Group 2005b)
Restore watershed health	Acres of fuel-reduction or watershed-enhancing treatments that meet restoration treatment guidelines for riparian habitats. • Adoption and utilization of the Landfire Assessment Model • Coordination with and support of the San Juan Watershed Group, San Juan Basin Russian Olive Salt Cedar Task Force, San Juan Soil and Water Conservation District, The River Reach Foundation, San Juan Watershed Woody Invasive Initiative Task Force, and the BLM in implementing and determining social, economic, and environmental effects of riparian restoration treatments
Promote community involvement	Community outreach programs initiated: • Percentage of at-risk communities that have initiated a public outreach program and promoted volunteer efforts to reduce hazardous fuels • Number of communities supportive of public involvement process necessary to effect a seamless tree policy among local governments • Number of communities that have developed and implemented evacuation plans for identified high-risk areas • Individual home assessment completed in intermix communities
Encourage economic development	Wood-products industry growth and diversification to utilize all sizes of material removed by fuel reduction treatments: • Number of jobs in wildland fuel reduction businesses retained and number of jobs added • Number of value-added wood products developed by local industries • Number of wood-products industries added to local economy • Number of new jobs created in wood-products industries • Number of new markets for local products created • Number of technical assistance programs initiated to promote commercial uses for all size classes and diameters of wood-products materials

VI. DECLARATION OF AGREEMENT AND CONCURRENCE

The following partners in the development of this Community Wildfire Protection Plan have reviewed and do mutually agree or concur with its contents:

AGREEMENT

Dr. James Henderson, Chairman
San Juan County Board of County Commissioners — Date

Larry Marcum
Chief, San Juan County Fire Department — Date

Scott Eckstein
Mayor, City of Bloomfield — Date

George Duncan
Chief, Bloomfield Municipal Fire Department — Date

Mike Arnold
Mayor, City of Aztec — Date

Bert Bennett
Chief, Aztec Municipal Fire Department — Date

Bill Standley
Mayor, City of Farmington — Date

Robert Martin
Chief, Farmington Municipal Fire Department — Date

Louis Montoya
San Juan Soil and Water Conservation District — Date

CONCURRENCE

Craig Daugherty
Chama District Forester

Date

Steve Henke
Bureau of Land Management, Farmington Field Office

Date

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VIII. GLOSSARY OF FIRE MANAGEMENT TERMS

A

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

Aerial Ignition: Ignition of fuels by dropping incendiary devices or materials from aircraft.

Air Tanker: A fixed-wing aircraft equipped to drop fire retardants or suppressants.

Agency: Any federal, state, county, or city government organization participating with jurisdictional responsibilities.

Anchor Point: An advantageous location, usually a barrier to fire spread, from which to start building a fire line. An anchor point is used to reduce the chance of firefighters being flanked by fire.

Appropriate Tools: Methods for reducing hazardous fuels including prescribed fire, wildland fire use, and various mechanical methods such as crushing, tractor and hand piling, thinning (to produce commercial or pre-commercial products), and pruning. They are selected on a site-specific case and are ecologically appropriate and cost effective.

Aramid: The generic name for a high-strength, flame-resistant synthetic fabric used in the shirts and jeans of firefighters. Nomex, a brand name for aramid fabric, is the term commonly used by firefighters.

Aspect: Direction toward which a slope faces.

B

Backfire: A fire set along the inner edge of a fireline to consume the fuel in the path of a wildfire and/or change the direction of force of the fire's convection column.

Backpack Pump: A portable sprayer with hand-pump, fed from a liquid-filled container fitted with straps, used mainly in fire and pest control. (see Bladder Bag)

Bambi Bucket: A collapsible bucket slung below a helicopter. Used to dip water from a variety of sources for fire suppression.

Behave: A system of interactive computer programs for modeling fuel and fire behavior that consists of two systems: BURN and FUEL.

Bladder Bag: A collapsible backpack portable sprayer made of neoprene or high-strength nylon fabric fitted with a pump. (see Backpack Pump)

Blow-up: A sudden increase in fire intensity or rate of spread strong enough to prevent direct control or to upset control plans. Blow-ups are often accompanied by violent convection and may have other characteristics of a fire storm. (see Flare-up)

Glossary adapted from the NIFC's glossary (see http://www.nifc.gov/fireinfo/glossary.html).

Brush: A collective term that refers to stands of vegetation dominated by shrubby, woody plants, or low growing trees, usually of a type undesirable for livestock or timber management.

Brush Fire: A fire burning in vegetation that is predominantly shrubs, brush and scrub growth.

Bucket Drops: The dropping of fire retardants or suppressants from specially designed buckets slung below a helicopter.

Buffer Zones: An area of reduced vegetation that separates wildlands from vulnerable residential or business developments. This barrier is similar to a greenbelt in that it is usually used for another purpose such as agriculture, recreation areas, parks, or golf courses.

Bump-up Method: A progressive method of building a fire line on a wildfire without changing relative positions in the line. Work is begun with a suitable space between workers. Whenever one worker overtakes another, all workers ahead move one space forward and resume work on the uncompleted part of the line. The last worker does not move ahead until completing his or her space.

Burnable Acres: Any vegetative material/type that is susceptible to burning.

Burned Area Rehabilitation: The treatment of an ecosystem following fire disturbance to minimize subsequent effects. (1995 Federal Wildland Fire Policy.)

Burn Out: Setting fire inside a control line to widen it or consume fuel between the edge of the fire and the control line.

Burning Ban: A declared ban on open air burning within a specified area, usually due to sustained high fire danger.

Burning Conditions: The state of the combined factors of the environment that affect fire behavior in a specified fuel type.

Burning Index: An estimate of the potential difficulty of fire containment as it relates to the flame length at the most rapidly spreading portion of a fire's perimeter.

Burning Period: That part of each 24-hour period when fires spread most rapidly, typically from 10:00 a.m. to sundown.

Burn Intensity: The amount and rate of surface fuel consumption. It is not a good indicator of the degree of chemical, physical and biological changes to the soil or other resources. (see Fire Severity)

C

Campfire: As used to classify the cause of a wildland fire, a fire that was started for cooking or warming that spreads sufficiently from its source to require action by a fire control agency.

Candle or Candling: A single tree or a very small clump of trees that is burning from the bottom up.

Chain: A unit of linear measurement equal to 66 horizontal feet.

Closure: Legal restriction, but not necessarily elimination of specified activities such as smoking, camping, or entry that might cause fires in a given area.

Cold Front: The leading edge of a relatively cold air mass that displaces warmer air. The heavier cold air may cause some of the warm air to be lifted. If the lifted air contains enough moisture, the result may be cloudiness, precipitation, and thunderstorms. If both air masses are dry, no clouds may form. Following the passage of a cold front in the Northern Hemisphere, westerly or northwesterly winds of 15 to 30 or more miles per hour often continue for 12 to 24 hours.

Cold Trailing: A method of controlling a partly dead fire edge by carefully inspecting and feeling with the hand for heat to detect any fire, digging out every live spot, and trenching any live edge.

Command Staff: The command staff consists of the information officer, safety officer and liaison officer. They report directly to the incident commander and may have assistants.

Community Impact Zone (CIZ): The zone around a community that may be impacted by wildfire. Similar to Defensible Space, but on a community level.

Complex: Two or more individual incidents located in the same general area, which are assigned to a single incident commander or unified command.

Condition Class: Based on coarse scale national data, Fire Condition Classes measure general wildfire risk as follows:

> Condition Class 1. For the most part, fire regimes in this Fire Condition Class are within historical ranges. Vegetation composition and structure are intact. Thus, the risk of losing key ecosystem components from the occurrence of fire remains relatively low.
>
> Condition Class 2. Fire regimes on these lands have been moderately altered from their historical range by either increased or decreased fire frequency. A moderate risk of losing key ecosystem components has been identified on these lands.
>
> Condition Class 3. Fire regimes on these lands have been significantly altered from their historical return interval. The risk of losing key ecosystem components from fire is high. Fire frequencies have departed from historical ranges by multiple return intervals. Vegetation composition, structure and diversity have been significantly altered. Consequently, these lands verge on the greatest risk of ecological collapse. (Cohesive Strategy, 2002, in draft)

Contain a fire: A fuel break around the fire has been completed. This break may include natural barriers or manually and/or mechanically constructed line.

Control a fire: The complete extinguishment of a fire, including spot fires. Fireline has been strengthened so that flare-ups from within the perimeter of the fire will not break through this line.

Control Line: All built or natural fire barriers and treated fire edge used to control a fire.

Cooperating Agency: An agency supplying assistance other than direct suppression, rescue, support, or service functions to the incident control effort; e.g., Red Cross, law enforcement agency, telephone company, etc.

Coyote Tactics: A progressive line construction duty involving self-sufficient crews that build fire line until the end of the operational period, remain at or near the point while off duty, and begin building fire line again the next operational period where they left off.

Creeping Fire: Fire burning with a low flame length and spreading slowly.

Crew Boss: A person in supervisory charge of usually 16 to 21 firefighters and responsible for their performance, safety, and welfare.

Critical Ignition Zones: Those areas that are likely to be key in the formation of large wildfires if ignition occurs at that location. These include locations such as at the bottom of a hill, or in fuels that will ignite easily and sustain growth of fire with increasing flame lengths and fire intensity.

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

Curing: Drying and browning of herbaceous vegetation or slash.

D

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

Debris Burning: A fire spreading from any fire originally set for the purpose of clearing land or for rubbish, garbage, range, stubble, or meadow burning.

Defensible Space: An area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and the loss to life, property, or resources. In practice, “defensible space” is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation. (see Survivable Space)

Deployment: See Fire Shelter Deployment.

Detection: The act or system of discovering and locating fires.

Direct Attack: Any treatment of burning fuel, such as by wetting, smothering, or chemically quenching the fire or by physically separating burning from unburned fuel.

Dispatch: The implementation of a command decision to move a resource or resources from one place to another.

Dispatcher: A person employed who receives reports of discovery and status of fires, confirms their locations, takes action promptly to provide people and equipment likely to be needed for control in first attack, and sends them to the proper place.

Dispatch Center: A facility from which resources are directly assigned to an incident.

Division: Divisions are used to divide an incident into geographical areas of operation. Divisions are established when the number of resources exceeds the span-of-control of the operations chief. A division is located with the Incident Command System organization between the branch and the task force/strike team.

Dozer: Any tracked vehicle with a front-mounted blade used for exposing mineral soil.

Dozer Line: Fire line constructed by the front blade of a dozer.

Drip Torch: Hand-held device for igniting fires by dripping flaming liquid fuel on the materials to be burned; consists of a fuel fount, burner arm, and igniter. Fuel used is generally a mixture of diesel and gasoline.

Drop Zone: Target area for air tankers, helitankers, and cargo dropping.

Drought Index: A number representing net effect of evaporation, transpiration, and precipitation in producing cumulative moisture depletion in deep duff or upper soil layers.

Dry Lightning Storm: Thunderstorm in which negligible precipitation reaches the ground. Also called a dry storm.

Duff: The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil.

E

Ecosystem: A spatially explicit, relative homogeneous unit of the Earth that includes all interacting organisms and components of any part of the natural environment within its boundaries. An ecosystem can be of any size, e.g., a log, pond, field, forest, or the Earth's biosphere (Society of American Foresters, 1998).

Ecosystem Integrity: The completeness of an ecosystem that at geographic and temporal scales maintains its characteristics diversity of biological and physical components, composition, structure, and function (Cohesive Strategy, 2000).

Energy Release Component (ERC): The computed total heat released per unit area (British thermal units per square foot) within the fire front at the head of a moving fire.

Engine: Any ground vehicle providing specified levels of pumping, water and hose capacity.

Engine Crew: Firefighters assigned to an engine. The Fireline Handbook defines the minimum crew makeup by engine type.

Entrapment: A situation where personnel are unexpectedly caught in a fire behavior-related, life-threatening position where planned escape routes or safety zones are absent, inadequate, or compromised. An entrapment may or may not include deployment of a fire shelter for its intended purpose. These situations may or may not result in injury. They include "near misses."

Environmental Assessment (EA): EAs were authorized by the National Environmental Policy Act (NEPA) of 1969. They are concise, analytical documents prepared with public participation that determine if an Environmental Impact Statement (EIS) is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.

Environmental Impact Statement (EIS): EISs were authorized by the National Environmental Policy Act (NEPA) of 1969. Prepared with public participation, they assist decision makers by providing information,

analysis and an array of action alternatives, allowing managers to see the probable effects of decisions on the environment. Generally, EISs are written for large-scale actions or geographical areas.

Equilibrium Moisture Content: Moisture content that a fuel particle will attain if exposed for an infinite period in an environment of specified constant temperature and humidity. When a fuel particle reaches equilibrium moisture content, net exchange of moisture between it and the environment is zero.

Escape Route: A preplanned and understood route firefighters take to move to a safety zone or other low-risk area, such as an already burned area, previously constructed safety area, a meadow that won't burn, natural rocky area that is large enough to take refuge without being burned. When escape routes deviate from a defined physical path, they should be clearly marked (flagged).

Escaped Fire: A fire that has exceeded or is expected to exceed initial attack capabilities or prescription.

Extended Attack Incident: A wildland fire that has not been contained or controlled by initial attack forces and for which more firefighting resources are arriving, en route, or being ordered by the initial attack incident commander.

Extreme Fire Behavior: "Extreme" implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One of more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.

F

Faller: A person who fells trees. Also called a sawyer or cutter.

Field Observer: Person responsible to the Situation Unit Leader for collecting and reporting information about an incident obtained from personal observations and interviews.

Fine (Light) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Fingers of a Fire: The long narrow extensions of a fire projecting from the main body.

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

Fire Behavior Forecast: Prediction of probable fire behavior, usually prepared by a Fire Behavior Officer, in support of fire suppression or prescribed burning operations.

Fire Behavior Specialist: A person responsible to the Planning Section Chief for establishing a weather data collection system and for developing fire behavior predictions based on fire history, fuel, weather and topography.

Fire Break: A natural or constructed barrier used to stop or check fires that may occur or to provide a control line from which to work.

Fire Cache: A supply of fire tools and equipment assembled in planned quantities or standard units at a strategic point for exclusive use in fire suppression.

Fire Crew: An organized group of firefighters under the leadership of a crew leader or other designated official.

Fire Defense System: The cumulative effect of the fire suppression system of a community, including fuels reduction programs, fire breaks, defensible space, and the response capabilities of emergency personnel.

Fire Frequency: The natural return interval for a particular ecosystem.

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

Fire Hazard Reduction Zone: Home ignition zone area, where fuel reduction and home fire resistant projects should take place to reduce the risk of a wildfire damaging a structure.

Fire Intensity: A general term relating to the heat energy released by a fire.

Fire Line: A linear fire barrier that is scraped or dug to mineral soil.

Fire Load: The number and size of fires historically experienced on a specified unit over a specified period (usually one day) at a specified index of fire danger.

Fire Management Plan (FMP): A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans.

Fire Management Planning: A generic term referring to all levels and categories of fire management planning, including: preparedness, prevention, hazardous risk assessment, and mitigation planning.

Fire Perimeter: The entire outer edge or boundary of a fire.

Fire-prone ecosystem: Ecosystems that historically burned intensely at low frequencies (stand replacing fires), those that burned with low intensity at a high frequency (understory fires), and those that burned very infrequently historically, but are not subject to much more frequent fires because of changed conditions. These include fire-influenced and fire-adapted ecosystems (Cohesive Strategy, 2000).

Fire Regime: A generalized description of the role fire plays in an ecosystem. It is characterized by fire frequency, predictability, seasonality, intensity, duration, scale (patch size), as well as regularity or variability. Five combinations of fire frequency, expressed as fire return interval in fire severity, are defined:

> Groups I and II include fire return intervals in the 0 - 35 year range. Group I includes Ponderosa pine, other long needle pine species, and dry site Douglas fir. Group II includes the drier grassland types, tall grass prairie, and some Pacific chaparral ecosystems.
>
> Groups III and IV include fire return internals in the 35 - 100+ year range. Group III includes interior dry site shrub communities such as sagebrush and chaparral ecosystems. Group IV includes lodgepole pine and jack pine.

Group V is the long interval (infrequent), stand replacement fire regime and includes temperate rain forest, boreal forest, and high elevation conifer species.

Fire-Return Interval: The number of years between successive fire events at a specific site or an area of a specified size.

Fire Risk Reduction Zone: A zone targeted for risk reduction, including measures such as fuels reduction, access protection, and construction of structures to minimize the risk of ignition from wildfire.

Fire Season: (1) Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities. (2) A legally enacted time during which burning activities are regulated by state or local authority.

Fire Severity: The amount of heat that is released by a fire and how it affects other resources. It is dependent on the type of fuels and the behavior of the fuels when they are burned. (see Burn Intensity)

Fire Shelter: An aluminized tent offering protection by means of reflecting radiant heat and providing a volume of breathable air in a fire entrapment situation. Fire shelters should only be used in life-threatening situations, as a last resort.

Fire Shelter Deployment: The removing of a fire shelter from its case and using it as protection against fire.

Fire Storm: A fire of great size and intensity that generates and is fed by strong inrushing winds from all sides; the winds add fresh oxygen to the fire, increasing the intensity.

Fire Triangle: Instructional aid in which the sides of a triangle are used to represent the three factors (oxygen, heat, fuel) necessary for combustion and flame production; removal of any of the three factors causes flame production to cease.

Fire Use Module (Prescribed Fire Module): A team of skilled and mobile personnel dedicated primarily to prescribed fire management. These are national and interagency resources, available throughout the prescribed fire season, that can ignite, hold and monitor prescribed fires.

Fire Use: The combination of wildland fire use and prescribed fire application to meet resource objectives.

Fire Weather: Weather conditions that influence fire ignition, behavior and suppression.

Fire Weather Watch: A term used by fire weather forecasters to notify using agencies, usually 24 to 72 hours ahead of the event, that current and developing meteorological conditions may evolve into dangerous fire weather.

Fire Whirl: Spinning vortex column of ascending hot air and gases rising from a fire and carrying aloft smoke, debris, and flame. Fire whirls range in size from less than one foot to more than 500 feet in diameter. Large fire whirls have the intensity of a small tornado.

FIREWISE: A public education program developed by the National Wildland Fire Coordinating Group that assists communities located in proximity to fire-prone lands. (For additional information visit the Web site at

http://www.firewise.org.)

Firefighting Resources: All people and major items of equipment that can or potentially could be assigned to fires.

Flame Height: The average maximum vertical extension of flames at the leading edge of the fire front. Occasional flashes that rise above the general level of flames are not considered. This distance is less than the flame length if flames are tilted due to wind or slope.

Flame Length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.

Flaming Front: The zone of a moving fire where the combustion is primarily flaming. Behind this flaming zone, combustion is primarily glowing. Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front. Also called fire front.

Flanks of a Fire: The parts of a fire's perimeter that are roughly parallel to the main direction of spread.

Flare-up: Any sudden acceleration of fire spread or intensification of a fire. Unlike a blow-up, a flare-up lasts a relatively short time and does not radically change control plans.

Flash Fuels: Fuels such as grass, leaves, draped pine needles, fern, tree moss and some kinds of slash, that ignite readily and are consumed rapidly when dry. Also called fine fuels.

Forb: A plant with a soft, rather than permanent woody stem, that is not a grass or grass-like plant.

Fuel: Combustible material. Includes, vegetation, such as grass, leaves, ground litter, plants, shrubs and trees, that feed a fire. (see Surface Fuels)

Fuel Bed: An array of fuels usually constructed with specific loading, depth and particle size to meet experimental requirements; also, commonly used to describe the fuel composition in natural settings.

Fuel Loading: The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

Fuel Model: Simulated fuel complex (or combination of vegetation types) for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.

Fuel Moisture (Fuel Moisture Content): The quantity of moisture in fuel expressed as a percentage of the weight when thoroughly dried at 212 degrees Fahrenheit.

Fuel Reduction: Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control. Incorporated within this are treatments to protect, maintain, and restore land health and desired fire cycles.

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Fusee: A colored flare designed as a railway-warning device and widely used to ignite suppression and prescription fires.

G

General Staff: The group of incident management personnel reporting to the incident commander. They may each have a deputy, as needed. Staff consists of operations section chief, planning section chief, logistics section chief, and finance/administration section chief.

Geographic Area: A political boundary designated by the wildland fire protection agencies, where these agencies work together in the coordination and effective utilization of firefighting resources.

Ground Fuel: All combustible materials below the surface litter, including duff, tree or shrub roots, dried out dead wood, peat, and sawdust that normally support a glowing combustion without flame.

H

Haines Index: An atmospheric index used to indicate the potential for wildfire growth by measuring the stability and dryness of the air over a fire.

Hand Line: A fireline built with hand tools.

Hazard Reduction: Any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread.

Hazardous Fuels Reduction: “Fuel Reduction” is defined as the manipulation or removal of fuels, including combustion, to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control. Incorporated within this are treatments to protect, maintain, and restore land health and desired fire cycles. “Hazard Reduction” is defined as any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread.

Head of a Fire: The side of the fire having the fastest rate of spread.

Heavy Fuels: Fuels of large diameter such as snags, logs, large limb wood, that ignite and are consumed more slowly than flash fuels.

Helibase: The main location within the general incident area for parking, fueling, maintaining, and loading helicopters. The helibase is usually located at or near the incident base.

Helispot: A temporary landing spot for helicopters.

Helitack: The use of helicopters to transport crews, equipment, and fire retardants or suppressants to the fire line during the initial stages of a fire.

Helitack Crew: A group of firefighters trained in the technical and logistical use of helicopters for fire suppression.

Holding Actions: Planned actions required to achieve wildland prescribed fire management objectives. These actions have specific implementation timeframes for fire use actions but can have less sensitive implementation demands for suppression actions.

Holding Resources: Firefighting personnel and equipment assigned to do all required fire suppression work following fireline construction but generally not including extensive mop-up.

Home Ignitability: The ignition potential within the Home Ignition Zone.

Home Ignition Zone: The home and its immediate surroundings. The home ignition zone extends to a few tens of meters around a home not hundreds of meters or beyond. Home ignitions and, thus, the WUI fire loss problem principally depend on home ignitability.

Hose Lay: Arrangement of connected lengths of fire hose and accessories on the ground, beginning at the first pumping unit and ending at the point of water delivery.

Hotshot Crew: A highly trained fire crew used mainly to build fireline by hand.

Hotspot: A particular active part of a fire.

Hotspotting: Reducing or stopping the spread of fire at points of particularly rapid rate of spread or special threat, generally the first step in prompt control, with emphasis on first priorities.

I

Incendiary: Causing or capable of causing fire.

Incident: A human-caused or natural occurrence, such as wildland fire, that requires emergency service action to prevent or reduce the loss of life or damage to property or natural resources.

Incident Action Plan (IAP): Contains objectives reflecting the overall incident strategy and specific tactical actions and supporting information for the next operational period. The plan may be oral or written. When written, the plan may have a number of attachments, including: incident objectives, organization assignment list, division assignment, incident radio communication plan, medical plan, traffic plan, safety plan, and incident map.

Incident Command Post (ICP): Location at which primary command functions are executed. The ICP may be co-located with the incident base or other incident facilities.

Incident Command System (ICS): The combination of facilities, equipment, personnel, procedure and communications operating within a common organizational structure, with responsibility for the management of assigned resources to effectively accomplish stated objectives pertaining to an incident.

Incident Commander: Individual responsible for the management of all incident operations at the incident site.

Incident Management Team: The incident commander and appropriate general or command staff personnel assigned to manage an incident.

Incident Objectives: Statements of guidance and direction necessary for selection of appropriate strategy(ies), and the tactical direction of resources. Incident objectives are based on realistic expectations of what can be accomplished when all allocated resources have been effectively deployed.

Indigenous Knowledge: Knowledge of a particular region or environment from an individual or group that lives in that particular region or environment, e.g., traditional ecological knowledge of American Indians (FS National Resource Book on American Indian and Alaskan Native Relations, 1997).

Infrared Detection: The use of heat sensing equipment, known as Infrared Scanners, for detection of heat sources that are not visually detectable by the normal surveillance methods of either ground or air patrols.

Initial Attack: The actions taken by the first resources to arrive at a wildfire to protect lives and property, and prevent further extension of the fire.

J

Job Hazard Analysis: This analysis of a project is completed by staff to identify hazards to employees and the public. It identifies hazards, corrective actions and the required safety equipment to ensure public and employee safety.

Jump Spot: Selected landing area for smokejumpers.

Jump Suit: Approved protection suite work by smokejumpers.

K

Keech Byram Drought Index (KBDI): Commonly used drought index adapted for fire management applications, with a numerical range from 0 (no moisture deficiency) to 800 (maximum drought).

Knock Down: To reduce the flame or heat on the more vigorously burning parts of a fire edge.

L

Ladder Fuels: Fuels that provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

Large Fire: (1) For statistical purposes, a fire burning more than a specified area of land, e.g., 300 acres. (2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface.

Lead Plane: Aircraft with pilot used to make dry runs over the target area to check wing and smoke conditions and topography and to lead air tankers to targets and supervise their drops.

Light (Fine) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Lightning Activity Level (LAL): A number on a scale of 1 to 6 that reflects frequency and character of cloud-to ground lightning. The scale is exponential, based on powers of 2 (i.e., LAL 3 indicates twice the lightning of LAL 2).

Line Scout: A firefighter who determines the location of a fire line.

Litter: Top layer of the forest, scrubland, or grassland floor, directly above the fermentation layer, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Live Fuels: Living plants, such as trees, grasses, and shrubs, in which the seasonal moisture content cycle is controlled largely by internal physiological mechanisms, rather than by external weather influences.

M

Micro-Remote Environmental Monitoring System (Micro-REMS): Mobile weather monitoring station. A Micro-REMS usually accompanies an incident meteorologist and ATMU to an incident.

Mineral Soil: Soil layers below the predominantly organic horizons; soil with little combustible material.

Mobilization: The process and procedures used by all organizations, federal, state and local for activating, assembling, and transporting all resources that have been requested to respond to or support an incident.

Modular Airborne Firefighting System (MAFFS): A manufactured unit consisting of five interconnecting tanks, a control pallet, and a nozzle pallet, with a capacity of 3,000 gallons, designed to be rapidly mounted inside an unmodified C-130 (Hercules) cargo aircraft for use in dropping retardant on wildland fires.

Mop-up: To make a fire safe or reduce residual smoke after the fire has been controlled by extinguishing or removing burning material along or near the control line, felling snags, or moving logs so they won't roll downhill.

Multi-Agency Coordination (MAC): A generalized term that describes the functions and activities of representatives of involved agencies and/or jurisdictions who come together to make decisions regarding the prioritizing of incidents and the sharing and use of critical resources. The MAC organization is not a part of the on-scene ICS and is not involved in developing incident strategy or tactics.

Mutual Aid Agreement: Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.

N

National Environmental Policy Act (NEPA): NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It sets policy and procedures for environmental protection, and authorizes Environmental Impact Statements and Environmental Assessments to be used as analytical tools to help federal managers make decisions.

National Fire Danger Rating System (NFDRS): A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels.

National Wildfire Coordinating Group (NWCG): A group formed under the direction of the Secretaries of Agriculture and the Interior and comprised of representatives of the US Forest Service, Bureau of Land Management, Bureau of Indian Affairs, National Park Service, US Fish and Wildlife Service, and Association of State Foresters. The group's purpose is to facilitate coordination and effectiveness of wildland fire activities and provide a forum to discuss, recommend action, or resolve issues and problems of substantive nature. NWCG is the certifying body for all courses in the National Fire Curriculum.

Nomex ®: Trade name for a fire resistant synthetic material used in the manufacturing of flight suits and pants and shirts used by firefighters. (see Aramid)

Normal Fire Season: (1) A season when weather, fire danger, and number and distribution of fires are about average. (2) Period of the year that normally comprises the fire season.

O

Operations Branch Director: Person under the direction of the operations section chief who is responsible for implementing that portion of the incident action plan appropriate to the branch.

Operational Period: The period of time scheduled for execution of a given set of tactical actions as specified in the Incident Action Plan. Operational periods can be of various lengths, although usually not more than 24 hours.

Overhead: People assigned to supervisory positions, including incident commanders, command staff, general staff, directors, supervisors, and unit leaders.

P

Pack Test: Used to determine the aerobic capacity of fire suppression and support personnel and assign physical fitness scores. The test consists of walking a specified distance, with or without a weighted pack, in a predetermined period of time, with altitude corrections.

Paracargo: Anything dropped, or intended for dropping, from an aircraft by parachute, by other retarding devices, or by free fall.

Peak Fire Season: That period of the fire season during which fires are expected to ignite most readily, to burn with greater than average intensity, and to create damages at an unacceptable level.

Performance Measures: A quantitative or qualitative characterization of performance (Government Performance and Results Act of 1993).

Personnel Protective Equipment (PPE): All firefighting personnel must be equipped with proper equipment and clothing in order to mitigate the risk of injury from, or exposure to, hazardous conditions encountered while working. PPE includes, but is not limited to, 8-inch high-laced leather boots with lug soles, fire shelter, hard hat with chin strap, goggles, ear plugs, aramid shirts and trousers, leather gloves, and individual first aid kits.

Preparedness: Condition or degree of being ready to cope with a potential fire situation.

Prescribed Fire: Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescribed Fire Plan (Burn Plan): This document provides the prescribed fire burn boss information needed to implement an individual prescribed fire project.

Prescription: Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Prevention: Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards.

Project Fire: A fire of such size or complexity that a large organization and prolonged activity is required to suppress it.

Pulaski: A combination chopping and trenching tool, which combines a single-bitted axe-blade with a narrow adze-like trenching blade fitted to a straight handle. Useful for grubbing or trenching in duff and matted roots. Well-balanced for chopping.

R

Radiant Burn: A burn received from a radiant heat source.

Radiant Heat Flux: The amount of heat flowing through a given area in a given time, usually expressed as calories/square centimeter/second.

Rappelling: Technique of landing specifically trained firefighters from hovering helicopters; involves sliding down ropes with the aid of friction-producing devices.

Rate of Spread: The relative activity of a fire in extending its horizontal dimensions. It is expressed as a rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually it is expressed in chains or acres per hour for a specific period in the fire's history.

Reburn: The burning of an area that has been previously burned but that contains flammable fuel that ignites when burning conditions are more favorable; an area that has reburned.

Red Card: Fire qualification card issued to fire rated persons showing their training needs and their qualifications to fill specified fire suppression and support positions in a large fire suppression or incident organization.

Red Flag Warning: Term used by fire weather forecasters to alert forecast users to an ongoing or imminent critical fire weather pattern.

Rehabilitation: The activities necessary to repair damage or disturbance caused by wildland fires or the fire suppression activity.

Relative Humidity (Rh): The ratio of the amount of moisture in the air, to the maximum amount of moisture that air would contain if it were saturated. The ratio of the actual vapor pressure to the saturated vapor pressure.

Remote Automatic Weather Station (RAWS): An apparatus that automatically acquires, processes, and stores local weather data for later transmission to the GOES Satellite, from which the data is re-transmitted to an earth-receiving station for use in the National Fire Danger Rating System.

Resiliency: The capacity of an ecosystem to maintain or regain normal function and development following disturbance (Society of American Foresters, 1998).

Resources: (1) Personnel, equipment, services and supplies available, or potentially available, for assignment to incidents. (2) The natural resources of an area, such as timber, grass, watershed values, recreation values, and wildlife habitat.

Resource Management Plan (RMP): A document prepared by field office staff with public participation and approved by field office managers that provides general guidance and direction for land management activities at a field office. The RMP identifies the need for fire in a particular area and for a specific benefit.

Resource Order: An order placed for firefighting or support resources.

Response Time: The amount of time it takes from when a request for help is received by the emergency dispatch system until emergency personnel arrive at the scene.

Retardant: A substance or chemical agent that reduces the flammability of combustibles.

Restoration: The active or passive management of an ecosystem or habitat toward its original structure, natural compliment of species, and natural functions or ecological processes (Cohesive Strategy, 2000).

Run (of a fire): The rapid advance of the head of a fire with a marked change in fire line intensity and rate of spread from that noted before and after the advance.

Running: A rapidly spreading surface fire with a well-defined head.

Rural Fire Assistance: The Department of the Interior Rural Fire Assistance program is a multi-million dollar program to enhance the fire protection capabilities of rural fire districts. The program will assist with training, equipment purchase, and prevention activities, on a cost-share basis.

S

Safety Zone: An area cleared of flammable materials used for escape in the event the line is outflanked or in case a spot fire causes fuels outside the control line to render the line unsafe. In firing operations, crews progress so as to maintain a safety zone close at hand allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuel breaks; they are greatly enlarged areas, which can be used with relative safety by firefighters and their equipment in the event of a blow-up in the vicinity.

Scratch Line: An unfinished preliminary fire line hastily established or built as an emergency measure to check the spread of fire.

Severe Wildland Fire (catastrophic wildfire): Fire that burns more intensely than the natural or historical range of variability, thereby fundamentally changing the ecosystem, destroying communities and / or rate or threatened species /habitat, or causing unacceptable erosion (GAO / T-RCED-99-79) (Society of American Foresters, 1998).

Severity Funding: Funds provided to increase wildland fire suppression response capability necessitated by abnormal weather patterns, extended drought, or other events causing abnormal increase in the fire potential and/or danger.

Single Resource: An individual, a piece of equipment and its personnel complement, or a crew or team of individuals with an identified work supervisor that can be used on an incident.

Size-up: To evaluate a fire to determine a course of action for fire suppression.

Slash: Debris left after logging, pruning, thinning or brush cutting; includes logs, chips, bark, branches, stumps and broken understory trees or brush.

Sling Load: Any cargo carried beneath a helicopter and attached by a lead line and swivel.

Slop-over: A fire edge that crosses a control line or natural barrier intended to contain the fire.

Slurry: A mixture typically of water, red clay and fertilizer dropped from air tankers for fire suppression.

Smokejumper: A firefighter who travels to fires by aircraft and parachute.

Smoke Management: Application of fire intensities and meteorological processes to minimize degradation of air quality during prescribed fires.

Smoldering Fire: A fire burning without flame and barely spreading.

Snag: A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

Spark Arrester: A device installed in a chimney, flue, or exhaust pipe to stop the emission of sparks and burning fragments.

Spot Fire: A fire ignited outside the perimeter of the main fire by flying sparks or embers.

Spot Weather Forecast: A special forecast issued to fit the time, topography, and weather of each specific fire. These forecasts are issued upon request of the user agency and are more detailed, timely, and specific than zone forecasts.

Spotter: In smokejumping, the person responsible for selecting drop targets and supervising all aspects of dropping smokejumpers.

Spotting: Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

Staging Area: Locations set up at an incident where resources can be placed while awaiting a tactical assignment on a three-minute available basis. Staging areas are managed by the operations section.

Strategy: The science and art of command as applied to the overall planning and conduct of an incident.

Strike Team: Specified combinations of the same kind and type of resources, with common communications, and a leader.

Strike Team Leader: Person responsible to a division/group supervisor for performing tactical assignments given to the strike team.

Structure Fire: Fire originating in and burning any part or all of any building, shelter, or other structure.

Suppressant: An agent, such as water or foam, used to extinguish the flaming and glowing phases of combustion when direction applied to burning fuels.

Suppression: All the work of extinguishing or containing a fire, beginning with its discovery.

Surface Fuels: Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also

grasses, forbs, low and medium shrubs, tree seedlings, heavier branchwood, downed logs, and stumps interspersed with or partially replacing the litter.

Survivable Space: The distance between vegetational fuels and a structure necessary to protect the building from radiant heat and its ignition mechanics. The separation distance was formerly called “Defensible Space” due to the implication that the fire department could intercede. The term “Survivable Space” eliminates the dependence on manual suppression and implies that the distance alone provides the protection. (see Defensible Space)

Swamper: (1) A worker who assists fallers and/or sawyers by clearing away brush, limbs and small trees. Carries fuel, oil and tools and watches for dangerous situations. (2) A worker on a dozer crew who pulls winch line, helps maintain equipment, etc., to speed suppression work on a fire.

T

Tactics: Deploying and directing resources on an incident to accomplish the objectives designated by strategy.

Tanker: Either a tank truck used to deliver water from a water source to the scene of a fire, or a fixed wing aircraft used for fire suppression by dropping slurry on the flank or head of a fire.

Temporary Flight Restrictions (TFR): A restriction requested by an agency and put into effect by the Federal Aviation Administration in the vicinity of an incident that restricts the operation of nonessential aircraft in the airspace around that incident.

Terra Torch ®: Device for throwing a stream of flaming liquid, used to facilitate rapid ignition during burn out operations on a wildland fire or during a prescribed fire operation.

Test Fire: A small fire ignited within the planned burn unit to determine the characteristic of the prescribed fire, such as fire behavior, detection performance and control measures.

Timelag: Time needed under specified conditions for a fuel particle to lose about 63 percent of the difference between its initial moisture content and its equilibrium moisture content. If conditions remain unchanged, a fuel will reach 95 percent of its equilibrium moisture content after four timelag periods.

Torching: The ignition and flare-up of a tree or small group of trees, usually from bottom to top.

Two-way Radio: Radio equipment with transmitters in mobile units on the same frequency as the base station, permitting conversation in two directions using the same frequency in turn.

Type: The capability of a firefighting resource in comparison to another type. Type 1 usually means a greater capability due to power, size, or capacity.

U

Uncontrolled Fire: Any fire that threatens to destroy life, property, or natural resources, and [definition completed from National Wildfire Coordinating Group, Glossary of Wildland Fire Terminology www.nwcg.gov/pms/pubs/glossary/ (a) is not burning within the confines of firebreaks, or (b) is burning with

such intensity that it could not be readily extinguished with ordinary tools commonly available. (see Wildfire)

Underburn: A fire that consumes surface fuels but not trees or shrubs. (see Surface Fuels)

Unplanned and Unwanted Wildland Fires: An unplanned and unwanted fire is one burning outside the parameters as defined in land use plans and fire management plans for that location (including areas where the fire can be expected to spread) under current and expected conditions. Unplanned and unwanted fires include fires burning in areas where fire is specifically excluded; fires that exhibit burning characteristics (intensity, frequency, and seasonality) that are outside prescribed ranges, specifically including fires expected to produce severe fire effects; unauthorized human caused fires (arson, escaped camp fires, equipment fires, etc.); and fires that occur during high fire dangers, or resource shortage, where the resources needed to manage the fire are needed for more critical fire management needs. Unplanned is not the same as unscheduled. The time of a lightning fire ignition is not known; however, a lightning-caused fire could still be used to meet fuels and ecosystem management objectives if that type of fire is expected to burn within the parameters of an approved plan; the fire is burning within the parameters for the area; is not causing, or has the potential to cause, unacceptable effects; and funding and resources to manage the fire are available.

V

Vectors: Directions of fire spread as related to rate of spread calculations (in degrees from upslope).

Volunteer Fire Department (VFD): A fire department of which some or all members are unpaid.

W

Water Tender: A ground vehicle capable of transporting specified quantities of water.

Weather Information and Management System (WIMS): An interactive computer system designed to accommodate the weather information needs of all federal and state natural resource management agencies. Provides timely access to weather forecasts, current and historical weather data, the National Fire Danger Rating System (NFDRS), and the National Interagency Fire Management Integrated Database (NIFMID).

Wet Line: A line of water, or water and chemical retardant, sprayed along the ground, that serves as a temporary control line from which to ignite or stop a low-intensity fire.

Wildfire: [definition added from National Wildfire Coordinating Group, Glossary of Wildland Fire Terminology www.nwcg.gov/pms/pubs/glossary/] An unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fire where the objective is to put the fire out. (see Uncontrolled Fire; Wildland Fire)

Wildland: [definition added from Wikipedia.org] wildland is an areas of land where plants and animals exist free of human interference. Ecologists assert that wildlands promote biodiversity, that they preserve historic genetic traits and that they provide habitat for wild flora and fauna.

Wildland Fire: Any nonstructure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Implementation Plan (WFIP): A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits.

Wildland Fire Situation Analysis (WFSA): A decision-making process that evaluates alternative suppression strategies against selected environmental, social, political, and economic criteria. Provides a record of decisions.

Wildland Fire Use: The management of naturally ignited wildland fires to accomplish specific, planned resource management objectives in predefined geographic areas outlined in Fire Management Plans. Wildland fire use is not to be confused with “fire use,” which includes prescribed fire.

Wildland Urban Interface (WUI): The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels (Glossary of Wildland Fire Terminology 1996).

Wind Vectors: Wind directions used to calculate fire behavior.

APPENDIX A: POTENTIAL NATURAL VEGETATION GROUPS

The following is general information about potential natural vegetation groups, also known as Biophysical settings (BpS), as described within the *Fire Regime Condition Class (FRCC) Interagency Handbook Reference Conditions*. Potential natural vegetation groups (PNVGs) are the primary landscape delineations for determination of the natural fire regime and fire regime condition class. The following includes the potential natural vegetation groups composing the wildland-urban interface of the San Juan Basin Community Wildfire Protection Plan. For additional information, see the *FRCC Interagency Handbook* (FRCC Interagency Working Group 2005a).

Potential Natural Vegetation Group: Riparian

Geographic Area: Western United States

Description: Bottomlands and montane riparian forests in a wide variety of climates and ecoregions. Includes black cottonwood (*Populus trichocarpa*), red alder, (*Alnus rubra*), aspen (*Populus tremuloides*) and other riparian communities. In general, riparian areas have characteristics that reduce the frequency and severity of fire relative to their surrounding uplands. These characteristics include less steep slopes, surface water, saturated soils, shade, fewer lightning ignitions, cooler air temperatures, lower daily maximum temperatures, higher relative humidity, higher fuel moisture content and lower wind speeds. The fire regimes of forested Potential Natural Vegetation Groups (PNVG) are critical to maintaining adequate large woody debris within embedded riparian areas.

Riparian areas on 1st through 3rd order streams will generally reflect the fire regime of their surrounding PNVG. For riparian areas within any particular PNVG, the percentage of riparian area or length in any vegetation class (A-E) should be similar to its respective surrounding PNVG. Where available moisture or topography create fuel conditions that are substantially moister or less flammable than the surrounding PNVG, these systems will generally have less frequent and less severe fire regimes than the surrounding PNVG. In these cases, the percentage of riparian area or length in early serial or open conditions (classes A, C and D) will likely be less than the surrounding PNVG, and the percentage of riparian area or length in closed conditions (classes B and E) will likely be more than the surrounding PNVG.

Riparian areas on 4th order streams will in general have less frequent and less severe fire regimes than the surrounding PNVG. In these cases, the percentage of riparian area or length in A, C and D will likely be less than the surrounding PNVG, and the percentage of riparian area or length in B and E will likely be more than the surrounding PNVG. Bear in mind the role of other disturbance processes (e.g., flooding) in the maintenance of natural vegetation mosaics and fuels along riparian areas. Reference conditions for riparian areas should be considered within the context of the surrounding upland PNVGs and the width of the riparian area or stream order. Riparian systems within landscapes may cross multiple PNVGs.

Potential Natural Vegetation Group: Desert Grassland with Shrubs

Geographic Area: Interior Southwest (AZ, NM) and Southern Great Plains (W. TX)

Description: This type typically occurs in foothills where the plains transition to foothills landforms. Vegetation is grassland dominated by blue grama, tobosa grass, and galleta grass with intermingled forbs and half-shrubs. Shrubs (oak, mahogany, mesquite) are a minor component (less than 5%) of this type, typically occurring on rock outcrops or edges of steep draws and ravines. However, if fire is substantially reduced or excluded shrubs will encroach and substantially increase.

This vegetative type is described within Fire regime group II with frequent stand replacement fires. The mean fire interval is about 10 years with high variation due to drought, which reduces fire frequency and moist periods that increase fire frequency. Grazing of the grassy fuels by large ungulate herds (buffalo) also substantially influenced fire mosaic patterns in this type. This type typically burns during the late spring (May, June, early July) and fall (late September, October, November) in association with the hot, dry periods that follow the winter and late spring (December through April) rainy season and summer (late July, August, early September) monsoon season. The desired future condition of the desert grassland vegetative type is dominate resprouts of desert grassland species and post-fire associated forbs and half-shrubs with 20 to greater than 40 percent grasses and forbs generally associated with productive soils on gentle slopes, flats, and mesa tops. In mid-serial stages this type consists of 65 Less than 40 percent grasses and forbs generally associated with gravelly and cobbly soils of the steeper more rugged slopes. By late serial stages a range of 15 percent cover of mature oaks, mahogany, mesquite, sagebrush, yucca, opuntia, saltbush, and other shrub species; typically associated with rock outcrops or draws that protect the shrubs from fire. In closed canopy types 4 to greater than 15 percent cover of oaks, mahogany, mesquite, sagebrush, yucca, opuntia, saltbush, and other shrub species; typically have multiple layers with young ingrowth and some litter/duff accumulation; often associated with small areas that escape 1-3 fire cycles because of grazing patterns or terrain; typically occurs on the more productive soils; can become somewhat fire resistant as a result of dense shade, but during dry years when this type burns it burns very hot.

Potential Natural Vegetation Group: Desert Grassland with Trees

Geographic Area: Interior Southwest (AZ, NM) and Southern Great Plains (W. TX)

Description: This type typically occurs in foothills where the plains transition to foothills and mountain landforms. Vegetation is grassland dominated by blue grama, tobosa grass, and galleta grass with intermingled forbs and half-shrubs. Within the natural disturbance and succession regime trees (pinyon, juniper, long needle pines) are a minor component (less than 5%) of this type, typically occurring on rock outcrops or edges of steep draws and ravines. However, if fire is substantially reduced or excluded trees will encroach and substantially increase.

Fire Regime Description: Fire regime group II, frequent replacement. The mean fire interval is about 10 years with high variation due to drought, which reduces fire frequency and moist periods that increase fire frequency. Grazing of the grassy fuels by large ungulate herds (buffalo) also substantially influenced fire

mosaic patterns in this type. This type typically burns during the late spring (May, June, early July) and fall (late September, October, November) in association with the hot, dry periods that follow the winter and late spring (December through April) rainy season and summer (late July, August, early September) monsoon season.

Potential Natural Vegetation Group: Desert Shrubland with Grasses

Geographic Area: Southwest, Southern Great Plains, Colorado Plateau, and Great Basin and scattered within the Southern Rocky Mts.

Description: This type typically occurs on upland flats, benches, gentle slopes or well drained valley and draw bottoms. Vegetation is shrubland dominated by blackbrush, creosote bush, tarbush, mormon tea, sand sage, three awn, tobosa grass, galleta grass, and black grama with intermingled forbs.

Fire Regime Description: Fire regime group III, infrequent mixed. The mean fire interval is about 45 years with high variation due to year to year variation in grass production related to drought and moisture cycles. Fire years are typically correlated with high spring moisture years in geographic areas dominated by cool season moisture and high summer moisture in areas dominated by monsoon season rains. Grazing of the grassy fuels by large ungulates increases the variation of the fire interval.

Potential Natural Vegetation Group: Desert Shrubland with Grasses and Trees

Geographic Area: Occurs in the Southwest, Southern Great Plains, Colorado Plateau, and Great Basin and scattered within the Southern Rocky Mts.

Description: This type typically occurs in foothills where plains, valleys, and playas transition to foothills landforms. Vegetation is shrubland dominated by blackbrush, creosote bush, tarbush, mormon tea, sand sage, three awn, tobosa grass, galleta grass, and black grama with intermingled forbs. Within the natural disturbance and succession regime trees (pinyon, juniper, long needle pines) are a minor component (less than 5%) of this type, typically occurring on rock outcrops or edges of steep draws and ravines. However, if fire is substantially reduced or excluded trees will encroach and substantially increase.

Fire Regime Description: Fire regime group III, infrequent mixed. The mean fire interval is about 40 years with moderate variation due to year to year variation in grass production related to drought and moisture cycles. Fire years are typically correlated with high spring moisture years in geographic areas dominated by cool season moisture and high summer moisture in areas dominated by monsoon season rains. Fire years often occur when these higher moisture years follow several years of drought. Grazing of the grassy fuels by large ungulates increases the variation of the fire interval.

Potential Natural Vegetation Group: Juniper-Pinyon (Infrequent Fire Type)

Geographic Area: Columbia Plateau, Central Rockies, Great Basin, Colorado Plateau, Southwest Desert, Southern Rockies.

Description: PNVG is somewhat rare subset of Juniper Pinyon-Frequent Fire type, scattered throughout the Colorado Plateau, Southern Rockies, and Southwest Desert. Sites are characterized by a very infrequent, very high severity fire regime (>400 year fire return interval), with dense old growth structural attributes. Sites are commonly rugged slopes, canyons, and mesa tops with many barriers to fire spread. Soils are most often shallow, rocky, and coarse-textured. This type usually abuts desert shrub or sparsely vegetated sites, and may be referred to as "Pinyon-Juniper Forest."

Fire Regime Description: Fire Regime V, primarily long-interval (e.g., >200 yr) stand replacement fires.

Potential Natural Vegetation Group: Juniper-Pinyon (Frequent Fire Type)

Geographic Area: Columbia Plateau, Central Rockies, Great Basin, Colorado

Plateau, Southwest Desert, Southern Rockies.

Description: PNVG is widespread across Nevada, Utah, Colorado, New Mexico, and Arizona. Sites range from gently rolling uplands to moderately and very steep slopes. Juniper-Pinyon types occupy dry foothills, plateaus, mesas, and mountain slopes. Soils range from shallow to moderately deep; climate is semi-arid. This type occupies a band above desert shrub/grasslands and below montane forests. This woodland PVT is generally dominated by Colorado or singleleaf pinyon pine and Utah juniper, but also includes Rocky Mountain and one-seed juniper. Understory associates include manzanita spp., sagebrush spp., gambel oak, and a mixture of cool and warm season grasses.

Fire Regime Description: Fire Regimes I and IV; ranging from short- to moderately long interval (e.g., 30-100 yr) mixed severity- and stand replacement fires.

Potential Natural Vegetation Group: Interior chaparral.

Geographic Area: Great Basin, Central Rockies, Colorado Plateau, Southern Rockies.

Description: PNVG common to mountain foothills and lower slopes from eastern Idaho, east to Wyoming, and south to Arizona and New Mexico. Sites are mixed shrub associations ecotonal to mixed conifer, juniper, pine/oak woodlands, and quaking aspen communities. Co-dominant shrubs are primarily gambel oak, bigtooth maple, ceanothus, manzanita, and scrub oak species. Sites usually transitional to forests as soils and climate allow.

Fire Regime Description: Fire Regime IV, primarily moderately long -interval (e.g., 40-60 yr) stand replacement fires.

Potential Natural Vegetation Group: Ponderosa Pine Southwest

Geographic Area: Southwestern U.S. (Arizona, New Mexico, Utah)

Description: Found in mountains and foothills of Arizona and New Mexico, generally on gentle to steep slopes. Most often found on southerly aspects in montane zone. Large openings with grass and oak can be

found in this PNVG. Other pine species (e.g., Southwestern White Pine), Abies spp., and Pseudotsuga menzesii also may be present.

Fire Regime Description: Very frequent surface fires with occasional mixed and very rare stand replacement fires. Succession is dependent on frequent fire.

Vegetation Type and Structure: Class Percent of Description Landscape:

A: post replacement 15 Grass, oak, and shrub following replacement fire or reburn.

B: mid-development closed 4 > 30% canopy cover of sapling and pole pine, Douglas-fir, and Abies spp.

C: mid- open 20 < 30% canopy cover dominated by ponderosa pine. Other southwest pine species may be present (e.g., Arizona, Chihuahua, Apache). Grass-oak understory.

D: late- open 60 <30% canopy cover dominated by ponderosa pine. Other southwest pine species may be present (e.g., Arizona, Chihuahua, Apache). Grass-oak understory.

E: late- closed 1 >3 0% canopy cover of ponderosa pine, Southwestern
White Pine, Douglas-fir, and Abies spp.

Potential Natural Vegetation Group: Southwest Shrub Steppe with Trees

Geographic Area: Southwest (primarily southeast Arizona and southern New Mexico).

Description: This type typically occurs in the foothills of the desert mountain ranges. Vegetation is open shrubland with grass and scattered pockets of trees. Vegetation is dominated by flourensia, creosote bush, tarbush, mesquite, catclaw, opuntia, yucca, black grama, tobosa grass, blue grama, sideoats grama, and threeawns, with intermingled forbs. Scattered trees include pinyon, juniper, and oaks.

Fire Regime Description: Fire regime group II, frequent replacement. The mean fire interval is about 8 years with moderate variation due to year to year variation in grass production related to drought and moisture cycles. Fire years are typically bimodal occurring in the late spring (May and June) and fall (September and October) correlated with grass production following spring summer monsoon moisture. Grazing of the grassy fuels by large ungulates increases the variation of the fire interval. This type generally occurs in a zone between the shrub steppe and the pinyon juniper zone. Vegetation Type and Structure of Fire Regime Group II.

APPENDIX B: THREATENED, ENDANGERED, AND SENSITIVE SPECIES

Table B.1. Federally listed, proposed, and candidate species and critical habitat that occur or potentially occur in the SJBCWPP WUI

Species	Status	Comments
Knowlton's cactus *Pediocactus knowltonii*	E	Endemic to New Mexico on rolling gravel hills in the piñon-juniper/sagebrush plant community. Entire wild population is fenced and protected from disturbances. Mesa Verde cactus.
Mesa Verde Cactus *Sclerocactus mesae-verdae*	T	Found in soils derived from Mancos, Fruitland, and Lewis shale. Largest population on Ute and Navajo tribal lands. All populations on lands managed by FFO are protected in the Hogback ACEC.
Mancos milkvetch *Astragalus humillimus*	E	Found in piñon-juniper woodlands and desert shrublands on sandstone rimrock ledges and mesa tops in San Juan County and adjacent Colorado. All populations on lands managed by FFO are protected in the Hogback ACEC.
Colorado pikeminnow *Ptychocheilus lucius*	E	Inhabits sections of the San Juan River and other rivers in the upper Colorado River basin. No wild Colorado pikeminnows have been detected in the planning area. Colorado pikeminnow designated critical habitat N/A Colorado pikeminnow designated critical habitat consists of portions of the San Juan River beginning at the NM Highway 371 bridge in Farmington and continues downstream to Lake Powell.
Razorback sucker *Xyrauchen texanus*	E	Inhabits sections of the San Juan River and other rivers in the upper Colorado River basin. No razorback suckers have been detected in the planning area.
Bald eagle *Haliaeetus leucocephalus*	T	Bald eagles migrate through and winter in the planning area. Important habitats used by the eagles are protected and managed under FFO land use planning decisions and the Bald Eagle ACEC activity plan of 1992.
Mountain plover *Charadrius montanus*	PT	Endemic grassland species in the western United States. Nine breeding records in the planning area from 1970 to 1999. Suitable nesting habitat on FFO lands has been identified and special management stipulations are attached to permits. May nest on AFO land but not confirmed.
Mexican spotted owl *Strix occidentalis lucida*	T	Found in the southwestern United States, principally in New Mexico and Arizona. After extensive surveys, no nesting has been confirmed of FFO or AFO. Mexican spotted owl critical habitat N/A Critical habitat designated in 2001. All designated critical habitat in the planning area is located within the boundaries of the proposed Mexican Spotted Owl ACEC.
Yellow-billed cuckoo *Coccyzus americanus*	C	Western subspecies breeds in Arizona, California, and New Mexico. Nests in cottonwood/willow riparian habitat along rivers. Recent data indicates it is very rare in the San Juan River valley. Potential habitat on FFO land was surveyed for this species in 2002.
Southwestern willow flycatcher *Empidonax trailii extimus*	E	No breeding southwestern willow flycatchers (SWWF) have ever been detected in the planning area. All designated potential SWWF habitat is protected and managed under the guidelines of the Southwestern Willow Flycatcher Habitat Management Plan of 1998.
Black-footed Ferret *Mustela nigripes*	E	No breeding Black-footed ferrets are known from the planning area. Black-footed ferrets require established prairie dog towns for food and shelter which often occur in the Plains and Great basin Grasslands vegetation types.

Source: Farmington Resource Management Plan with Record of Decision (USDI BLM 2003).
Note: E = Endangered, T = Threatened, PT = proposed threatened, C = candidate species.

Table B.2. State-listed and other special-status species that occur or potentially occur in the SJBCWPP WUI

Species	Status			Comments
	USFWS species of concern	BLM sensitive species	State	
Acoma fleabane, *Erigeron acomanus*	X	X	SOC	Grows in sandy soil at base of entrada sandstone Cliffs. Endemic to McKinley County on and in area of FFO and AFO land.
Aztec gilia, *Aliciella formosa*	X	X		Grows in salt desert shrublands on soil from Nacimiento Formation. Known from San Juan County in New Mexico on FFO land in tri-cities area.
Bisti fleabane, *Erigeronbistiensis*	X	X		Found in Great Basin desert scrub on soils from Ojo Alamo Sandstone Formation.
Brack's fishhook *Sclerocactus cloveriae* var. *brackii*	X	X		Occurs on sandy-clay hills of the Nacimiento Formation in desert scrub habitat.
Knight's milkvetch *Astragalus knightii*	X	X	SOC	On rimrock ledges of the Dakota Formation in conifer woodlands. Known only from the Mesa Prieta area of the middle Rio Puerco on AFO land and could occur in the planning area.
Parish's alkali grass, *Puccinellia parishii*	X	X	E	Grows in alkali seeps and wetlands in desert scrub. Occurs on AFO land in Sandoval County, possibly within the planning area.
Ripley's milkvetch, *Astragalus ripleyi*	X	X	SOC	Found from sagebrush to ponderosa pine in Rio Arriba and Taos counties in New Mexico and adjacent Colorado. Could occur on FFO land. Not detected on the Jicarilla Ranger District during species-specific surveys.
Sivinski's fleabane, *Erigeron sivinskii*	X	X	SOC	Inhabits steep barren shale slopes of the Chinle Formation in coniferous woodlands in McKinley County, New Mexico and Apache County, Arizona. Occurs in the southern part of FFO land.
New Mexico silverspot butterfly, *Speyeria Nokomis nitocris*	X	X		Found in moist habitats around marshes and along streams in southwestern United States. May occur, but not confirmed, in riparian habitats on FFO and AFO lands.
San Juan checkerspot butterfly, *Euphydryas anicia chuskae*	X	X		Found at high altitudes in alpine tundra and pine forests in the Chuska Mountains in McKinley, San Juan Counties in New Mexico, Apache County, and Arizona. Not likely to occur on FFO land.
San Juan tiger beetle, *Cicindela lengi jordai*	X	X		Found along sandy washes in May and June in parts of San Juan County. May occur on FFO land.
San Ysidro tiger beetle, *Cicindela willistoni funaroi*	X	X		Found on mudflats from mid-July to August in New Mexico and Arizona. Could occur on mudflats on FFO and AFO lands.

Continued

Table B.2. State-listed and other special-status species that occur or potentially occur in the SJBCWPP WUI

Species	Status			Comments
	USFWS species of concern	BLM sensitive species	State	
William Lar's tiger beetle, *Cicindela fulgida williaml arsi*	X	X		Found along streams and on mudflats in June and July in Arizona and New Mexico, and may occur on FFO and AFO lands.
Roundtail chub, *Gila robusta*	X	X	E	Historically occurred in the San Juan, Zuni, San Francisco, and Gila River drainages. Currently, rare in the San Juan River but it may occur in area of FFO river tracts.
American and arctic peregrine falcons, *Falco peregrinus anatum* and *F. p. tundrui*	X	X	T	The American peregrine falcon nests in the western and eastern United States, while the arctic peregrine falcon breeds north of the tree line. The American peregrine falcon nests in New Mexico and both subspecies migrate through the state. There are three nest sites on FFO land but it is not known to nest elsewhere on the planning area.

Source: Farmington Resource Management Plan with Record of Decision (USDI BLM 2003).
Note: FSOC = federal species of concern, SOC = state species of concern, E = endangered, T = threatened, PT = proposed threatened, C = candidate species. USFWS species of concern have no legal requirements under the ESA.

APPENDIX C. NATIONAL FIRE DANGER RATING SYSTEM FUEL MODEL SELECTION KEY

I. Mosses, lichens, and low shrubs predominate ground fuels

A. An overstory of conifers occupies more than one-third of site

Model Q

B. There is no overstory or it occupies less than one-third of the site

Model S

II. Marsh grasses and/or reeds predominate

Model N

III. Grasses and/or forbs predominate

A. There is an open overstory of conifer and/or hardwoods

Model C

B. There is no overstory

1. Woody shrubs occupy more than one-third, but less than two-thirds of the site

Model T

2. Woody shrubs occupy less than two-thirds of the site

a. The grasses and forbs are primarily annuals

Model A

b. The grasses and forbs are primarily perennials

Model L

IV. Brush, shrubs, tree reproduction or dwarf tree species predominate

A. The average height of woody plants is 6 ft or higher

1. Woody plants occupy two-thirds or more of the site

a. One-fourth or more of the woody foliage is dead

1) Mixed California chaparral

Model B

2) Other types of brush

Model F

b. Up to one-fourth of the woody foliage is dead

Model Q

c. Little dead foliage

Model O

2. Woody plants occupy less than two-thirds of the site

Model F

B. Average height of woody plants is less than 6 ft

1. Woody plants occupy two-thirds or more of the site

a. Western United States

Model F

b. Eastern United States

Model O

2. Woody plants occupy less than two-thirds but more than one-third of the site

a. Western United States

Model T

b. Eastern United States

Model D

3. Woody plants occupy less than one-third of the site

a. The grasses and forbs are primarily annuals

Model A

b. The grasses and forbs are primarily perennials

Model L

V. Trees predominate

A. Deciduous broadleaf species predominate

1. The area has been thinned or partially cut, leaving slash as the major fuel component

Model K

2. The area has not been thinned or partially cut

a. The overstory is dormant; leaves have fallen

Model E

b. The overstory is in full leaf

Model R

B. Conifer species predominate

1. Lichens, mosses, and low shrubs dominate as understory fuels

   Model Q

2. Grasses and forbs are the primary ground fuel

   Model C

3. Woody shrubs and/or reproduction dominate as understory fuels

   a. The understory burns readily

      1) Western United States

         Model T

      2) Eastern United States

         a) The understory is more than 6 feet tall

            Model O

         b) The understory is less than 6 feet tall

            Model D

   b. The understory seldom burns

      Model H

4. Duff and litter; branch wood and tree boles are the primary ground fuel

   a. The overstory is over mature and decadent; there is a heavy accumulation of dead debris

      Model G

   b. The overstory is not decadent; there is only a nominal accumulation of debris

      1) Needles are 2 inches or more in length (most pines)

         a) Eastern United States

            Model P

         b) Western United States

            Model U

      2) The needles are less than 2 inches long

         Model H

VI. Slash is the predominate fuel type

A. The foliage is still attached; there has been little settling

1. The loading is 25 tons/acre or more

   Model I

2. The loading is less than 25 t/ac but more than 15 t/ac

   Model J

3. The loading is less than 15 tons/acre

   Model K

B. Settling is evident; the foliage is falling off; grasses, forbs and shrubs are invading

1. The loading is 25 tons/acre or more

   Model J

2. The loading is less than 25 tons per acre

   Model K

APPENDIX D: FIRE DEPARTMENT HAZARD ASSESSMENTS

Independent hazard assessments were conducted by the fire departments of Bloomfield and Farmington. The city fire department hazard assessments show known areas of elevated concern identified by the fire chiefs within their response zones regardless of hazard-analysis results. In addition to the hazard area assessments by the city fire chiefs, county and local fire chiefs also identified areas of elevated concern due to known areas of high fuel loading or due to high fire response occurrence. These areas collectively are collectively labeled as areas of elevated concern in Figure 2.7. The following appendix is a list of hazard assessments for the cities of Bloomfield and Farmington by area, not by priority ranking.

Bloomfield Fire Department High Wildland Fire Hazard Area #1 – BHA1

1. Hazard Area/Location: Bloomfield Arroyo from County Road 4900 to the San Juan River.

2. Roads/Access/Egress issues: Few narrow roads access parts of the arroyo, yet most of the arroyo is inaccessible by fire apparatus.

3. Water Supply: 14 hydrants spread out near the arroyo.

4. Population/Amount/Age other issues: Several homes built on the banks of the arroyo, also the city water treatment plant, the pre-K–Kindergarten public school, and one natural gas well.

5. Fuels type: Cottonwood, Russian olive, sagebrush, and other bushes and grasses.

6. Aspect: East and west drainages sloped to the south.

7. Topography: Structures at the top of the drainage slopes.

8. Population/Exposure Value: Roughly 44 homes average value $175,00 each, one public school, water treatment plant, and a gas well.

Bloomfield Fire Department High Wildland Fire Hazard Area #2 – BHA2

1. Hazard Area/Location: Arroyo that follows Newby Lane to the San Juan River.
2. Roads/Access/Egress issues: One narrow winding road for main access, mostly inaccessible for fire apparatus.
3. Water Supply: 4 hydrants close to the arroyo, limited water supply.
4. Population/Amount/Age other issues: 17 homes very close to vegetation.
5. Fuels type: Cottonwood, Russian olive, elm, sagebrush, and grasses.
6. Aspect: Mostly east facing slopes on the north end with some west facing slopes spread throughout.
7. Topography: Structures scattered along the area on various slopes.
8. Population/Exposure Value: More than 17 homes close to the arroyo also the Jr high school in close proximity.

Bloomfield Fire Department High Wildland Fire Hazard Area #3 – BHA3

1. Hazard Area/Location: Arroyo that runs from Pixley Ln. south past Hwy. 64.
2. Roads/Access/Egress issues: Limited access due to fenced yards.
3. Water Supply: 12 hydrants spread throughout.
4. Population/Amount/Age other issues: 42 single family dwellings.
5. Fuels type: Cottonwood, Russian olive, elm, sagebrush and grasses.
6. Aspect: Mostly Flat, some east and west facing slopes.
7. Topography: Structures at top of hill drainages.
8. Population/Exposure Value: Roughly 42 homes of various price ranges, also several small businesses and a church in close proximity.

Bloomfield Fire Department High Wildland Fire Hazard Area #4 – BHA4

1. Hazard Area/Location: Arroyo between Deer Trail and Palomino Lane
2. Roads/Access/Egress issues: Both roads are narrow, dead end, gravel roads.
3. Water Supply: 5 Hydrants with low flow.
4. Population/Amount/Age other issues: 8 homes in the middle of the vegetation with many more nearby.
5. Fuels type: Cottonwood, elm, Russian olive, sagebrush, and grasses.
6. Aspect: East and west facing slopes.
7. Topography: Structures at tops and bottoms of hills.
8. Population/Exposure Value: More than 8 homes and a Circle S gas station.

Bloomfield Fire Department High Wildland Fire Hazard Area #5 – BHA5

1. Hazard Area/Location: Drainage between Dulce Drive and Kirby Lane
2. Roads/Access/Egress issues: Dulce Dr. small residential street, Kirby Ln. winding Gravel Road.
3. Water Supply: 5 hydrants spread throughout.
4. Population/Amount/Age other issues: 14 homes.
5. Fuels type: Cottonwood, Russian olive, sagebrush and other types of brush, and grasses.
6. Aspect: East and west facing drainages.
7. Topography: Structures on top of hills.
8. Population/Exposure Value: 14 homes average value of $175,000 each, city park on the east side of the drainage.

Bloomfield Fire Department High Wildland Fire Hazard Area #6 – BHA6

1. Hazard Area/Location: West Swamp, between South Church Street, West Maple Ave, Calle del Rio, and Hwy 550, extending east past Hwy 550.

2. Roads/Access/Egress issues: No access to the center, Hwy 550 runs through the east side. Fires in this area tend to require closing the highway due to smoke.

3. Water Supply: 17 hydrants.

4. Population/Amount/Age other issues: 37 homes nearby.

5. Fuels type: Russian olive, cattails, and various grasses.

6. Aspect: Flat.

7. Topography: Flat.

8. Population/Exposure Value: 37 homes mostly mobile homes some site built, several businesses, Best Western motel, 2 restaurants, and a gas station. The City waste water treatment plant and municipal operations center are in this area.

Bloomfield Fire Department High Wildland Fire Hazard Area #7 – BHA7

1. Hazard Area/Location: East Swamp, between South First Street, West Broadway and South Johnson Street.

2. Roads/Access/Egress issues: Limited access mostly through driveways.

3. Water Supply: 15 hydrants in the area.

4. Population/Amount/Age other issues: 41 homes.

5. Fuels type: Cottonwood, Russian olive, cattails, and various grasses.

6. Aspect: Mostly flat with hills on the north and west sides.

7. Topography: Mostly flat with hills on the north and west sides.

8. Population/Exposure Value: 41 homes mostly mobile homes with some site-built homes in the area.

Farmington Fire Department High Wildland Fire Hazard Area #1 – FHA1

1. Hazard Area/Location: Cliffside Corridor.
2. Roads/Access/Egress issues: Seven structures on top of Alta Vista steep one-way road. All other areas in this corridor should be accessible with type 6 and type 1 engines can get very close.
3. Water Supply: Adequate hydrants throughout Cliffside Corridor. Irrigation ditch access is located on Princeton (at dead end). Hydrants spaced far apart along edge of cliff.
4. Population/Amount/Age other issues: 85 houses, approximately 255 residents of various ages.
5. Fuels type: Grass, shrubs, timber, litter, large cottonwoods, logging slash and snags.
6. Aspect: South, flat on top.
7. Topography: Mainly steep hillside that flattens out on top.
8. Population/Exposure Value: $14,195,000 (approximately).

Farmington Fire Department High Wildland Fire Hazard Area #2 – FHA2

1. Hazard Area/Location: Mortenson, behind Safeway.
2. Roads/Access/Egress issues: Mortenson is a two-lane paved road dead end road that does allow access to the center of the fuel load. Access to south 15 behind Safeway and Home Depot but with problems from 6' fences. Access to north is via Cliffside drive, which is a narrow two-lane road.
3. Water Supply: Good hydrants for protection behind Home Depot, Safeway and Best Buy. Hydrant along Cliffside is lacking. Some approximately 800' of separation.
4. Population/Amount/Age other issues: Moderate age 30–50 age range and 4 persons per household.
5. Fuels type: Large cottonwoods, numerous snags, dead trees, moderate ground duff.
6. Aspect: Flat.
7. Topography: Flat.
8. Population/Exposure Value: 9 residential homes to the north of the area addressed off Mortenson. Also several associated out buildings. These are homes with a value of $167,000 per home.

Farmington Fire Department High Wildland Fire Hazard Area #3 – FHA3

1. Hazard Area/Location: Applewood.
2. Roads/Access/Egress issues: No access problems within type 6 engines. Do not recommend type 1 engine on dirt roads in this area.
3. Water Supply: Good hydrants throughout this area.
4. Population/Amount/Age other issues: 11 homes on Applewood, 8 homes on Rowe, 3 commercial structures with minimal threat on Main St. Population is around 57 residents of various ages. One well site east of Applewood and Hubbard intersection.
5. Fuels type: Large cottonwoods, grass, shrubs, timber, litter, logging slash.
6. Aspect: Flat.
7. Topography: Flat.
8. Population/Exposure Value: $3,173,000 in residential value. Hanson Honda, Atoni Corp, Old furniture superstore building and one well site with minimal threat.

Farmington Fire Department High Wildland Fire Hazard Area #4 – FHA4

1. Hazard Area/Location: Railroad/McColnal/English Rd.
2. Roads/Access/Egress issues: Gravel road on Railroad and English.
3. Water Supply: Good hydrants spaced 600–800'.
4. Population/Amount/Age other issues: Medium and older, average household population is 3.
5. Fuels type: Russian olives, ground cover, and cottonwoods. Area from end of railroad rd to Herreara is inaccessible.
6. Aspect: Flat along railroad.
7. Topography: Along railroad bottom is flat. Raises to step grade to west below Kayenta and English.
8. Population/Exposure Value: Seven million dollar houses, 1 well site, and 25 additional structures above area on Highland, English and Kayenta. Total structural value of $11,175,000.

Farmington Fire Department High Wildland Fire Hazard Area #5 – FHA5

1. Hazard Area/Location: 38th/Twlight Dr./Melrose/35th.
2. Roads/Access/Egress issues: Bottom canyon access off Pinion Hills Blvd. via oilfield access. Dead-end roads.
3. Water Supply: Hydrants along streets on top of canyon.
4. Population/Amount/Age other issues: 10–12 older homes with possible retired population.
5. Fuels type: Pinyon/juniper and cottonwoods and nonnative plants.
6. Aspect: West and southwest.
7. Topography: Sandstone canyon surrounding neighborhood.
8. Population/Exposure Value: Residential, $2–2.75 million.

Farmington Fire Department High Wildland Fire Hazard Area #6 – FHA6

1. Hazard Area/Location: Suntuoso Ct/Civitan Park.
2. Roads/Access/Egress issues: Cul-de-sac and limited access from golf course.
3. Water Supply: Hydrants in area.
4. Population/Amount/Age other issues: Retired population, 12 duplex condos.
5. Fuels type: Mix of trees and cattail grasses and some shrubs.
6. Aspect: South.
7. Topography: Hillside.
8. Population/Exposure Value: Residential, $1.5–2 million.

Farmington Fire Department High Wildland Fire Hazard Area #7 – FHA7

1. Hazard Area/Location: 20th St./Municipal Dr./Galde Rd.
2. Roads/Access/Egress issues: Densely spaced house on residential streets/lateral ditch road.
3. Water Supply: Hydrants and irrigation ditch.
4. Population/Amount/Age other issues: Moderately populated.
5. Fuels type: Russian olive and cottonwood trees.
6. Aspect: South.
7. Topography: Hillside divided by irrigation ditch.
8. Population/Exposure Value: Residential, $1.75–2.5 million.

Farmington Fire Department High Wildland Fire Hazard Area #8 – FHA8

1. Hazard Area/Location: Santa Barbara St./27th St./Venada St./ 24th St.
2. Roads/Access/Egress issues: 24th St. accesses bottom of canyon.
3. Water Supply: Hydrants in neighborhood, good master stream accesses from Santa Barbara St.
4. Population/Amount/Age other issues: Moderate density, 10–12 new construction and older homes.
5. Fuels type: Saltcedar, cottonwood trees, some pinyon/juniper.
6. Aspect: Southwest.
7. Topography: Small canyon in dense neighborhood.
8. Population/Exposure Value: Residential, $2–3 million

Farmington Fire Department High Wildland Fire Hazard Area #9 – FHA9

1. Hazard Area/Location: Berg Park/Northwest side of the Animas River south of San Juan Blvd. and east of Scott Ave.
2. Roads/Access/Egress issues: The main access to Berg Park is from the parking area at the intersection of Scott and San Juan. Access can also be made from the south end of Tucker and through the Reiley Industrial equipment yard. The roads and trails in the park are narrow and in many areas are bridged over by heavy vegetation. This creates issues with access during fire conditions. These roads are also the main egress points for people in the park. This fact creates a problem during festivals due to large crowds that will be walking these roads.
3. Water Supply: 1,000 gpm hydrants at Tucker and River Rd. and Fairview and River Rd. 1,000 gpm hydrant at Service and Electric can be accessed through a locked gate in the Reiley industrial equipment yard. Water can be drafted from the Animas River.
4. Population/Amount/Age other issues: The major populations that will be effected are the businesses that are along San Juan Blvd. These businesses all have defensible space backing to the park. Chain-link fences prevent access to the park from the back of these businesses. During regular use the park is sparsely populated with park users. During festivals the park is populated with several thousand people including many elderly and handicapped park users.
5. Fuels type: Thick ground and ladder fuels and well established canopy extends through most of the park. Open areas are overgrown with grasses and brush.
6. Aspect: Because of the relatively flat topography of the park area, aspect has little effect on this area.
7. Topography: The topography of this area is relatively flat with gentle up-river slopes and some areas that slope gently away from the river.
8. Population/Exposure Value: Business values and park properties.

Farmington Fire Department High Wildland Fire Hazard Area #10 – FHA10

1. Hazard Area/Location: Animas River Park/southeast side of the Animas River south of Browning Parkway and north of Southside River Rd.
2. Roads/Access/Egress issues: The main road access is from the parking area at the north end of the park. From here one road extends into the park to the nature center. A second road extends through the park and along Willet Ditch. These roads are narrow and in many areas are bridged over by heavy vegetation. This creates issues with access and egress during fire conditions. These roads are also the main egress points for people in the park. This fact creates a problem during festivals due to large crowds that will be walking these roads.
3. Water Supply: 1,000 gpm hydrants at MOC, Red Barn and Nature Center. 500 gpm hydrant at Harbor Lane with foot bridge access across Willett Ditch. Drafting from Willett Ditch and Animas River is possible.
4. Population/Amount/Age other issues: Residences are limited to homes along Coy Ave, Almon Dr, Harbor Lane, and Dekalb street. These homes are separated from the main part of Animas Park by the Willett Ditch. The majority of these homes have defensible space around them and easy egress onto Southside River Road. During regular use the park is sparsely populated with park users. During festivals the park is populated with several thousand people including many elderly and handicapped park users.
5. Fuels type: Thick ground and ladder fuels and well-established canopy extends through most of the park. Open areas are overgrown with grasses and brush.
6. Aspect: Because of the relatively flat topography of the park area, aspect has little effect on this area.
7. Topography: The topography of this area is relatively flat with gentle up-river slopes and some areas that slope gently away from the river.
8. Population/Exposure Value: Average home price is $160,000 to $167,000.

Farmington Fire Department High Wildland Fire Hazard Area #11 – FHA11

1. Hazard Area/Location: Butler to Cooper between Vine and Crestview.
2. Roads/Access/Egress issues: Vine or Crestview.
3. Water Supply: 8 hydrants on Vine and 11 on Crestview.
4. Population/Amount/Age other issues: 228 mostly older residents.
5. Fuels type: Heavy brush trees.
6. Aspect: Southern.
7. Topography: Steep hill approximately 40 feet.
8. Population/Exposure Value: 31 homes, $5,177,000.

Farmington Fire Department High Wildland Fire Hazard Area #12 – FHA12

1. Hazard Area/Location: Westland Park Rd west to the river.
2. Roads/Access/Egress issues: Westland Park Rd limited access.
3. Water Supply: 15 hydrants and a canal.
4. Population/Amount/Age other issues: 228, all ages.
5. Fuels type: Heavy brush trees.
6. Aspect: All.
7. Topography: Mostly flat.
8. Population/Exposure Value: Apartments and homes, $10,521,000.

Farmington Fire Department High Wildland Fire Hazard Area #13 – FHA13

1. Hazard Area/Location: Between Main St. and Pinion west to American Home Furnishing.
2. Roads/Access/Egress issues: S. Lake St., Pinion and American Home Furnishing.
3. Water Supply: 2 hydrants at American Home Furnishing and 3 on Lake St.
4. Population/Amount/Age other issues: 100+ of all ages from unassisted to full assistance needed.
5. Fuels type: Thick grass, heavy brush and trees.
6. Aspect: Western.
7. Topography: Flat with a steep hill at Lake St.
8. Population/Exposure Value: Homes, hospital, and businesses. Multimillion dollar value considering homes (9 buildings) and the hospital.

Farmington Fire Department High Wildland Fire Hazard Area #14 – FHA14

1. Hazard Area/Location: Auburn Corridor from Comanche to 20th along Auburn.
2. Roads/Access/Egress issues: Very busy narrow street along bottom of the area. Narrow residential street along the top.
3. Water Supply: Several hydrants along the top. 3 hydrants along Auburn on the bottom.
4. Population/Amount/Age other issues: Very high residential population along top of edge of the area.
5. Fuels type: Heavy (1 hour) around ground fuels with dense cottonwood and Russian olive trees throughout the area.
6. Aspect: West-facing slope from Comanche to Boyd. East-facing slope from Boyd to 20th.
7. Topography: Steep (25 to 40 percent) slope throughout.
8. Population/Exposure Value: 48 homes at $167,000 each; $8,016,000 total approximate.

Farmington Fire Department High Wildland Fire Hazard Area #15 – FHA15

1. Hazard Area/Location: Shadow Valley Area. From Navajo NW to 30th between Echo and Shadow Valley.
2. Roads/Access/Egress issues: Residential area with two-lane narrow streets moderate traffic. Shadow Valley Road has no outlet.
3. Water Supply: 2 hydrants on Echo, 1 on the corner of Gladden and Navajo, nothing on Shadow Valley.
4. Population/Amount/Age other issues: Most of the homes affected are on Echo with only 6 homes on Shadow Valley.
5. Fuels type: Heavy (1 hour) around ground fuels and moderately dense cottonwood and Russian olive trees throughout the area.
6. Aspect: Northwest to southeast drainage.
7. Topography: Creek bottom with mild slopes throughout.
8. Population/Exposure Value: 22 homes at $167,000 each; $3,674,000 total approximate.

Farmington Fire Department High Wildland Fire Hazard Area #16 – FHA16

1. Hazard Area/Location: The Glade drainage from Apache to Navajo between Auburn and Airport.
2. Roads/Access/Egress issues: Access for brush trucks is a two track road that runs the length of the area. Access for engines on the east side is dead end trailer park roads with no access on the west side. Egress for residents will be effected by supple lines out of the trailer park going across Auburn.
3. Water Supply: Very limited to a minimal number of hydrants located across Auburn with 1 hydrant on the end of Paralee.
4. Population/Amount/Age other issues: There is an elementary school at the south end of the area and several trailer parks along the east side of the area. There is a walk path from the school to the trailer park used by neighborhood children.
5. Fuels type: Heavy ground (1 hour) fuel and moderately dense cottonwood and Russian olive trees throughout the area.
6. Aspect: North to south drainage.
7. Topography: Creek bottom with moderate slope to the west.
8. Population/Exposure Value: 22 homes at $167,000 each; $3,674,000 total approximate.

Farmington Fire Department High Wildland Fire Hazard Area #17 – FHA17

1. Hazard Area/Location: Deer Trail, from W. Main St. to Inland St.
2. Roads/Access/Egress issues: Narrow dead-end vegetation next to road.
3. Water Supply: Hydrant 1379 east of Deer Trail on Main St. and hydrant 1380 toward the north end of Deer Trail.
4. Population/Amount/Age other issues: Moderate population, approximately 50–75 residents, various ages.
5. Fuels type: Mixed fuel type, sparse to very heavy fuel loads of green standing to dead and down, 1-100 hour fuels.
6. Aspect: Northwest to south.
7. Topography: Primarily 0%–20%, La Plata River drainage.
8. Population/Exposure Value: 14 residential structures at $167,000 each with various outbuilding structures around residential units; approximately a $3,000,000 total value.

APPENDIX E. ADDITIONAL RESOURCES

Firewise Information and Web Sites

Arizona State Forester. Provides granting and other information sources, *http://www.azsf.az.gov/Grants/grants.html*.

Bureau of Land Management. Fire Web site, *http://www.fire.blm.gov/*.

Colorado State Forest Service. *Protecting Your Home, Forest and Property From Wildfire*, *http://csfs.colostate.edu/protecthomeandforest.htm*.

Ecological Restoration Institute. *Forest Restoration for Homeowners, A Guide for Residents of Southwestern Ponderosa Pine Forests. Information pamphlet covering homeowner strategies for fire safety*, *http://www.eri.nau.edu/cms/files/General/ERIhomeowners.pdf*.

Joint Fire Sciences CWPP Project Team. *"Enhancing Collaboration and Building Community Capacity, http://www.jfsp.fortlewis.edu*.

Environmental Protection Agency. Catalog of Federal Funding Sources for Watershed Protection, *http://cfpub.epa.gov/fedfund*.

Federal Emergency Management Agency (FEMA). State Hazard Mitigation Officers, *http://www.usfa.fema.gov; http://www.fema.gov/about/contact/shmo.shtm*.

FEMA. Kids wildland fire Web site, *http://www.fema.gov/kids/wldfire.htm*.

FEMA. Pre-disaster Mitigation Program, *http://www.fema.gov/government/grant/pdm/index.shtm*.

Fire Safe Council. Web site, *http://www.FireSafeCouncil.org*.

Firewise Communities. Web site, *http://www.firewise.org/index.php*.

Firewise Communities. *USA national recognition program*, *http://www.firewise.org/usa*.

Five-Star Restoration Matching Grants Program. USDA Woody Biomass Grant Program. Provides grant funding for treatments of biomass from fuels and restoration treatments, *www.fpl.fs.fed.us/tmu/grant/biomass-grant.html*.

Joint Fire Science Program. *Wildfire Protection Plans.* Provides resource links and information for community wildfire protection planning, *http://jfsp.fortlewis.edu/links.asp*.

National Association of Fire Chiefs. Information on equipment training and resources, *http://www.iafc.org*.

National Fire Lab. Web site, *http://www.firelab.org*.

National Fire Plan Community Assistance. Web site, *http://www.fireplan.gov/overview/NationalFirePlanCommunityAssistance2006.htm*.

National Fire Protection Association (NFPA) *NFPA 299 (Standard for Protection of Life and Property from Wildfire); NFPA 295 (Standard for Wildfire Control); NFPA 291 (Recommended Practice for Fire Flow Testing and Marking of Hydrants); NFPA 703 (Standard for Fire Retardant Impregnated Coatings for Building Materials); NFPA 909 (Protection of Cultural Resources); NFPA 1051 (Standard for Wildland Fire Fighter Professional Qualifications); NFPA 1144 (Standard for Protection of Life and Property from Wildfire); NFPA 1977 (Standard on Protective Clothing and Equipment for Wildland Fire Fighting)*: *http://www.nfpa.org; http://www.nfpa.org/Catalog*.

National Interagency Fire Center. Web site, *http://www.nifc.nps.gov/fire*.

National Interagency Fire Center. *Wildland Fire- Communicator's Guide.* This is a guide for fire personnel, teachers, community leaders, and media representatives, *http://www.nifc.gov/preved/comm_guide/wildfire/pdfs/chapter_4.pdf*.

National Park Service. *Community Tool Box.* Excellent information and materials provided for use in public participation and collaborative projects, *http://www.nps.gov/phso/rtcatoolbox/*.

National Park Service. Fire and Aviation, *http://www.nps.gov/applications/fire/index.cfm*.

National Wildfire Coordinating Group. Fire Prevention and Education, Wildland-Urban Interface guides, documents, videos and other resources. *http://www.nwcg.gov/pms/prev_ed_wui.htm*.

National Wildland Fire Coordinating Group. Home Protection and Firewise- website with many links to fire education, *http://www.nwcg.gov/teams/wfewt/biblio/hprotect1.html*.

New Mexico State Forestry Division. Web site: publications, fire assistance grants, and other state resources, links to additional information sources, *http://www.emnrd.state.nm.us/EMNRD/forestry/index.htm information*.

Partnership Resource Center. Joint project of the FS and National Forest Foundation for partnerships and collaboration. *http://www.partnershipresourcecenter.org*.

PBS NOVA—"*Fire Wars*," *http://www.pbs.org/wgbh/nova/fire*.

Red Lodge Clearinghouse. Information on funding sources, grant writing, training opportunities, and links to technical assistance, *http://www.redlodgeclearinghouse.org/resources/index.html*.

SAFECO Corporation. *The Fire Free Program, Reduce Your Risk of Wildfire*, *http://www.safecoplaza.com/safecoplaza/salesandmarketing/promotions/relations/firefree.pdf*.

SAFECO Corporation. *The Natural Disaster Safety Guide*, *http://www.safecoplaza.com/safecoplaza/salesandmarketing/promotions/relations/disaster.pdf*.

San Juan Public Lands Center. Fire information clearinghouse Web site, *http://www.SouthwestColoradoFires.org*.

Slack, P. Sponsored by the Colorado State Forest Service (CSFS) and the Federal Emergency Management Agency (FEMA). *Firewise Construction Design and Materials Publication, An excellent publication providing homeowners and builders with design and techniques that offer more protection from wildland fire*, *http://csfs.colostate.edu/library/pdfs/fire/construction_booklet.pdf*.

Southwest Area Forest, Fire, and Community Assistance Grants. This Web site lists grants that are available to communities to reduce the risk of wildfires in the urban interface, *http://www.SouthwestAreaGrants.org*.

Southwest Community Forestry Caucus. Establishes a coordinated communication network about community forest restoration in the southwestern states of Arizona, Colorado, New Mexico and Utah, *http://ocs.fortlewis.edu/SWCommunityForestry/default.asp*.

Southwest Coordination Center. Provides incident information, safety, software and training, *http://gacc.nifc.gov/swcc/*.

The Nature Conservancy, Forest Service and the US Department of the Interior. *Global Fire Initiative.* Information on training and networking, *www.tncfire.org/training_usfln.htm*.

University of Arizona. *Arizona Wildfire and the Environment Series*: *Forest Home Fire Safety; Fire-Resistant Landscaping; Creating Wildfire-Defensible Spaces for Your Home and Property; Homeowners' "Inside and Out" Wildfire Checklist; Firewise Plant Materials for 3000 Feet and Higher Elevations; Soil Erosion Control After a Wildfire; Recovering from Wildfire; A Guide for Arizona's Forest Owners; Wildfire Hazard Severity Rating Checklist for Arizona Homes and Communities*, *http://cals.arizona.edu/pubs*.

USDA Forest Service. Fire Education Materials, *http://www.symbols.gov*.

USDA Forest Service. Forest Products Laboratory, 2007 Woody Biomass Grants, *http://www.fpl.fs.fed.us/tmu/grant-2007/biomass-grant.html*.

USDA Forest Service, Southwest Region Partnerships. Information on national and regional agreements, links for partners. *http://www.fs.fed.us/r3/partnerships/*.

USDA Forest Service. Stewardship and Landowner Assistance Programs, *http://www.fs.fed.us/spf/coop/programs/loa/*.

US Department of Homeland Security.Fire Web site, *http://www.ready.gov/america/beinformed/fires.html*.

US Department of Interior agencies (Bureau of Indian Affairs, Bureau of Land Management, Fish and Wildlife Service, National Park Service), the USDA Forest Service, and state land departments. *Living with Fire- A Guide for the Homeowner*. This is one of the most detailed pieces of Firewise information for landowners to reference when creating survivable space around their homes, *http://www.fs.fed.us/r3/publications/documents/livingwithfire.pdf*.

US Fire Administration and Assistance to Firefighters Grant Program, Web site, *http://www.usfa.dhs.gov/; http://www.usfa.dhs.gov/grants/*.

Western States Wildland Urban Interface Grants. Funds allocated to 17 western states distributed through a competitive process administered by the Western States Fire Managers, a working group established by the Council of Western State Foresters.

CD ROM

Arizona Firewise Communities Educator's Workshop, Payson, AZ, February 18–19, 2003.

Burning Issues, Florida State University and the USDI Bureau of Land Management, 2000.
Interactive multimedia program for middle and high school students to learn about the role of fire in the ecosystems and the use of fire management in rural areas.

Wildland Fire Communicator's Guide.
This interactive CD-ROM complements the book.

Other Publications

It Can't Happen to My Home! Are You Sure? A publication by the USDA Forest Service, Southwestern Region, 12-page document.

Wildfire Strikes Home! It Could Happen to You, How to Protect Your Home! / Homeowners Handbook, from the USDI Bureau of Land Management, the USDA Forest Service and state foresters (publication nos. NFES 92075 and NFES 92074).

Everyone's Responsibility: Fire Protection in the Wildland Urban Interface, NFPA, 1994.This National Fire Protection Association book shows how three communities dealt with interface problems.

Is Your Home Protected from Wildfire Disaster? A Homeowner's Guide to Wildfire Retrofit, Institute for Business and Home Safety, 2001. This book provides homeowners with guidance on ways to retrofit and build homes to reduce losses from wildfire damage.

Road Fire Case Study, NFPA, 1991. Stephen Bridge. Provides information to assist planners, local officials, fire service personnel, and homeowners.

APPENDIX F: SALTCEDAR/RUSSIAN OLIVE INFORMATION

The continued degradation of native riparian plant communities from invading tree species is a significant concern to the citizens of New Mexico. The following information is presented by the CAG to assist municipal, state, and federal land managers with basic recommendations for the management of invading saltcedar and Russian olive within the San Juan Basin. Invading tree species information is taken from Kris Zouhar's (2004) *Tamarix* spp. description accessed from the online Fire Effects Information System. These recommendations are intended to help implement the recommendations of *The New Mexico Forest and Watershed Health Plan* (New Mexico Forest and Watershed Health Planning Committee 2004), the *Strategy for Long-Term Management of Exotic Trees in Riparian Areas for New Mexico's Five River Systems, 2005–2014* (USDA FS and NMSFD 2005), and the *San Juan Basin Watershed Management Plan* (San Juan County Watershed Group 2005).

Saltcedar:

Saltcedar is one of the most widely distributed and troublesome nonnative invasive plants along watercourses in the southwestern United Sates. Saltcedar reduces recreational usage of parks, and riparian areas for camping, hunting, fishing, and agriculture. Since its escape from cultivation, saltcedar has spread primarily in the southwestern United States and northern Mexico although its distribution extends into many parts of North America. It is especially pervasive in New Mexico and has dominated low areas bordering the channel of the most river systems since the 1940s. More than 50 percent of the area covered by floodplain plant communities was dominated by saltcedar by 1970 (<www.fs.fed.us/database/feis/plants>). Saltcedar-dominated communities are often monotypic, though cottonwood and willow are common associates. Several studies in New Mexico suggest that saltcedar communities do not support as high a density of native bird species as do native plant communities; however saltcedar provides habitat for a number of bird species including white-winged and mourning doves, summer tanager, yellow billed cuckoo and the endangered Southwestern willow flycatcher. Saltcedar communities can trap and stabilize alluvial sediments, reducing the width, depth and water-holding capacity of river channels. This can subsequently increase the frequency and severity of overbank flooding. These stands can have extremely high evapotranspiration rates when water tables are high but not necessarily when water tables are low or under drought conditions. Because saltcedar stands tend to extend beyond the boundaries of native phreatophytes and to develop higher leaf area index, water use by saltcedar on a regional scale might be substantially higher than for other riparian species. While the natural flood disturbance regime seems to promote native species and discourage saltcedar, preservation of natural conditions in riparian areas is rarely a factor in the SJBCWPP.

There is little quantitative information on prehistoric frequency, seasonality, severity, and spatial extent of fire in North American riparian ecosystems. Fires in low- to mid-elevation southwestern riparian plant communities dominated by cottonwood, willow, or mesquite are thought to have been infrequent. Increases in fire size or frequency have been reported for New Mexico river systems in recent decades. Fire appears to be less common in riparian ecosystems where saltcedar has not invaded. Increases in fire size and frequency are attributed to a number of factors including an increase in ignition sources, increased fire frequency in surrounding uplands, and increased abundance of fuels. The structure of saltcedar stands

may be more conducive to repeated fire than that of native vegetation. Saltcedar can contribute to increased vertical canopy density, creating volatile fuel ladders, thereby increasing the likelihood of negative impacts of wildfire. Saltcedar plants can have many stems and high rates of stem mortality, resulting in a dense accumulation of dead, dry branches vertically within the canopy as well as within the fuel bed. Large quantities of dead branches and leaf litter are caught in saltcedar branches above the ground surface, enhancing the crowns' flammability. In summary, the likelihood of fire in southwestern riparian ecosystems is greatest with the combination of flood suppression, water stress, and saltcedar presence. The presence of saltcedar in southwestern riparian ecosystems may favor its own propagation by further altering the natural disturbance regime, thereby further decreasing the already limited extent of native cottonwood and willow communities. Additionally, in the absence of flooding, regeneration of native trees is impeded, and organic matter accumulates, thus increasing chances for future fires that may further alter the species composition and structure of southwestern riparian forests and promote the spread of saltcedar and other fire-tolerant species (<www.fs.fed.us/database/fesi/plants/tree/tamspp/fire_ecology>).

Once established in large stands saltcedar can rarely be controlled or eradicated with a single method, and many researchers and managers recommend combining physical, biological, chemical, and cultural control methods. Removing saltcedar must also be accompanied by an ecologically healthy plant community that is weed resistant and meets other land use objectives such as wildlife habitat or recreational use benefits. The best phenological stage to burn and reburn saltcedar to reduce density, canopy, and hazardous fuel loads is during the peak of summer, presumably due to ensuing water stress. Use of fire alone to control saltcedar, however, is generally ineffective, only killing above ground portions of the plant leaving the root crown intact and able to produce vigorous sprouts. Saltcedar stands can burn hot with erratic fire behavior with numerous firebrands transported downwind from the headfire. Prescribe fire set-up requires poorly receptive fuels downwind from the headfire. Saltcedar in dense stands that have not burned in 25–30 years exhibit extreme fire behavior and crowning due to closed canopy at any time of the year. They can have flame lengths exceeding 140 feet, resulting in near complete fuel consumption. Stands reburned after 5 to 6 years show vastly different fire behavior, carrying fire only if there is adequate fine fuel load and continuity. Due to the ability to transport fire brands at least 500 feet downwind, blacklines should be at least 700 feet wide, headfires installed with temperatures 65–95 degrees Fahrenheit, relative humidity of 25–40 percent, and wind speeds less than 15 miles per hour.

Managers must be prepared for extreme fire behavior in old decadent stands. Where high intensity fire is not preferred due to presence of less fire resistant vegetative species, fuel reductions through mechanical and chemical controls are recommended. Ignited prescribed fire can be used to thin dense saltcedar stands to follow-up applications of mechanical and chemical controls (www.fs.fed.us/database/feis/plants/tree/tamspp/fire_effects). Mechanical and chemical methods are commonly employed for saltcedar control (*Low-Impact, Selective Herbicide Application for Control of Exotic Trees: Saltcedar, Russian Olive and Siberian Elm; A preliminary Field Guide by Doug Parker and Max Williamson* [USDA FS 2003]). November through January is the most effective time to achieve first time kills of saltcedar by cutting below the root collar, probably because the plants are entering dormancy at that time and translocating resources into their roots. Whole-tree extraction through use of equipment, such as the patented Boss Tree Extractor (<www.bossreclamation.com>), has achieved 90 percent mortality after initial treatment. In areas where

native riparian vegetation species or other habitat issues create a need for agile specific treatment designs, whole tree removal may be considered as the preferred treatment. Herbicide application is most effective when applied immediately after cutting. Full strength application of garlon® painted on cut stumps within 15 minutes of cutting or applied with a backpack sprayer using 20–30 percent mix of garlon® with Ag oil has been successful with the exception of spring months when sap is moving up from the root mass (*Low-Impact, Selective Herbicide Application for Control of Exotic Trees: Saltcedar, Russian Olive and Siberian Elm; A preliminary Field Guide by Doug Parker and Max Williamson* [USDA FS 2003]). Extraction and mulching of saltcedar will require treatments of re-sprouts by mechanical or chemical control methods. Changes in nature of disturbance from fire (frequency, intensity, and severity) have been effected by both saltcedar invasion and by other changes in the invaded communities. Fire frequency and fire behavior in saltcedar invaded communities are thought to be different than in native plant communities. In the absence of flooding to remove debris, accumulation of woody material can increase to levels that may have a profound effect on the ecology of the system

Russian Olive:

Russian olive is native to southern Europe and to central and western Asia. Within this region it occurs primarily on coasts, in riparian areas, and in other relatively moist habitats. It is also a component of several forest types, including mixed tamarisk-olive (*Tamarix-Elaeagnus*) forests, Russian olive–dominated stands, cottonwood (*Populus* spp.) and Russian olive woodlands. It is unclear when Russian olive was initially introduced to North America, although its introduction as a horticultural plant was certainly intentional. Russian olive has been cultivated for shade, hedges, wind- and snowbreaks, soil stabilization, wildlife habitat, landscaping, and to provide pollen for honeybees both in its native range and in North America. Russian olive is highly invasive in seasonally wet riparian and flood plain habitats, where it has been observed to replace native willow and cottonwood species. It can grow under dense stands of saltcedar, out compete resident plants and eventually dominate riparian sites. (Howard 2004, USDA FS and NMSFD 2005)

Russian olive became prominent outside cultivated areas in the western United States about 2 to 5 decades after it was introduced. Most recommendations for planting are from the early 1900s, and escapes (or naturalization) are reported from the 1930s through 60s in Nevada, Arizona, New Mexico, Colorado, Idaho, Texas, and California. Russian olive is common throughout the Southwest, especially along rivers on the Colorado Plateau and other high elevation sites, including the Rio Grande and San Juan Rivers. It is well established and continues to spread in the Four Corners region. Habitat and plant community information comes primarily from these areas, although individual or scattered occurrences are also indicated in other areas such as in critical desert tortoise habitat in the Mojave and Colorado deserts. In New Mexico, the Russian olive is widely distributed in the middle Rio Grande, Pecos, and San Juan river basins. Russian olive stands are often represented by densely forested thickets, often with greater than 90% total canopy cover, and some scattered mature Rio Grande cottonwood in the canopy.

The Russian olive/redtop community type and is found on lowland river bars on the San Juan River in northwestern New Mexico. Shrubs are usually poorly represented in this community type, and may include sandbar willow or saltcedar. The herbaceous layer is dominated by the nonnative invasive grass redtop,

with a wide variety of other mesic forbs and grasses. On some southwestern riparian sites, dense, nearly monotypic stands of tamarisk and/or Russian olive form a nearly continuous, closed canopy with no distinct overstory layer. Canopy height generally averages 16 to 33 feet (5–10 m), with canopy density uniformly high. The lower 6.5 feet (2 m) of vegetation often contains a tangle of dense, often dead, branches. Live foliage density may be relatively low from 0 to 6.5 feet (2 m) aboveground, but it increases higher in the canopy. Russian olive may also grow as scattered individuals or groups under a canopy of mature riparian vegetation or in mixed stands of varying canopy height and density.

There is no information in the literature specifically addressing fire adaptations in Russian olive. Several workers report that Russian olive sprouts from the trunk, root crown, and/or roots after top-kill or damage, and some report sprouting from roots and root crown following fire. Information on fire regimes in which Russian olive evolved is lacking. Similarly, there is little quantitative information on prehistoric frequency, seasonality, severity and spatial extent of fire in North American riparian ecosystems, where Russian olive is commonly invasive. The structure of stands supporting nonnative invasive species may carry fire better than that of native vegetation. Saltcedar and Russian olive can contribute to increased vertical canopy density, creating volatile fuel ladders, thereby increasing the likelihood and impacts of wildfire. The spread of highly flammable, nonnative vegetation such as tamarisk, giant reed (*Arundo donax*), and cheatgrass in these communities, “is due partly to the same changes in flow regimes that render riparian areas more flammable, making it difficult to disentangle the effects of the nonnative species from the effects of the management factors that have enhanced their spread.” There is no experimental evidence regarding the flammability of Russian olive vegetation or the effects of fire on Russian olive plants or seeds. Observational evidence indicates that Russian olive is top-killed by prescribed fire in tallgrass prairie and by wildfire in riparian communities on the Rio Grande. Fire in tall-grass prairie sites generally does not top-kill trees greater than 2 inches (5cm) dbh.

In general, early detection is critical for preventing establishment of large populations of invasive plants. Monitoring in spring, summer, and fall is imperative. Managers should eradicate established Russian olive plants and small patches adjacent to burned areas to prevent or limit postfire dispersal and/or spread into the site. When planning a prescribed burn, managers should preinventory the project area and evaluate cover and phenology of any Russian olive and other invasive plants present on or adjacent to the site, and avoid ignition and burning in areas at high risk for Russian olive establishment or spread due to fire effects. Managers should also avoid creating soil conditions that promote weed germination and establishment. Also, wildfire managers might consider including weed prevention education and providing weed identification aids during fire training; avoiding known weed infestations when locating fire lines; monitoring camps, staging areas, helibases, etc., to be sure they are kept weed free; taking care that equipment is weed free; incorporating weed prevention into fire rehabilitation plans; and acquiring restoration funding. Additional guidelines and specific recommendations and requirements are available

Russian olive has spreading, thorny branches and thicket-forming growth that make excellent wildlife cover. Mourning doves, mockingbirds, roadrunners, and several other kinds of birds are said to use Russian olive for nesting. Some researchers have examined Russian olive's relative usefulness to wildlife as compared with native plant species it replaces, with mixed results. Some studies and reports indicate less certainty about the role and/or impacts of Russian olive on native wildlife species. The threatened

Southwestern willow flycatcher, for example, nests in native vegetation where available but also nests in thickets dominated by Russian olive and saltcedar, and individuals of both species are used as nesting substrates.

When planning Russian olive control, integrating several approaches will likely be necessary, depending on the size, age, and extent of the population. Mowing, cutting, burning, excavation, spraying, girdling, and bulldozing have all been used to reduce aboveground Russian olive biomass, with varying degrees of success. Russian olive removal can be labor intensive and expensive, especially in the first year of large-scale removal. Most published accounts of effective Russian olive suppression employ chemical treatment, either alone or combined with mechanical technique. Cultural control, in the sense of managing for natives, is an important consideration.

Physical control techniques alone may be suitable for removal of Russian olive seedlings and saplings, whereas control of larger individuals usually requires application of herbicide or removal of the stump by burning, since cut trees typically sprout from the roots and root crown. Manually removing seedlings and saplings (< 4 inches (10 cm) diameter) and their roots is an effective control method. It is most effective when soil is moist. Any remaining exposed roots should be cut off below ground level and buried.

Control is difficult once Russian olive trees mature and populations are well-established. The most effective control method is the cut-stump herbicide treatment. Girdling and cutting are not effective controls by themselves, as trees are likely to sprout below the girdled or cut areas or along roots.

Techniques such as mowing, cutting, girdling, chaining, and bulldozing can suppress Russian olive on invaded sites, although the disadvantages to such approaches can be substantial, including the necessity for frequent treatment repetition, the indiscriminate removal of other species, and severe soil disturbance. Additionally, these approaches are not effective without long-term monitoring and follow-up removal of sprouts.

Herbicides may be effective in gaining initial control of a new invasion or a severe infestation, but are rarely a complete or long-term solution to weed management. Use of herbicides may be limited in natural areas, and it is suggested that native species large enough to provide "good structure" be present to fill the niche left by removed Russian olive. Herbicides that have been reported as effective at controlling Russian olive to varying degrees include glyphosate, imazapyr, triclopyr, picloram, and 2,4-D.

Foliar spraying of herbicide has provided “successful control” of Russian olive in some cases, although long-term response is unclear. This approach may be neither feasible nor desirable in many riparian settings due to potential effects on nontarget species, and potential for overspray or drift when applied to large stands. Small seedlings can also be killed with foliar applications of a mixture of picloram and 2,4-D.

Cut-stump herbicide treatments can be effective if the cut surface is treated with herbicide immediately after cutting. Cuts should be made as close to the ground as possible. In an 80-acre (32 ha) cottonwood gallery forest on the Middle Rio Grande in New Mexico, Russian olive is the codominant tree in mixed stands. From November 1998 through February 1999, Russian olive less than 4 inches (10 cm) in diameter were mowed, using mulching tractors, larger trees were cut with chainsaws, and triclopyr ester was applied to the cut stump within 5 minutes of cutting. A second pass was made with mulching tractors to pulverize

the remaining tree waste. By summer 1999, Russian olive root sprouts occurred throughout the site. Numerous root sprouts were found in proximity to larger, sprayed stumps, suggesting that the rate of triclopyr used was not effective on stumps exceeding 8 inches (20 cm) in diameter. Triclopyr was applied to leaves of Russian olive root sprouts each year for three subsequent summers. Each follow-up treatment required fewer people and less time. Continued monitoring and spot treatments keeps Russian olive under control at the site.

For trees that do not have to be removed or immediately taken down, exposing more than 50 percent of the cambium by cutting into the bark with a saw or ax close to ground level and introducing herbicides into the exposed areas is also effective. Injecting herbicide capsules around the base of the trunk has also been successful for controlling Russian olive. When injecting herbicides into the cambium of a standing tree, monitoring should occur during the same year to ensure that the entire tree is affected.

Additional Recommendations:

An integrated vegetation management approach to saltcedar and Russian olive is presented within the *Strategy for Long-Term Management of Exotic Trees in Riparian Areas for New Mexico's Five River Systems, 2005–2014* (USDA FS and NMSFD 2005). This integrated management approach established objectives that vary based on the level of infestation and the location of the site within the river system. The following are varying levels of infestation within a river system and the priorities for their management:

- Headwater and other unfastened areas: The priority is to protect these sites from infestation, prevent upstream seed sources, and maintain or improve the health of existing native plant communities.
- Riparian Site with light infestation: The priority is to remove exotic trees, reduce upstream seed source, and protect and enhance existing native plant communities.
- Areas of Special Concern: The priority is to identify riparian areas or wetlands that have a special focus (recreational uses or habitat for threatened, endangered, or sensitive species) and to preserve, create, or enhance the unique attributes on such sites.
- Densely infested sites: The priority is to remove dense or monotypic stands of exotic trees and restore desirable plant species to achieve specific objectives.

The CAG recommends that a comprehensive survey be conducted on the San Juan, Animas, and La Plata rivers in the San Juan Basin to provide precise information on the degree of infestation, recommendations for site-specific treatments, and cost estimates for treatments to prevent continued spread of exotic trees and to restore functioning native species riparian systems (see USDA FS and NMSFD [2005] for additional information on cost and management/control recommendations).