Greenlee County Community Wildfire Protection Plan

for At-Risk Communities of the Apache National Forest in Greenlee County

Apache Grove – Beaverhead – Big Lue – Blue
Clifton – Duncan – Eagle Creek – Franklin
Granville – Guthrie – Hannagan Meadow
Morenci – Sheldon – Sprucedale
Three Way – York

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Greenlee County
Community Wildfire Protection Plan

September 2005

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ACRONYMS AND ABBREVIATIONS

GCWPP	Greenlee County Community Wildfire Protection Plan
ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
AIGG	Arizona Interagency Coordinating Group
ANF	Apache National Forest
APS	Arizona Public Service
ARS	Arizona Revised Statutes
A-S NFs	Apache-Sitgreaves National Forests
ASU	Arizona State University
BA	basal area
BLM	Bureau of Land Management
BRPA	Blue Range Primitive Area
CAG	Community Action Group
CR	County Road
CWPP	Community Wildfire Protection Plan
DPS	Department of Public Safety
EAS	Emergency Alert System
ESA	Endangered Species Act
dbh	diameter at breast height
drc	diameter at root collar
FMU	Fire Management Use
FONSI	Finding of No Significant Impact
FR	Forest Road
FS	Forest Service
GIS	geographic information system
HFRA	Healthy Forests Restoration Act of 2003
IGA	Intergovernmental Agreement
IRA	Inventoried Roadless Area
ISO	Insurance Services Office
LMP	Land Management Plan
NEPA	National Environmental Policy Act
NFP	National Fire Plan
NRWG	White Mountains Natural Resources Working Group
OHV	Off Highway Vehicle
PAC	spotted owl protected activity center
PFA	goshawk post fledgling family area
RAC	Eastern Arizona Counties Resource Advisory Committee
RFA	Rural Fire Assistance
RT	recommended treatment
PP	ponderosa pine
SFA	State Fire Assistance
SR	State Route
TES	Threatened, Endangered Species

TNC	The Nature Conservancy
U of A	University of Arizona
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
WMS	White Mountain Stewardship Project
WUI	wildland-urban interface

I. INTRODUCTION

The Greenlee County Wildfire Protection Plan (GCWPP) for the "at-risk" communities and remote at-risk private inholdings located in and around both the Apache National Forest (ANF) managed by the US Department of Agriculture (USDA) Apache-Sitgreaves National Forests (A-S NFs) and public lands administered by the US Department of the Interior (USDI) Bureau of Land Management (BLM) Gila District in Greenlee County, was developed in response to the Healthy Forests Restoration Act of 2003 (HFRA). This recent legislation established unprecedented incentives for communities to develop comprehensive wildfire protection plans in a collaborative, inclusive process. Furthermore, this legislation gives direction to the USDI and USDA 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 Interior to expedite the development and implementation of hazardous fuel reduction projects on lands managed by the Forest Service (FS) and 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 development of a Community Wildfire Protection Plan (CWPP). Priority areas include the wildland-urban interface (WUI), municipal watersheds, areas impacted by windthrow or insect or disease epidemics, and critical wildlife habitat that would be negatively impacted 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 (in Arizona, the State Forester). 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 GCWPP is developed to assist local governments, fire departments, fire districts, and residents in the identification of lands—including federal lands—at-risk from severe wildfire threat and to identify strategies for reducing fuels on wildlands while improving forest and rangeland health, supporting local industry and local economies, and improving public and firefighter safety and response capabilities.

Guidance for development of the GCWPP is based on *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities* (Communities Committee, Society of American Foresters, National Association of Counties, National Association of State Foresters 2004). The GCWPP was collaboratively developed through consultation with the A-S NFs and the BLM Gila District using *The Healthy Forests Initiative and Healthy Forests Restoration Act: Interim Field Guide* (USDA Forest Service and Bureau of Land Management 2004). As additional guidance documents become available, any changes or amendments will be incorporated into the GCWPP.

The at-risk communities of Eagle Creek and the Blue Area and at-risk private inholdings of the GCWPP analysis are, are located in the Alpine and Clifton Districts of the A-S NFs. The majority of lands surrounding the at-risk communities of Clifton, Morenci, Duncan, and Franklin and the communities of

York, Sheldon, and Guthrie, in the southern portion of Greenlee County are located adjacent to "public lands," as defined in HFRA Sec .3.1.A. and B; and state lands. The following sections detail these communities' background and need for the GCWPP, identify current policies, and provide overviews of the process and goals of the GCWPP.

A. Background

The process for developing this CWPP included evaluation of Greenlee County, in its entirety, to identify communities and remote private land holdings 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 Community Action Groups (CAGs). These CAGs were chartered to define and locate interface and intermix communities where significant community values and infrastructure are at-risk because of potential wildland fire. To complete this task the CAGs developed a three-tiered approach. This tiered approach included:

Tier 1… Determination of analysis area

- 1,848 square miles of Greenlee County (see Figure 1.1)

Tier 2…Determination of at-risk communities

- Interface[1] communities of Clifton, Morenci, Duncan, and Franklin
- Intermix[2] communities of Eagle Creek, Blue Area, (including Hannagan Meadows, Beaverhead through Sprucedale), Granville, York, Sheldon, and Guthrie (including the Big Lue, Loma Linda, Verde Lee, Three Way, and Apache Grove)
- Infrastructure and evacuation routes

Tier 3…Determination of "at-risk" remote private inholdings

- Defined by a private residence
- Risk of wildfire by either:
  - Continuous fuels near structures
  - Ineffective fire fighting response because of response time or high vegetative fuel loads and geographic features

The CAGs reviewed the *Federal Register Vol. 66, No. 3* (2001) to determine categories of at-risk communities and risk factors to be considered in analyzing the private lands in the County. They reviewed the definition of WUI as found in HFRA to delineate the "area in or adjacent to an at-risk community …." The CAGs also reviewed Section 101.16.B.iii. of HFRA in order 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 definition of the WUI as referenced in A *Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implimentation Plan* is "the line, area, or zone where structures and other human development meet

[1] The Interface community exists where structures directly abut wildland fuels
[2] The Intermix community exists where structures are scattered throughout a wildland area *Federal Register Vol. 66, No. 3* January 2001

Figure 1.1. Analysis area

or intermingle with undeveloped wildland or vegetative fuel." This definition was also used in defining "at-risk private inholdings." Collectively, all three tiers constitute the GCWPP.

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, Arizona faced extreme drought during the 2002 water year (October 2001–September 2002), the driest water year for many parts of the state (*Drought and Climate in Arizona: Top Ten Questions and Answers Final Report,* 2004). Recent Arizona snowpacks have been below normal, with the 2002 winter being the fourth year of continued drought in the Southwest. Based on five-year precipitation averages, 1999–2003 was one of the driest spells on record for this climate division. According to the *Drought Fact Sheet* from the Arizona Climate Division 2, the driest five-year averages of cool-season precipitation were:

- 59.1 percent of average for 1900–1904
- 68.2 percent of average for 1999–2003
- 71.8 percent of average for 1955–1959 and 1968–1972
- 74.2 percent of average for 1947–1951
- 76.5 percent of average for 1960–1964

Continued extreme weather conditions, dry fuels, and increasing fuel loading on federal and nonfederal lands contribute to the potential for catastrophic wildland fires in and around the GCWPP communities. These communities have developed this CWPP to increase preparedness, reduce hazardous wildland fuels, and increase communication with local, county, state, and federal emergency response personnel by determining areas of high risk from catastrophic wildland fire, developing mitigation measures to reduce hazardous wildland fuels, improving emergency response to unplanned wildfire, and reducing structural ignitability throughout the CWPP area.

Since the mid-1990s, the majority of wildfire starts have occurred in the northern portion of the GCWPP analysis area with 19 of those fires growing to over 100 acres and collectively totaling over 71,500 acres burned. Although landscape-scale fires have not been prevalent in the lower elevation and desert vegetation zones of the WUI, many 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 districts and governments initiated fire preparedness enhancements and land treatment efforts (see Section I.D.3. Local Policies) to recognize and act on those current conditions that result in the accumulation of unacceptable levels and types of natural fuels that significantly threaten the communities with a catastrophic wildfire.

Greenlee County has long recognized the importance of managing the WUI, as well as developing and implementing landscape treatments in the interior forest to reduce fuel loads and restore natural forest ecosystems. Greenlee County along with the Apache-Sitgreaves, Coronado, and Tonto National Forests; the Southwest Regional Director of the US Fish and Wildlife Service (USFWS); the Arizona Game and Fish Department (AGFD); Gila, Graham, Apache, and Navajo Counties; Governor Jane Hull; and the University of Arizona (U of A) are signatories to the 1997 Cooperative Agreement formalizing the White Mountains Natural Resource Working Group (NRWG). The mission of the NRWG is "to allow

for innovative approaches to achieving vegetative management strategies through the use of prescribed fire and through mechanical treatments while providing for improved water quality and quantity, accelerating riparian restoration, mitigating impacts of catastrophic fire associated with forest and rangeland ecosystem health for biodiversity, and promoting quality effective partnerships" (NRWG Mission Statement, 1997).

While developing this CWPP, Greenlee County officials wanted all lands in the county to be reviewed for the potential of catastrophic wildland fire. During the countywide initial analysis, intermix and interface communities were identified in accordance with the *Federal Register Vol. 66, No. 3* (2001); *Field Guidance Identifying and Prioritizing Communities at Risk* National Association of State Foresters (2003)*; Arizona Wildland Urban Interface Assessment* (2004), *and the Communities at Risk Matrix* (2004). In accordance with HFRA, the WUI was delineated and defined for these communities. Evacuation/resource response routes and significant infrastructures were also identified to provide for firefighter safety and to ensure the protection of life and property. In this manner, Greenlee County ensured that all residents and property were considered in the initial evaluation. Recommendations for mitigating catastrophic wildland fire potential will be developed in this CWPP for intermix and interface communities identified in the WUI and for at-risk private inholdings located in the analysis area. The CWPP will also provide recommendations for areas outside of the WUI that have been identified for further analysis such as forest ecosystem health or watershed enhancing treatments.

To create a single GCWPP that captured local interest and advanced understanding regarding the critical issues, two CAGs and a "Collaborative Community Wildfire Protection Planning Committee"—composed of representatives from each CAG—was established. The first CAG focused on the at-risk community of Blue, and included residents from this community as well as the Dry Blue of New Mexico, ANF personnel from the Alpine Ranger District, and representatives from other interest groups (e.g., The Nature Conservancy (TNC), Greenlee County Cattle Growers Association). The intent was to share information on existing wildfire risk conditions, fire history, and current efforts to mitigate wildfire risk and then to help recommend strategies needed to mitigate risk to the community and the watershed of the Blue River from catastrophic wildland fire through fuel reduction treatments and enhanced fire response and preparedness.

A second CAG was established for the communities of Eagle Creek, Clifton, Morenci, York, Sheldon, Franklin, Guthrie (including Big Lue, Loma Linda, Three Way, and Apache Grove) and Duncan. This CAG was comprised of local government representatives from Clifton and Duncan, ANF personnel from the Clifton Ranger District, BLM Gila District personnel, and representatives from other interest groups (e.g., TNC, Eagle Creek Watershed Working Group, U of A Cooperative Extension, Phelps Dodge Corporation (Phelps Dodge), Greenlee County Cattle Growers Association). The second CAG focused on existing wildfire conditions, fire history, and making recommendations to mitigate risk from catastrophic wildland fire to protect their at-risk communities and watersheds associated with Eagle Creek, Chase Creek, San Francisco River, and Gila River.

Both CAGs meet all criteria of the collaborative guidance established by the Wildland Fire Leadership Council and have been the core of the public involvement process for the GCWPP. During

deliberations, the CAGs discussed contributions from technical experts and reviewed references and guidance documents.

Figure 1.2 summarizes the process that the local CAGs followed to produce the GCWPP. 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 GCWPP and serve as a road map for the rest of this document.

B. Wildland-Urban Interface

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 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)—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* —a plan for reducing wildland fire risk—place 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 forest 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," are in this GCWPP and managed under the jurisdiction of the A-S NFs (mostly to the north) and BLM Gila District (mostly to the south). Tribal lands are adjacent to the western boundary of the southern CAG and Arizona State Trust Land (primarily on the south and east) is located adjacent to the communities of Clifton, Morenci, York, Sheldon, Franklin, Guthrie (including Big Lue, Loma Linda, Verde Lee, Three Way, and Apache Grove), and Duncan. The towns of Clifton and Duncan are the only incorporated communities located in the planning area. All other communities are under the jurisdiction of the County. Private ownership of land is mainly restricted to the communities listed, although there are numerous private inholdings throughout the GCWPP analysis area.

The WUI described in the GCWPP includes 146,847 acres of private, county, and state lands and 234,516 acres of federal lands for a total of 381,363 acres. The CAGs also established evacuation/resource distribution routes that add an additional 37,813 acres to the WUI for a combined total of 419,176 acres identified for priority treatment. Additional information on the process used to delineate the WUI boundaries and a description of those communities involved are found in Section II.

C. Fire Regime and Condition Class

In compliance with HFRA, federal lands in the WUI were evaluated for Fire Regime and current Condition Class. A natural fire regime is a general classification of the role a fire would play across a landscape in the absence of human intervention. The FS has created five categories of natural (historic) fire regimes based on the number of years between fires (fire frequency) combined with the severity of fire on dominant overstory vegetation (*Development of Coarse-Scale Spatial Data for*

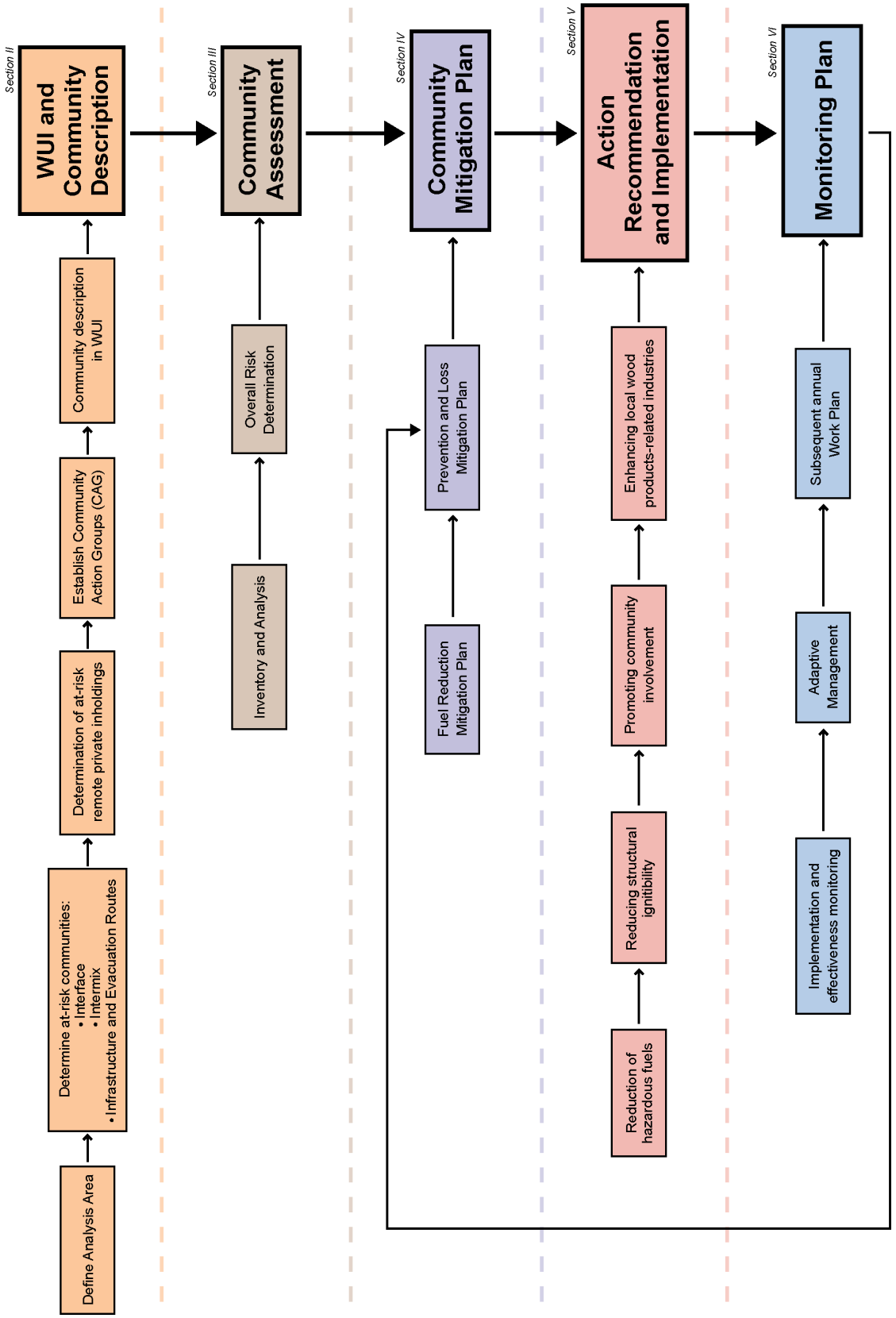

Figure 1.2. Process followed to produce the GCWPP.

Wildland Fire and Fuel Management [Forest Service 2002]). The majority of the GCWPP's WUI lands are composed of natural Fire Regime 1, which is described as forested lands where wildland fires have occurred at a 0–35-year frequency, with low severity of burn.

A Condition Class is the FS's classification of the extent of departure from the natural fire regime. For example, a forest in Condition Class 1 is a forest system in its natural fire return interval and at low risk for losing ecosystems components from wildland fire. A Condition Class 2 forest has moderately departed from its historic fire occurrence range and has a moderate risk of losing habitat components. Condition Class 3 forests have significantly departed from their historic fire regime return intervals, and their risk of losing key habitat components is high. The majority of lands in the WUI are currently designated as Condition Class 2 (47 percent), with 33 percent designated as Condition Class 1 and 20 percent designated as Condition Class 3 lands.

D. Desired Future Condition and Relevant Fire Policies

The desired future condition of federal land is a return to Condition Class I status. Federal lands in this Condition Class can carry wildfire without significant impacts to forest components. Once in this condition class, natural processes such as fire can be incorporated into long-term management practices to sustain forest health. The desired future condition of nonfederal lands in the WUI is to have private land owners 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 forest. Additionally, structures that comply with fire-safe recommendations are much more likely to survive wildland fires that spread into the community.

Local governments, NRWG, the Arizona Sustainable Forests Partnership, the Sierra Club, TNC, Eagle Creek Watershed Working Group, Gila Watershed Partnership, Greenlee County Cattle Growers Association, Center for Biological Diversity, Upper Gila River Association, Phelps Dodge, Tucson Electric Power, Duncan Valley Electric, and many others have collaborated with the BLM Gila District and A-S NFs to develop innovative and active forest and rangeland management initiatives. Public education and private property treatment projects in the communities, coupled with current efforts of local fire department programs, are planned to create safer, 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 and 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. The Working Group found the 1995 Policy to be sound and appropriate; however, it recommended a few additions to address ecosystem sustainability, science, education, 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, and
- promote community assistance.

Federal wildfire reduction policy on National Forest and public lands (i.e. BLM) are planned and administrated locally through the A-S NFs and BLM Gila District, which are the governing agencies for the federal lands associated in the GCWPP planning area. The *Apache-Sitgreaves National Forests Plan* (amended in 1996) includes wildfire management guidelines for these federal lands. A-S NFs' fire management activities include wildland fire suppression, prescribed burns, and wildland fire use in six general fire management zones. The WUI is located in several Fire Management Zones including Zone I, which includes three primary vegetation types: ponderosa pine/Gamble oak, mixed conifer, and spruce-fir. Some areas in the WUI are designated Zone II, which includes high mountain grassland, pinyon-juniper, and associated grasslands vegetation types. Zone III, is comprised primarily of woodland, mountain shrub, and semi-desert vegetation types with a similar characteristic fire regime, and is found throughout the Clifton Ranger District and exhibits moderate to high fire burn intensities with common stand replacement occurring after fire. Zone V is compromised of ponderosa pine-oak shrub and is found below the Mogollon Rim and extensively throughout the Blue Range Primitive Area where the potential for landscape scale wildland fire is high. Zone VI consists of the Blue Range Primitive Area and proposed administrative additions. The Blue Range Primitive Area encompasses a variety of vegetation types such as pinyon-juniper/oak woodland, mountain shrub and semi-desert types in lower elevations, to ponderosa pine forest in upper elevations. Resource damage potential is high in watershed areas of high risk and where fire has not previously occurred in this Zone. In accordance with the *Draft Revised Standards and Guides for Management Ignited Prescribed Fire/Wildland Fire Use Apache-Sitgreaves National Forests Land and Resource Management Plan Jan. 25, 2005*, "fire is the primary management tool for maintaining and/or enhancing the primitive values of the areas. A systematic program of planned prescribed burning or wildland fire use for resource benefit may be undertaken to accomplish management area objectives." In these Fire Management Zones, specific management standards and guidelines are analyzed with regard to wildfire suppression.

Under the Proposed Action described in *Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management Finding of No Significant Impact (FONSI) and Environmental Assessment* USDI (2004) BLM-administered public lands are assigned one of two land use allocations for fire management. Allocation 1 includes areas suitable for wildland fire use for resource management benefit. Allocation 1 lands in the GCWPP analysis area principally include pinyon-juniper woodland, semidesert grassland, interior chaparral, and the evergreen woodland vegetative community types. Allocation 2 includes areas not suitable for wildland fire use for resource benefit. These include desert scrub and riparian vegetative community types located in the GCWPP analysis area.

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. Local communities and fire departments in the GCWPP analysis area have made this information available to their citizens and have encouraged its application.

2. State Policies

Arizona has been proactive in assessing wildfire risk on a regional level. The list of wildland interface communities published in the *Federal Register* on August 17, 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. Subsequent to the updated list of at-risk communities published in the *Federal Register* on August 17, 2001 the report entitled, *Field Guidance: Identifying and Prioritizing Communities at Risk, National Association of State Foresters, June 27, 2003* (<www.fireplan.gov/reports/424-438-en-pdf>), outlined the process by which the states will update the list of at-risk communities. The Arizona State Forester provides an updated list of Arizona at-risk communities in December of each year. The *Arizona Wildland Urban Interface Assessment* (2004) is a statewide strategic report using aerial imagery and geographic information system (GIS) technology to identify and map wildfire risk. Using the categories of topography, wildfire risk, fire hazard, and structural density, the report addresses wildfire risk to residential areas in the WUI. In the GCWPP analysis area, Clifton is rated "high;" Hannagan Meadow and the community of Blue are rated "moderate;" and Franklin, Big Lue, Duncan, Sheldon, Three Way, Apache Grove, York, and Morenci are rated "low" for potential wildfire impact. The Arizona State Land Department (ASLD) can enter into inter-governmental agreements with fire departments to establish cooperative fire rate agreements, which reimburses fire departments for response services when dispatched to a wildland fire incident outside of the department's service area. The Town of Duncan currently has such a cooperative fire rate agreement. The Arizona State Forester has the sole responsibility and authority for "certification" of communities for national Firewise™ program recognition.

Recognizing the significant effects of catastrophic wildfire on the biological, cultural, and economic value of Arizona's ponderosa pine forests, Governor Janet Napolitano convened "The Annual Forest Health and Safety Conference: Building on Lessons Learned" in March 2003. This conference resulted in the creation of the science-based Forest Health Advisory Council, which provided recommendations to the governor on actions that can be taken now and in the future for improving the health of Arizona's forests. The Forest Health Advisory Council developed six major principles for restoring forest health that were adopted by the Arizona Forest Health Oversight Council in November 2003. The CAGs have also reviewed *The Report of the: Governor's Arizona Forest Health Oversight Council, Executive order 2003-16 March 21, 2005*. The Report includes six recommendations/principles directed at the Arizona legislature, eleven recommendations directed to the Governor and Executive Branch, one recommendation to the Corporation Commission, six recommendations to Congress, three recommendations for Communities, two recommendations for Citizens and the Private Sector, and two recommendations for future study. These "Guiding Principles" and updated recommendations of the Forest Health Oversight Council were thoroughly reviewed by the CAGs to ensure that they were embedded in the goals of this GCWPP. The principles focused on issues of integration, sustainable

communities and economies, ecological integrity, land use and planning, funding and compliance, and practices that are effective and efficient with low environmental and socioeconomic impact.

During the Forty-sixth Legislative Session of 2004, legislation was passed governing the adoption of an "Urban-Wildland Interface Code" (Arizona Revised Statutes [ARS] §9-806 and ARS §11-861) and identifies the Arizona State Forester as a position in the Executive Branch (ARS §37-621, 622). This legislation also created the "Healthy forest enterprise incentives" (ARS §41-1516) and established the "State urban-wildland fire safety committee" (ARS §41-2148). During the Forty-Seventh Legislative Session of 2005, amendments (HB2276) to the new legislation were introduced as recommended by the Arizona Forest Health Oversight Council to clarify and improve implementing processes. The CAGs have reviewed the 2004 legislation and the 2005 amendments, and believe this legislation significanly enhances the Arizona State Forester's ability to react to rapidly increasing threats within the WUI and encourages the development of the forest products industry in support of local community values across the state.

3. Local Policies

The GCWPP communities are aware that traditional approaches to forest management, wildland fire management, and community growth in the WUI have produced extensive areas at high risk from catastrophic wildfire. These communities aspire to a restored, self-sustaining, biologically diverse forest and rangeland, which contribute to a quality of life demanded by local citizens and expected by visitors. Current forest conditions and treatment prescriptions that can 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 rigorously implemented. Greenlee County residents that have developed the GCWPP 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 community considered ecosystem restoration, community protection, economic development, protection of significant infrastructure, public and firefighter safety, and protection of remote at-risk private inholdings in the county, while developing this CWPP.

Greenlee County has recently developed "Evacuation Plans" to be included in the current County Evacuation Plan for the Blue and Eagle Creek intermix communities. These Plans 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 County Evacuation Plan is currently under revision by the Local Emergency Planning Committee.

In addition to the county and towns, the Eagle Creek Watershed Partnership—a multidisciplinary work group whose mission is to enhance the Eagle Creek Watershed—have supported FS projects including small-diameter tree thinning and treating wildland fuels through controlled burning practices. The Eagle Creek Watershed Partnership has supported land treatments that reduce understory fuels, increase herbaceous forage production, and enhance forest, rangeland and watershed health.

The appearance and health of the forests and rangelands in and around the GCWPP communities provide not only an economic base (recreation, agriculture, water supplies) for the communities, but

also provide 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 A-S NFs and BLM Gila District in determining community-based and accepted land management practices that restore and enhance today's forest and rangelands, while providing protection from wildland fire threats and from fire starts in these communities.

E. Grants/Current Projects

Financial commitments required to reduce the risk of catastrophic wildfire can be extensive for the FS and BLM, as well as for the small rural communities surrounded by federal lands. In 2001, the NFP created a funding process through which Congress provided 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 Arizona State Forester, grants awarded for the 2002/03 Fiscal Year totaled approximately $10.4 million.

The Arizona State Forester administers annual grants such as the Volunteer Fire Assistance (VFA) Grant Program**,** USDI Rural Fire Assistance (RFA) Grant Program, and State Fire Assistance (SFA) Grants. Distribution of these grant monies has been on a competitive basis, with the Arizona Interagency Coordinating Group (AICG) evaluating submitted applications. Table 1.1 displays grants allocated in the GCWPP planning area.

Table 1.1. Grants submitted for the GCWPP planning area, 2004–2005

Grant recipient	Project/ Treatment	Description
Environmental Economic Communities Organization for Greenlee County	Hazardous fuel reduction	SFA grant for hazardous fuels treatments in the WUI

Source: Fire Management Division of the Arizona State Land Department 2004

The GCWPP communities have been involved with and supportive of programs designed to stimulate local forest products-related industries and that significantly reduce forest fuels in the WUI such as the White Mountain Stewardship Project (WMS). Stewardship contracts for forest treatments are not new to the A-S NFs, and have been used in the treatment of 3,000 acres. The US Congress recently enacted legislation expanding stewardship contracting authority, allowing for long-term contracts (up to 10 years) for firms participating in programs that meet land management objectives. The WMS contract to treat an estimated 5,000 to 25,000 acres per year for the next 10 years has been awarded by the A-S NFs. Although the existing WMS contract currently does not extend into Greenlee County, future stewardship projects identify potential projects in the Beaverhead and Sprucedale areas. Communities located in the WUI endorse the WMS and support fuel reduction programs that encourage local economic and forest-related industry growth through productive use of the wildland treatment byproducts. The CAGs do recognize that implementing fuel reduction treatments throughout the county will stimulate private local businesses to perform this work. Table 1.2 identifies treatment areas in the A-S NFs located in and around the GCWPP WUI boundary.

Table 1.2. ANF treatment areas

Project area location	Treatment name	Description	Acres treated
A-S NFs Fuels Treatment Projects in Greenlee County	Mesa ecosystem restoration	AGFD and Wildlife Organization Grant for removal of small trees improving wildlife habitat	8,809
	Chitty ecosystem restoration	Proposed for AGFD and Wildlife Organization Grant for removal of small trees improving wildlife habitat	14,068
	Pigeon ecosystem eestoration	Proposed for AGFD and Wildlife Organization Grant for removal of small trees improving wildlife habitat	36,599
	Mallet WUI	Proposed for U of A and County funding for insect and disease tree removal and habitat enhancement	3,243
	Sheep Wash thinning/burn	Proposed for Wildlife Organization funding for wildlife habitat enhancement	
	Arrow fire management use	Use of fire for fuel load reduction	1,320
	Blackjack thinning	Mechanical thinning	123
	Coal Creek	Broadcast burn to reduce fuel load	207
	Hot Air	A mixed use of broadcast burn, hand and aerial thinning.	7,321
	Isabelle	Broadcast burn to reduce fuel load	9,161
	Mesa prescribed burn	Broadcast burn to reduce fuel load	2,839
	Mitchell prescribed burn	Broadcast burn to reduce fuel load	4,000
	Pineflats	Prescribed fire (700 cares) and thinning (200 acres)	900
	Horton prescribed burn	Broadcast burn to reduce fuel load	2,000

Source: A-S NFs 2005

F. Need for the Community Wildfire Protection Plan

GCWPP communities exist adjacent to wildlands, and as growth occurs more citizens and property will become at-risk from wildland fire. The communities in the WUI, Greenlee County, the BLM Gila District, and A-S NFs recognize that the WUI is not static; it will continue to grow. Therefore, 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. There may be difficult or special ecological circumstances that warrant management practices other than projected ecological balance. These special areas and/or circumstances, however, must be individually analyzed and evaluated.

HFRA provides for community-based decision-making and empowers local governments to determine the boundaries of the WUI that surrounds their communities. The communities in the GCWPP have been forced to recognize the costs of restoration treatments weighed against the costs of suppressing catastrophic wildfire, with the accompanying direct property and income losses as compared to the indirect losses from evacuation, closing of transportation routes during wildfires and other disruptions. Such wildland fires as the Blue Complex, KP, and Maverick have disrupted travel, closed recreation

areas, and threatened communities from potential flood and debris flows in the wake of a landscape fire on watersheds above the GCWPP communities.

G. Goals

The CAGs have agreed on ten primary goals of the GCWPP:

- improve fire prevention and suppression
- reduce hazardous forest fuels
- restore forest health
- promote community involvement and education
- recommend measures to reduce structural ignitability in the GCWPP area
- encourage economic development and stability in the community through protection of the ecosystem and utilization of forest products
- identify watersheds at-risk and potential impacts to downstream communities
- identify funding needs and opportunities
- expedite project planning
- prioritize high risk projects

These goals are mostly strategic in a planning sense, however, the action recommendations developed by the CAGs to reach these goals are prescriptive, designed to be implemented in specific time frames and with measurable outcomes. In developing this CWPP, it was not intended that each and every action recommendation meet each and every goal; some action recommendations are specific to a single or few goals. For instance, fuel reducing treatments in designated fuel break areas of the WUI will assist in meeting fire prevention and suppression goals but may not be designed to "restore forest health." The CAGs believe that the synergistic effects of implementing all action recommendations will achieve the stated goals of the GCWPP over time.

The GCWPP meets all criteria of HFRA. It has been collaboratively developed and agreed to by the applicable local governments, fire departments, state agency responsible for forest management, A-S NFs, BLM Gila District (the primary relevant federal entities), and other interested parties. The GCWPP establishes a coordinated, collaborative, performance-based framework of recommendations to meet its outlined goals.

H. Planning Process

Several county, A-S NFs, and BLM Gila District planning documents and studies have incorporated wildfire management guidelines and standards for forests in the GCWPP planning area. The goals, policies, and guidelines outlined in these documents, in addition to the above-mentioned public involvement process, were all critical inputs into the development of the GCWPP. The studies, plans, and documents reviewed include:

- *Apache-Sitgreaves National Forests Land and Resource Management Plan* (amended 1996)

- *Apache-Sitgreaves National Forests Land and Resource Management Plan, Revised Standards and Guides for Management of Ignited Prescribed Fire/Wildland Fire Use* (draft January 25, 2004)
- *Clifton Community Plan* (2002)
- *Greenlee County Evacuation Plan* (revised 2005)
- *Draft Eagle Creek Watershed Working Group Watershed Based Action and Management Plan.* (2002)
- *Duncan Community Plan* (2002)
- *Governors Forest Health Guiding Principles* (November 2003)
- *Greenlee County Comprehensive Plan* (2003)
- *Northern Arizona Council of Governments Comprehensive Economic and Development Strategy Update* (2004)
- *The Report of the: Governor's Arizona Forest Health Oversight Council, Executive order 2003-16* (March 21, 2005)
- *USDI Bureau of Land Management Safford District Resource Management Plan (August 1991)*
- *USDI Bureau of Land Management Proposed Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management Finding of No Significant Impact (FONSI) and Environmental Assessment* (March 2004)

Successful implementation of the GCWPP will require a collaborative effort among multiple layers of government and a broad range of special interest groups. The CAGs must develop processes and systems that ensure recommended treatments and actions of the GCWPP 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.

Upon approval of this GCWPP by the Towns of Clifton and Duncan, Greenlee County, and the local fire departments and fire districts, and after concurrence by the A-S NFs Forest Supervisor, the BLM Gila District Manager, and the Arizona State Forester, it will be forwarded to the Arizona State Forester, BLM Gila District Manager and A-S NFs Supervisor for implementation funding of the priority action recommendations.

These communities' and governments' commitment to the successful implementation of the GCWPP is an assurance that they will cooperate in developing any formal agreements necessary to ensure the plan's timely execution, monitoring, and reporting. It is the intent of Greenlee County and the Towns of Clifton and Duncan to designate a single organization to be responsible and accountable for the implementation of this GCWPP. There should be one agent to coordinate with interested parties and industry, accept grants, implement priority projects, and monitor and update the GCWPP as necessary. Both CAGs concurred that Greenlee County will assume the responsibility and accountability for the implementation of this GCWPP through the emergency management office.

II. WILDLAND-URBAN INTERFACE AND COMMUNITY DESCRIPTION

A. Wildland-Urban Interface Delineation Process

The GCWPP defines the WUI of the at-risk intermix communities of Blue and Eagle Creek; the interface/intermix communities of Morenci and Duncan; the interface community of Clifton; and the wildland area around at-risk remote private inholdings, significant community infrastructures, and necessary evacuation routes located in Greenlee County (Figure 2.1). The intermix and interface communities are all in the vicinity of federal lands and, using HFRA criteria and guidance published in the *Federal Register*, are considered to be at-risk from wildland fire. The lands that surround these communities and private inholdings are so removed from the natural fire regime that they are conducive to a large-scale wildland fire, and such a wildfire in their vicinity could threaten human life and property.

The GCWPP process of delineating WUI boundaries involved collaboration with the local, state, and federal governments; fire chiefs and the CAGs. The CAGs represented the public interest through participating government officials, planners, natural resource specialists, and other interested parties from throughout the analysis area, including TNC, Eagle Creek Watershed Partnership, Blue Community Action Group, Greenlee County Cattle Growers, Upper Gila River Association, Phelps Dodge, Tucson Electric Power, and Duncan Valley Electric. Additionally, resource specialists from the A-S NFs and BLM Gila District assisted the CAGs in the boundary-delineation process.

Within the analysis area, the CAGs delineated a single WUI boundary that surrounds the communities of Blue, Eagle Creek, Morenci, Duncan, and Clifton; significant community infrastructures; and roadways used as evacuation/fire fighting resource distribution routes. This WUI is the minimum area needed to provide protection to the extensive watersheds, adequate evacuation routes, and protection to these communities from wildland fire. The CAGs also identified fuel mitigation treatments for those areas around at-risk remote private inholdings where continuous wildland fuels exist in close proximity to structures. The watershed in the WUI consists of both federal and nonfederal lands in the riparian corridors of Eagle Creek and the Blue, San Francisco, and Gila Rivers. There are no reservoirs found on these rivers within the WUI. These river systems with associated tributaries are considered critical or suitable habitat for several threatened, endangered and sensitive species (see Appendix 1) and have remarkable scenic, recreational, fish and wildlife, and historic and cultural values. In addition, critical local and federal agency communication facilities are found on Guthrie and Rose Peaks, Glenwood Brushy Peak, South Mountain Alpine Peak, and Mitchell Peak. The CAGs developed a WUI that includes 381,363 acres of private, state, and federal lands. The CAGs also established evacuation/resource distribution routes that added an additional 37,813 acres to the WUI for a combined total of 419,176 acres identified for priority treatment.

Participants in the WUI delineation meetings included representatives from the Clifton Municipal Fire Department and the Duncan Rural Fire District, the fire responding units of Phelps Dodge, the A-S NFs' Clifton and Alpine Ranger Districts, AGFD, USFWS, Greenlee County Emergency Management personnel, U of A Cooperative Extension, TNC, Greenlee County Cattle Growers, and interested citizens. General elements used in creating the WUI for the communities included:

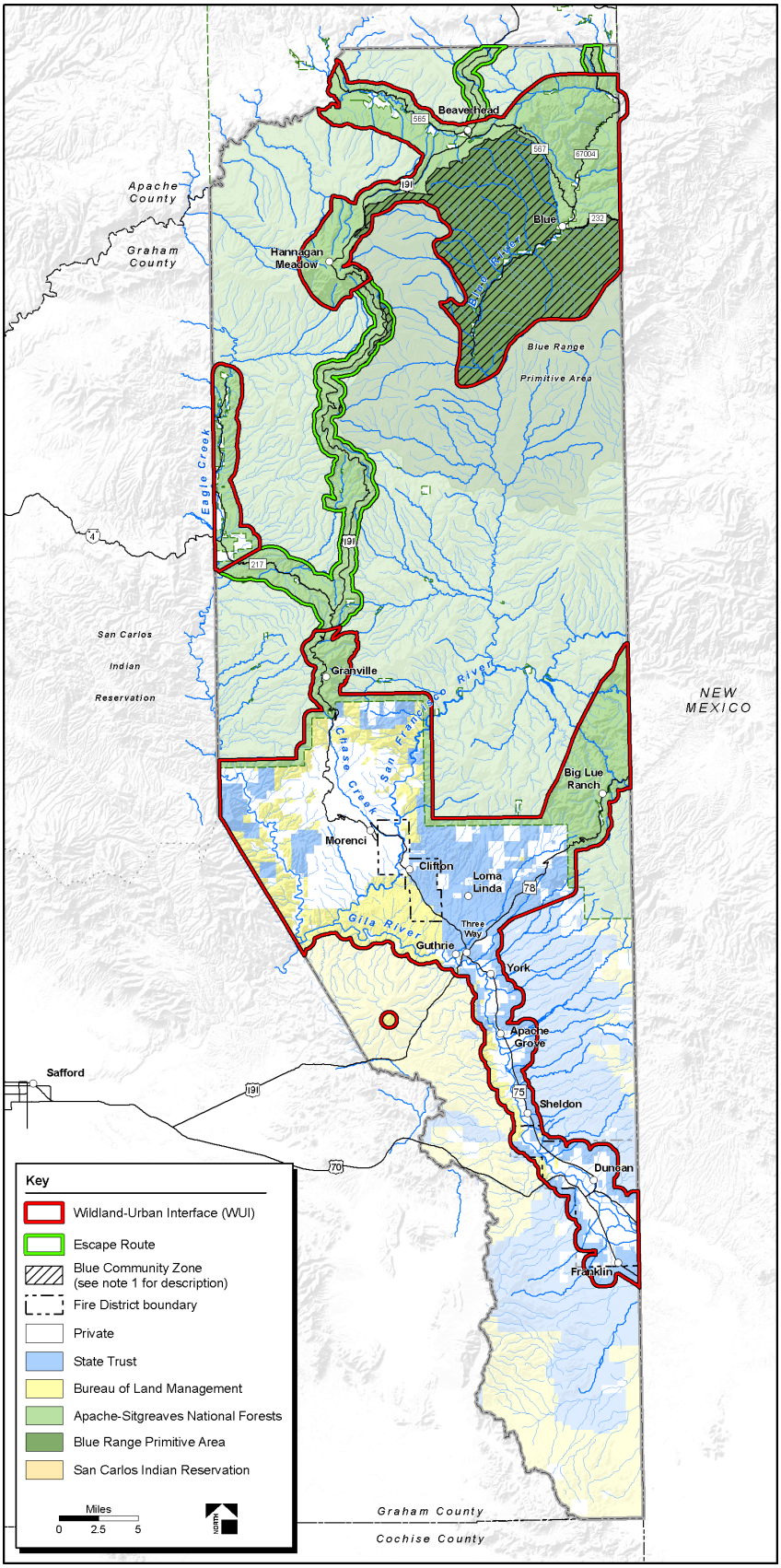

Figure 2.1. Wildland-Urban Interface

- fuel hazards, consideration of local topography, fire history, vegetative fuels, natural fire breaks
- historical fire occurrence
- community development characteristics
- local fire-fighting preparedness
- municipal watershed protection
- infrastructure and evacuation routes

The communities of Blue and Eagle Creek lie in areas where vegetation and topography are aligned in such a manner that wildland fire may spread so rapidly that without treatments, facilities and homes might be overrun in a matter of hours, prior to any effective suppression measures being taken. Both of these communities have poor ingress and egress, extremely limited communication capabilities, and limited effective evacuation/fire fighting response access. The CAGs also reviewed Section 101.16.B.iii of HFRA in order 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 non-effective communication increases the potential severity of wildland fire to both property and public/firefighter safety. Therefore the CAGs considered it to be increasingly important for private land treatments to be specifically identified and coordinated with fuel mitigation treatments on adjacent federal lands. In some instances, the greater public protection from wildland fire may be to remain at a residence that has effectively reduced wildland fuels and established defensible space, rather than attempt escape from isolated areas of poor communication and

Figure 2.1 Note 1
Blue Community Zone Description

Because of the steep topography, sensitive watersheds, community values, high incidence of fire starts, and the high fire risk surrounding the community of Blue, a much larger defensible area needs to be identified to protect the community from a potential catastrophic wildfire. This area is much larger than those that typically exist in other CWPP. Past fires in the vicinity of Blue have dropped embers on homes several miles away from the fire line, clearly demonstrating the need for a larger defensible space. However, because of this rugged terrain, the existence of the Blue Range Primitive Area, and large tracts of roadless areas, there are both physical and legal limitations to the types of treatments available, whether it's near homes and escape routes or further away.

There are a variety of mechanical and/or nonmechanical treatment tools that have been used historically on public lands. Potential mechanical approaches include chainsaws and helicopters, The Wilderness Act of 1964 allows for the use of chainsaws and aircraft in Primitive Areas—with Forest Supervisor approval—during wildland fire events, severe fire risk conditions (i.e., widespread disease or insect infestation, severe drought, or severe departure from historic fire regime conditions), or when forest health, human life, or property are at risk. Other approaches have included hand tools, targeted livestock use, and fires (both natural and planned ignitions). Prescribed fire is a tool that is permissible in the Primitive Area; however, it requires environmental documentation and clearances before use of human resources, hand equipment, and planned ignition can occur.

Depending on other specific legal constraints, adjacent areas outside the Blue Range Primitive Area, roadless areas, and steep slopes could benefit from mechanical thinning. Wider defensible zones may be up to one mile from the furthest point on both sides of the Blue River Road (e.g., private land, power and phone lines). Taking into account local land features, vegetation types and densities, the primary defensible zone may be smaller or larger as determined by fire scientists. Outlying fence lines, cabins, water developments, fire towers, and other pertinent infrastructure will also need defensible areas around them. That defensible area may be established by using trails, natural features, or treated fence lines to create a fire line.

Government agencies and local residents have both financial and manpower limitations. As a result, it is imperative that all parties collaborate to identify, acquire, and utilize additional funding, human resources, and tools that are appropriate and available to create a fire safe area surrounding this community in an economical, expeditious, and environmentally sensible manner.

marginally effective evacuation corridors.

B. Community Description

General descriptions of the communities include land ownership, jurisdiction, development trends, population, infrastructure (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—each of great economic importance to the communities, county, and the A-S NFs. In addition, TNC has recently undertaken a science-based analysis for the various eco-regions of Arizona. Their analysis indicates that both the Blue River and Eagle Creek watersheds are two of Arizona's highest-ranking sites for biodiversity due to several factors including riparian habitat quality, perennial river systems, diversity of native fish species, and potential for long-term conservation. Also, Arizona Audubon and the area's local Audubon Chapter considers the Blue River and associated tributaries important avian habitat for migrating, breeding, and wintering birds. Interest by these groups brings no additional government regulation or management stipulations, but does increase national awareness of these watersheds and of the private and public land managers whose ownership and stewardship have served to maintain significant wildlife biodiversity. In turn, this awareness leads to increased outdoor recreation visitation that ultimately enhances the economic value of these areas for both the local communities and the A-S NFs. Such economic and biological values are critically dependent upon the health of both the Blue River and Eagle Creek watersheds.

Riparian habitat, particularly in the arid southwest, is of high importance to both humans and wildlife. While only 2 percent of Arizona's landscape is composed of perennial rivers, streams, and other water resources such as wetlands and springs, over 80 percent of all Arizona's wildlife depend on these aquatic resources and their associated riparian habitat. Over the past century, however, 90 percent of these water resources have been altered, degraded, or lost. Remaining perennial waters such as Blue River and Eagle Creek represent some of the last naturally-functioning free-flowing riverine systems in the state and their riparian quality is nearly unmatched. The emphasis in this plan towards improving wildland fire protection and therefore improving the health of both watersheds will only serve to help maintain these riverine systems and allow them to persist as high-quality wildlife and human habitat.

Vegetation in Greenlee County ranges from mixed coniferous forests in the north to deserts in the south. There are significant river systems and associated tributaries that bisect the county from north to south including Eagle Creek and the Blue, San Francisco, and Gila Rivers. The San Francisco and Gila Rivers enter the southern portion of the county from New Mexico. A portion of United States Route (US) 191 also known as the "Coronado Trail Scenic Road" passes through the county from Alpine through Clifton and Morenci. The area was explored by Francisco Vasquez de Coronado in 1540, and what is said to be the Spanish explorer's route is now the Coronado Trail Scenic Road. The Coronado Trail Scenic Road promotes and provides access for hiking, mountain biking, camping, sight seeing, hunting and fishing, and guide/outfitting operations, all of significant economic interest to Greenlee County.

The County covers approximately 1,900 square miles, the majority of which (64 percent) is FS lands. Other land ownership includes: 15 percent public land administered by the BLM, 15 percent state lands, with individual or corporate ownership accounting for nearly 6 percent, and other public lands comprising the remaining percentage. Major contributors to the county's economy include copper mining, ranching, agriculture, and tourism (mostly outdoor recreation). Goods production constitutes the major employment (approximately two-thirds) followed by government and other private service providing the other one-third. Hunting, fishing, camping, and off-highway vehicle (OHV) recreation are popular activities of residents and visitors and add significant revenue to the county. According to a study conducted by Arizona State University (ASU) entitled *The Economic Importance of Off-Highway Vehicle Recreation,* OHV expenditures totaled $12.0 million for Greenlee County. Hunting and fishing, under a similar ASU report entitled, *The Economic Importance of Hunting and Fishing* brings in an additional $2.7 million to the county. This number does not include the nearly $500,000 that is spent on days scouting prior to the hunt. Any closure or limited access to public lands within the County would have a major impact on the local businesses that rely on the revenue associated with those activities. The Clifton Ranger District of the A-S NFs within Greenlee County, receives an estimated 327,000 recreational visitors per year.

Clifton and Duncan are the only incorporated municipalities in the County. Just under one-half (3,420) of the 2003 estimated population of 8,605 people reside in these two communities. Collectively the communities of Clifton, Morenci, and Duncan comprise over 60 percent (5,302) of the County's estimated 2003 population.

1. Blue Area

Located in the northeastern portion of the WUI, the Blue Area consists of unnamed private parcels in Blue, the FS Upper Blue River and Blue Crossing Campgrounds, the FS Blue River Ranger Station, the Blue School House, and the Blue Post Office, all of which are significant community assets. In addition, the Blue Area includes private parcels around Sprucedale and Beaverhead, FS lease lands around Hannagan Meadow Lodge (all of which are commercial businesses located in the Alpine Ranger District of the A-S NFs), and residents of the Dry Blue in New Mexico. The Blue Area CAG determined evacuation routes in compliance with the *Federal Register Vol. 66, No. 3*, (2001).

The CAG considered the threat of wildfire from the forestlands in delineating this area of the WUI that extends to the south, east, and west of the community center. Because of the steep topography, sensitive watersheds, community values, and high fire start occurrence a much larger defensible space for community wildfire protection is included for compatibility of land use designations of the primitive and roadless areas. To the north, the WUI extends to the Greenlee County boundary along Forest Road (FR) 281; to the Arizona-New Mexico border along FR 232; and connects to US 191 evacuation route at the US 191–FR 567 junction. The northern boundary around Sprucedale-Beaverhead is the Greenlee County boundary on FR 26, tying in the south and east to the US 191 evacuation route. The WUI includes the power line supplying electrical power to the northern portion of the Blue Area and recommends additional fuel reduction treatments adjacent to the power line easement ensuring protection during wildland fire or an ignited prescribed burn. The CAG recommends that power lines in the Blue Area should be marked or flagged to reduce potential strikes during aerial fire fighting

responses. The northern boundary of the WUI has a characteristic change in vegetation type from pinyon-juniper to ponderosa pine.

The Alpine Ranger District of the A-S NFs has completed a structural assessment describing risk from wildland fire for almost all private inholdings around Sprucedale-Beaverhead and the Blue. The FS has also provided a Firewise™ workshop for members of the Blue. Assessments are available to landowners and can be viewed at the ANF Alpine District Office. Walk around assessments have been, and will continue to be, available upon request from the landowner. The Blue Area CAG places a high priority for treatments within, and for protection to, private property (½ mile fuel breaks along the Blue Road) and access roads to private lands. Access to Blue is from the Red Hill Road (FR 567) or the Blue River Road (FR 281) originating from US 191 and US 180. The Blue can also be accessed from the Pueblo Park Road connecting to US 180 in New Mexico. There is no through access from the southern portion of the community to US 191, making ingress and egress during a catastrophic wildfire event problematic.

The land ownership in the Blue Area is a mix of private land inholdings surrounded by A-S NFs land, and contains many riparian areas including the Blue River corridor. The Blue River is known for its scenic beauty, historical, cultural, recreational, and wildlife values that are significant values to the community, county, and the A-S NFs. The Blue River also runs through the Blue Range Primitive Area, which contains many trails that support extensive primitive outdoor recreation opportunities. The trail system and natural land features should be considered in wildland fire treatment and response as potential fire lines or access routes. The riparian areas in the Blue Area provide habitat for several threatened, endangered, and sensitive species including Mexican spotted owl, northern goshawk, Apache trout, Gila trout, loach minnow, and spikedace. Habitat enhancing treatments for reducing fuel and lessening threat of catastrophic wildland fire would protect the recreational and scenic values of the Blue River and assist in preserving sensitive riparian habitat and wildlife species in accordance with Section 102.a.5.B. of HFRA.

The Blue Area is not in a fire district. Wildland fire response on federal land is from the Alpine Ranger District of the A-S NFs, however, permission needs to be sought from private landowners for wildland fire response to federal lands that are only accessible through private property. The closest structure protection for private property is the Alpine Volunteer Fire Department. The communities in the Blue Area lie where vegetation and topography are aligned in such a manner that wildland fire may spread so rapidly that without treatment, facilities and homes might be overrun in a matter of hours, prior to any effective suppression measures being taken. Residents in the Blue Area have poor ingress and egress, extremely limited communication capabilities, and limited effective evacuation/fire fighting response.

The Blue Range Primitive Area is described as Fire Management Zone VI in the A-S NFs Land Management Plan (LMP). The Blue Range Primitive Area encompasses a variety of vegetation types such as pinyon-juniper/oak woodland, mountain shrub, and semi-desert types in lower elevation to ponderosa pine forest in upper elevations. Resource damage potential is high within watershed areas of risk and where fire has not previously occurred within this Fire Management Zone. In accordance with the *Draft Revised Standards and Guides for Management Ignited Prescribed Fire/Wildland Fire Use Apache-Sitgreaves National Forests Land and Resource Management Plan* (2005), “fire is the

primary management tool for maintaining and/or enhancing the primitive values of the areas. A systematic program of planned prescribed burning or wildland fire use for resource benefit may be undertaken to accomplish management area objectives." Prescribed fire will be the primary tool for wildland fuel mitigation in the Blue Range Primitive Area. The use of fire, helicopters, and hand tools for the preparation of wildland fire use management triggers the need for NEPA documentation. During a wildfire emergency, mechanical and aerial fire fighting equipment can be used subject to Forests Supervisor approval. The combination of fuel load, topography, poor access, and ineffective communication increases the potential severity of wildland fire to both property and public/firefighter safety.

2. Eagle Creek Area

The Eagle Creek Area is located along the western edge of Greenlee County, in the Clifton Ranger District of the A-S NFs and adjacent to the San Carlos Indian Reservation. Eagle Creek is a "Category 2 intermix community" as described within the *Federal Register Vol. 66, No 3.* (2001). Significant infrastructure adjacent to the Eagle Creek Area includes the Arizona Department of Transportation (ADOT) maintenance yard located on US 191 immediately west of the FR 217 junction, the Phelps Dodge water pumping facilities located immediately east of Eagle Creek at Big Dry Canyon and Bear Canyon, and the Trail Cabin FS administrative site at the junction of FR 217 and US 191. Access to Upper Eagle Creek is from FR 217, originating at US 191 north of Clifton-Morenci, or from the San Carlos Indian Reservation Road 4 from the east. Upper Eagle Creek contains several parcels of private land that collectively constitute the Community of Upper Eagle Creek, which at one time supported the Eagle Creek School House. The historic Eagle Creek School House still remains and serves as a local community center. The intermix community of Eagle Creek is located within the riparian corridor of Eagle Creek, which serves as a domestic and irrigation water source; water is also pumped from the area by Phelps Dodge for downstream mining operations in Morenci. The community is comprised of 14 private land parcels supporting 31 full time and 4 part-time residents. This community was founded as a livestock producing community with associated pasture and crop production. However, in recent years Upper Eagle Creek has become a significant hunting area for deer, elk, bear and mountain lion as well as for general outdoor recreation.

As opposed to the heavier fueled vegetative communities in the northern portion of the WUI, the second CAG, focused on the southern section of the WUI, is concerned primarily about wildfire threats from the riparian vegetation along the creek, flashy grassland fuels, and thick shrub dominated fuels. Access to the private lands along Upper Eagle Creek is restricted to the unimproved, single lane, dirt surfaced FR 217. This creates a situation of a single escape route from the private lands if evacuation from a catastrophic wildfire event were to occur. Conversely, the only response access to fire occurrence for ground-based equipment is also from FR 217. Initial wildland fire response would be from the Clifton Ranger District. The Clifton Ranger District does not have a wildland fire engine in the vicinity, but does maintain a fire crew of 6–7 personnel at the Strayhorse Administrative Area from mid-May through September. On occasions during critical fire danger periods the Clifton Ranger District may staff additional resources at the Trail Cabin FS Administrative Site located at the intersection of FR 217/US 191.

Communication with residents of Eagle Creek is sporadic, at best. There are no telephone landlines to the community and only intermittent cellular phone coverage. Resident notification of a catastrophic event would be successful from personal contact by responding emergency response personnel. No other way currently exists to ensure communication with residents or visitors of Upper Eagle Creek. Due to the remoteness of the community, current delay in wildland fire suppression response time, and lack of communication, the second CAG will recommend the Clifton Ranger District acquire and maintain a fire response staff and appropriate ground based equipment (type 6 engine) in the Eagle Creek Area. The FS will pursue improving current initial attack capabilities of existing resources. The Strayhorse crew may include a type 6 engine and/or increased crew size; the Clifton District may also position an engine and crew during periods of high fire danger in other areas along US 191, or at the district office. Eagle Creek residents also recommend Greenlee County continue Emergency Response Planning and include enhanced communication equipment on Rose Peak and a coordinated “phone tree” communication process for enhanced telephone/radio notification of residents during catastrophic wildland fire. The Eagle Creek Community also recommends that up to four residents per year be provided with wildland/structural fire fighting equipment and the training necessary for initial attack of wildland fire within the community.

Eagle Creek does provide extensive outdoor recreational opportunities, and the ANF has developed campground facilities in Eagle Creek to support recreational users. The diversions and water delivery (open ditch) systems transport water to irrigated fields within private lands. These structures support agriculture within the community and provide domestic livestock water sources. The riparian corridors associated with the Upper Eagle Creek include occupied habitat for endangered or threatened species such as the Chiricahua and lowland leopard frogs and loach minnow. Eagle Creek is known for its scenic beauty, historical, cultural, recreational, and wildlife values which are significant values to the community, county, and the A-S NFs. Habitat enhancing treatments for reducing wildland fuel and lessening 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 and will also protect the significant values of Eagle Creek.

With an estimated year-round population of slightly more than 30 residents, Upper Eagle Creek experiences seasonal visitation associated with the recreational opportunities located in the region. This includes increases in visitors during the summer months, and during the fall big and small game hunting seasons. The increase in visitations, as well as the dispersed nature of campers during early fall hunting seasons, increases the need for communication and rapid fire suppression response. The community of Eagle Creek is not in a fire district. Initial response for suppression of wildland fire in the WUI is from the Clifton Ranger District of the A-S NFs. The FS fire response does not include actual structural protection since structure protection is not the function or training of FS wildland fire response crews. Additional fire protection to this area of the WUI is provided by aerial response from the A-S NFs. The Clifton Ranger District has identified helispots for fire response and emergency evacuation, if necessary. The Clifton Ranger District has also completed a structural assessment that describes risk from wildland fire and provides recommendations for fire risk mitigation for almost all private inholdings in the Eagle Creek Area.

3. Morenci Area

The Morenci Area of the WUI consists of Phelps Dodge owned lands and the properties in and around Granville. Morenci was settled in the late 1800s as a mining town; and mining is still the leading economy in the area. The community of Morenci is not incorporated; however, it is home to one of the nation's largest open pit copper mines. Granville consists of the Granville campground, a FS recreation site that receives an estimated 85 recreational visitors per day during the summer months, six FS permitted recreation residences, and the Cherry Lodge Recreational Area. Being in close proximity to Morenci, Granville is used by local residents and community visitors as an outdoor recreation area that provides respite from the heat during the summer months.

US 191 passes through Morenci and is the primary business center where most commercial development is located. The Morenci Area is reported to have a population of over 1,800 residents occupying over 750 housing units (U.S. Census Bureau http://factfinder.census.gov). Morenci does support a Unified School District and fire department through Phelps Dodge, but does not have a police department. Fire response to the mine and the residents in Morenci is provided by the Phelps Dodge Fire Response personnel, while fire response to Granville is from the Clifton Ranger District of the A-S NFs.

There is Threatened and Endangered Species (TES) habitat in the Morenci Area along Lower Eagle Creek. The riparian habitat has been identified as potential habitat for spikedace and razorback sucker. There are additional significant riparian values and wildlife habitat in the San Francisco River and Chase Creek where they bisect the Granville area.

The Morenci Area is located within the uplands habitat west of Chase Creek and the San Francisco River at an elevation of just over 4,700 feet. Vegetation ranges from pinyon pine and juniper woodlands in the north to desert shrub in the south. The CAGs considered threats to the Morenci Area from human caused fire starts within recreation areas, the WUI, and natural fire starts within the WUI adjacent to the private lands of the community.

4. Clifton Area

This area of the WUI includes Clifton and the developments of Loma Linda, Verde Lee and the Big Lue Ranch. The Clifton Area also includes the power line supplying electrical power to the eastern portion of the WUI. The second CAG recommends additional fuel reduction treatments be implemented adjacent to the power line easement to ensure protection during wildland fire or a prescribed burn.

Lying south of the confluence of the Blue and San Francisco Rivers is the community of Clifton. Clifton was incorporated in 1909 and has always been the county seat. Clifton, known as the birthplace of Geronimo, includes the historic Chase Creek Business District lying along US 191. The historic Chase Creek Business District maintains a number of buildings that are among the best-preserved examples of Territorial Period Architecture in Arizona. In its heyday Chase Creek gave Clifton a reputation as the "town tougher than Tombstone." Mining and mineral processing dominate the economy of Clifton, with Phelps Dodge being the major employer.

The Clifton Area is an interspersion of several habitats, including perennial streams and riparian corridors of willows/cottonwoods or monotypic stands of saltcedar along the San Francisco River. Also

characteristic of the upland habitats are large expanses of unbroken desert lands, rocky bluffs, and scattered juniper woodlands. The elevation of Clifton ranges from just below 3,500 to just under 4,500 feet above mean sea level. Major vegetation types in the community include desert shrub and grasslands in the southern portion of the WUI area to pinyon-juniper woodlands in the north. There are no identified TES species or critical habitat designations within the Clifton Area. However, significant riparian values exist within the San Francisco River and Chase Creek. These riparian corridors provide for community recreation areas and habitat for diverse wildlife species.

The CAGs also consider catastrophic wildland fire in the watersheds above the community as a major community threat, in addition to wildfire in the WUI. Subsequent to such a catastrophic wildland fire in the upper watersheds the resulting increases in flood and debris flows remain as great, if not a greater, threat to the community as from wildland fire within the WUI.

5. Duncan Area

The Town of Duncan and the associated communities of Franklin, Sheldon, Apache Grove, York, Three Way, and Guthrie are considered the Duncan Area. These communities lie adjacent to, or in the immediate uplands of the Gila River corridor, and contain the County's principle agricultural areas. Approximately 5,000 acres are farmed in these Gila River valley communities. The principle crops include cotton, grains, and vegetables. Livestock production and dairy cattle also play an important role in the local economy. Economics associated with the commercial sector consist primarily of small retail and service establishments (Arizona Department of Commerce Community Profile, 2004).

The Duncan Area has a broad range of community facilities, including a public museum, public parks, a library, and a golf course. The estimated year-round population of Duncan is just over 800 residents with an estimated population from the 2000 Census of approximately 3,500 residents in the Duncan Area. The major vegetative communities of the Duncan Area include the riparian corridor of the Gila River and associated desert shrub on adjacent uplands. The CAGs considered the principle fire hazard for the community to be human or natural fire starts within the heavily overdense monotypic salt cedar stands that dominate riparian areas of the Gila River within and adjacent to private lands. The CAGs also consider catastrophic wildland fire within the upper Gila watershed above the communities as a major community threat, in addition to wildfire within the WUI. Subsequent to such a catastrophic wildland fire on the upper watersheds the resultant potential increases in flood and debris flows remain as great, if not a greater, threat to the communities as from wildland fire within the WUI.

The CAGs also recommends watershed enhancing treatments to be conducted on the Upper Gila Watershed within the state of New Mexico to protect downstream communities from potentially devastating flood and debris flows that could originate as a result of catastrophic wildland fire in the upper watershed.

6. At-risk Private Inholdings:

<u>Tule Springs Ranch</u>

Tule Springs Ranch is located west of US 191. There has been no Wildfire Home Assessment completed for the property. It is recommended that an assessment be conducted.

T Links Ranch

T Links Ranch is located east of US 191 along the Juan Miller Road (FR 475). The Juan Miller Road is rocky, steep in areas with only four-by-four vehicle access to the Blue River. The nearest water sources would be at Blue River and at Trail Cabin Work Center on US 191.

6k6 Ranch

The 6k6 Ranch lies mainly within a flat area, west of US 191 off FR 515. The ranch is comprised of four outbuildings, two propane tanks, and a fuel storage tank. A small well for drinking water is the only reliable water source around the ranch. Light fuels (grasses) can be mowed to improve defensibility. A water system (sprinklers) would be optimal protection in the event of a wildfire.

Mallet Ranch

The Mallet Ranch is located west of US 191 on FR 515. The ranch is located on a flat valley bottom, but the main structure is near a steep hill. There is a large pasture to the southwest of the residence that could serve as both a helispot or safety zone (when burned out). Water source consists of a gravity fed tank, filled by a spring. The spring, however, is not perennial and should not be considered a reliable water source for wildfire suppression use. The ranch has a good chance of being protected if a fire should advance from the southwest. Mechanical thinning on private and FS lands would reduce heavy cured fuel loads. The primary concern with this property is notification and evacuation.

7. Private Assets on FS Lease Land:

Hannagan Meadow Lodge

Hannagan Meadow, located in the Blue Area, is an historic lodge that has been in continuous operation since 1926. The lodge is located south of Alpine Arizona on US 191. The lodge consists of eight guest cabins, a restaurant, a general store, and associated outbuildings.

Granville

Granville, located in the Morenci Area, is a FS recreational development that includes six private cabin lease sites. The Clifton Ranger District of the A-S NF completed a Wildfire Home Assessment Form for each of these private cabins. The FS recommendations for reducing structural ignition from the cabin sites generally include removal of dead vegetation, trimming of ladder fuels, management of ignition sources such as propane tanks and firewood piles, and installation of cabin names or numbers along the main access road for identification purposes. The Clifton Ranger District will coordinate fuel reduction and fire safe landscaping with each cabin lessee.

III. COMMUNITY ASSESSMENT

The community assessment is a risk analysis of potential catastrophic wildfire to the communities identified in the GCWPP. This risk analysis incorporates the current Condition Class, wildfire fuel hazards, risk of ignition, wildfire occurrence, and the at-risk community values. Local preparedness and protection capabilities are also factors that contribute to delineation of areas of concern. The areas of concern for wildfire fuel hazards, risk of ignition and wildfire occurrence, and community values are evaluated and mapped, and then each is 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.

A. Fire Regime and Condition Class

Prior to European settlement of North America, fire played a natural (historical) role on the landscape. Five historical regimes have been identified during that time period based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes include:

Fire Regimes

	Frequency	*Severity*
Regime I	0–35 years	low[a]
Regime II	0–35 years	high[b]
Regime III	35–100^{+} years	low
Regime IV	35–100^{+} years	high
Regime V	200^{+} years	high

[a]<75% of the dominant overstory vegetation replaced
[b]>75% of the dominant overstory vegetation replaced (stand replacement)

The majority of WUI lands consist of Fire Regime I, with Fire Regime II, III, IV, and V comprising the remaining percentage as described in *Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management* (Schmidt et.al. 2002). The ponderosa pine forests in the GCWPP communities have a historic fire cycle of every 3–7 years, consistent with Fire Regime I.

The fire regime 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. There are three classes based on low (Condition Class 1), moderate (Condition Class 2), and high (Condition Class 3) departures from the natural (historical) regime (see Figure 3.1).

The majority of lands in the WUI are currently designated as Condition Class 2 (43 percent), with 25 percent classified as Condition Class 1, and 31 percent classified as Condition Class 3 lands (see Table 3.1). Condition Class 3 lands in the WUI include the Ponderosa Pine Cover Type, with forest density ranging from 67 to 100 percent. Condition Class 2 lands in the WUI also include the Ponderosa

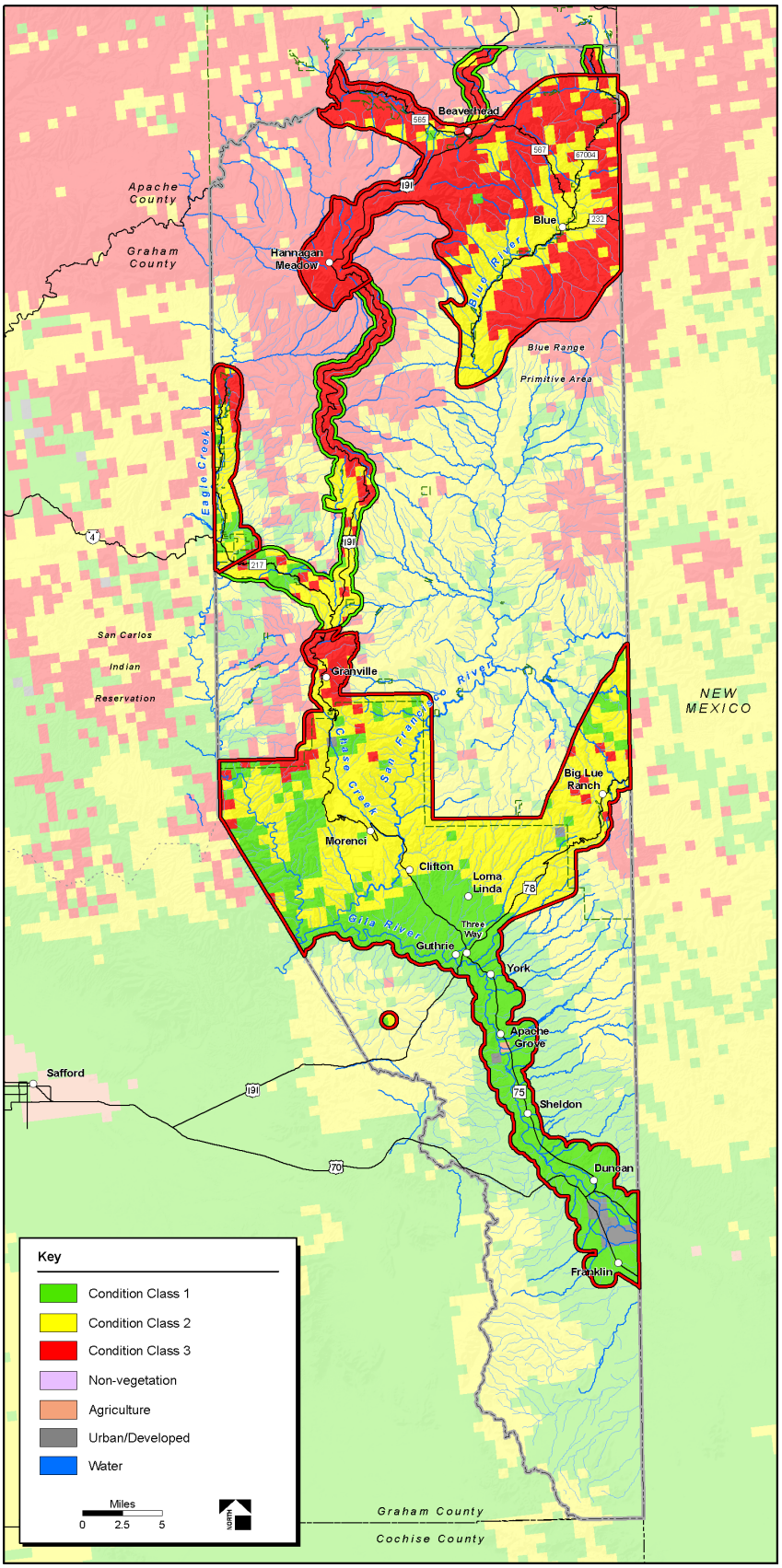

Figure 3.1. Condition Class

Pine Cover Type, but with forest density ranging from 33 to 66 percent. These ratings are developed from Potential Natural Vegetation (such as Ponderosa Pine Cover Type) as the primary natural vegetation type and from the historical fire regime. The following table describes the percentage of each Condition Class in the GCWPP WUI:

Table 3.1 Condition Class by percentage area covered

GCWPP communities	Condition Class 1 (%)	Condition Class 2 (%)	Condition Class 3 (%)
Blue Area	0	32	68
Eagle Creek Area	18	58	22
Clifton Area	33	64	2
Morenci Area	26	61	11
Duncan Area	91	1	0
Total WUI	25	43	31

Source: Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management (Schmidt et.al. 2002)

The desired future condition of federal land is a return to Condition Class 1 as described in *Fire Regime and Condition Class Field Procedures—Standard & Scorecard Methods* (USDA Forest Service 2003):

> Open park-like savanna grassland, or mosaic forest, woodland, or shrub structures maintained by frequent surface or mixed severity fires. [S]urface fires typically burn through a forest understory removing fire-intolerant species and small-size classes and removing <25 percent of the upper layer, thus maintaining an open single-layer overstory of relatively large trees. [M]osaic fires create a mosaic of different-age, postfire savannah forest, woodlands, or open shrub patches by leaving >25 percent of the upper layer (generally <40 hectares [100 acres]). Interval[s] can range up to 50 [years] in systems with high temporal variability.

Semidesert grassland and desert scrub communities desired future condition as described in the *Proposed Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management Finding of No Significant Impact (FONSI) and Environmental Assessment,* BLM 2004.

> Perennial grasses to cover its historic range of variability, annual grass cover is reduced, an adequate cover and mix of natural plant species that have good vigor are dominant. In terms of fire management and fire ecology, the desired future conditions are for fire to control or reduce exotic annual weeds such as red brome and to limit woody vegetation such as juniper, tarbush, whitethorn and creosotebush to non-hazardous levels.

B. Fuel Hazards

The arrangement of fuel, relative flammability, and fire potential of vegetation varies greatly in the WUI. Fuel hazards depend on composition, type, arrangement, and/or condition of vegetation such that, if the fuel were ignited, an at-risk community or its community infrastructure could be threatened. Additionally, the existing topography in an area can create natural firebreaks that help reduce the fuel hazard in communities.

Evaluation of the vegetative fuels on federal and nonfederal land in the WUI was conducted through a spatial analysis using GIS technology in a series of overlays that helped the CAGs 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 3.2 identifies the total amount of land in the untreated areas of the WUI that were evaluated in overall wildland risk because of increased fuel hazards.

Several fuel hazard components, including slope, aspect, vegetation type, vegetation density, ground fuel loads (in relation to vegetation type), and treated areas, were analyzed (see Figures 3.2–3.5). Table 3.3 identifies the different values given to these various fuel hazards components. The influence the components carry were compiled to create areas of high, moderate, and low fuel hazards (Figure 3.6). Areas with dense ponderosa pine tree growth (greater than 100 trees per acre) are shown on the map as having a high risk from fuel hazards.

Recent small-diameter treatments in ponderosa pine stands in the WUI have removed an average of 12 tons per acre. This amount of removed fuel complex is consistent with fuel model 10 as described in *Aids to Determining Fuel Models for Estimating Fire Behavior* (Anderson 1982) for the timber vegetation type. Therefore, an overall estimate of 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 ponderosa pine vegetation type. This fuel model type was considered highest in fuels risk. Fuel model 4 represents the 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. This includes the chaparral, mixed gray oak, mountain mahogany, manzanita, pinyon and juniper vegetative types. Saltcedar vegetative communities depending on vertical height, density, and understory components could be considered fuel model 4. Fuel loading is estimated to average 13 tons per acre with dead woody material distributed both vertically within the canopy and in the fuel bed. Vegetative components of this fuel model were considered as moderate risk.

Fuel model 6 consists of a broad range of shrub conditions, including stands of chaparral, oak brush, mesquite and hardwood slash. Fuel loads vary from 3 to 8 tons per acre and average 6 tons per acre for all live and dead fuels greater than 3 inches. Vegetative components of this fuel model were considered as lower risk. Areas with 40 percent slopes or greater and in an area of high or moderate ground fuels because of vegetation type and density, create high risk from fuel hazards. 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 shown as moderate risk from fuel hazards. All other areas have low risk from fuel hazards, including the areas that have been previously treated or burned.

Table 3.2. Fuel hazards

GCWPP communities	Total land area (acres)	Treated and untreated lands (acres)	Ponderosa pine[a] >100 trees/ acre (untreated acreage)	Slopes ≥ 40%[b] (untreated acreage)	South-, southwest-, or west-facing slopes[b] (untreated acreage)
Blue Area	140,084	*treated:* 33,447 *untreated:* 105,594 *proposed:* 1,043	50,687	48,610	54,086
Eagle Creek Area	13,841	*treated:* 0 *untreated:* 13,725 *proposed:* 116	638	1,870	6,861
Clifton Area	87,512	*treated:* 326 *untreated:* 84,274 *proposed:* 2,912	0	16,347	37,681
Morenci Area	90,988	*treated:* 252 *untreated:* 84,424 *proposed:* 6,312	0	49,074	35,351
Duncan Area	48,938	*treated:* 0 *untreated:* 48,938 *proposed:* 0	0	2,122	20,080
Total WUI	**381,363**	***treated:* 34,025** ***untreated:* 336,955** ***proposed:* 10,383**	**51,205**	**118,027**	**154,059**
Evacuation Route	37,813	*treated:* 3,510 *untreated:* 17,111 *proposed:* 17,192	11,582	9,831	15,081

Source: Logan Simpson Design Inc. and A-S NFs database (2004)

[a] Ponderosa pine biotic community

[b] When aspect is south, southwest, or west, or when slope is ≥ 40 percent in areas of pinyon-juniper woodland or grassland, the fuel hazards risk rises to high

Considerable wildfire suppression efforts, coupled with the uninterrupted growth of small-diameter trees, created forest vegetative components that could not support the natural wildfire regime. Subsequently, wildfires became more frequent and severe than ever before in the region's modern history. Vegetated

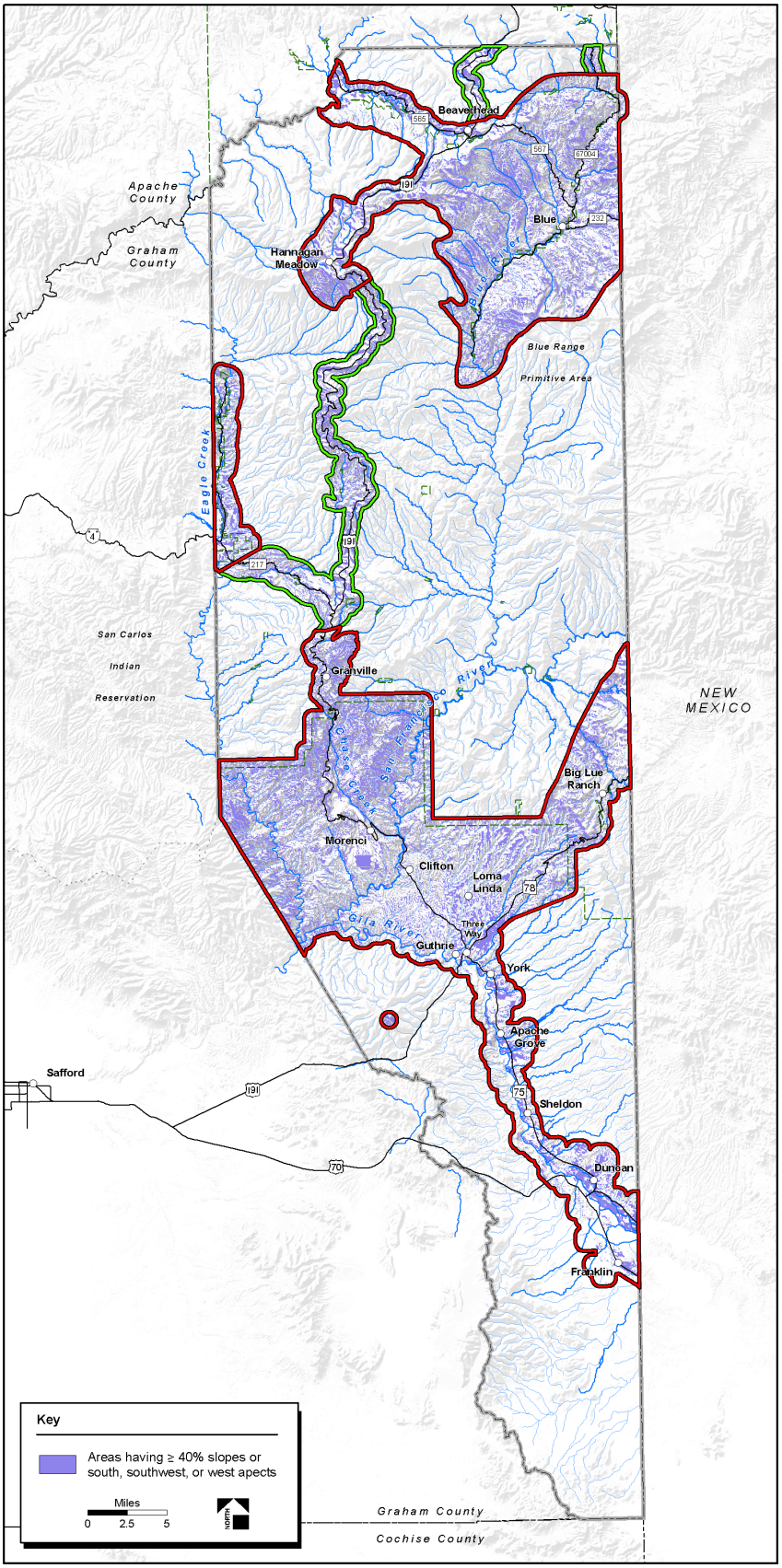

Figure 3.2. Aspect and slope

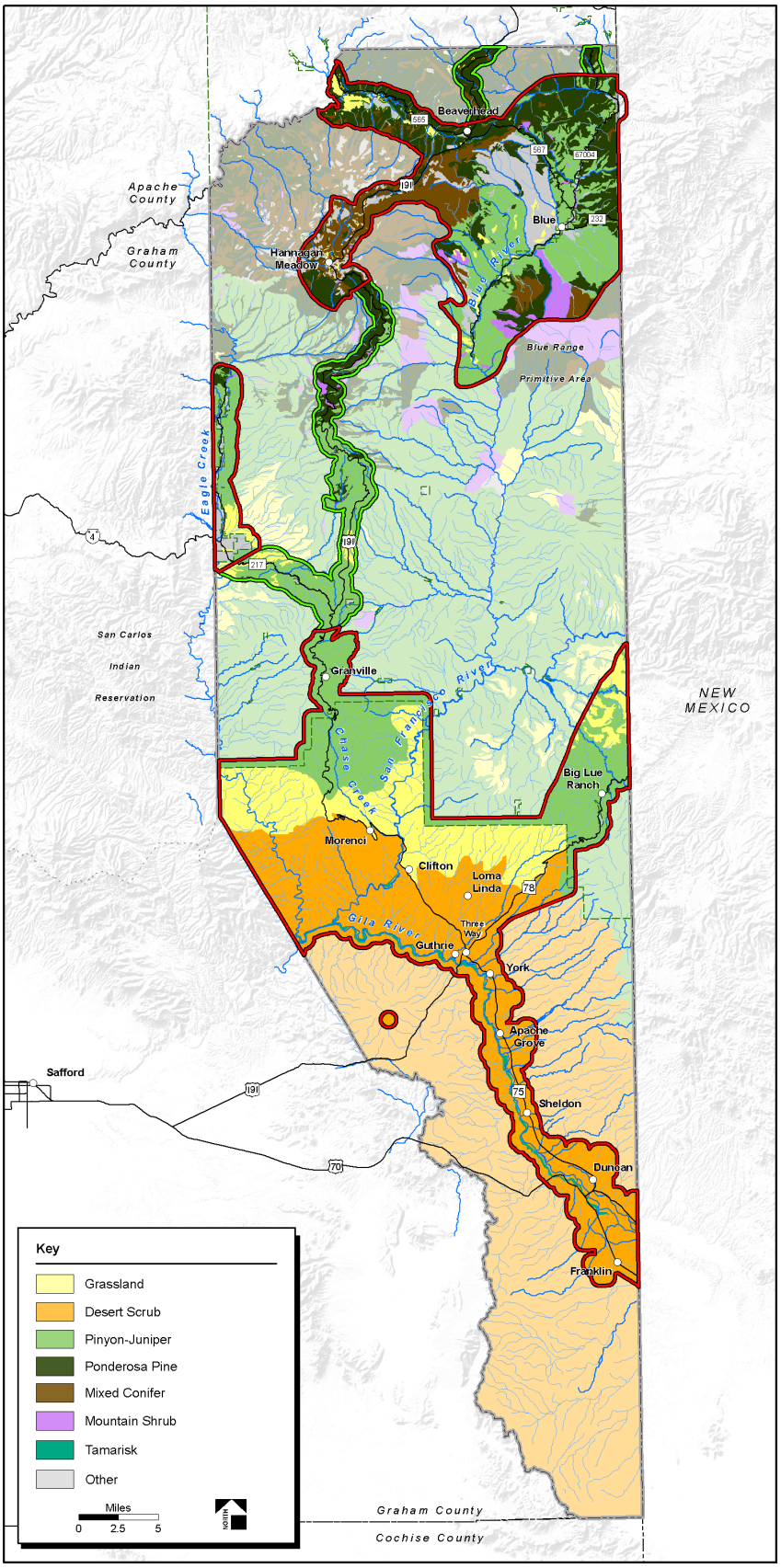

Figure 3.3. Vegetation type

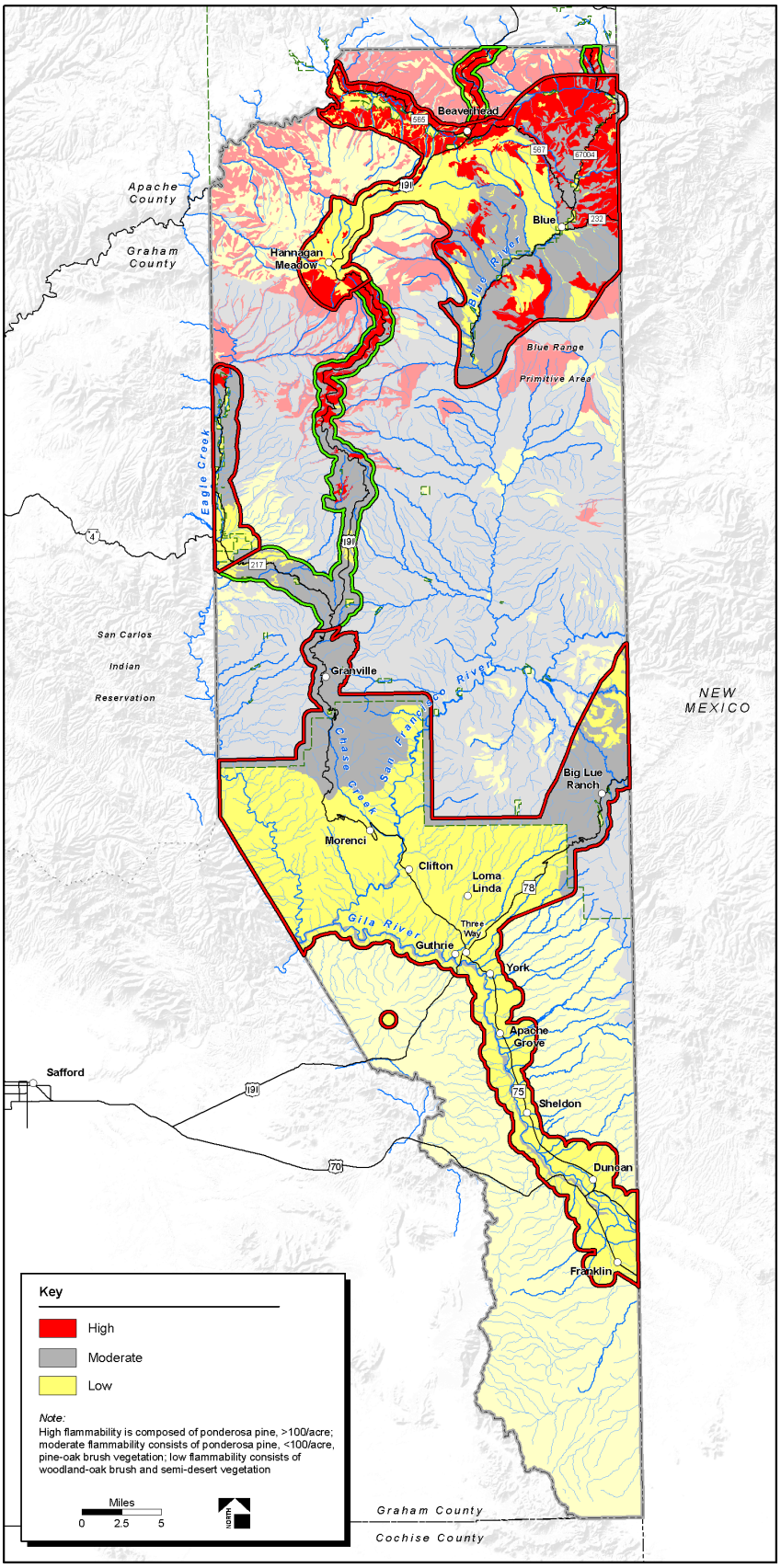

Figure 3.4. Vegetation type and density (flammability)

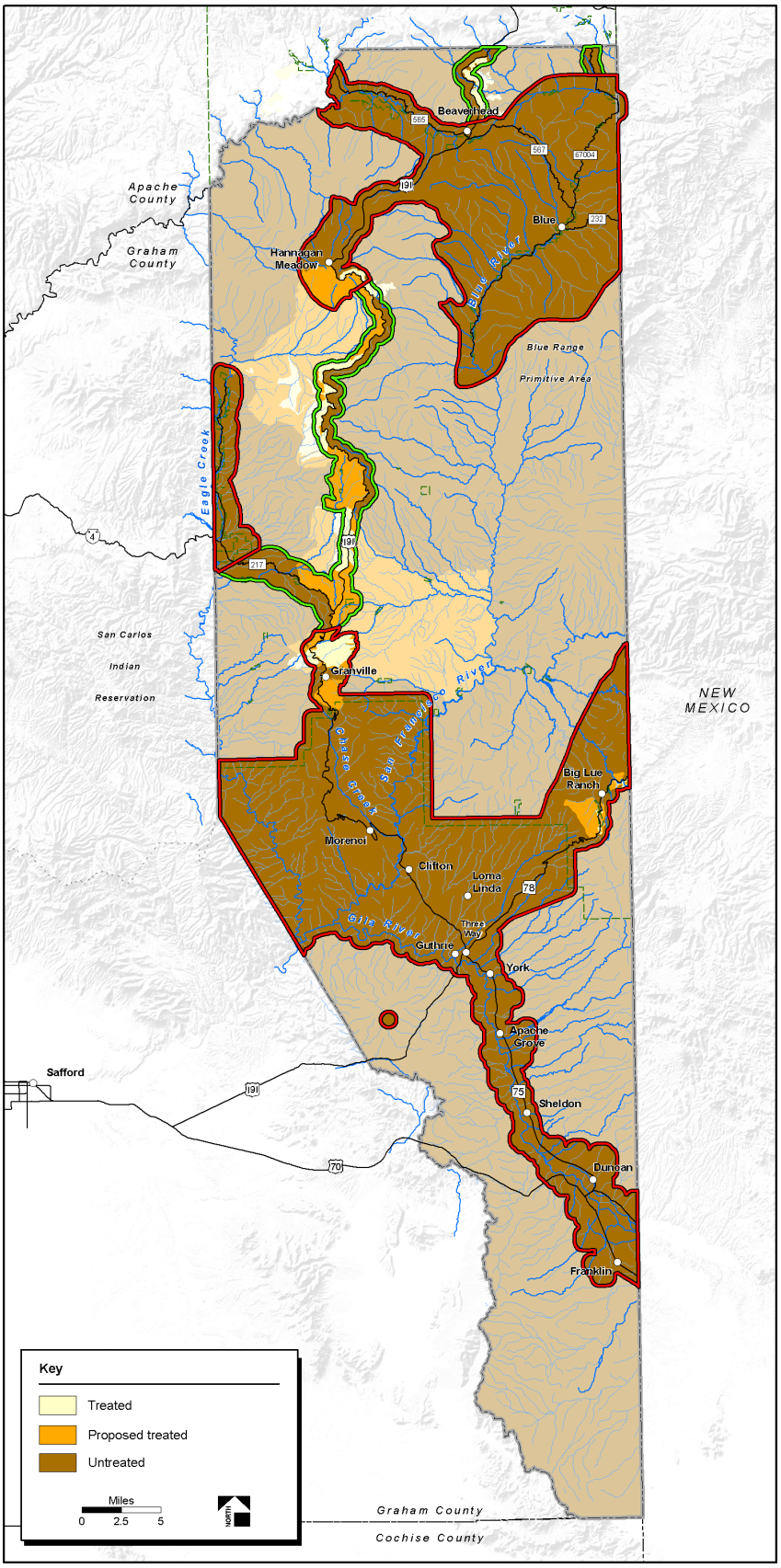

Figure 3.5. Treated, proposed treated, and untreated areas

areas with ponderosa pine densities greater than 100 trees per acre create a greater risk for the spread of wildfire because of the potential crown-fire effect, fuel loading and fuel ladder-fire scenario. Areas of ponderosa pine were differentiated from areas of mixed conifer, pinyon-juniper and pine-oak woodland associations, and oak-brush and semidesert vegetative zones because of the greater associated fire intensity with the former and fire spread with the latter. Resource damage potential is moderate in oak-brush associations and in generally lower in semidesert vegetation types. The vegetative types within the Blue Range Primitive Area (BRPA) consist of ponderosa pine in the upper elevations and woodland oak-brush in lower elevations. The potential for major conflagrations is high in some heavily vegetated areas with high resource damage potential. Planned and systematic prescribed burning is the primary management tool to reduce vegetative fuel accumulation in the BRPA.

Table 3.3. Fuel hazards components

Fuel Hazards Components		Influence[a]
Vegetation type and density	Ponderosa pine, >100/acre	H
	Pine-oak brush vegetation	M
	Woodland oak-brush and semi-desert vegetation	L
Burned areas		L
Slopes ≥ 40 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

Wildland fuels have generally been categorized into four groups: grasses, brush, timber, and slash. The differences in fire behavior among these groups are basically related to fuel load and its distribution. The fuel load is a significant factor in determining whether a fire will be ignited, its rate of spread, and its 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. 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" (Anderson 1982).

Fuels hazards have been correlated with fuel load by vegetation type for this analysis. Semi-desert shrub land vegetative types were estimated to support a total fuel load of less than 7 tons per acre of fuels and are mostly in Condition Class 1 (historic fire regime), pine-oak brush is estimated to support a total fuel load of 13 tons per acre, while ponderosa pine with densities of 100 trees/acre was estimated to support a minimum total fuel load of 12 tons per acre. Table 3.3 shows the influence on risk assessment by vegetative types based on the fuel loads supported by each vegetation group.

Slopes greater than or equal to 40 percent and areas with south-, southwest-, or west-facing slopes were also identified as having greater risks because of the fuel ladder-fire effect associated with steep terrain and decreased humidity associated with the microclimates created by exposed aspects. Areas of the WUI adjacent to major stream channels are steep and heavily dissected, with many areas having slopes exceeding 40 percent. Areas with none of these fuel hazard characteristics and areas that have been treated, or have proposed treatments, are identified as having less risk. See Section III.E. for a fuel hazards summary for each community.

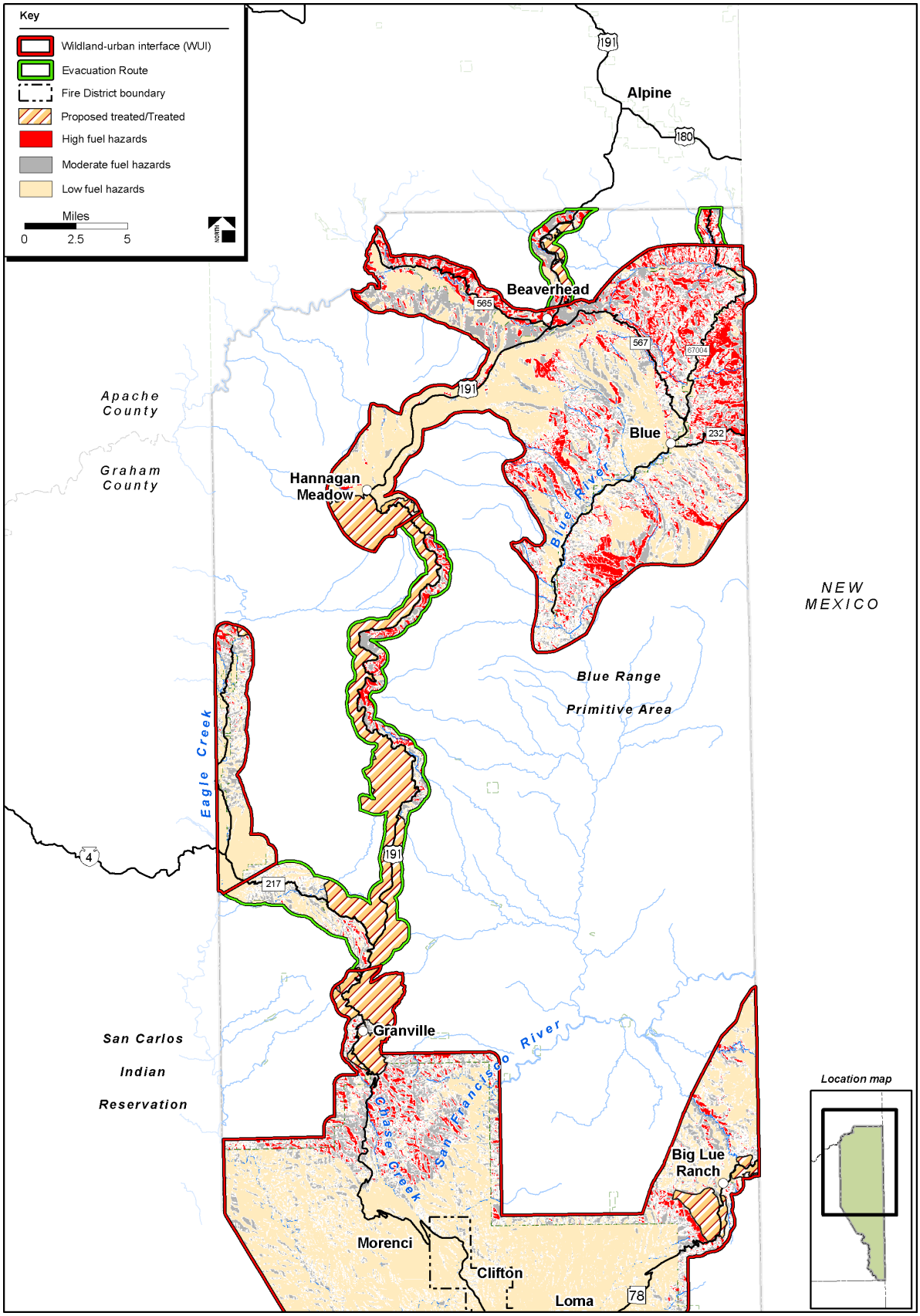

Figure 3.6. Fuel hazards

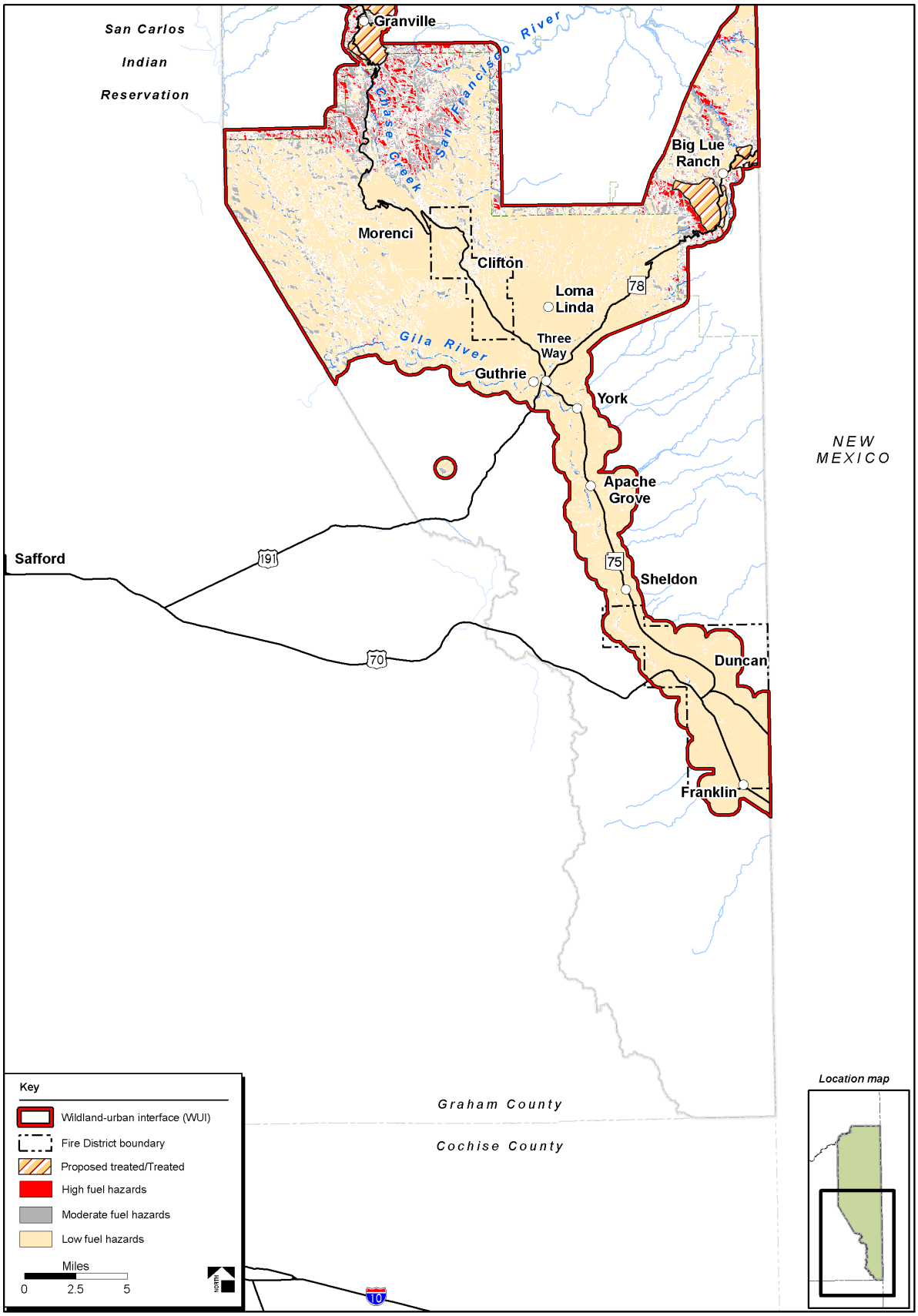

Figure 3.6. Fuel hazards (cont'd)

C. Risk of Ignition and Wildfire Occurrence

Past regional wildfire events are surmounted by the current potential for catastrophic wildfire destruction. Because of the combination of current drought conditions, inability to sufficiently reduce the density of small-diameter trees, and regional history of forest fires, the question is not "if" but "when" there will be a wildfire that threatens the WUI. Fire history for this region has come to the forefront because of the significant wildfires that occurred in or close to the GCWPP area since 1995. Past large fires in the GCWPP include:

Blue Complex

- near Hannagan Meadow
- summer 2003
- 18,802 acres burned

KP Fire

- near Hannagan Meadow
- summer 2004
- 16,091 acres burned

Maverick Fire

- near Big Lue
- spring 2004
- 2,008 acres burned

Rose Fire

- near Rose Peak
- summer 2004
- 884 acres burned

During the 2002–2004 summer fire season, public use restrictions and closures were imposed by the A-S NFs because of severe fire conditions. The common denominators for the region include severe fire weather, high tree-density, and drought as wildfire facilitators. The lightning-fire season begins for this region in spring and can continue until fall. The midsummer monsoon storms typically raise the humidity, reducing the risk of large catastrophic fires.

Table 3.4 details the high, moderate, and low values assigned to fire start incidents. Figure 3.7 corresponds to this table and shows areas with higher frequencies of ignition points, i.e., areas of greater concern. These 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 3.8 details the extent of fires that have occurred within the past 10 years. The combined risk of wildfire occurrence is shown in Figure 3.9. See Section III.E. for a summary discussion of ignition risk and wildfire occurrence in each community.

Table 3.4. Ignition history and wildfire occurrence

Ignition history and wildfire occurrence components	Value
>5 Fire starts/1,000 acres	H
3–4 Fire starts/1,000 acres	M
0–2 Fire starts/1,000 acres	L

Source: Logan Simpson Design Inc. BLM and A-S NFs database (2004)

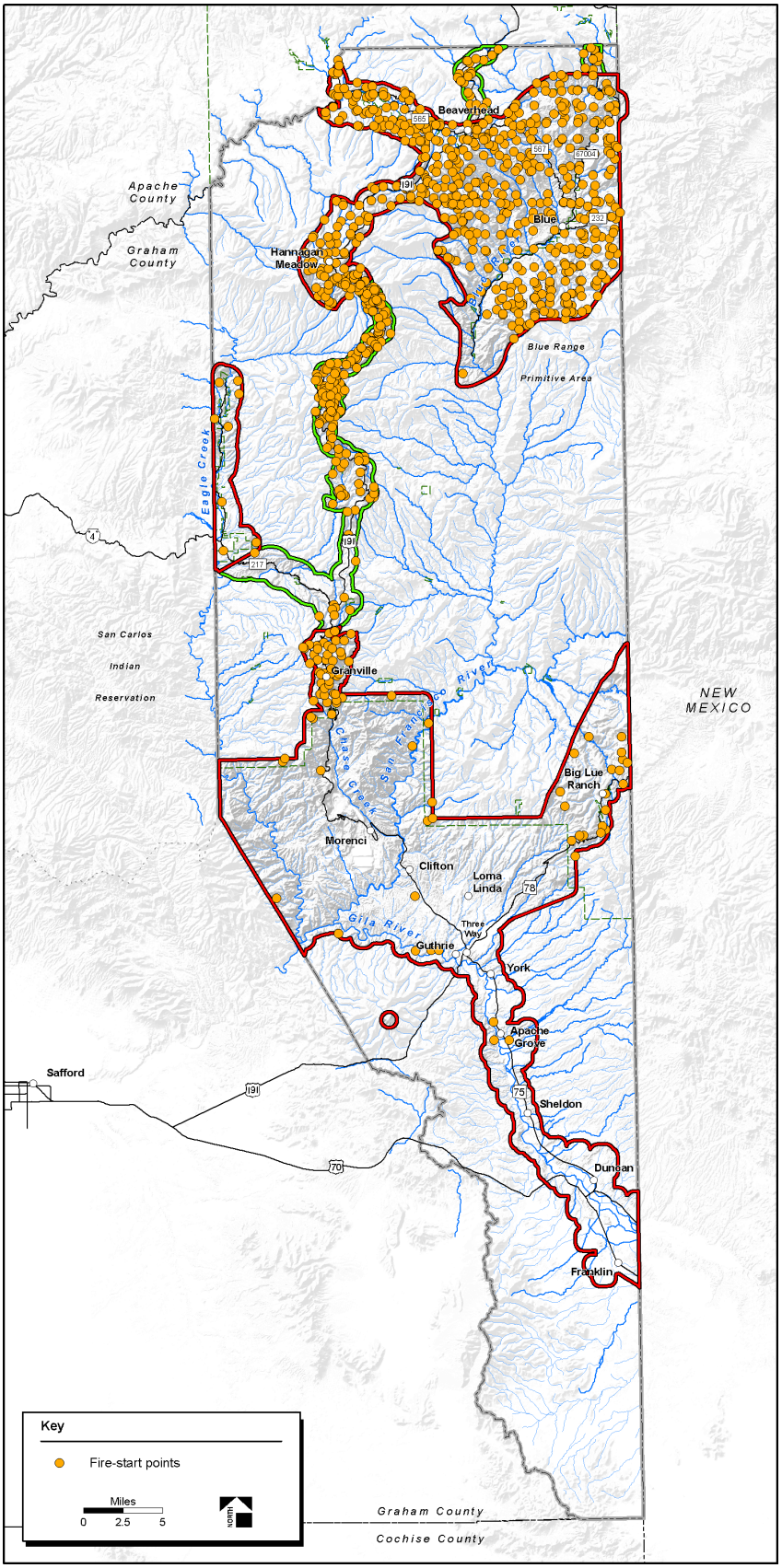

Figure 3.7. Natural and human fire starts

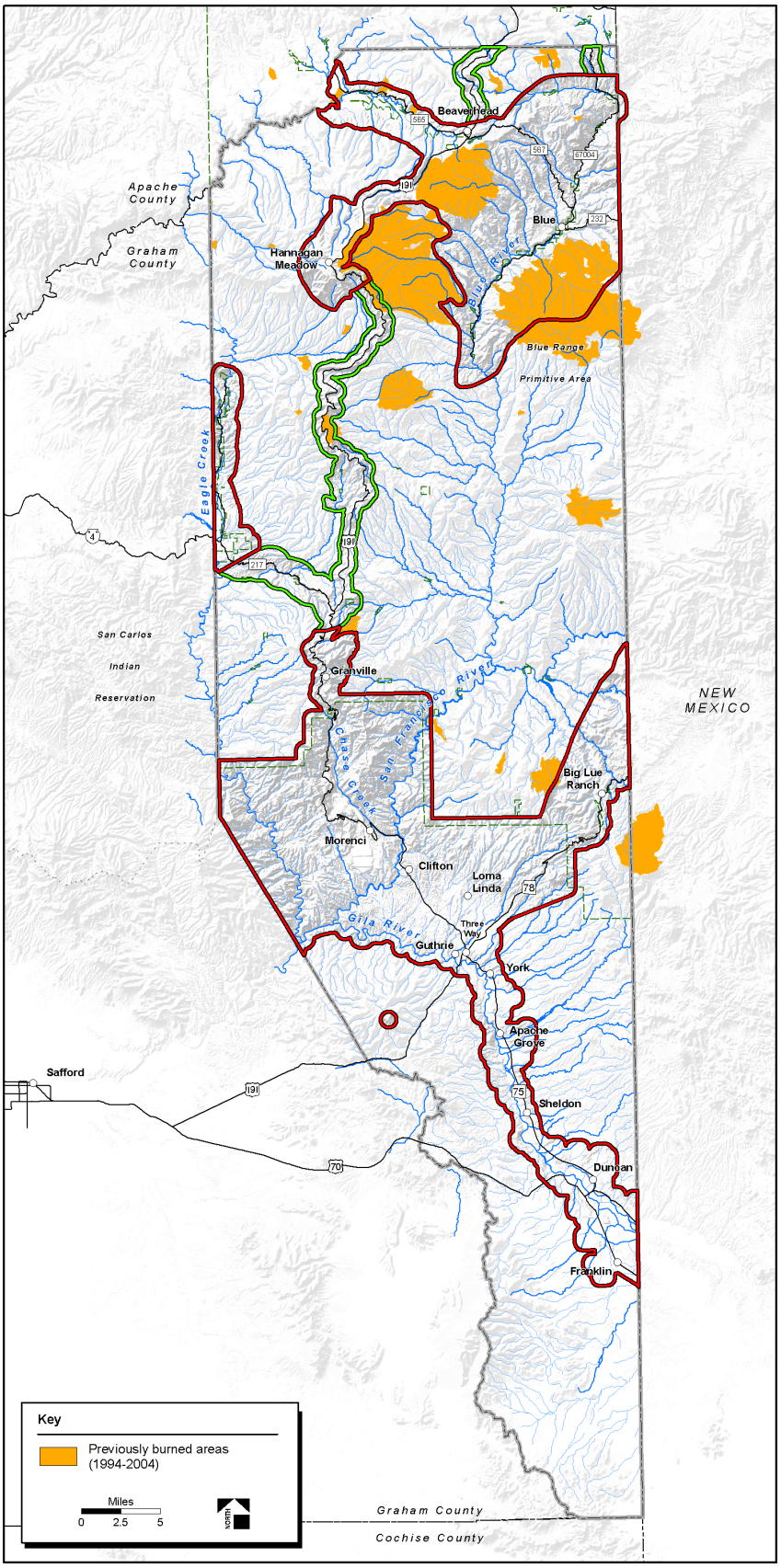

Figure 3.8. Wildfire occurrence history (1994–2004)

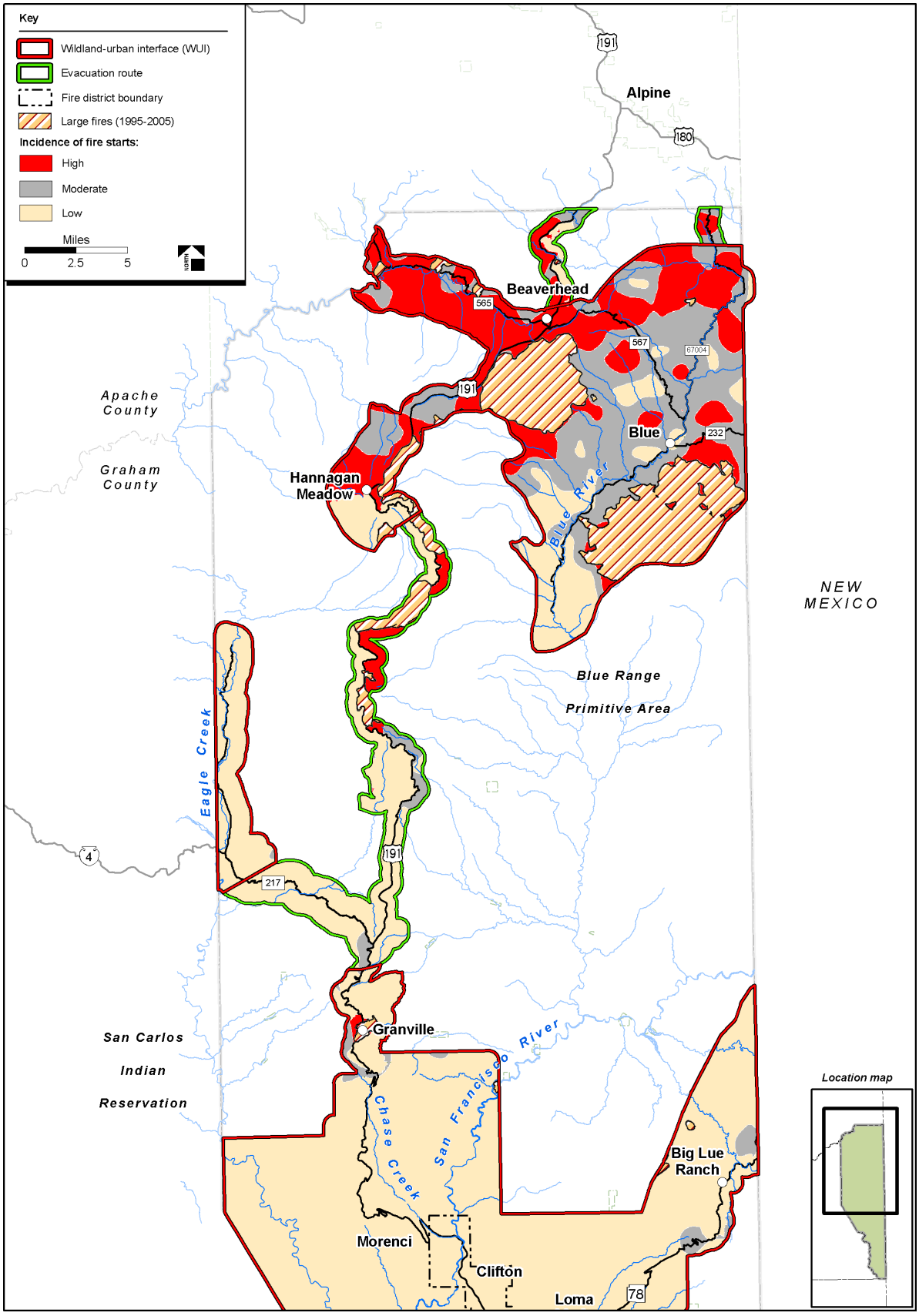

Figure 3.9. Ignition history and wildfire occurrence

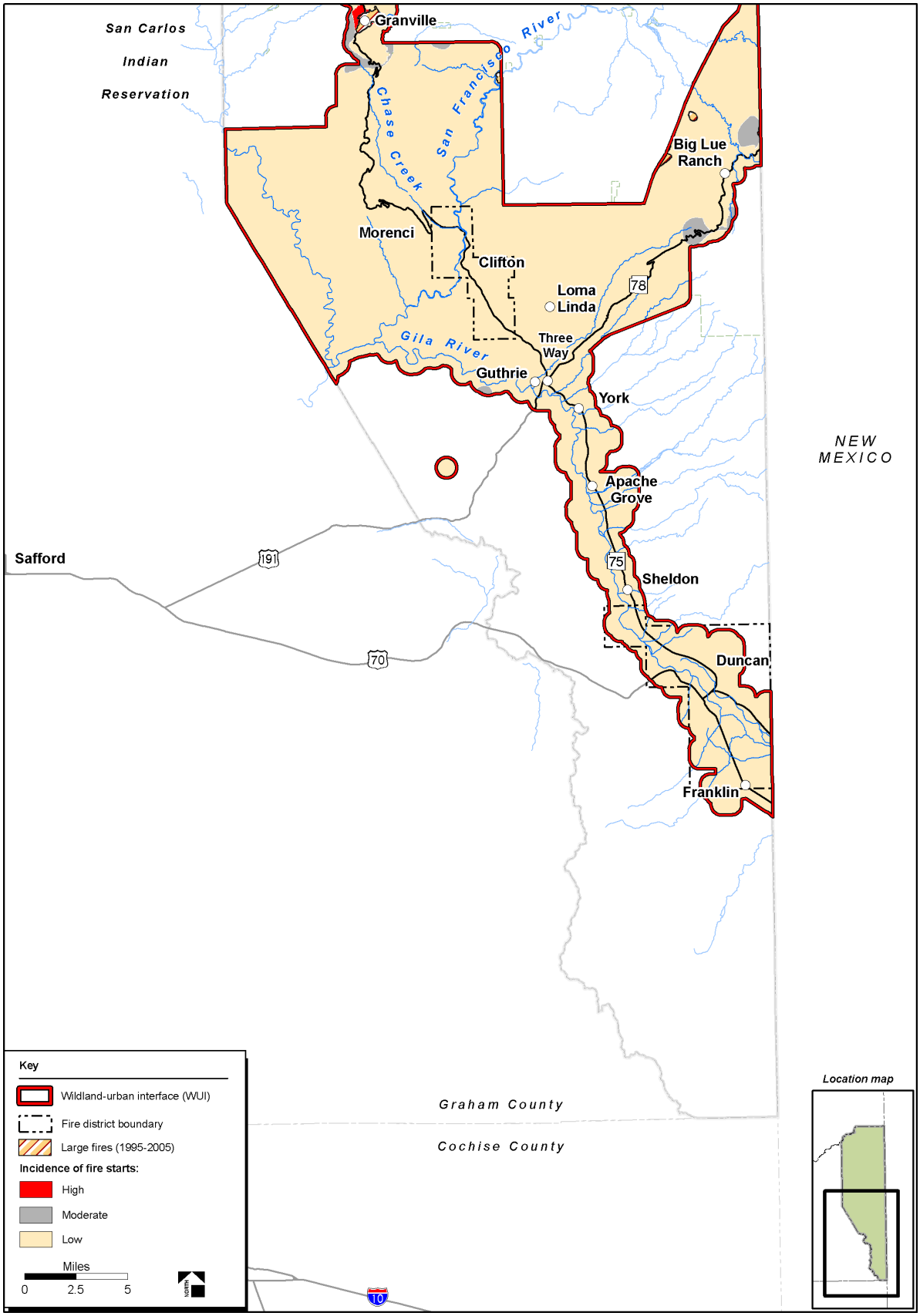

Figure 3.9. Ignition history and wildfire occurrence (cont'd)

D. Community Values at Risk

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

Table 3.5. Community values

Community value components	Value
Housing and businesses structures, infrastructure and escape routes in Condition Class 3	H
Housing and business structures and infrastructure in Condition Class 1 and 2	M
Recreation areas	M
Wildlife habitat	M
All other areas	L

Source: Logan Simpson Design Inc

Community values identified in Table 3.5 and mapped in Figures 3.10–3.12 include housing and businesses structures, essential infrastructure, recreation areas, and wildlife habitat. Developed land, escape routes, and infrastructure within Condition Class 3, the area of highest wildland fire risk, were given the highest value in the community. Developed land, infrastructure, campgrounds, parks and trail systems, and wildlife habitat within Condition Class 1 and 2 were given a moderate value. These components were compiled into a single map (Figure 3.13), which identifies high, moderate, and low areas with respect to valued community elements. The following information further describes the community values in the GCWPP. Section III.E. summarizes community values for each community.

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

The local fire districts, local government personnel, and CAG members have identified high-risk areas including the economic corridors that line US 191, SR 75, and SR 78 that have been and continue to be the focus of community development. Structures associated with housing and commercial development located in subdivisions and in more dispersed areas of the county are also at high risk. The CAGs have also identified significant infrastructures such as power lines and communication facilities that are not within designated WUI or evacuation route corridors and have recommended fuel modification treatments that will reduce the threat of wildland fire impacting these facilities. Transportation corridors between WUI communities that will serve as evacuation routes and resource distribution corridors in the event of wildland fire have been identified by the CAGs. The CAGs have recommended fuel modification treatments for evacuation corridors that will provide safe evacuation from WUI communities in the event of catastrophic wildland fire.

2. Recreation Areas/Wildlife Habitat

Recreational features, including rivers, designated campgrounds, 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 are analyzed as a community value because of the benefits that these recreation areas provide to the local citizens and community visitors. A 50-foot buffer area was delineated for the trail system for planning purposes. 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.

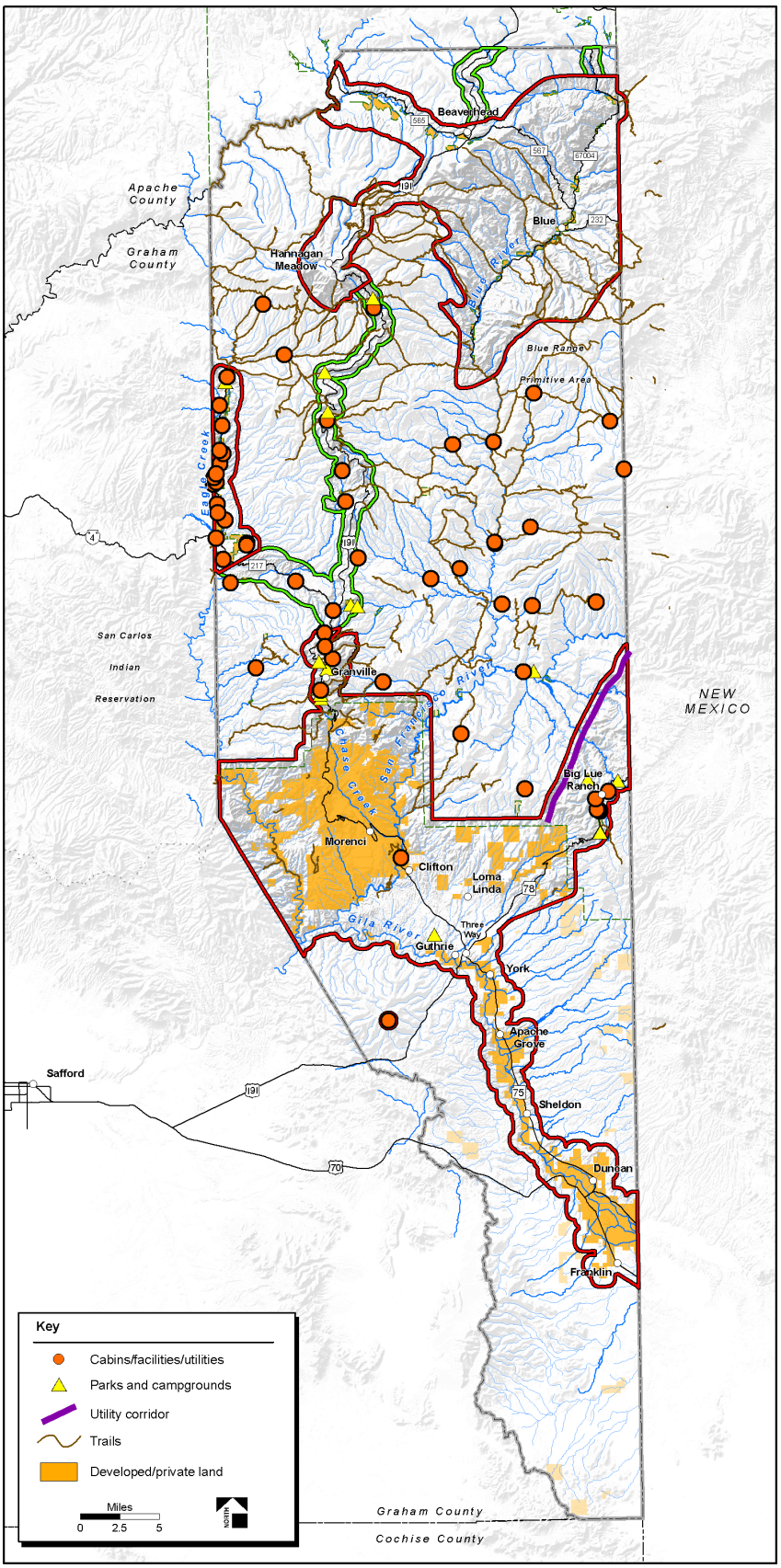

Figure 3.10. Developed land, infrastructure, and designated recreational areas

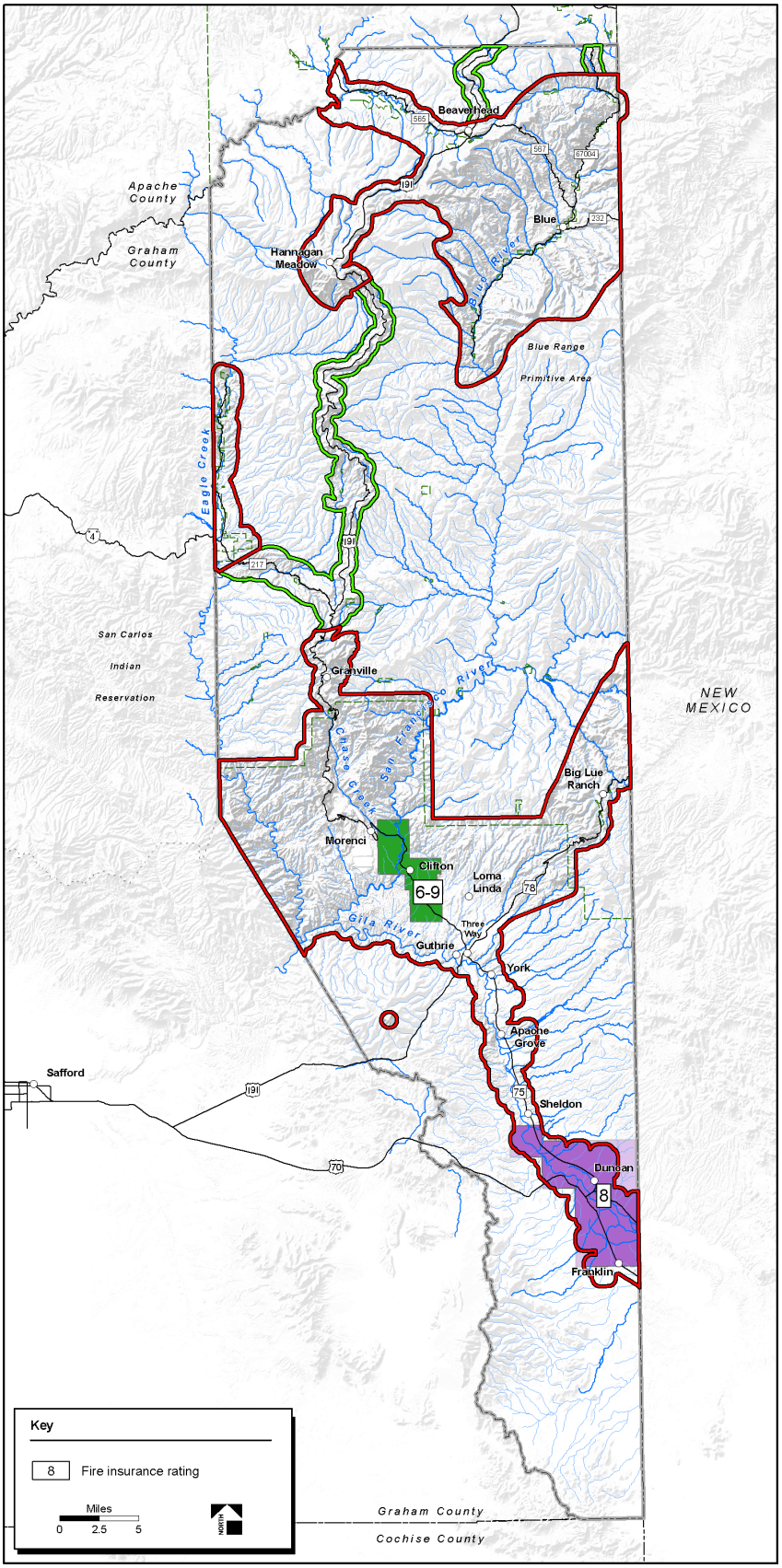

Figure 3.11. Fire insurance ratings

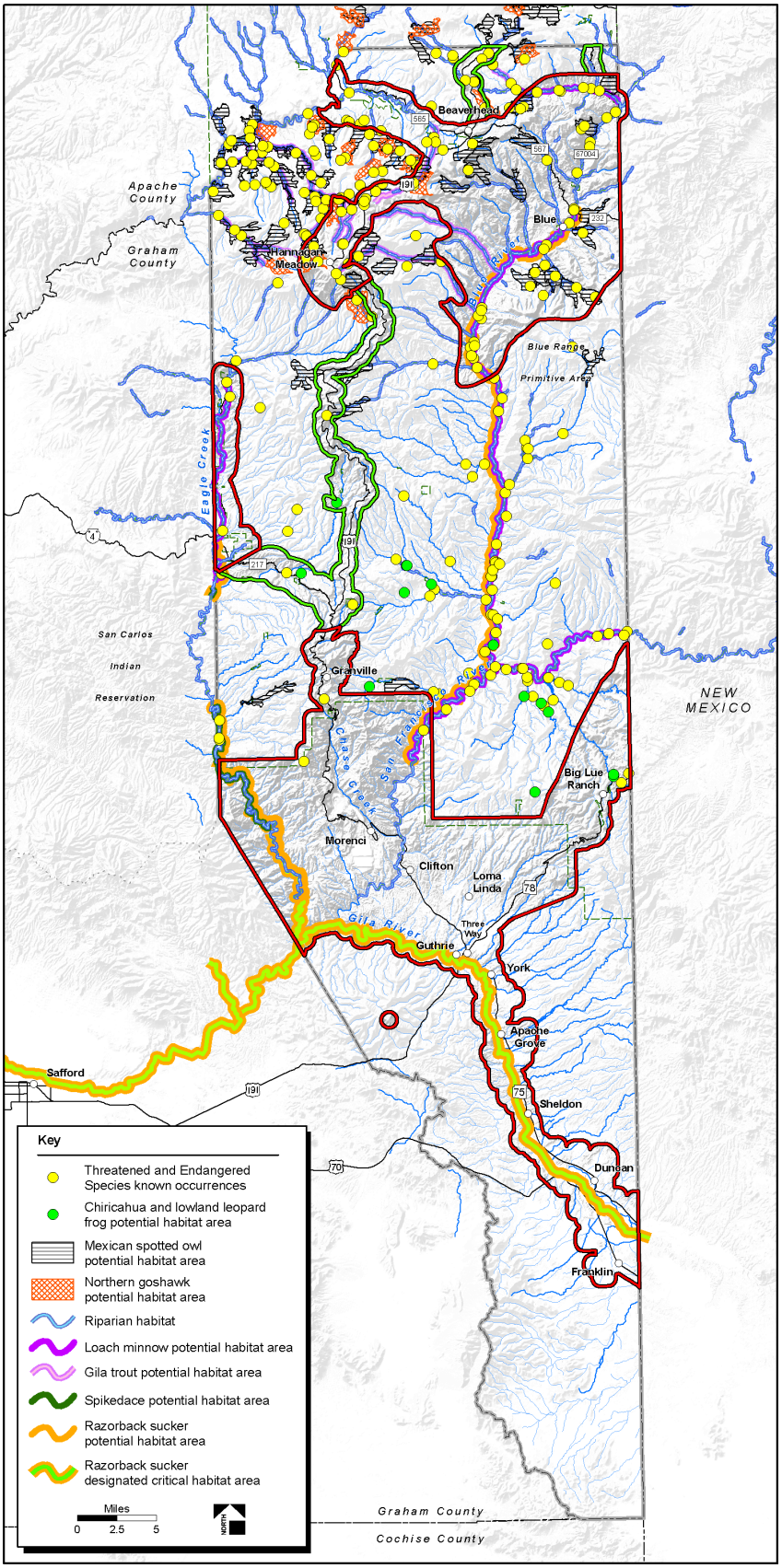

Figure 3.12. Sensitive wildlife habitat

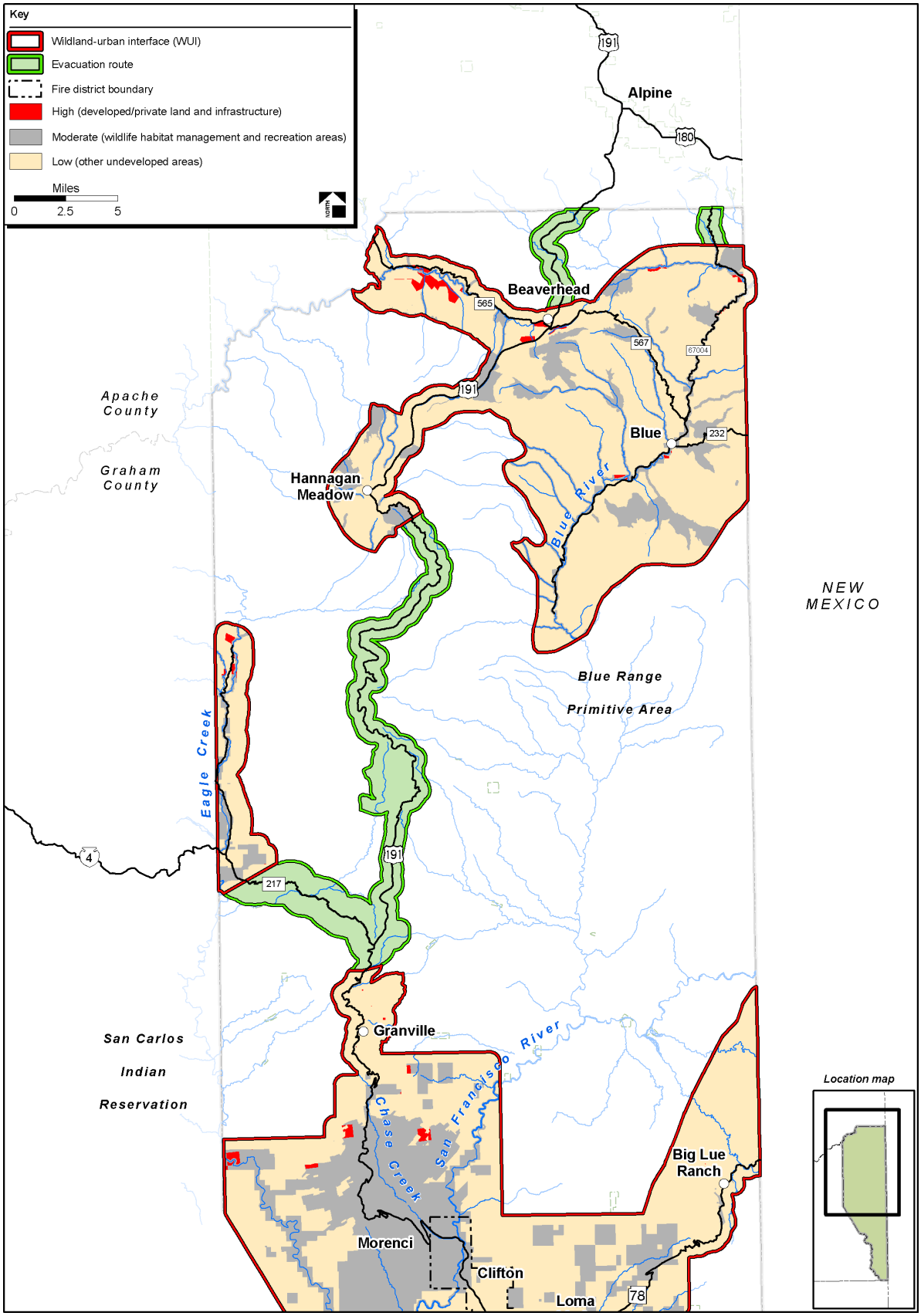

Figure 3.13. Community values

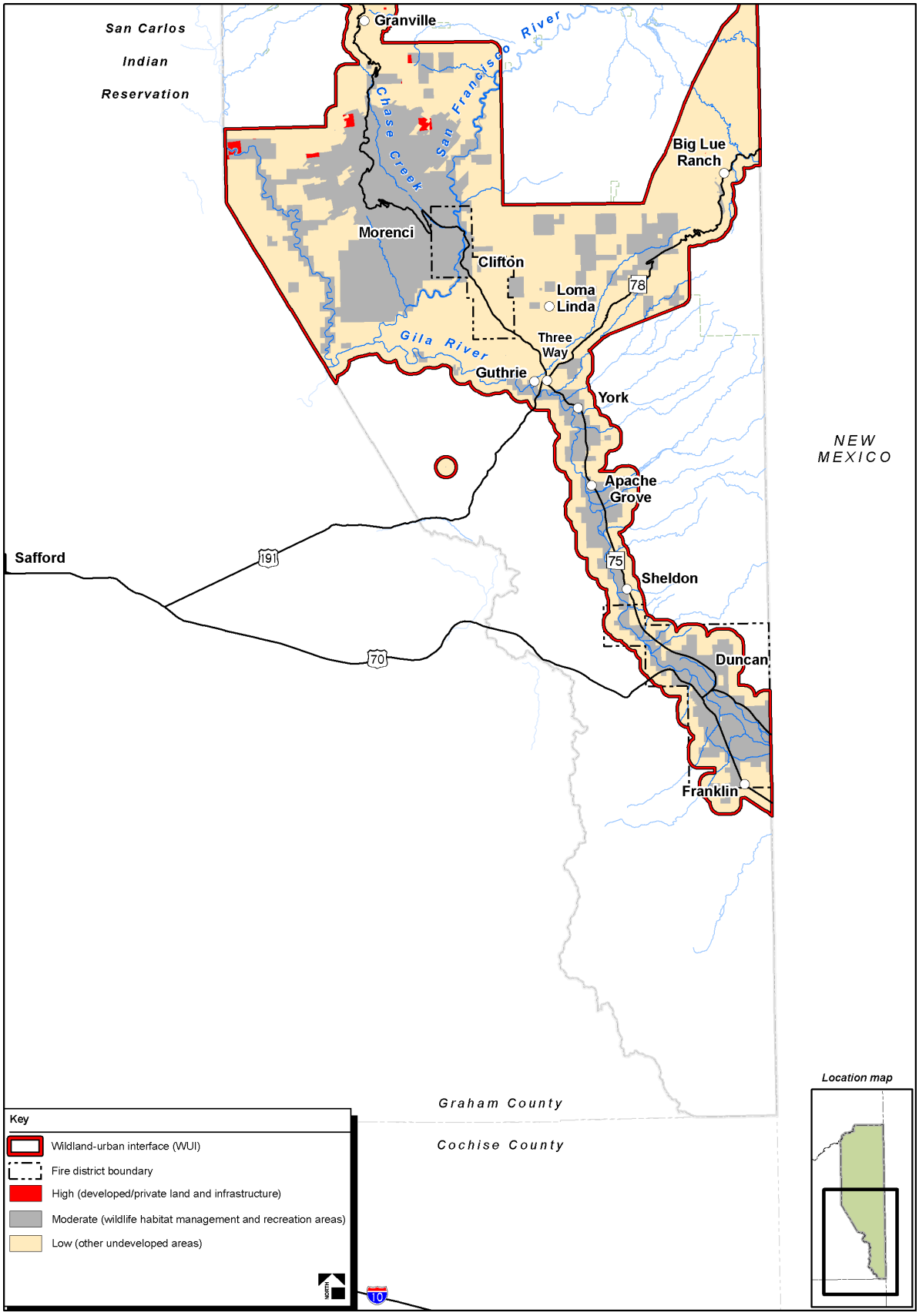

Figure 3.13. Community values (cont'd)

The WUI includes known and potential habitat areas for several species listed as threatened or endangered under the Endangered Species Act (ESA) and for species designated as sensitive by the Regional Forester in 1999 and considered within the *Proposed Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management Finding of No Significant Impact (FONSI) and Environmental Assessment,* BLM 2004 (Appendix 1). The Gila River riparian corridor contains several TES species, such as the Southwestern willow flycatcher. The CAGs have determined that habitat enhancing treatments for reducing wildland fuel and lessening threat of catastrophic wildland fire in the Gila River corridor would assist in preserving the sensitive riparian habitat and wildlife species in accordance with Section 102.a.5.B. of HFRA and will also protect recreational values associated with the Gila River by local residents. If a proposed fuel treatment might potentially affect an ESA listed species, consultation with the USFWS may be required, and, based on the site-specific circumstances, the project may require a more extensive analysis under the NEPA. 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 at the time of planning site-specific treatments. Generally, habitat areas for these species are identified in this analysis as having moderate risk because of their association with community values. A 100-foot buffer area was delineated along the riparian areas and habitats associated with special status species for planning purposes. Additionally, any treatments in these species' habitat areas will require further analysis in accordance with the *Apache-Sitgreaves National Forests Plan* and the *Proposed Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management Finding of No Significant Impact (FONSI) and Environmental Assessment,* BLM 2004*. M*easures to minimize the effects to listed and proposed species were established on FS lands during consultation with the USFWS under a Regional Programmatic Consultation process completed by the FS in 2001 and the BLM in 2004. Implementation of "minimization or conservation measures" is required under the programmatic Biological Opinion issued by USFWS for these projects. Additional evaluation and consultation may be required if project boundary or treatment recommendations are not consistent with proposals outlined in the project Environmental Assessments.

3. Watersheds

The WUI includes several significant watersheds that supply both irrigation and drinking water and provide substantial outdoor recreation opportunities in and around the communities. The watersheds in the WUI consist of both federal and nonfederal lands and include Eagle Creek, Chase Creek, and the Blue, San Francisco, and Gila Rivers. 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 from catastrophic wildfire. The majority of watersheds in the WUI are located on federal lands and are at some level of risk from 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 the recreational sport fisheries in these rivers through inflows of sediment and ash. The downstream communities are also at greater risk after a catastrophic wildland fire in the watershed due to changes in peak stream flow frequency or magnitude, and 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 will minimize fuels, making the projects consistent with the Community Mitigation Plan as identified in Section IV. The fuel reduction treatments recommended in this CWPP are consistent with direction in HFRA for the protection of municipal watersheds by significantly lowering the risk of a catastrophic wildland fire. The CAGs additionally recommend that watershed enhancement planning be initiated by the A-S NFs and BLM to delineate a protection zone around the perimeter of the watersheds that extend into each community municipal watershed. 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.

A healthy watershed can provide many positive attributes. These include water quality, diverse aquatic and wildlife species, and vegetation that protect the soil and prevents erosion. Since watersheds extend beyond property and WUI boundaries the CAGs believe that they are a significant community concern. The CAGs recommend that, in addition to the GCWPP, a Watershed Health Plan be initiated to supplement the treatments identified in this CWPP. The CAGs identified and recommend that Level V watersheds 3, 4, 5, 7, 9, 10, and 12 (see Figure 3.14) be included in the Watershed Health Plan and be prioritized by Condition Class and treatment status. Good stewardship activities can help maintain and enhance a healthy watershed or restore an unhealthy one and lower the risk of a catastrophic wildfire.

The San Francisco and Upper Gila-Mangus watersheds that originate in New Mexico and the Upper Gila-San Carlos Reservoir watershed immediately west of Eagle Creek and northwest of the communities of Morenci and Clifton also have direct effects on the downstream communities in the GCWPP. Although each watershed is not entirely contained in the WUI boundary, the effect of a catastrophic wildfire and its aftermath on the watershed will impact these communities. Heavy monsoon rains over burned watersheds could result in severe fire-related erosion, flooding and destructive debris flows that would place life and property downstream from burned watersheds at great risk. The CAGs recommend that the GCWPP Administrator work with Graham County; the San Carlos Indian Reservation; Catron, Grant and Hidalgo Counties of New Mexico; and associated individual communities that are outside of the analysis area to ensure that any planning efforts concerning those watersheds address the concerns of the downstream communities in Greenlee County.

4. Local Preparedness and Protection Capability

For many years the Insurance Services Office (ISO) has conducted assessments and rated communities on available fire protection. The rating process grades each community's fire protection on a scale of 1–10, (1 being ideal and 10 being poor) based on ISO's Fire Suppression Rating Schedule. There are five factors that make up the ISO fire rating. Water supply, the most important single 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.

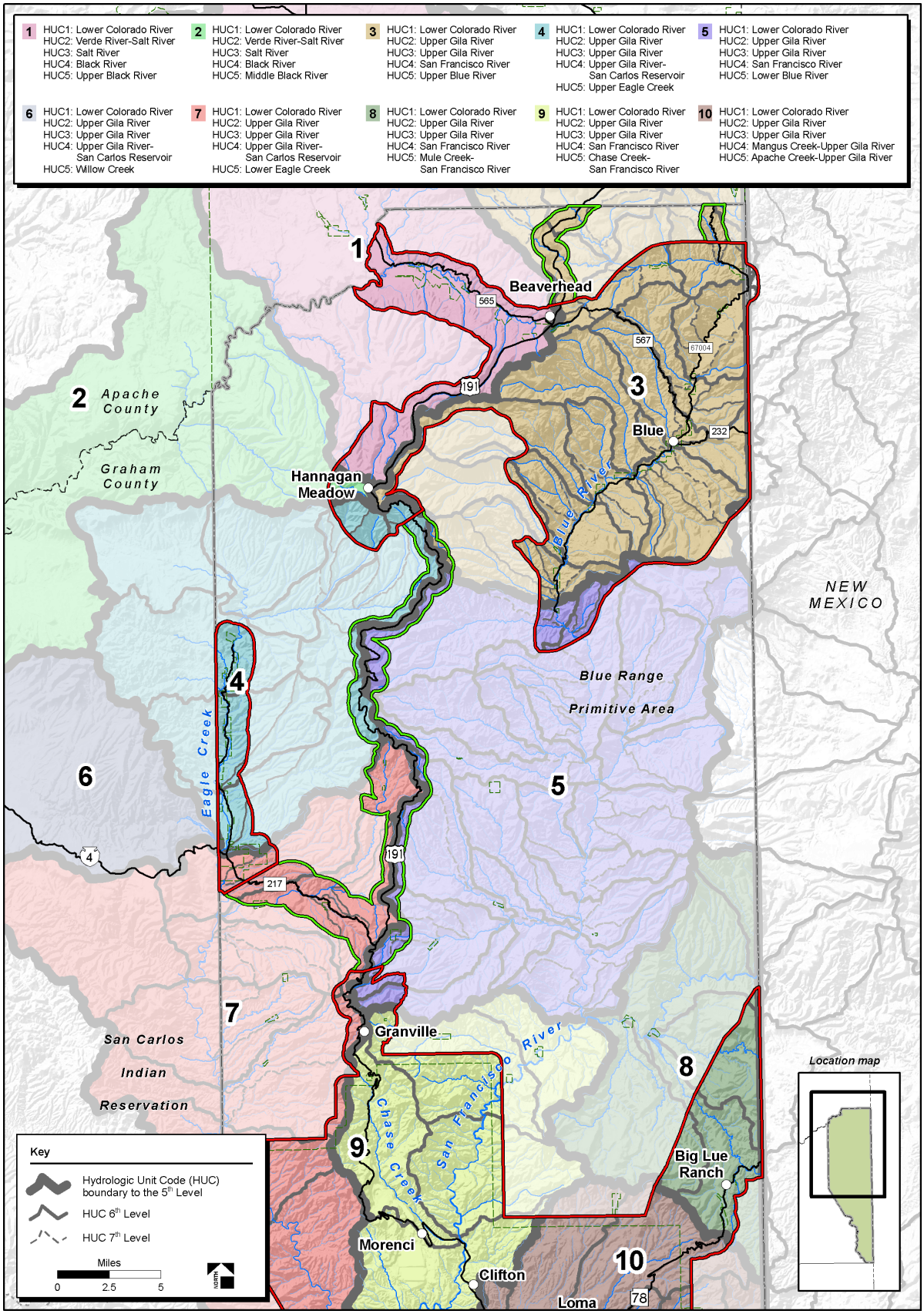

Figure 3.14. Watersheds

The major concern of fire districts in the GCWPP communities is adequate equipment (including the age of the existing equipment) and lack of fire districts. Surface water supplies are limited in all communities. 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.

Greenlee County has developed an evacuation plan for the Blue and Eagle Creek communities in the GCWPP area only. With regard to evacuation procedures, essential items needed in an emergency, the need to report to designated registration/reception centers, notification of evacuation routes, and transportation needs must be developed for the remaining communities located in the WUI.

Greenlee County, in cooperation with the FS, is working with potential partners on the installation of cellular phone tower repeaters for northern Greenlee County. These repeaters will greatly improve emergency communication throughout the county. Potential repeater locations include Guthrie and Rose Peaks, Glenwood Brushy Peak, South Mountain Alpine Peak, the Sheriff's Department site, and Telegraph Peak.

The Duncan Rural Fire District provides protection to over 560 houses in, or in proximity to, the identified WUI, to include the Town of Duncan and Franklin, as well as adjacent rural areas within the fire district boundary. The Clifton Municipal Fire Department provides protection to an estimated 1,100 houses in the Clifton town limits. The Morenci Fire Department provides initial fire response in the community of Morenci and portions of the town of Clifton. However, the Morenci Fire Departments main concern is protecting mine structures and approximately 800 houses in the Morenci community. The surrounding communities of Sheldon, Apache Grove, York, Loma Linda, Verde Lee, and Guthrie currently have no fire response capabilities. Figures 3.11 and 3.13 display local preparedness and protection capabilities, identify the fire district boundaries, and the ISO rating for each identified community.

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 are analyzed spatially and an overall cumulative risk for the WUI is calculated. Table 3.6 and Figure 3.15 display the results of the cumulative risk analyses and translate these results into the relative percentages of WUI areas of high, moderate, and low risk. A summary of the community assessment as it relates to each of the described community's WUI follows below.

1. Blue Area

The Blue Area is mostly composed of Condition Class 3 lands. Some Condition Class 2 lands occur in the northwestern Blue Area, with Condition Class 1 lands occurring on treated private acreage and in agricultural lands. The fuel hazard rating is high for most of the Blue Area. The principal fuel hazard for this portion of the WUI include thick stands of untreated small-diameter ponderosa pine vegetation found on federal lands generally to the north of the private land in the Blue, in Hannagan Meadow, and around the Sprucedale/Beaverhead areas.

Table 3.6. Cumulative risk levels, by percentage of WUI area

GCWPP communities	High risk (%)	acres	Moderate risk (%)	acres	Low risk (%)	acres	Total Acres
Blue Area	50	70,042	37	51,831	13	18,211	140,084
Eagle Creek Area	8	1,107	53	7,336	39	5,398	13,841
Clifton Area	4	3,500	33	28,879	63	55,133	87,512
Morenci Area	10	9,098	61	55,503	29	26,387	90,988
Duncan Area	0	0	47	23,001	53	25,937	48,938
Evacuation Routes	100	37,813	0	0	0	0	37,813
Total Acres		121,560		166,550		131,066	419,176

Source: Logan Simpson Design Inc.

Private land fuel modification treatments are expected to increase in the Blue Area as landowners continue to treat private parcels to fire-safe conditions. There are fuel reduction treatments currently planned on federal lands in the vicinity of the Blue School. High fuel loads along with thick forest stands create higher risk of wildfire ignition in high-use areas. Historic lightning caused fire starts in the Blue Area are not infrequent; and fire starts from the south and southwest as well as from within the private parcels pose the greatest risk to the developments because of prevailing winds and extensive fuel loads. During the 2003 and 2004 fire season, fires in the vicinity placed the community of Blue on standby for evacuation, threatened homes, irrigation structures, and agricultural crops.

The BRPA to the south of the Blue Area was established in 1933 and is the last designated Primitive Area in the United States. The BPRA includes 173,762 acres of rugged mountains, steep canyons, and is only accessible through the FS trail system. The A-S NFs Plan establishes the Blue Primitive Area as Fire Management Zone VI (Amendment 1- Replacement Page 114) stating a high potential for resource damage from major fire. The *Draft Revised Standards and Guides for Management Ignited Prescribed Fire/Wildland Fire Use* (2004) prescribes fire as the primary management tool for maintaining and/or enhancing the primitive values of the area. It further states, “A systematic program of planned prescribed burning or wildland fire use for resource benefit may be undertaken to accomplish management area objectives.” Administratively, mechanized equipment for fire suppression is restricted to extreme emergencies and requires Forest Supervisor approval. Portions of the Blue Area north of the BRPA are within theA-S NFs Inventoried Roadless Areas (IRA). Current IRA designation does allow for road construction and reconstruction. Within the IRA, the objectives of this CWPP will be achieved primarily with thinning, piling and burning, and prescribed fire under the current authority of the *Apache Sitgreaves National Forests Land and Resource Management Plan* (amended 1996).

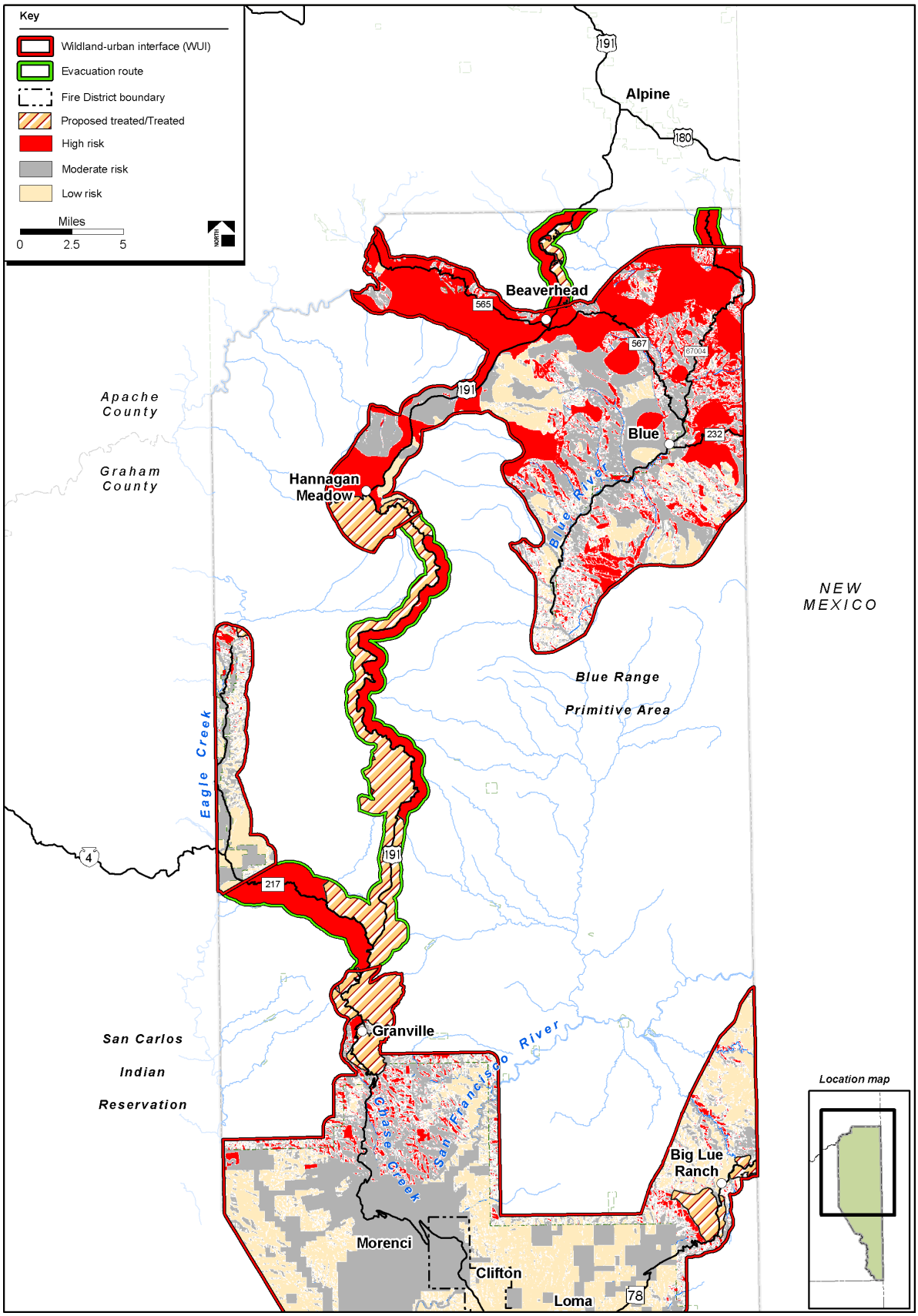

Figure 3.15. Cumulative risk analysis

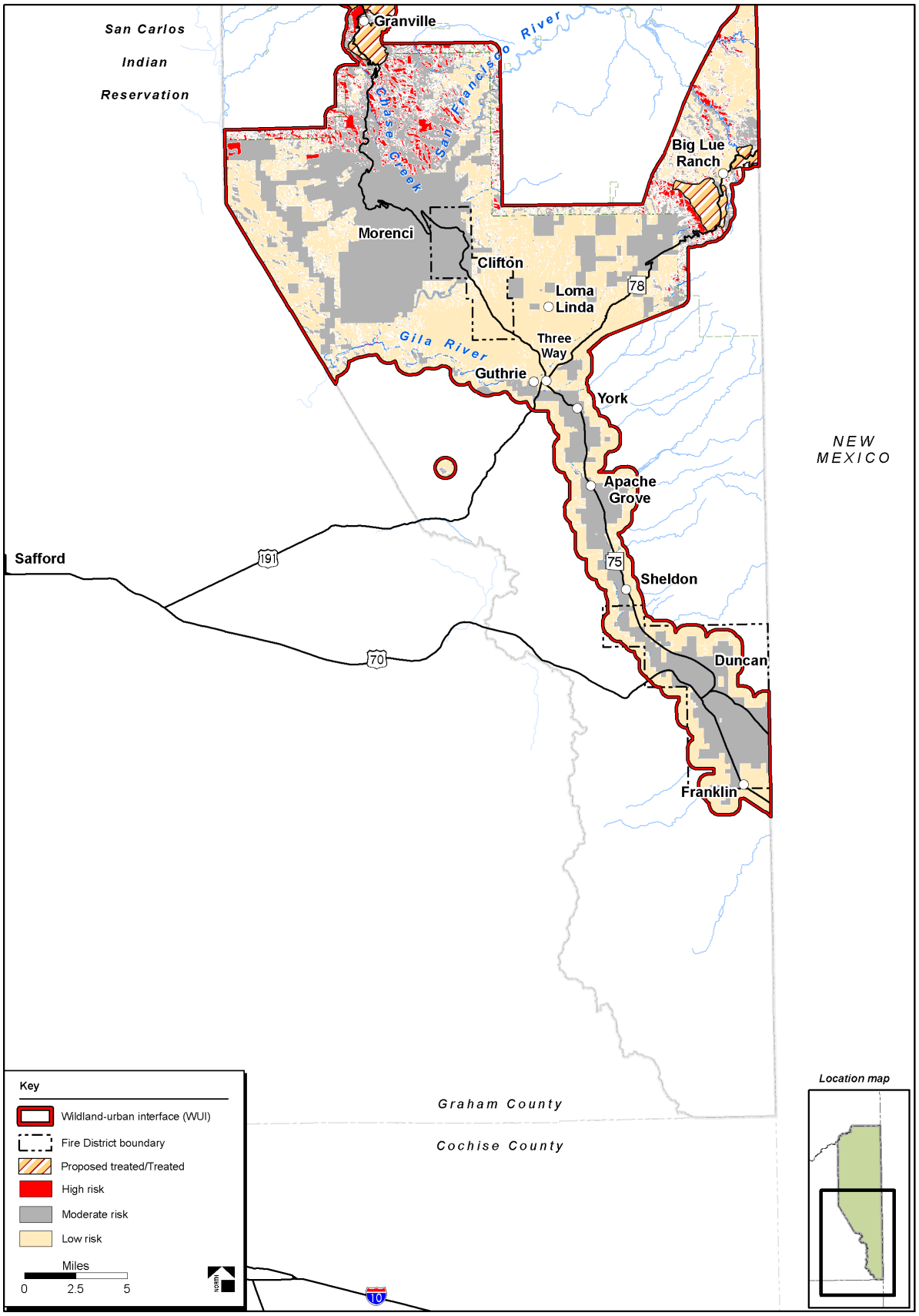

Figure 3.15. Cumulative risk analysis (cont'd)

Blue is accessed by FR 281 from the north, FR 567 from the west, and FR 232 from the east. The commercial developments in this portion of the WUI include Joy's fish hatchery. Access to individual private parcels and residences is generally not adequate for simultaneous emergency evacuation and fire fighting response. The closest available surface water in this portion of the WUI is the Blue River that can provide an area for aerial bucket or ground-vehicle drafting. Access to the Sprucedale/Beaverhead area private lands, used primarily as seasonal guest ranches, is along FR 24 and FR 26 originating from US 191. The Hannagan Meadow Lodge and recreation area is accessed primarily from US 191. These commercial developments support significant recreational opportunities in Greenlee County.

Restricted access and limited water availability add to the threat of habitat and property loss for wildland fire. In addition to homeowner response, the closest wildland fire fighting response would be from the Alpine District of the A-S NFs. However, since the community is not within a fire district, properties have an ISO fire rating of 10. Greenlee County does encourage residents not within a fire district to form their own districts and subsequently secure funding for fire fighting equipment, provide firefighter training and to maintain yearly certifications. Residents in this portion of the WUI would follow the *Greenlee County Emergency Management Evacuation Procedures* in emergency situations.

2. Eagle Creek Area

The Eagle Creek Area is mostly composed of Condition Class 2 lands that occur in proximity to private land with a few Condition Class 1 lands occurring on agricultural acreage in the community and in adjacent grassland habitats. Eagle Creek does provide for domestic drinking water and farmland irrigation. Eagle Creek is also pumped by Phelps Dodge for downstream mining operations. Private property in Eagle Creek lies within the Clifton District of the A-S NFs and is adjacent to the eastern boundary of the San Carlos Apache Reservation. The Communities recognize the threat of wildland fire originating from within the San Carlos Apache Reservation. The CAGs encourage the San Carlos Apache Reservation and Graham County to recommend land treatments as necessary for additional watershed and community protection within the Eagle Creek Area. Eagle Creek residents request the San Carlos Apache Reservation improve Indian Road 4 to be usable as an evacuation and resource distribution route. The Eagle Creek further requests the San Carlos Apache Reservation plan wildland fuel reduction treatments within ½ mile of private lands adjacent to Eagle Creek as well as those structures occurring within the vicinity on the San Carlos Apache Reservation. The FS is analyzing some portions of this area of the WUI for fuel reduction treatments, and has conducted fuel assessments of the residential structures in Eagle Creek to aid in future decisions concerning necessary fuel modifications *(USDA Forest Service, Apache-Sitgreaves National Forests, Clifton Ranger District, Wildland-Urban Interface Structure Assessment,* 2004). Current fuel modification treatment projects in and around the Eagle Creek Area include Mitchell Peak, Mesa, Mallet, Pine Flat, Hot Air, Strayhorse, and Robinson Mesa. All of these project areas are interconnected along the US 191 corridor with only the Mallet and Strayhorse projects having ranch structures or facilities located within the project perimeter. Out of all the projects, the Strayhorse project is the most favorable to act as a fire safety zone or staging area during a wildfire event because of its access and ingress/egress opportunities. Individual private land fuel modification treatments are expected to increase in Eagle Creek as landowners continue to bring private parcels to fire-safe conditions. The principal fuel hazards for this portion of the WUI include thick, untreated, riparian hardwood vegetation stands found on both private and

federal lands in and around the community. In some eastern areas of Eagle Creek, fuel hazards decrease because of a vegetative change to high mountain grasslands. Historic lightning and human-caused fire starts in Eagle Creek occur near the northern portion in the community. Fire starts from the south and southwest as well as from private parcels pose the greatest risk to the community because of prevailing winds and extensive fuel loads. High fuel loads, high public use, and areas of high historic fire starts, along with thick vegetation stands, remote housing density, and no initial fire response other than by residents, creates a higher risk of wildfire ignition in the Eagle Creek Area.

Access to Eagle Creek is provided by FR 217 (originating from US 191) and is the major access corridor to the community. Limited access is available from the San Carlos Indian Reservation from the Point of Pines Road (Indian Route 4 by permit only). The "middle road" (FR 802) is closed at the San Carlos Indian Reservation boundary and therefore is not viable for emergency response or evacuation. There is at least one area where a small plane could be landed in the Eagle Creek Area if needed. Within the Juan Miller area, residents of the three private parcels as well as summer visitors to the FS campground and surrounding areas are also restricted to one access road (FR 475) for ingress and egress. These are mostly primitive roads and not suitable for emergency response or evacuation. In addition to poor access an additional concern of Eagle Creek residents is the general lack of communication (including a lack of cellular phone coverage). Communications within the Eagle Creek Area consist of three Greenlee County Sheriff's Department radios, two satellite telephones located at the Phelps Dodge pumping stations, and three residents with internet access. Updated communication equipment installed on Rose Peak, the development of a "phone tree" communication plan for local residents, and the acquisition of "phone enhancers" would greatly improve communications. In addition to the remoteness of the community, additional concerns resulting from a catastrophic wildland fire include potential contamination of drinking water and the economic impacts caused by loss of livestock grazing.

Community values identified in this portion of the WUI include significant wildlife habitats associated with the Eagle Creek riparian area, a FS campground, the historic Eagle Creek School House (that now serves as the community center), and hiking trails on FS lands adjacent to the community. FR 217 is the only major access road into Eagle Creek and access from FR 217 to individual private parcels and residences is generally not adequate for simultaneous emergency evacuation and fire fighting response, particularly if the FS Honeymoon campground is involved in any emergency evacuation. The A-S NFs Clifton District private property profile for the Eagle Creek Area reported 14 individual homes, with risk evaluated from vegetation, physical attributes, structure and other combustibles on the property.

Recommendations to landowners for risk mitigation are included in Section IV of this GCWPP. Additional recommendations for remote private lands include identifying properties by name on placards or road signs along FR 217 and locating hydrants, wells, or surface water sources that could be accessed to replenish water supplies of fire response equipment, both ground based drafting and aerial bucketing *(USDA Forest Service, Apache-Sitgreaves National Forests, Clifton Ranger District Wildland Urban Interface Structure Assessments 2004)*. Eagle Creek consists of 31 permanent residents and 4 part time residents. Seasonal residents and tourists during peak summer months greatly increase the local population. There is no fire response capability by the community of Eagle Creek. Surface water is available in this portion of the WUI from the creek and private impoundments for aerial bucket or ground-vehicle drafting. Wildland fire protection is provided to the community by the A-S NFs Clifton Ranger District. Eagle Creek residents

recommend that 4 local residents per year receive training in both structural and wildland fire fighting and be equipped to provide initial attack response to fires within the community. Training and equipment acquisition should continue until a suitable number of residents are trained and equipped to provide adequate initial attack. Properties within the community are not in a fire district and therefore have an ISO fire rating of 10. Greenlee County does encourage residents not within a fire district to form their own districts and subsequently secure funding for fire fighting equipment, provide fire fighter training, and to maintain yearly certifications. Residents in this portion of the WUI would follow the *Greenlee County Emergency Management Evacuation Procedures* in emergency situations.

3. Morenci Area

Most of the WUI associated with the Morenci Area consist of Condition Class 1 and 2 lands. Condition Class 1 lands occur mostly around the private acres in the community. An area of low fuel hazard is located in the western and southern portion of this WUI area due to change in fuel types from mountain shrub to semidesert and desert shrub habitats. Areas of moderate fuel hazards are located immediately around the community because of high fuel loads associated with the pinyon-juniper woodland and mountain shrub types. The FS is analyzing the northern portions of this WUI area for fuel reduction treatments, and has initiated public scoping for future decisions on fuel modification projects.

With the exception of the proposed Granville fuel modification treatment project, there are currently no additional decisions standing for fuel modification treatments to the south on state and public lands. The principal fuel hazards for this portion of the WUI include thick, mountain brush stands found on FS lands to the north of the community as well as in the undeveloped public and private lands within and adjacent to the community. Fuel hazards decrease in the southern and western areas of the Morenci Area because of vegetative changes to desert shrub types. In addition to higher fuel loads in the north, some areas of south-southwest aspects and slopes of 40 percent or greater are found. Fire starts from the south are the greatest risk to the residential and commercial developments because of prevailing winds, steep slopes, and moderate fuel loads. High fuel loads, high public use, terrain consisting of south-southwest aspect, slopes of 40 percent or greater, and areas of high historic fire starts along with higher fuel loads create higher risk of wildfire ignition in the northern area of the community of Morenci.

Access into Morenci and Granville is provided solely by US 191. Community values identified in this area of the WUI include the Phelps Dodge Morenci Mine; community infrastructures such as motel, restaurants and service provider industries: six permitted recreation residences; the Granville campground; and the Cherry Lodge recreational area. US 191 is the main access road in the area, and access from US 191 to many individual private parcels and residences is generally not adequate for simultaneous emergency evacuation and firefighting response in an emergency evacuation. There are no hydrants in the Granville area.

4. Clifton Area

Condition Class 1 lands occur mostly in the southern half of the Clifton Area. The town of Clifton lies among a mix of state, public, and FS lands. With the exception of the proposed Blackjack and Coal Creek fuel modification treatments around the Big Lue, there are no additional federal or state land decisions standing for fuel modifications or proposed treatments in and around the Clifton area. Individual private

land fuel modification treatments are expected to increase in the Clifton Area as landowners continue to bring private parcels to fire-safe conditions. The principal fuel hazards for this portion of the WUI include the mountain and semidesert shrub vegetation type occurring to the north and west of the community. Fuel hazards decrease in some eastern and southern areas because of vegetative changes to unbroken desert shrub lands. Fuel hazard risk, is in part, determined by vegetation types indicative of ground fuel loads. Mountain shrub habitats for example, will contain as much as 13 tons per acre of light (1- to 10-hour fuels) and heavy fuels (10-hour and greater fuels). These fuels can support extreme fire spread rates and place adjacent habitats and communities at risk because of that rate of fire spread and fire intensity. Therefore, areas on the northern and western town limits have a higher risk of ignitability. In addition to high fuel loads, areas of south-southwest aspects and slopes of 40 percent or greater are found in Clifton. High fuel loads, high public use, terrain consisting of south-southwest aspect, slopes of 40 percent or greater, and areas of high historic fire starts, along with thick mountain shrub stands and housing density, create higher risk of wildfire ignition in the Clifton Area.

Access to Clifton is provided by US 180/191 and SR 78, the community's major transportation corridors and commercial development centers. Community values identified in this portion of the WUI include significant municipal water supplies, a recreation area associated with the Gila Box Riparian National Conservation Area, and a broad range of community facilities including schools, parks, a public library, and post office. US 180/191, as well as most town-maintained roads, are adequate for simultaneous emergency evacuation and fire fighting response. There are hydrants in the Clifton town limits. The US Census Bureau 2000 profile for the Clifton Area reported 1,087 individual housing units, of which 919 are owner-occupied. The Clifton Municipal Fire Department provides fire protection to the community that has an ISO fire rating of 6 to 9. Private land developments outside of the Clifton town limits such as Verde Lee and Loma Linda, are not within a fire district and therefore have an ISO rating of 10. Greenlee County does encourage rural areas outside of existing fire districts and municipalities to join or establish a fire district.

5. Duncan Area

The Duncan Area consists of mostly Condition Class 1 lands. Private land fuel modification treatments are mostly associated with the saltcedar vegetative component of the Gila River. Wildland fuel modification treatments have not been necessary in these upland communities. The principal fuel hazards for this portion of the WUI includes the riparian vegetation associated with the Gila River and associated tributaries, occurring in conjunction with private structures. Upland vegetative fuels can significantly increase based on winter and spring precipitation. Summer drought periods following wet winter/spring rains increase fine fuels and potential for wildland fire. Although no current condition class has been determined for the Gila River and associated tributaries riparian corridors, dense monocultures of saltcedar have created potential fire conditions beyond normal range of intensity with potential of significant loss of habitat components from wildland fire. Fuel hazards are generally moderate to low in the upland areas of the WUI because of primarily open and broken desert shrub vegetation types. Fuel hazard risks are primarily from riparian fires that can produce rapid fire spread thereby placing adjacent habitats and community structures at a greater risk. Therefore, areas along the riparian corridor have a high risk of ignitability that is not depicted in the overall fuel hazards determination. Fire starts from the riparian area,

as well as from private parcels, pose the greatest risk to structures because of rate of fire spread, and residential and riparian fuel loads. The accumulation of fuel within the riparian area due to continual invasion and growth of saltcedar is considerably higher than normal adding to firefighter and public safety threats from wildland fire in the WUI.

Access to the Duncan Area is provided by US 180/191, US 70, SR 75, and SR 78, which are the major transportation corridors and commercial development centers for these communities. Community values identified in the Duncan Area that require enhanced wildfire protection include significant municipal and agricultural district water supplies and a broad range of community facilities such as electrical lines, natural gas lines, railroad lines and bridge crossings. However, subsequent to the Homeland Security Act of 2002, some of these community infrastructures are not depicted on interface maps within the Duncan Area.

US 180/191, US 70, SR 75, and SR 78, as well as most town-maintained roads, are adequate for simultaneous emergency evacuation and firefighting response. There are few hydrants in the Duncan Area, and surface water is not immediately available in this portion of the WUI for aerial bucket or ground-vehicle drafting. The US Census Bureau 2000 profile for the Duncan Area reported over 1,600 total housing units, with more than 380 of those units within the town of Duncan. The Duncan Rural Fire District responds only to fires in the fire district, including the town of Duncan and Franklin, and has an ISO fire rating of 8. The Duncan Area recommends development of a wildfire response plan that includes provisions for better coordination of wildland fire suppression efforts, including wildland fire mutual aid agreements. Additionally it is recommended that communities outside of the Duncan Rural Fire District consider joining or establishing a fire district. The communities of Sheldon, Apache Grove, York, Three Way, and Guthrie are not within a fire district and therefore have an ISO rating of 10.

IV. Community Mitigation Plan

Section IV prioritizes the areas that need fuel treatment and recommends the types and methods of treatment and/or management necessary to mitigate the potential for catastrophic wildland fire in the WUI. Also presented in this section are the GCWPP communities' recommendations for enhanced wildland fire protection capabilities; public education, information, and outreach; and support for local wood products industries.

A. Administrative Oversight

Generally, the most efficient way to manage the urban forest is through a single entity responsible for implementing the action recommendations of the GCWPP. This will allow for enhanced coordination of management actions and reduced inconsistency among local, state, and federal agencies. Implementation of the GCWPP in a manner that ensures timely decision-making at all levels of government and that provides for community protection and forest restoration is the highest GCWPP priority. Therefore, the primary recommendation of the GCWPP is for the Greenlee County Emergency Services Director to manage the implementation of this GCWPP, encourage commercial and volunteer activities that promote forest health and reduce the risk of catastrophic wildland fire, and create the single point of contact at both the county and community level for implementing the GCWPP. The GCWPP Administrator 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 GCWPP. Grant information should be routinely searched for updated grant application cycles. The following is a list of federal, state, and nongovernmental websites that can be monitored to obtain the updated grant application cycle information:

federal

- <www.fs.fed.us/r3/asnf>
- <www.fs.fed.us/r3/partnership>
- <www.fireplan.gov>
- <www.nrcs.usda.gov>

state

- <www.land.state.az.us>
- <www.azstatefire.org>

nongovernmental

- <www.iwjv.org>
- <www.azwildlife.org>
- <www.sonoran.org>

The Greenlee County Emergency Services Director would also be responsible for the development of "community bulletins" and other forms of public service announcements informing residents of wildfire dangers and preventative measures. Greenlee County Emergency Services will identify the responsibilities for coordinating, implementing, monitoring, and reporting to the signatories the status of the current-year priority recommendations. Greenlee County Emergency Services would 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 plans will be submitted to the signatories for review and approval each year. Once approved by the participating government entities and fire districts, the GCWPP will be presented to the Arizona State Forester, A-S NFs Forest Supervisor, and the BLM Gila District Manager for concurrence, and, subsequently, will be submitted for funding through HFRA and other grant or funding sources.

The CAGs also recommend that the GCWPP Administrator responsibilites include coordinating with those communitites outside of the analysis area (San Carlos Apache Reservation; Graham and Apache Counties in Arizona; and Catron, Grant and Hilalgo Counties in New Mexico) to ensure that any planning efforts concerning those watersheds address the concerns of the downstream communities in Greenlee County.

B. Fuel Reduction Priorities

To prioritize treatments, the WUI and evacuation corridors have 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 3.14). The risk areas are further identified and categorized into manageable, site-specific areas in the WUI and along evacuation corridors, with an overall risk value determined for each area. Additionally, each site-specific area in the WUI and evacuation corridor is labeled based on the nearest community (Table 4.1 and Figure 4.1). The CAGs recognize and, where appropriate, recommend treatments that are consistent between the WUI, evacuation corridor areas, and at the landscape level.

In the GCWPP, 54 site-specific areas were identified and given overall risk values. Additionally, each of these areas was ranked and described along with a recommendation for its preferred treatment type and method whether in the WUI boundary, as an evacuation route, or as significant community infrastructure. Treatment recommendations are described in Section 4.2 and consider commercial—and other—opportunities for utilizing small-diameter trees and woody material byproducts from treatments. The following map and table identify and describe the site-specific risk areas in the WUI.

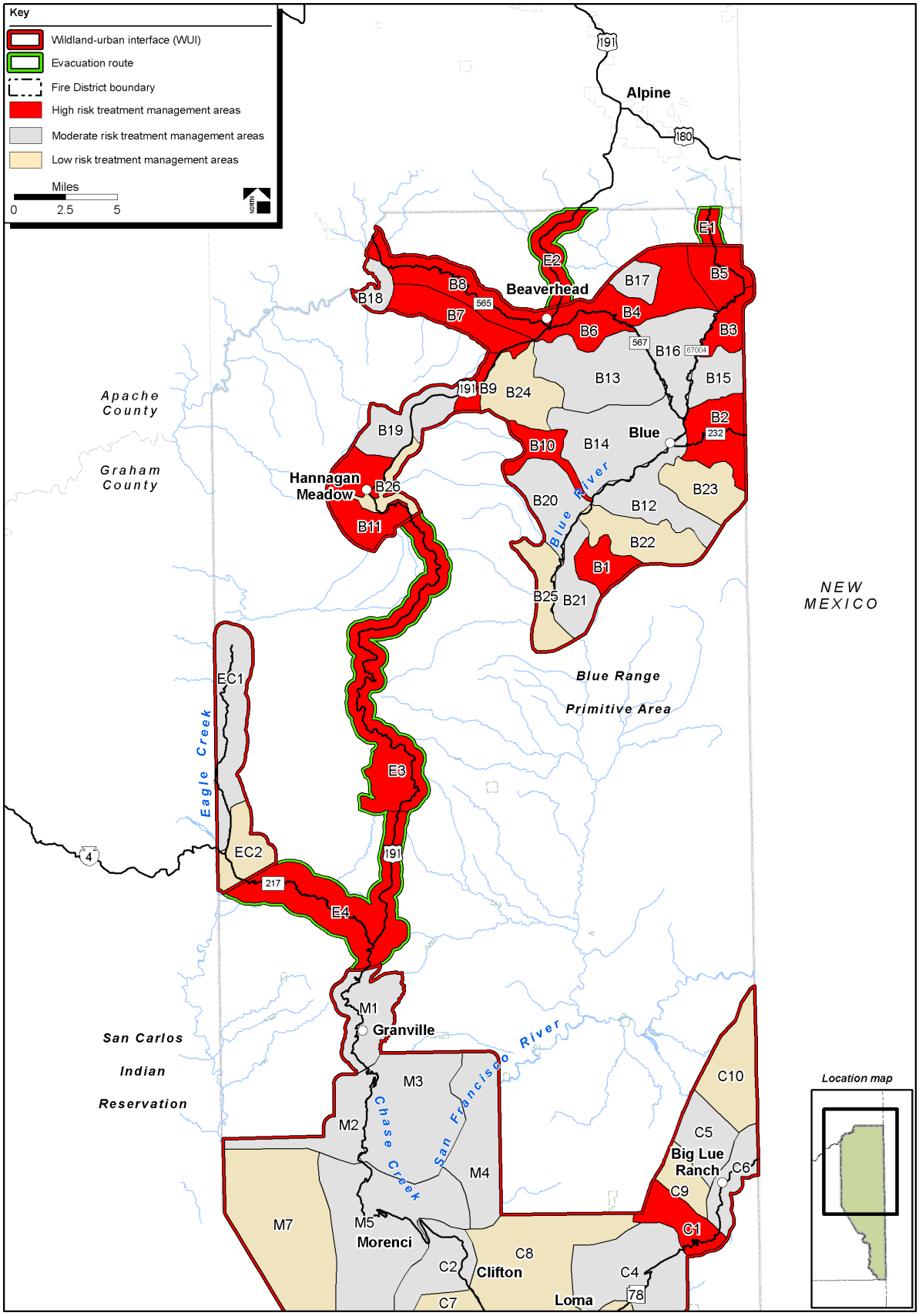

Figure 4.1. Treatment management areas

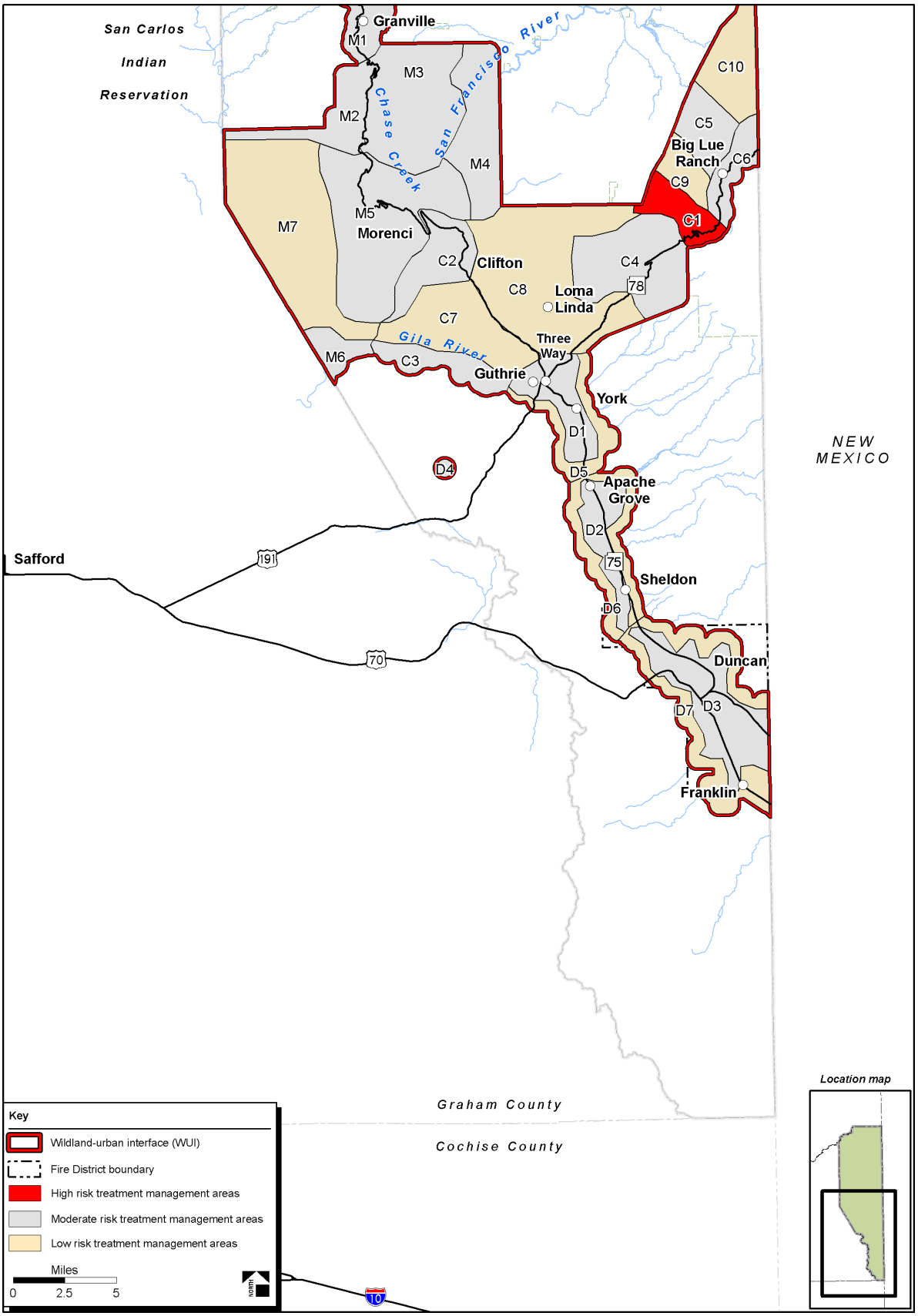

Figure 4.1. Treatment management areas (cont'd)

Table 4.1. Identified treatment management areas

Treatment management area	Map ID	Risk value	Location and description	Recommended treatment(s)[a]	Total acres	Federal acres	Nonfederal acres
Blue	B1	High	Located southwest of Blue in the BRPA, federal lands have not been identified for treatment	9	3,173	3,173	0
Blue[b]	B2	High	Located east of Blue primarily federal lands in the BRPA not identified for treatment and single private land area	1, 2, and 9	6,163	6,103	60
Blue[b]	B3	High	Located northeast of Blue primarily federal land areas not identified for treatment with adjacent private lands	1–3, 5, 7, and 9	2,799	2,504	295
Blue[b]	B4	High	Located northwest of Blue these federal land areas have not been identified for treatment	1–3, 5, 7, and 9	7,643	7,618	25
Blue[b]	B5	High	Located north of Blue these federal forested lands with intermix private lands not identified for treatment	1–3, 5, 7, and 9	4,409	3,923	486
Blue	B6	High	Located northwest of Blue in the BRPA federal land associated with evacuation route and intermixed private lands not identified for treatment	1–3, 5, 7, and 9	2,870	2,796	74
Blue	B7	High	Located south of Sprucedale and Beaverhead federal land with intermix private lands not identified for treatment	1–3, 5, 7, and 9	5,859	5,641	218
Blue	B8	High	Located north of Sprucedale and Beaverhead federal and private lands associated with evacuation route not identified for treatment	1–3, 5, 7, and 9	8,066	6,922	1,144
Blue	B9	High	Located south of Sprucedale and Beaverhead federal land along US 191 evacuation route within WUI	5, 7, and 9	1,643	1,643	0
Blue	B10	High	Unburned federal lands in the BRPA west of Blue not identified for treatment	9	3,119	3,119	0
Blue	B11	High	Federal land adjacent to Hannagan Meadow Lodge not identified for treatment	1, 2, 5, 7, and 9	7,284	7,284	0
Blue	B12	Moderate	Primarily federal lands of moderate fuels southeast of Blue in the BRPA not identified for treatment	1, 2, and 9	7,326	6,950	376
Blue	B13	Moderate	Federal lands northeast of Blue in the BRPA adjacent to evacuation route in moderate fuels not identified for treatment	9	11,276	11,276	0
Blue	B14	Moderate	Primarily federal lands west of Blue in the BRPA adjacent to the Blue Road evacuation route not identified for treatment	1, 2, and 9	11,879	11,464	415
Blue[b]	B15	Moderate	Primarily federal acres northeast of Blue adjacent to FR 281 evacuation route in moderate fuels not identified for treatment	1–3, 5, 7, and 9	3,698	3,635	63
Blue[b]	B16	Moderate	Primarily federal acres north of Blue adjacent to FS 567 and FR 281 evacuation routes in a previously burned area	1–3, 5, 7, and 9	6,688	6,535	153

(table continued on next page)

Table 4.1. Identified treatment management areas *(continued)*

Treatment management area	Map ID	Risk value	Location and description	Recommended treatment(s)[a]	Total acres	Federal acres	Nonfederal acres
Blue[b]	B17	Moderate	Mostly federal acres not identified for treatment northeast of Beaverhead in moderate fuels not identified for treatment	5 and 9	2,257	2,199	58
Blue	B18	Moderate	Federal lands west of Sprucedale in moderate fuels not identified for treatment	5, 7, and 9	1,859	1,859	0
Blue	B19	Moderate	Federal lands north of Hannagan Meadow Lodge adjacent to US 191 evacuation route in the WUI not identified for treatment	5, 7, and 9	6,131	6,131	0
Blue	B20	Moderate	Primarily federal lands in the BRPA adjacent to west flank of FR 281 evacuation route in moderate fuels not identified for treatment	1, 2, and 9	6,037	6,020	17
Blue	B21	Moderate	Primarily federal lands in the BRPA adjacent to southeast flank of FR 281 evacuation route in moderate fuels not identified for treatment	1, 2, and 9	4,596	4,547	49
Blue	B22	Low	Primarily federal lands in the BRPA adjacent to east flank of FR 281 evacuation route in moderate fuels not identified for treatment	1, 2, and 9	6,544	6,504	40
Blue	B23	Low	Federal lands in the BRPA west of Blue in low fuels in previously burned area	9	5,407	5,407	0
Blue	B24	Low	Federal lands in the BRPA adjacent to and east of US 191 south of Beaverhead in previously burned area	9	6,592	6,592	0
Blue	B25	Low	Located in the very southern portion of the Blue WUI in the BRPA federal and intermix private land in area of low fuel hazard	1, 2, and 9	4,461	4,308	153
Blue	B26	Low	Federal acres located adjacent to US 191 east of Hannagan Meadow Lodge in a previously burned area	5, 7, and 9	2,305	2,305	0
Clifton	C1	High	Primarily federal acres bisecting SR 78 evacuation route northeast of Clifton in an area of higher fuel hazard not identified for treatment	1–4, 6, 7, and 9	4,537	4,469	68
Clifton	C2	Moderate	Located in the northwestern town limits of Clifton primarily private lands in moderate fuel hazard	1, 2, 4, 6, 9, and 10	6,968	375	6,593
Clifton	C3	Moderate	Primarily federal acres south of the Gila Rover west of Clifton in an area of moderate riparian fuels	8, 10, and 11	5,205	4,733	472
Clifton	C4	Moderate	Located north of Three Way bisecting SR 78 intermix federal land and private lands	1–4	13,510	995	12,515
Clifton	C5	Moderate	Federal land northwest of Big Lue in moderate vegetative fuel and slope area that have not been identified for treatment	4–7, and 9	5,084	5,084	0
Clifton	C6	Moderate	Intermix federal and private lands adjacent to SR 78 evacuation route in area of moderate cumulative risk partially proposed for treatment	1–5, 7, and 9	4,211	4,000	211

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Table 4.1. Identified treatment management areas *(continued)*

Treatment management area	Map ID	Risk value	Location and description	Recommended treatment(s)[a]	Total acres	Federal acres	Nonfederal acres
Clifton	C7	Low	Intermix federal and private land within the town limits of Clifton and west to the Gila River in areas of low fuel risk	1, 2, 8, 10, and 11	11,422	10,356	1,066
Clifton	C8	Low	Intermix federal and private land within the town limits of Clifton and east of US 191 including Loma Linda development in areas of low fuel risk	1, 2, and 10	25,674	2,593	23,081
Clifton	C9	Low	Federal land west of Big Lue Ranch in areas of low fuel risk not identified for treatment	4–7, and 9	3,136	3,136	0
Clifton	C10	Low	Federal land north and west of Big Lue ranch adjacent to New Mexico in area of low fuels risk not identified for treatment	4–7, and 9	7,764	7,764	0
Duncan	D1	Moderate	Primarily private with intermix federal lands including Guthrie, Three way and York bisecting SR 75 and riparian vegetation of the Gila River	1–3, 8, 10, and 11	6,626	154	6,472
Duncan	D2	Moderate	Primarily private with intermix federal lands including Apache Grove and Sheldon bisecting SR 75 and riparian vegetation of the Gila River	1–3, 8, 10, and 11	5,430	216	5,214
Duncan	D3	Moderate	Primarily private with intermix federal lands including Duncan and Franklin bisecting SR 75 and riparian vegetation of the Gila River	1–3, 8, 10, and 11	12,763	148	12,615
Duncan	D4	Low	Includes communication site on federal lands	1–3	501	501	0
Duncan	D5	Low	Intermix federal and private lands in the WUI both east and west from York, Three Way and Guthrie	10	4,963	702	4,261
Duncan	D6	Low	Intermix federal and private lands in the WUI both east and west from York, Three Way and Guthrie	10	6,816	2,832	3,984
Duncan	D7	Low	Primarily private and intermix federal acres in the WUI both east and west from Duncan and Franklin	10	11,839	608	11,231
Eagle Creek	EC1	Moderate	Includes private and federal land adjacent to riparian vegetation in Eagle creek and FR 217 evacuation route	1–6, and 8	9,421	7,549	1,872
Eagle Creek	EC2	Low	Includes private and federal land east of Eagle creek along FR 217 evacuation route in area of low fuel hazard	1–6, and 8	4,420	3,255	1,165
Escape[b] Route	E1	High	Federal land in the northwest of Blue WUI adjacent to FR 281 evacuation route in area of high fuel hazard	4–7, and 9	1,295	1,295	0
Escape Route	E2	High	Federal land north of Beaverhead adjacent to US 191 evacuation route in area of high fuel hazard	4–7, and 9	4,157	4,157	0
Escape Route	E3	High	Includes private and federal land south of Hannagan Meadow Lodge adjacent to US 191 evacuation route	1–3, 4–7, and 9	16,810	16,773	37

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Table 4.1. Identified treatment management areas *(continued)*

Escape Route	E4	High	Includes private and federal land southeast of the community of Eagle Creek along FR 217 and intersecting US 191	1–3, 4–7, and 9	15,551	15,289	262
Morenci	M1	Moderate	Includes federal land and single private parcel surrounding Granville in area of moderate fuel hazard	1–5, 7, and 9	7,331	7,323	8
Morenci	M2	Moderate	Intermix federal and private land west of US 191 northwest of Morenci in area of moderate fuel hazard	1–7, and 9	6,746	5,135	1,611
Morenci	M3	Moderate	Intermix federal and private land east of US 191 southeast of Granville in area of moderate fuel hazard	1–7, and 9	16,306	5,638	10,668
Morenci	M4	Moderate	Intermix federal land private land northwest of Morenci adjacent to the riparian vegetation of the San Francisco River in area of moderate fuel hazard	1–6, and 10	10,737	7,193	3,544
Morenci	M5	Moderate	Primarily private with intermix federal land within the community of Morenci and private land west of the community	1–4, and 10	22,720	1,170	21,550
Morenci	M6	Moderate	Intermix federal and private lands south of Morenci and south along the Gila River adjacent to riparian vegetation in area of moderate risk	8, 10, and 11	2,865	2,334	531
Morenci	M7	Low	Intermix federal and private land west of Morenci in area of low fuel risk	10	24,283	9,794	14,489

[a] See Table 4.2 for descriptions of these eleven treatment types

[b] —Portions of this unit include A-S NFs IRA

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

Table 4.2 iIdentifies treatment recommendations for lands located in the treatment management areas described in Figure 4.1. These treatments are designed to meet the fuel reduction/modification objective of the GCWPP. Figure 4.2 shows general areas of the recommended treatments in the WUI. In accordance with Section 102(*e*) of HFRA, fuel reduction and modification treatments recommended in the GCWPP are designed to "contribute toward the restoration of the structure and composition of old-growth stands … and retaining the large trees contributing to old-growth structure." There are no designated Old-Growth Management Areas located in the WUI. However, the HFRA fuel reduction treatments are designed to enhance old-growth forest conditions and will be compliant with standards and guidelines established in the *Apache-Sitgreaves National Forests Plan* (2004).

Additionally, to ensure compliance with Section 102(*f*) of HFRA, the GCWPP focuses on the treatment and thinning of small-diameter trees to create defensible space, fuel breaks, and acceptable forest Condition Classes for community and significant infrastructure protection, to provide safer evacuation routes for communities, and to improve fire fighter safety in the WUI. The primary component of the GCWPP land treatments is to increase the likelihood that fire behavior will result in minimal flame lengths to maintain fire on the ground, reduce ladder fuels, and minimize crown fire potential. The desired future conditions of the proposed treatment areas will enhance homeowner and firefighter safety, allow for a higher probability of suppression on initial attack, and reduce loss of private structures. These treatment recommendations were also developed with consideration of

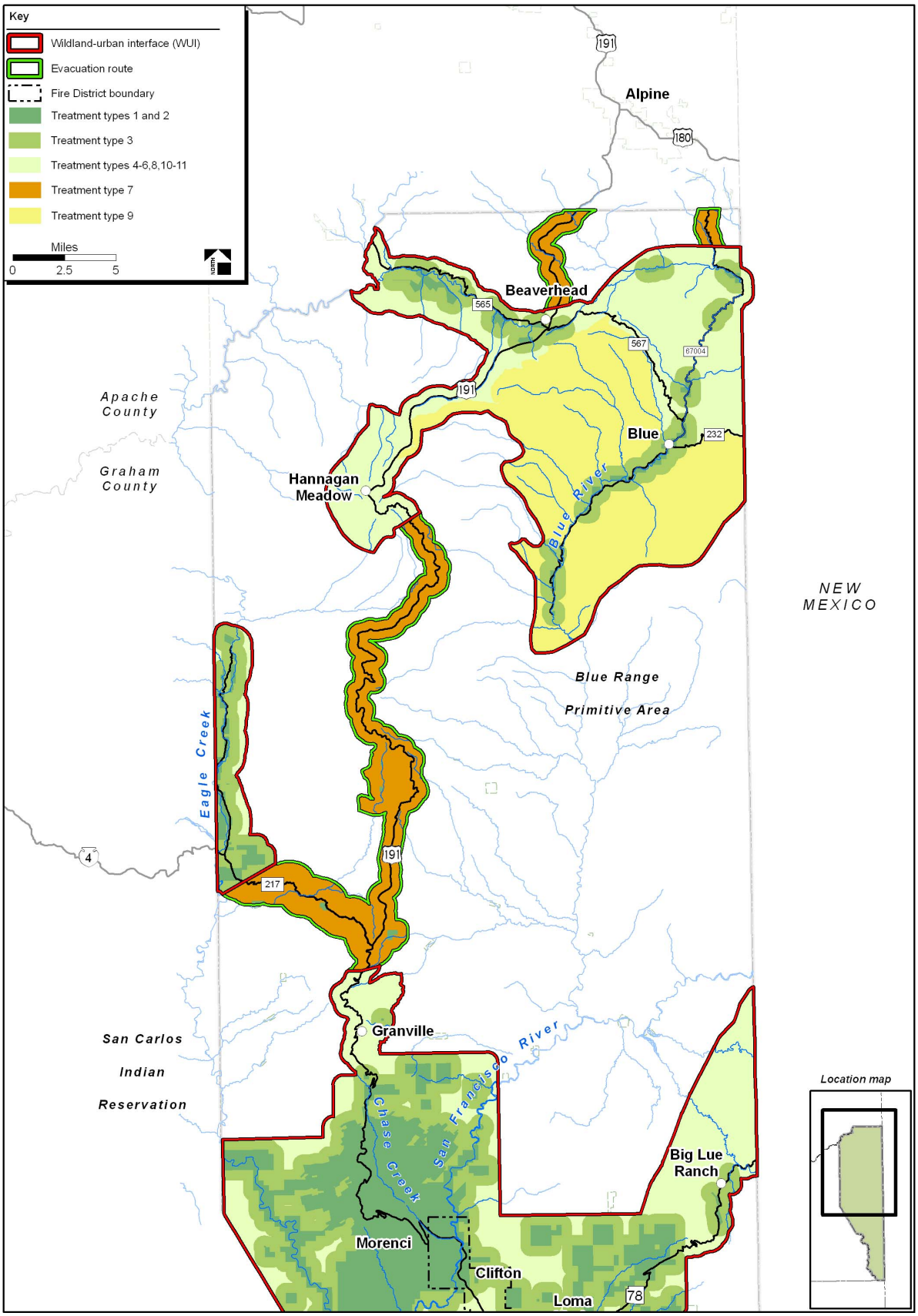

Figure 4.2. Treatment recommendations

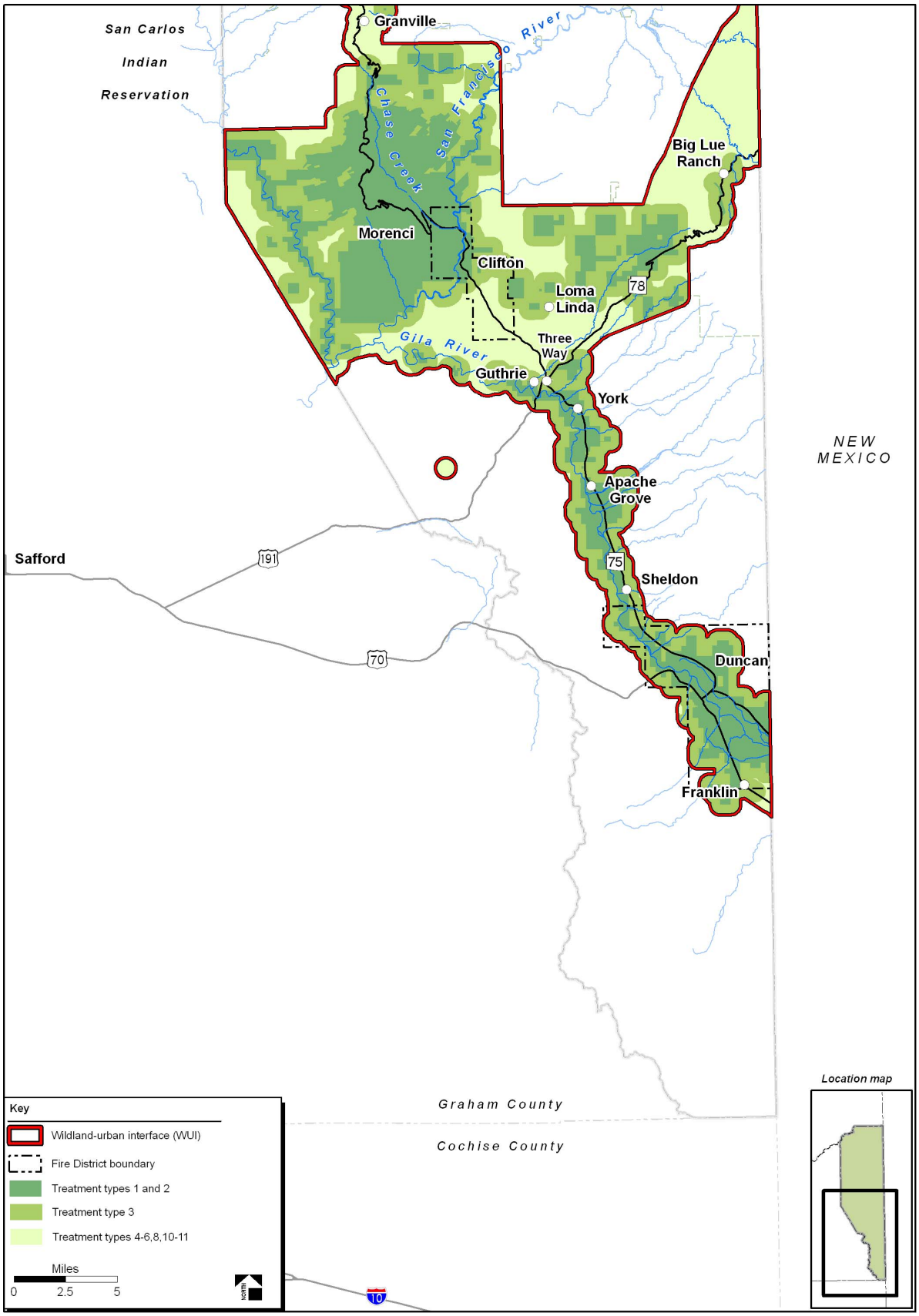

Figure 4.2. Treatment recommendations (cont'd)

wildlife biodiversity and forest health and restoration as well as watershed and ground water enhancement. The CAGs recognize 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 prescribed burns, may be required. The application of natural ignitions will be applied to areas where fire use is allowed to assist in returning vegetation to historical parameters (Condition Class 1). Environmental conditions will be closely monitored to determine the feasibility of using a natural ignition wildland fire for resource benefit. Parameters will be based on Energy Release Components (ERC) trends, long-term weather trends, and current vegetative conditions. The CAGs further recognize that resource specialist will conduct site-specific analysis of proposed treatment areas and any identified site-specific mitigation measures will determine the actual footprint of fuel modification treatments across the WUI landscape. Within the BRPA and IRA, the objectives of this CWPP will be achieved primarily through thinning, piling, and burning; wildland fire use management; and prescribed fire under the authority of the *Apache Sitgreaves National Forest Land and Resource Management Plan* (amended 1996).

In addition, anticipating and planning for needed mitigation measures will provide for a diversity of treatments and therefore habitats across the landscape. In many treatment areas a diversity of all age classes, vegetation structural stages, and retention of snag and down woody material will not only reduce fire hazard near the communities, but provide for irregular vegetative patterns of habitat for density dependent, as well as open forest, wildlife species. The CAGs recognize that 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 (conifers >16 inches diameter at breast height [dbh] and juniper >12 inches diameter at root color [drc]) are not considered in fuel reduction/modification prescriptions unless they are diseased, dying, or dead trees on private property or diseased, dying, or dead trees on federal land and are in excess of standards for standing snags delineated in the *Apache-Sitgreaves National Forests Plan*, and in accordance with guidance provided in *the USDI BLM Proposed Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management Finding of No Significant Impact (FONSI) and Environmental Assessment,* (2004). The exception to this standard applies to snags within ½ mile of private land or within designated fuel breaks, adjacent to a significant community infrastructure, or evacuation corridor where all snags may be removed if necessary for fire resiliency. Evacuation corridors are generally planned to extend ½ 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 greater from private land. The CAGs do recognize and agree that in some areas the target basal area (BA) may be exceeded due to the number of existing trees greater than 16 inches dbh. In some areas, live trees over 16 inches dbh or 12 inches drc may be removed if necessary to achieve comparably fire-resilient stands as appropriate for the forest type (HFRA. Sec. 102.f.1.B.).

The CAGs recognize and support the Clifton Ranger District in taking an integrated approach to vegetation management and hazardous fuels treatments. The district recognizes the importance of

linking both the small-scale urban interface treatments specific to hazardous fuels reduction and landscape level ecosystems treatments. There are several projects, varying in size, which are linked north and south along the district. The projects include areas with small-scale intensive treatments in high risk areas. Intensive treatments are 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 problem fire behavior.

On federal lands, the silvicultural prescriptions and estimated costs per acre used in the GCWPP are:

- thinning 0–16 inches dbh
  - mechanical thin and pile: $500/acre
  - thin and hand-pile: $700/acre
- hand-pile slash and burn
  - hand-pile: additional $135/acre
  - burning piles: additional $50/acre
- roller chopping < 8 inches dbh
  - thinning: $60–$80/acre
- hydro axe
  - thinning: $30–$60/acre
- broadcast burn
  - $50/acre to conduct the burn
  - $35/acre for monitoring the burn

Broadcast prescribed burning may be used as slash disposal, maintenance, and as a forest restoration tool where feasible and practical. Applicable *A-S NFs Land Management Plan* and *BLM Arizona Statewide Land Use Plan for Fire, Fuels and Air Quality standards and guidelines* will be followed for fire management activities. Conservation measures as outlined in the *2001 Programmatic Biological Assessment WUI: Biological and Conference Opinion* and "best management practices" will be implemented during fire management activities within all areas of known federally protected species or habitats.

Recent small-diameter treatments in ponderosa pine stands in the A-S NFs have removed an average of 12 tons/acre of wildland fuels. This fuel complex is consistent with fuel model 10 as described in *Aids to Determining Fuel Models for Estimating Fire Behavior* (Anderson 1982) for the timber vegetation type. Therefore, an overall estimate of ground fuels to be removed, ranging from litter to understory fuels consisting of 1-hour to 100-hour fuels and live standing fuels, will average 12 tons/acre across the ponderosa pine vegetation type. Other fuel models include fuel model 6 consisting of a broad range of shrub conditions, including stands of chaparral, oak brush, and hardwood slash. Fuel loads vary from 3 to 8 tons/acre and average 6 tons/acre for all live and dead fuels >3 inches. Fuel model 4 represents stands of mature shrubs 6 feet or more in height, forming a continuous secondary overstory, and containing a significant amount of dead woody material. This includes the chaparral, mixed gray oak, mountain mahogany, manzanita, pinyon, and juniper vegetative types. Fuel loading is estimated to average 13 tons/acre with dead woody material distributed both vertically within the canopy and horizontally within the fuel bed. Saltcedar vegetative

communities depending on vertical height, density, and understory components could be considered fuel model 4. Commercial value of small-diameter products from fuel reduction treatments within the WUI is primarily from fuel wood. Commercial uses of the woody material from fuel reduction treatments are limited and will not affect cost of treatments. If silvicultural prescriptions require precommercial and commercial thinning with follow-up pile burning, total cost/acre treated may exceed $630/acre on small federal parcels. Average land treatment costs, considering treatment and handling of slash, is approximately $630/acre within forest types and $60/acre in other vegetation types.

Additionally, in most federal land treatment areas not all acres are involved. As mentioned previously, site-specific analysis may exclude some acres from treatment, due to topography such as slope and resource issues such as riparian corridors or a sensitive wildlife area. In areas where prescribed and/or natural fire are the proposed tool for fuel management, natural barriers and other existing control features will be used to determine treatment boundaries, leaving some acres within an analysis area untreated. Therefore, solely for the purposes of estimating treatment costs, federal land is based on average treatment cost/acre, with a footprint covering 80 percent of the management area proposed for fuel modification treatment.

Private land treatments in the WUI typically occur on small land parcels near power lines, structures, and other obstacles. In recent years, the number of diseased, dying, and dead large trees on private lands has increased. In many cases, the owner of a small residential lot and/or the Community Fire Department will not allow cut trees and slash to be piled and burned on the property. However, broadcast prescribed burning may be used as slash disposal, maintenance, and as a restoration tool where feasible and practical on private lands in or adjacent to communities where the applicable fire department/district standards are followed. Chipping or removal and transportation of slash to a disposal site increases treatment costs. Treatments necessary to meet these recommendations, on private land parcels within the A-S NFs, have varied in cost from less than $300/acre to over $1,900/acre and have averaged $1,200/acre. Costs/acre will vary greatly for treatment of private parcels, depending on variables and landowner needs. Site analysis shows that land applications will be appropriate for no more than 60 percent of each acre. For example, in residential areas, homesites, streets, and other improvements are included within GIS-mapped estimates, but will not require treatment. Cost/acre is modified at a per-acre cost by using a multiplier of 0.6.

The recovery cost of wood products from private parcels is comparable to that achieved with federal treatments; however, the treatment cost is much higher. Across all landscapes the commercial uses of the woody material from fuel reduction treatments are limited and will not affect the cost of effective treatments on federal or residential land. Cost estimates for treatments in the WUI are based on these estimates for both federal and nonfederal land treatments.

Table 4.2. Fuel modification and treatment plans

Treatment number	1 Developed private parcels less than 2 acres			2 Undeveloped private parcels or single structure parcels in excess of 2 acres		3[d] Federal or Arizona State Trust Lands within 0.5 mile of private land		4[d] Pinyon/juniper woodland within the WUI	5[d] Forest types greater than 0.5 mile from private land	
Treatment category	**Zone 1** (0–10 feet from structures)	**Zone 2** (10–30 feet from structures)	**Zone 3** (30–100 feet from structures)	Slopes <40	Stream beds, channels and Slopes ≥ 40%	Slopes <40	Slopes ≥40	All slopes	Ponderosa pine	Mixed conifers
Vegetation	Remove all ladder fuels and reduce flammable vegetation. Remove and destroy all insect-infested, diseased, and dead trees.	Remove all 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 clear space around brush or planting groups.	Remove all ladder fuels; remove and destroy all insect-infested, diseased, and dead trees. Maximum density of trees (whichever is greater: for PP[a], 60 square feet. BA[a] at 80–100 trees/acre *or* average density of 100 trees/acre)	Remove all ladder fuels; remove and destroy all insect-infested, diseased, and dead trees. See page 77 for fuel modification plan developed to promote forest health, prevent spread of fire to adjacent property, and create defensible space with considerations for wildlife and groundwater protection. Single structure or structures on parcels in excess of two acres should include treatment 1 in proximity of structures and treatment 2 to remaining acres. Treatments 1 and 2 are recommended for structures located on lands under private lease with concurrence of the FS.	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 prescribed burns. Develop fuel modification plan (see page 77) for treatments.	Follow A-S NFs *Plan* standards and guidelines within PFA and PACs. Target BA for conifers is 40–80 depending on current VSS distribution, target crown spacing and canopy cover. Conifers greater than 16-inch dbh[a] will be targeted for retention unless needed to promote fire-resilient stands. Target BA may be achieved through mechanical treatment or ignited prescribed fire. See page 77 for fuel modification plan developed to promote forest health, prevent spread of fire to adjacent property, and 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 PS trees will be retained, other trees encroaching on meadows may be cut.	Same as for slopes <40 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 page 77 for fuel modification plan developed to promote forest health, prevent spread of fire to adjacent property, and 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 >16 inches drc[a] will be targeted as leave trees unless it is necessary to remove some to achieve the desired spacing.	Follow A-S NFs *Plan* standards and guidelines within PFA and PACs. Target BA, canopy cover and crown spacing will be variable depending on current VSS distribution. Areas of slope ≥ 40 percent and inaccessible areas may be treated with periodic prescribed burns or hand-thinned and hand-piled for future burns. Two to fifty acre openings may be established in restoration areas depending on habitat concerns and objectives for individual restoration projects. Restoration projects will be designed to promote presettlement trees thus creating fire resilient stands. Variable percentage of a project area may be left untreated, emphasizing drainages, riparian areas, wildlife cover and corridors, and water sources. Mechanical treatments will target trees <16 inch dbh to restore historic stand structure, and promote clumpy appearance. Strict spacing guidelines will not be adhered to in restoration areas to avoid manicured look.	Follow A-S NFs *Plan* standards and guidelines within PFA and PACs. Target BA will typically be higher than PP. Conifers 5–16 inches may be thinned; however target BA will be exceeded in some areas due to number of existing trees >16 inch dbh. Areas of slope ≥ 40 percent and inaccessible areas may be treated with periodic prescribed burns or hand-thinned and hand-piled for future burns. Two to fifty acre openings may be established in restoration areas depending on habitat concerns and objectives for individual restoration projects. Restoration projects will be designed to promote presettlement trees thus creating fire resilient stands. Variable percentage of a project area may be left untreated, emphasizing drainages, riparian areas, wildlife cover and corridors, and water sources. Treatments will target trees <16 inch dbh to restore historic stand structure and promote clumpy appearance. Strict spacing guidelines will not be adhered to in restoration areas to avoid manicured look.
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 ground around improvements.	Control erosion and sedimentation. Remove all pine needle or 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, creating downstream jams. Some slash and debris can be scattered and retained in small, ephemeral streambeds where 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 <40 percent; however, slash will be hand-piled and ignited prescribed fire will be the primary slash reduction treatment. NA for grassland types.	Slash may be loped and burned, or piled and burned, or chipped and removed. Slash may be utilized for soil stabilization on highly erosive soils when fire resiliency is not compromised.	Slash from mechanical treatment may include lop and burn, pile and burn, or utilized for soil stabilization. Slash from treatments on slopes ≥ 40 percent may include hand-piling and burning. Areas may be treated with periodic prescribed burns.	Slash from mechanical treatment may include lop and burn, pile and burn, or utilized for soil stabilization. Slash from treatments on slopes ≥ 40 percent may include hand-piling and burning. Areas may be treated with periodic prescribed burns.

Table 4.2. Fuel modification and treatment plans continued

Treatment number	6[d] Woodland type Federal and Nonfederal Lands		7[d] Escape and resource transportation corridors Federal and Nonfederal Lands	8 Riparian areas Federal and Nonfederal Lands	9[d] Wildland Fire use for Resource Objectives	10 Conditional suppression areas Federal and Nonfederal Lands	11 Saltcedar Federal and Nonfederal lands
Treatment category	Federal or State Lands ≤ ½ mile of private	Federal or State Lands >½ mile of private	Federal, State, or Local Government where designated as Escape Route	Federal or State Lands	Federal, State, or Private Lands	Federal, State, or Private Lands	Federal, State, or Private Lands
Vegetation	Mechanical treatments such as crushing, chipping, mastication and ignited prescribed fire may be used. Stands may be reduced to 40–50 BA. Create open stands producing flame lengths of 4 feet or less minimize crown fire potential and fuels are conductive to suppression action.	Mechanical thinning and ignited prescribed fire (see treatment 10) to reduce stands to 60–80 BA or to presettlement conditions based on TES surveys and local knowledge. 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 inch diameter 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 prescribe burning the project area. Large pine, pinyon, oak, and juniper 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 inch in diameter may be cut to reach projected BA, 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 conifers, leaving deciduous riparian trees and shrubs in areas where conifer encroachment has increased heavy woody fuels. Treatments will emphasize conifers <16 inch dbh. Snags, including conifer snags (>12 inch dbh) may be retained. All presettlement trees including conifers will be targeted for retention.	Ignited prescribed fire, including wildland natural fire, will be used as a planned tool to accomplish specific resource management objectives in accordance with A-SNFs LMP standards and guidelines (Fire Management Zones I, II, III, IV, V, and VI). Wildland fire will be the preferred or available prescription for hazardous wildland fuels management to reduce risk of catastrophic wildland fire in primitive areas, steep slopes, inaccessible areas, habitat maintenance or forest, grassland and woodland types where fire is determined to be the preferred tool for resource objectives. Ignited prescribed fire can occur at low, moderate, and high intensity. High intensity fire will be used to create openings by removing 100 percent of above ground vegetation	Lands currently in Condition Class 1 where 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. It also includes areas where fire never played a historic role in developing and maintaining ecosystems and where fire return intervals were very long. There are areas in the WUI where fire could have negative effects unless fuel modifications take place (see Treatment 9). These include areas where the use of fire may have ecological, social, or political constraints and areas where 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 prior to initiating suppression. Agency policy provisions may determine suppression response.	Areas of monotypic saltcedar may be treated mechanically, chemically, or by controlled burning and re-burning to reduce stem density, canopy, and excessive fuel loading. Preferred phenological stage for burning is peak summer months and post avian breeding. Blacklines should be at least 700 feet wide, headfire installed with temperatures 65 to 95°F, relative humidity of 25 to 40 percent and wind speeds <15mph. 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 upon initial treatments and may be considered a preferred treatment.
Slash	Slash treatments may include piling, lop, and burn, or piled and burned, or utilized for soil stabilization.	Same as ≤ ½ mile of private.	Snags, slash and down logs will be removed within 600 feet of private land. When greater than 600 feet from private property, pile or prescribed burning 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. Subsequent to removal of heavy woody fuels to ensure low intensity fire, cool season low intensity fires that move slowly down slope or into prevailing winds, or mid slope ignited prescribed fire 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 inch or greater) may be retained in riparian areas.	Slash, jack piles, down logs when greater than 600 feet from private property may be burned. Pile or prescribed burning will be used to remove fuel when greater than 600 feet from private land or as prescribed. 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 piled with preexisting fuels, and burned or otherwise utilized for soil stabilization. Disturbed areas should be immediately re-vegetated with a native plant community, containing no invasive species and meeting other land use objectives such as wildlife habitat enhancements or recreational use benefits.

[a] BA = basal area (in square feet)
PP = ponderosa pine
dbh = diameter breast height;
PAC = spotted owl protected activity center
PFA = goshawk post fledgling family area
drc = diameter root collar

[b] All insect-infested, diseased, and dead trees should be removed and destroyed in excess of A-S NFs' standard for snags.

[c] Maintenance treatments include mechanical removal or burning treatments designed and implemented to diminish understory mass and reduce laddering.

[d] Within IRAs, objectives will be achieved primarily with thinning, piling and burning, and prescribed fire

It is recommended that private landowners who wish to adopt fuel modification plans other than those described in Table 4.2 be prepared or certified by a professional forester, a certified arborist, or other qualified individuals. Fuel modification plans for federal and state lands within 0.5 mile of private land may be prepared for wildlife and watershed benefits including the retention of large snags of high wildlife value, in areas greater 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 ground water protection. The action identified by the fuel modification should be completed prior to development of the property or be identified during project initiation on federal and state lands.

1. Alternate Federal, State or Private Land Fuel Modification Plan

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

- A copy of the site plan.
- Methods and timetables for controlling, changing, or modifying fuels on the property(ies) 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 and/or insect-infested vegetation.
- A plan for the ongoing maintenance of the proposed fuel reduction and of control measures for disease and insect infestations.
- When a grouping of parcels in multiple ownership is proposed to achieve compliance with this section, the proposed vegetation management plan will need to be accepted by all owners of the property covered by the plan.

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 forest 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 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 of 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 FS lands to be categorically excluded from documentation of the results of an environmental assessment, the project must meet specific requirements:[3]

[3] See the *Forest Service Handbook*, Section 1909.15, Section 30.3

- 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 Class 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, its proposal must be satisfactorily reviewed to determine that no extraordinary circumstances exist. 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. Fuel reduction projects in these instances must comply with all land management plan requirements. For project proposals in the WUI, however, A-S NFs is not required to analyze any alternative to the proposed action unless the at-risk community has adopted a CWPP and the proposed action does not implement the CWPP in terms of general location and treatment methods. If the proposed action does not implement a CWPP, the analysis must consider the CWPP proposal as an alternative to the proposed action. Conversely, if the proposed action does implement a CWPP, the action alternative could be the treatments described on the specific federal lands in the WUI of the CWPP.

For these reasons, the communities in the GCWPP have striven to identify and recommend treatments that comply with the *Apache-Sitgreaves National Forests Plan* and *Proposed Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management. Finding of No Significant Impact (FONSI) and Environmental Assessment,* BLM 2004. For example, treatments in the BRPA and IRAs will be achieved under current authority of the *Apache Sitgreaves National Forest Land and Resource Management Plan* (amended 1996). In federal land management areas where an environmental assessment shows no additional documentation is warranted, the priority areas identified for treatment in the GCWPP and treatments recommended to meet fuel reduction or modification objectives should be considered as the action alternative by A-S NFs and the BLM Gila District.

2. 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 US and northern Mexico although its distribution extends to many parts of North America. It is especially pervasive in Arizona and has dominated low areas bordering the channel of the Gila River 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 arroweed and mesquite are common associates. Several studies in Arizona 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 GWCPP.

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 and/or mesquite are thought to have been infrequent. Increases in fire size or frequency have been reported for Gila River 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 and 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 cottonwoods. 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. 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 subsequent to 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. 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 (From Zouhar, Kris. 2003 Tamarix spp. *In: Fire Effects Information System [On Line]*. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory [2004]. Available <http://www.fs.fed.us/database/feis/>).

3. Watersheds

As mentioned in previous sections, the communities in the GCWPP were settled along the major streams and rivers of Greenlee County. Risk to communities from catastrophic wildland fire is present not only from within the WUI, but also from the upper watersheds. The adverse effects of a wildland fire event in or adjacent to these watersheds will create changes in peak flows, either by frequency and/or magnitude. Flood and debris flows resulting from catastrophic wildland fire in the watersheds will affect municipal watersheds. River and stream courses that will degrade water quality and quantity can cause the release of harmful heavy metals and create other effects from physical damage to property and habitats. The CAGs recognize the need to develop a CWPP necessary to protect and enhance the municipal watersheds. The CAGs also recognize that mitigating risk to the communities GCWPP area must also be provided from fire mitigating and watershed enhancing treatments of the upper watersheds. Therefore the CAGs recommend that in addition to the GCWPP, a Watershed Health Plan be initiated to supplement the treatments identified in this CWPP. The CAGs identified and recommend that Level V watersheds 3, 4, 5, 7, 9, 10, and 12 be included in the Watershed Health Plan and be prioritized by Condition Class and treatment status.

D. Prevention and Loss Mitigation

The GCWPP is intended to be used as a resource to assist in the coordination of long-term interagency mitigation of catastrophic wildfire events in the at-risk communities of the ANF and BLM Gila District. The communities in the GCWPP area have agreed on ten primary goals of the GCWPP:

- improve fire prevention and suppression
- reduce hazardous forest fuels
- restore forest health
- promote community involvement and education
- recommend measures to reduce structural ignitability in the GCWPP area
- encourage economic development and stability in the community through protection of the ecosystem and utilization of forest products
- identify watersheds at risk and potential impacts to downstream communities
- identify funding needs and opportunities
- expedite project planning
- prioritize high risk projects

The GCWPP should be periodically 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 interests. Communities in the GCWPP area have put forward the following action recommendations:

1. Improved Protection Capability and Reduction in Structural Ignitability

The risks of wildland fire igniting and spreading in the WUI are taken seriously by the communities. Fire Departments, BLM Gila District and A-S NFs fire response crews' performance 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 GCWPP communities:

a) Provide data to the Towns of Clifton and Duncan and Greenlee County for use in adoption of an Urban-Wildland Interface Code (ARS §9-906) and/or Fire Prevention Code (ARS §11-861). Such a code or codes would describe specific land standards that apply to trees and describe which conditions are acceptable and which are not. Such a code or codes in the WUI will depend on housing density and community values-at-risk such as watersheds, archeological resources, recreational resources, wildlife, grazing, and timber resources. Local land use policies could include incentives for private landowners to address defensible space and fuels management on their properties and implement fire-sensitive land use planning and subdivision requirements. In addition, the Towns of Clifton and Duncan and Greenlee County propose to develop and refine jurisdictional agreements needed for seamless land treatment policies, development of ordinances and codes designed to reduce ignitability for both structural and wildland points of ignition, and application and administration of grants and programs needed to provide for oversight, management, and implementation of the GCWPP. Decision making will

also include development of systems needed for evacuation, specific exigent circumstance mitigation, and firefighting resource distribution.

b) The communities recommend adoption of a consistent preparedness planning model, one that analyzes cost-effective fire protection within all administrative boundaries. 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 reference and coordinated suppression efforts among the community fire departments, Arizona State Forester, BLM Gila District, and the A-S NFs fire management and response departments.

c) The communities will map specific areas of high risk. These maps will depict resource needs and specific firefighting descriptions that narrowly focus on suppressing fires occurring in the high-risk areas. For example, within a specific neighborhood, there might be residents identified with special needs—a nursing home or a campsite—that, for evacuation, would require notifying specialized personnel, or, there might be a propane distribution center or other defined responses within the high-risk area. Additionally, specific subdivisions that currently have only one-way ingress/egress routes will be evaluated for evacuation and fire response.

d) A-S NFs, BLM Gila District, the Arizona Department of Environmental Quality, and local fire departments and fire districts will develop a Prescribed Fire Management Plan for the entire WUI. Specific burn plans could be produced consistent with the Prescribed Fire Management Plan and submitted to the USFWS for programmatic consultation necessary to implement saltcedar treatments. Concurrently, the communities and county will purse development of a “Wildfire Response Plan” that includes provisions for enhanced communication and coordination of wildland fire suppression efforts. Fire departments and the FS will enhance regulatory and control policies, such as open burning, campfires, smoking restrictions, and other use of fire within their boundaries and will enhance relationships with local law enforcement to ensure compliance with any adopted regulations.

e) Communities will incorporate trails and recreational areas and facilities into fire protection and response plans.

f) Additional comprehensive and frequent training for firefighters will be jointly conducted by A-S NFs, BLM Gila District, and the community fire departments. A common training activity should be conducted once a year prior to entry into the fire season for the purpose of emphasizing tactics of WUI suppression and interagency coordination. Communities will support Eastern Arizona College’s existing, or encourage, new training programs such as Fire Science and Emergency Medical Technology training programs. Continuing WUI fire suppression training must be made available to volunteer and regular firefighters in each fire district and fire department.

g) Obtain a small pumper truck for the Blue and Eagle Creek communities to be used as initial fire attack by local residents.

h) Construct a 5000-gallon water storage tank in Blue and Eagle Creek to improve water availability to firefighting resources. In the Blue Area it may be necessary to construct a well adjacent to the storage tank to ensure reliable water source to maintain water in the storage tank.

i) The County encourages the A-S NFs to analyze and recommend measures for enhanced wildland fire response and resource capabilities within the Blue and Eagle Creek areas.

j) The County, communities, and federal and state agencies will investigate ways to improve communication to residents of the County. This may include enhanced radio, telephone and/or internet communications to residents, and/or the development and implementation of emergency notification and evacuation systems. The CAGs also recommend the development of a "Communication Center" for enhanced notification and coordination of emergency response to catastrophic wildland fire.

k) Complete the Multi-Hazard Mitigation Plan for the Blue including hazardous fuel removal and maintenance at the Blue School, identifying and obtaining GIS coordinates for additional safety zones and helispots, including lighted areas for night landings.

l) The CAGs further recommend that at least 10 sets of basic wildland firefighter equipment be acquired and distributed to fire department personnel. The CAGs also recommend that provisions for training in wildland fire response be arranged for residents of Blue and Eagle Creek and that trained residents be provided with basic wildland firefighter equipment.

m) The Town of Duncan recommends enhanced wildland fire response infrastructure within the fire district. The recommendations include construction of three new fire department substations within the district and the purchase of one new tanker truck, one new tender, one new brush truck.

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

The County and communities in the GCWPP will develop and implement pubic outreach programs to help create an informed citizenry. The goal is to have residents support concepts of fire-safe landscaping and naturally functioning forest systems through restoration management and rapid response to wildland fire. The GCWPP is intended to be a long-term strategic instrument containing prescriptive recommendations to address hazardous fuels and enhance forest and rangeland health. To effectively achieve these goals, a grass roots 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) Develop a uniform "Urban-Wildland Interface Code" to enhance wildfire management strategies on private land. The Intergovernmental Agreement (IGA) signatories should adopt a "tree policy" standard to meet any adopted interface fire prevention code. It is recommended that a public involvement process that meets public notice/meeting requirements of the participating governments be initiated throughout the GCWPP analysis area. This public involvement process will derive, through overall community consensus, the seamless land use and structural

codes and ordinances necessary to reduce ignitability throughout the GCWPP communities and to comply with the ARS.

b) 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. Utilize the resources of the U of A, which has contracted with FS Region 3 to provide forest health analysis and evaluation for all nonfederal lands in Arizona. U of A is further tasked with forest health outreach throughout the state and has a lead role in the FireWise™ communities outreach program. Community bulletins for specific county residential areas and other public service announcements concerning wildfire threat and preparedness should be developed.

c) Continue and enhance the U of A, Navajo County Agricultural Extension Service, and Eastern Arizona College offering of Defensible Landscaping and Forest Health Workshops, which demonstrates actions that can be used to protect home and property from wildland fire.

d) Develop a video presentation describing treatments a homeowner can undertake to reduce ignitability, through both structural and land treatment improvements.

e) 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.

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

g) Fire department and fire district 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 that explain the need for fire awareness and the benefits of preparing private property for potential fire ignition.

3. Enhance Local Wood Products-Related Industries

The GCWPP communities will continue to support and promote private contractors who perform fire-safe mitigation work. The communities will support new businesses or expansion of existing businesses involved in the fuel reduction market. The communities encourage qualifying businesses (see ARS §41-1516) to apply to the Department of Commerce Healthy Forests Enterprise Incentive Program. The communities are committed to employing all appropriate means to stimulate industries that will utilize all size-classes of wood products resulting from hazardous-fuel reduction activities. Recommendations include:

a) Support and promote contractors who treat private land parcels.

b) Support the establishment of healthy forest enterprise businesses and support the new tax credit program for forest-related industries. (ARS §41-1516)

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

d) Support and promote the programs established and conducted by Eastern Arizona College in the Forest Worker Certification Program, which is designed to help businesses develop sound forest practices and diversify their skills. The GCWPP communities support a trained and ready work force for forest-related industries and to maintain a private work force and local industry necessary to complete fuel reduction treatments within the analysis area.

V. CWPP PRIORITIES: ACTION RECOMMENDATIONS AND IMPLEMENTATION

The GCWPP communities have developed action recommendations (Section IV) necessary to meet the plan's objectives. A precise set of land management prescriptions has been adopted for fuel reduction treatments and restoration of forest health on both federal and nonfederal lands. A series of recommendations that will reduce structural ignitability and improve fire prevention and suppression has been developed. The GCWPP expresses support from all participating communities for the local wood products industries and local wood products contractors. A unified effort to implement this collaborative plan requires timely decision making at all levels of government. The plan now must be strategically implemented to ensure that 1) action is taken on the highest-priority recommendations and 2) communities can handle the logistical demands of meeting the goals of each recommendation. The GCWPP 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 reduce the threat of catastrophic wildland fire. Additionally, there must be accountability for measuring and monitoring performance and outcomes of each action recommendation. In response to monitoring the implementation of each action recommendation in the "Wildfire Management Zone", the Greenlee County Emergency Services Director will draft an annual report and forward the report to the GCWPP communities, which they will use to adaptively adjust their annual action recommendations accordingly.

To meet GCWPP objectives for Fiscal-Year 2005/06, the CAGs developed and prioritized the following action recommendations. At the end of the fiscal year, projects implemented from these action recommendations will be monitored for effectiveness of meeting GCWPP objectives. For the life of the GCWPP, recommendations for additional projects will be made for each coming fiscal year based on project performance in the prior fiscal year.

A. Administrative Oversight

As stated previously, the communities concur that the most efficient way of implementing the GCWPP action recommendations is to delegate accountability to a single entity. Establishing a unified effort to collaboratively implement the GCWPP 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 Greenlee County Emergency Services Director is the primary action recommendation of the GCWPP communities and will be the single point of contact at both the county and community level for implementing the GCWPP. In order to meet funding needs and identify possible funding sources the GCWPP Administrator 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 GCWPP. Grant information from federal sources, state sources, and nongovernmental sources should be routinely searched for updated grant application cycles. The GCWPP communities will submit a request for HFRA grant funds through the FS and the Arizona State Forester to provide an estimated $125,000 grant that will be used to support the Greenlee County Emergency Services Director, provide logistics, cover travel, mileage, and other expenses. The IGA signatories would be willing to consider augmenting the HFRA funding for the Greenlee County Emergency Services Director if necessary to meet GCWPP objectives.

B. Community Priorities for Reduction of Hazardous Fuels and Reducing Structural Ignitibility

1. Blue Area Action Recommendations

The priority treatment areas and projects recommended by the Blue Area CAG will decrease vegetative fuels and thereby reduce wildfire intensity and potential impact to the communities and the surrounding forests. The recommended projects have "high" valuations for reducing wildfire risk from the adjacent forest. The 0.5-mile fuel break adjacent to the private property boundaries in the Blue Area are designed to provide protection to the private inholdings from rapid fire and the lack of timely response from organized wildfire suppression resources.

Table 5.1. Blue action recommendations for reduction of hazardous fuels

Treatment management area	Location and description	RT[a]	Project partners	Estimated treatment costs
Blue (B17)	Mostly federal lands not identified for treatment northeast of Beaverhead in moderate fuels not identified for treatment	5 and 9	A-S NFs and Greenlee County	Federal 2,199 acres: $221,659 annually Nonfederal 58 acres: $8,352 annually
Blue (B20)	Primarily federal lands in the BRPA adjacent to US 191 evacuation route not identified for treatment	1, 2, and 9	A-S NFs and Greenlee County	Federal 6,020 acres $606,816 annually Nonfederal 17 acres $2,448 annually

Table 5.2. Hannagan Meadow/Sprucedale/Beaverhead action recommendations for reduction of hazardous fuels

Treatment management area	Location and description	RT[a]	Project partners	Estimated treatment costs
Blue (B7)	Located south of Beaverhead and Sprucedale federal land with intermix private land not identified for treatment	1–3, 5, 7, and 9	A-S NFs and Greenlee County	Federal 5641 acres: $568,612 annually Nonfederal 218 acres: $31,392 annually
Blue (B11)	Federal lands adjacent to Hannagan Meadow Lodge not identified for treatment	5, 7, and 9	A-S NFs and Greenlee County	Federal 7284 acres: $734,227 annually

The Blue Area CAG also recommends that governments at all levels evaluate, maintain, and where necessary, upgrade community wildfire preparation and response facilities, capabilities, and equipment. The Blue Area CAG recommends the following priority actions be implemented during Fiscal Year 2005/06

Table 5.3. Blue Area priority action recommendations

Partners	Project	Equipment/expenses	Timeline
Blue Area	Conduct individual "Wildfire Home Assessments" for each private parcel and implement mitigation features in priority of risk determination	Risk Assessment by Greenlee County Emergency Services Director: $6,000 Implement recommended mitigation measures by property owners: $1,200 for three years	Begin 2005 Complete 2007
	Obtain small "pumper truck" for the Blue to be used as initial fire attack by local residents	Acquisition of "pumper truck" by Greenlee County: $30,000 and annual maintenance by Greenlee County: $2,000 annually	Acquire in 2005 Maintain annually
	Obtain a 5,000 gallon tank and construct a well for emergency fire fighting water availability	Obtain a 5,000 gallon tank and emergency well for fire fighting water availability, $5,000 storage tank and $75,000 well plus operating expense during wildland fire emergencies	Acquire and construct in 2005
	Due to remoteness of communities provide CPR and first aid training to all local residents	One time expense of $1,200 for instructor and travel	Conduct training in two sessions to ensure all residents have access to training in 2005
	Complete the Multi-Hazard Mitigation Plan including hazardous fuel maintenance at the Blue School, identifying and obtaining GIS coordinates for additional safety zones and helispots, including lighted areas for night landings	One time expense of $30,000 to complete the Multi-hazard Mitigation Plan and up to $10,000 annually for hazardous fuels reduction in safety zones and lighting in helispots	Begin 2005 Complete plan in 2006 and maintain each year

2. Eagle Creek Area Action Recommendations

The priority treatment areas and projects recommended by the Eagle Creek Area residents will decrease vegetative fuels and thereby reduce wildfire intensity and potential impact to the private inholdings and the surrounding forest. The 0.5-mile fuel break adjacent to the private property boundaries in Eagle Creek are designed to provide protection to the communities from rapid fire and the lack of timely response from organized wildfire suppression resources. The projects recommended have "high" valuations for reducing risk.

Table 5.4. Eagle Creek area action recommendations for reduction of hazardous fuels

Treatment management area	Location and description	RT[a]	Project partners	Estimated treatment costs
Eagle Creek (E3)	Evacuation Route including federal and private lands along US 191 north and east of the community	1–7, and 9	A-S NFs, Greenly County and the community of Eagle Creek	Federal, 16,783 acres: $1,691,726 annually Nonfederal, 37 acres: $26,640 annually
Eagle Creek (E4)	Evacuation Route along FR 217 including federal and private lands south of the community leading to the US 191 junction	1–7, and 9	A-S NFs, Greenly County and the community of Eagle Creek	Federal, 15,289 acres: $1,541,131 annually Nonfederal, 261 acres $187,920 annually

The Eagle Creek residents recommend that Greenlee County and the A-S NFs evaluate, maintain, and, where necessary, upgrade community wildfire preparation and response facilities, capabilities, and equipment. The Eagle Creek residents recommend the following priority actions be implemented during Fiscal Year 2005/06:

Table 5.5. Eagle Creek area priority action recommendations

Community	Project	Equipment/expenses	Timeline
Eagle Creek	Conduct individual "Wildfire Home Assessments" for each private parcel and implement mitigation features in priority of risk determination	Risk Assessment by Greenlee County Emergency Services Director: $6,000 Implement recommended mitigation measures by property owners: $1,200 for three years	Begin 2005 Complete 2007
	Obtain small pumper truck for the Eagle Creek community to be used as initial fire attack by local residents	Acquisition of pumper truck by Greenlee County: $30,000; and annual maintenance by Greenlee County: $2,000 annually	Acquire in 2005 Maintain annually
	Obtain a 5,000 gallon tank for fire fighting water availability	Obtain a 5,000 gallon tank for fire fighting water availability: one time expense of $5000	Acquire in 2005
	Due to remoteness of communities provide CPR and first aid training to all local residents	One time expense of $1,200 for instructor and travel	Conduct training in two sessions to ensure all residents have access to training in 2005
	Provide for training and equipment for 4 local residents in wildland and structural firefighting annually	Acquire initial attack fire training through State Foresters office assistance: $5,000 per four residents trained and equipped	Beginning training in 2005 continue until a cadre of resident firefighters trained and equipped

3. Morenci Area Action Recommendations

The priority treatment areas and projects recommended by the Morenci Community will decrease vegetative fuels and thereby reduce wildfire intensity and potential impact to the private inholdings and the surrounding forests. The projects recommended have "high" valuations for reducing risk.

Table 5.6. Morenci area action recommendations for reduction of hazardous fuels

Treatment management area	Location and description	RT[a]	Project partners	Estimated treatment costs
Morenci (M5)	Primarily private lands with intermix federal land within the community of Morenci and private land west of the community	1–4, and 10	A-S NFs, BLM Gila District, Greenlee County, and the community of Morenci	Federal, 1,170 acres $117,936 annually Nonfederal, 21,550 acres $302,400 annually plus conditional suppression at $35/acre for wildland fire monitoring
Morenci (M1)	Includes federal land and single private parcel surrounding Granville in area of moderate fuel hazard	1–5, 7, and 9	A-S NFs, Greenlee County, and the community of Morenci	Federal 7,323 acres $738,158 annually Nonfederal 8 acres $1,152 annually

The Morenci Community recommends that where necessary, community wildfire preparation and response facilities, capabilities, and equipment are upgraded. The Morenci Community recommends the following priority actions be implemented during Fiscal Year 2005/06:

Table 5.7. Morenci area priority action recommendation

Community	Project	Equipment/expenses	Timeline
Morenci	Contract with local small business for creation and maintenance of fuel break through agreement with the A-S NFs, BLM Gila District, and Phelps Dodge	$2,000 annual contract to local small business	Initiate request for proposal (RFP) for contract in 2005/06 Conducted every other year

4. Clifton Area Action Recommendations

The priority treatment areas and projects recommended by the Clifton Area will decrease vegetative fuels and thereby reduce wildfire intensity and potential impact to the private inholdings and the surrounding forests. The projects recommended have “high” valuations for reducing risk.

Table 5.8. Clifton area action recommendations for reduction of hazardous fuels

Treatment management area	Location and description	RT[a]	Project partners	Estimated treatment costs
Clifton (C2)	Located in the northwestern town limits of Clifton primarily private lands in moderate fuel hazard	1–2, 4, 6, 9, and 10	Greenlee County and the Town of Clifton	Federal, 375 acres $37,800 annually Nonfederal, 6,593 acres $949,392 annually plus conditional suppression at $35/acre for wildland fire monitoring
Clifton (C4)	Located north of Three Way bisecting SR 78 intermix federal land and private lands	1–4	BLM Gila District, Greenlee County, and the Town of Clifton	Federal, 995 acres $100,296 annually Nonfederal, 12,515 acres $1,802,160 annually plus conditional suppression at $35/acre for wildland fire monitoring

The Clifton Community recommends that where necessary, community wildfire preparation and response facilities, capabilities, and equipment are upgraded. The Clifton Area recommends the following priority actions be implemented during Fiscal Year 2005/06:

Table 5.9. Clifton area priority action recommendation

Community	Project	Equipment/expenses	Timeline
Clifton	Contract with local small business for creation and maintenance of fuel break through agreement with the A-S NFs, BLM Gila District, and Phelps Dodge	$2,000 annual contract to local small business	Initiate RFP for contract in 2005/06 Conducted every other year

5. Duncan Area Action Recommendations

The priority treatment areas and projects recommended by the Duncan area will decrease vegetative fuels and thereby reduce wildfire intensity and potential impact to the private inholdings and the surrounding forests. The projects recommended have “high” valuations for reducing risk.

Table 5.10. Duncan Area Action recommendations for reduction of hazardous fuels

Treatment management area	Location and description	RT[a]	Project partners	Estimated treatment costs
Duncan Area (D3)	Includes private land in the communities of Duncan and Franklin and public lands to the west and south	1–3, 8, 10, and 11	Greenlee County and the Town of Duncan	Federal, 215 acres $21,672 annually Nonfederal, 5,214 acres $750,816 annually plus conditional suppression at $35/acre for wildland fire monitoring
Duncan Area (D7)	Primarily private and intermix federal acres in the WUI both east and west of Duncan and Franklin	10	Greenlee County, and the Town of Duncan	Federal, 608 acres $21,280 per monitored wildland fire Nonfederal, 11,231acres mostly in conditional suppression $35/acre for wildland fire monitoring

The Duncan Community recommends that where necessary, community wildfire preparation and response facilities, capabilities, and equipment are upgraded. The Morenci Community recommends the following priority actions be implemented during Fiscal Year 2005/06:

Table 5.11. Duncan area priority action recommendations

Partners	Project	Equipment/expenses	Timeline
Duncan	Contract with local small business for creation and maintenance of fuel break through agreement with the BLM Gila District, and ASLD	$2,000 annual contract to local small business	Initiate RFP for contract in 2005/06 Conducted every other year
	Obtain wildland fire fighter training for 10 firefighters per year	Funds to attend training classes, and travel expenses for 10 firefighters annually: $2,500 per year tuition	Begin in 2005
	Obtaining wildland fire fighting equipment at 10 sets per year for three years	Funds to acquire 10 sets per year of wildland fire fighting equipment: $5,000 per 10 sets	Begin in 2005 continue through 2008
	Construct wildland fire response infrastructures	Obtain funds to construct three fire substation including all utility connections, one new tanker truck, one new tender, one new brush truck in each substation costing approximately $150,000.00 per substation	Begin in 2005 with first substation
	Expand existing water line from Gila River Bridge north 3 miles	Obtain funds to expand water line to provide additional fire hydrant for 3 miles within fire district	Begin in 2006

C. Greenlee County Priorities for Protection Capability and Reducing Structural Ignitability, Fiscal Year 2005/06

The GCWPP communities will evaluate, maintain, and, where necessary, upgrade community wildfire preparation and response facilities, capabilities, and equipment. It is also recommended that Greenlee County initiate a dialogue with the USFWS for programmatic consultation to implement fuel reduction treatments in areas of high wildland fire risk from thick stands of saltcedar. Table 5.12 lists the priority action recommendations for Fiscal Year 2005/06 that are applicable to all of Greenlee County.

Table 5.12. Greenlee County Action recommendations for wildland fire protection and reduced ignitability

Partners	Project	Equipment/expenses	Timeline
Greenlee County	Initiate a public involvement program in all GCWPP communities to develop an integrated, consistent, land use code	Public involvement program materials and meeting facilitation: $120,000 Technical assistance code and ordinance development: $45,000	Begin 2005 Complete 2007
	Develop and implement a comprehensive emergency response plan and appropriate communications, coordination and infrastructure development including a communication center and appropriate mutual aid agreements for all Greenlee County communities	Risk assessment by specific community areas: $45,000 Technical assistance: $20,000 Communication Center: $250,000	Begin 2005 Complete 2010
	Concur, obtain, and provide training in consistent wildland fire management model	Obtain Fire management model, ensure compatible soft and hardware among fire districts and train personnel: $2,000	Acquire and provide training in 2005 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 initially 1,000 brochures and initiate distribution in 2005 Provide information annually

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

The GCWPP communities will implement public outreach and education programs for residents and casual forest and community visitors alike to heighten awareness and understanding of the threats and other issues that wildland fire and forest disease pose to Greenlee County. Table 5.13 displays the GCWPP communities' priority recommendations to promote community involvement. Eastern Arizona College supports public education of wildland fire danger and preparedness in the GCWPP through existing programs such as Fire Science, Defensible Landscaping, and Forest Health Workshops. Additional programs that could be used or developed to enhance community outreach and education include:

- establish a communication liaison to notify Eastern Arizona College of educational opportunities and needs
- establish a liaison with Eastern Arizona College Community Business Services to identify community outreach and education needs.

- establish a means for requiring wildland fire workers to attain "best practices" through a formalized education or certification approach
- utilize the U of A's contract with the FS in Region 3 that provides forest health analysis and evaluation for all nonfederal lands in Arizona. The University is further tasked with forest and rangeland health outreach throughout the state and has a lead role in the FireWise™ communities outreach program
    - develop a DVD-based presentation to help citizens understand fire protection in the WUI, including user-friendly ways for the homeowner to conduct a "wildfire home assessment"
    - provide local tours showing wildland fire and home ignition mitigation treatments completed by private landowners and agencies

Table 5.13. Greenlee County action recommendations for enhanced public education, information, and outreach

Partners	Project	Equipment/expenses	Timeline
Greenlee County	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 2005 Distribute continually
	Initiate open-house tours of treated private and federal lands; complete 12 tours (one per month to ensure that all new property buyers will have opportunity to participate) consisting of 20 participants each	Vehicle rental and technical assistance for tour sponsorship, areas, and outreach; "take-home" materials: $25,000 annually	Begin 2005 Conduct continuously
	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 2005 Conduct continuously

E. Priorities for Enhancing Local Wood Products-Related Industries

The GCWPP 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. The GCWPP communities encourage new and existing qualifying businesses to participate in the State of Arizona's, Healthy Forests Enterprise Incentive Program. The development of local businesses to support harvesting, transporting, or processing of forest products is consistent with the goals of the GCWPP.

- support and assist in developing biomass opportunities in Greenlee County
- support and assist in developing transportation of forest products to end users in Greenlee County
- coordinate and cooperate with neighboring Graham County in the development of local small forest products user

F. Requested Funding for Fiscal Year 2005/06

Table 5.14 summarizes the total Fiscal Year 2005/06 costs to launch the GCWPP action recommendations. The budget includes the following considerations:

- an expedited environmental assessment process, according to HFRA stipulations, that is compliant with FS requirements
- estimates of possible forest product and slash production and of treatment/prescription costs are based on federal and nonfederal land assessments/calculations
- the GCWPP communities support development of local forest products industries
- site-specific treatment areas and requirements for implementing “extraordinary-circumstances” treatments are identified
- recommended public involvement processes (e.g., adoption of codes and ordinances) have associated costs and time requirements
- the Greenlee County Emergency Services Director oversight of the GCWPP has been established

Table 5.14. Fiscal Year 2005/06 budget

GCWPP objectives	Estimated Costs	
	State Forester	Forest Service/BLM
Administrative oversight		
Support of Greenlee County Emergency Services Director	$62,500	$62,500
Reduction of fuel hazards		
Blue (B17)	$8,352	$221,659
Blue (B20)	$2,448	$606,816
Hannagan/Sprucedale (B7)	$31,392	$568,612
Hannagan/Sprucedale (B11)		$734,227
Eagle Creek (E3)	$26,640	$1,691,726
Eagle Creek (E4)	$187,920	$1,541,131
Morenci (M5)	$302,000	$117,936
Morenci (M1)	$1,152	$738,158
Clifton (C2)	$949,392	$37,800
Clifton (C4)	$1,802,160	$100,296
Duncan (D3)	$750,816	$21,672
Duncan (D7)	$35.00/acre/fire monitored	$21,280
Wildland fire protection and reduced ignitability		
Blue and Eagle Creek area wildfire home assessment and implementation	$7,200	$7,200
Creation and maintenance of fuel break within Clifton and Morenci WUI	$2,000	
Public Involvement process for land use and structural code development	$65,000	
Emergency Response Plan development	$65,000	
Acquire consistent fire management model	$2,000	$20,000
Acquire “pumper trucks” for Blue and Eagle Creek	$62,000	
CPR and first aid training to residents of Blue and Eagle Creek	$2,400	
Complete Multi-Hazard Mitigation Plan for Blue, AZ	$20,000	
Acquire 5,000 gal water tank in Eagle Creek and Blue with emergency pump in Blue River	$85,000	
Provide for wildland fire fighting training and equipment for residents and firefighters at 10 per year minimum	$12,500	
Construct three fire stations in Duncan Fire District	$150,000/station	
Public education, information, and outreach		
Video description of compliant private lands	$17,500	$17,500
Public tours of treated private and federal lands	$12,500	$12,500
Total requested FY 2005/06 funds	$4,710,372	$6,583,513

VI. MONITORING PLAN

Monitoring is essential to ensure that GCWPP goals are met. Clifton, Duncan, and Greenlee County will actively monitor the progress of the GCWPP's action recommendations to determine the effectiveness of ongoing and completed projects in meeting GCWPP objectives and to recommend future projects necessary to meet GCWPP goals.

In accordance with Section 102.g.5. of HFRA, the GCWPP communities will participate in multiparty monitoring to assess progress toward meeting GCWPP objectives. This authority to participate in multiparty monitoring in conjunction with the A-S NFs, BLM Gila District, and other interested parties will be vested in the Greenlee County Emergency Services Director, as the responsible entity for implementing and monitoring the GCWPP. The GCWPP communities believe that participation in multiparty monitoring will provide effective and meaningful ecological and socioeconomic feedback on landscape and community fuel reduction projects and watershed enhancements and assist the A-S NFs and BLM Gila District in land management planning.

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

A. Administrative Oversight, Monitoring, and GCWPP Reporting

The Greenlee County Emergency Services Director will be responsible for implementing and monitoring the GCWPP action recommendations. The GCWPP Administrator 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 GCWPP. Grant information should be routinely searched for updated grant application cycles. The following is a list of federal, state, and nongovernmental websites that can be monitored to obtain the updated grant application cycle information:

federal

- <www.fs.fed.us/r3/asnf>
- <www.fs.fed.us/r3/partnership>
- <www.fireplan.gov>
- <www.nrcs.usda.gov>

state

- <www.land.state.az.us>
- <www.azstatefire.org>

nongovernmental

- <www.iwjv.org>
- <www.azwildlife.org>
- <www.sonoran.org>

Annual reporting by the GCWPP Administrator should include successful grant awards received implementing the Action Recommendations of the GCWPP. At the end of each year's fire season, the Greenlee County Emergency Services Director will produce an annual report detailing the success of

GCWPP project implementation and overall progress toward meeting GCWPP goals. The Greenlee County Emergency Services Director will review and make recommendations to the signatories to update the Community Mitigation Plan and the Prevention and Loss Mitigation Plan portions of the GCWPP, following adaptive management principles. This information will ensure timely decision making for all levels of government, and provide input necessary for the development of the next year's work plan and for prioritization of project recommendations, both annually and for the next 5 years. The Greenlee County Emergency Services Director will present the annual work plan to the IGA signatories for their agreement and submission to the Arizona State Forester, BLM, and FS for their concurrence and to forward the action recommendations of the current annual work plan for funding through the HFRA and other appropriate funding sources.

B. Effectiveness Monitoring

Table 6.1 shows the performance measures the Greenlee County Emergency Services Director will use to assess GCWPP performance against goals for the fiscal year. To assist in tracking of fuel treatment being planned and completed through Arizona Fire Assistance Grant programs, the Greenlee County Emergency Services Director will cooperate with the Arizona State Forester's State Fire Mapping program by providing detailed mapping information as requested.

Table 6.1. Performance measures to assess GCWPP progress

Goal	Performance measure
Improve fire prevention and suppression	Reduced wildland fire occurrence and acres burned (unplanned) in the WUI: • GCWPP communities have developed a WUI code consistent in terms of land treatments and structural codes • Effectiveness monitoring of fire prevention and suppression will include: - acres burned, degree of severity of wildland fire - percentage of wildland fire controlled on initial attack - number of homes and structures lost to wildland fire
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 GCWPP communities, and are moved to Condition Class 1 • Total acres treated through any fuel reduction measures, including prescribed fire, 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 Fire Regime Condition Class Version 1.0.5.* (2004)
Restore forest health	Acres of fuel reduction treatments that meet restoration treatment guidelines for federal lands. • Adoption and utilization of the Landfire Assessment Model • Coordinate with and support of the Stewardship Contract Multiparty Monitoring Board in determining social, economic, and environmental effects of forest 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
Reduce structural ignitability	Wildland Fire protection and reduced ignitability • IGA signatories have developed a consistent WUI Code and/or ordinance that effectively address ignitability issues. • Blue and Eagle Creek area wildfire home assessment completed and implementation initiated • Creation and maintenance of fuel break within Clifton and Morenci areas • Emergency Response Plan developed and in use • Consistent fire management model in use • Acquire “pumper trucks” for Blue and Eagle Creek • CPR and first aid training to residents of Blue and Eagle Creek • Complete Multi-Hazard Mitigation Plan for Blue • Acquire 5,000 gallon water tank in Eagle Creek • Provide for wildland fire fighting training and equipment for residents and fire fighters at 10 per year minimum • Construct 3 fire stations in Duncan
Encourage economic development	Wood products industry growth and diversification to utilize all sizes of material removed by fuel reduction treatments: • Number of jobs in forest restoration sector retained and number added • Number of value-added wood products developed by local industries • Number of wood products-related 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 • Growth in the number of trained and certified forest industry workers employed locally • Requirement of forest workers to achieve “best practices” certification through formalized education

VII. 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

Chairman, Greenlee County Board of Supervisors — Date: 10/19/05

Mayor, Town of Clifton — Date: 10-13-05

Mayor, Town of Duncan — Date: 10-11-05

Chief, Clifton Fire Department — Date: 10-13-05

Chief, Duncan Rural Fire Department — Date: 10-06-05

Chief, Morenci Fire Department — Date: 10/31/05

CONCURRENCE

Elaine Zieroth, Forest Supervisor,
Apache-Sitgreaves National Forests

10/24/05
Date

Kirk Rowdabaugh, State Forester

11/3/05
Date

Bill Civish, Bureau of Land Management, Gila District

10-28-05
Date

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Appendix 1. Threatened, endangered, and sensitive species potentially occurring in the WUI

Species Name	Status[a]	Comment
Plants		
Arizona alum root *Heuchera glomerulata*	SEN	Shaded rocky slopes near water from 4,000 to 9,000 feet above mean sea level (msl)
Arizona willow *Salix arizonica*	CA, SEN	High-elevation wet meadows and streamsides
Blumer's dock *Rumex orthoneurus*	SEN	Mid- to high-elevation wetlands
Gila groundsel *Senecio quaerens*	SEN	Associated with ponderosa pine in damp sites at high elevations
Gooddings onion *Allium gooddingii*	CA, SEN	Forested drainage bottoms and on moist north-facing slopes of mixed-conifer and spruce fir forests above 7,500 feet above msl
Mogollon paintbrush *Castilleja mogollonica*	SEN	High-elevation, wet grassy meadows and cienegas
Pinos Altos flame flower *Talinum humile*	SEN	Mid-elevation dry, gravelly soil terraces, often overlying bedrock
White Mountains clover *Trifolium longipes* var. *neurophyllum*	SEN	High-elevation, permanently wet meadows and springs
Wislizeni gentian *Gentianella wislizeni*	SEN	Mid-elevation open meadows or partially shaded mountain slopes
Invertebrates		
Arizona copper *Lycaena ferrisi*	SEN	Meadows and cienegas near the foodplant *Rumex hymeospalus*
California floater *Anodonta californiensis*	SEN	Shallow areas in unpolluted lakes, reservoirs, and perennial streams
False ameletus mayfly *Ameletus falsus*	SEN	High-elevation cold, swiftly flowing water
Mountain silverspot butterfly *Speyeria Nokomis nitocris*	SEN	Alpine meadows
Orange giant skipper *Agathymus neumoegeni*	SEN	Dry mountains with Parry's agave
Scudder's duskywing *Erynnis scudderi*	SEN	Higher elevation oak woodland
Spotted skipperling *Piruna polingi*	SEN	Moist woodland openings with lush vegetation, meadows, ravines, and streamsides in the mountains
Three Forks springsnail *Pyrgulopsis trivialis*	ESA CA, SEN	Springs, seeps, marshes, spring pools, outflows, and cienegas from 8,000 to 8,500 feet above msl
White Mountains water penny beetle *Psephenus montanus*	SEN	Cold, fast-flowing high-elevation streams
Fishes		
Apache (Arizona) trout *Onchorynchus apache*	ESA LT, SEN	Mid- to high-elevation, cold, clear mountain streams
Gila chub *Gila intermedia*	ESA PE, SEN	Mid-elevation headwater streams, cienegas, and springs or marshes
Gila trout *Oncorhynchus gilae*	ESA LE, SEN	Narrow, shallow, mountain headwater streams
Little Colorado sucker *Catostomus* sp.	SEN	Predominantly found in pools with abundant cover in creeks, small- to medium-sized rivers, and impoundments

(table continued on next page)

Appendix 1. Threatened, endangered, and sensitive species potentially occurring in the WUI (*continued*)

Fishes continued		
Little Colorado spinedace *Lepidomeda vittata*	ESA LT, SEN	Mid-elevation slow-to-moderate moving waters of the Little Colorado River and its north-flowing tributaries
Loach minnow *Tiaroga cobitis*	ESA LT, SEN	Upper Gila River Basin in turbulent, rocky riffles of mainstream rivers and their tributaries below 8,000 feet above msl
Roundtail chub *Gila robusta*	SEN	Cool to warm water, mid-elevation streams and rivers
Spikedace *Meda fulgida*	ESA LT, SEN	Mid-water habitats of runs, pools, and swirling eddies
Reptiles		
Mexican garter snake *Thamnophis eques megalops*	SEN	Densely vegetated habitat surrounding cienegas, cienega-streams, and stock tanks
Narrow-headed garter snake *Thamnophis rufipunctatus*	SEN	In permanently flowing streams, sometimes sheltered by broadleaf deciduous trees
Amphibians		
Chiricahua leopard frog *Rana chiricahuensis*	ESA LT, SEN	Mid-elevation natural and man-made aquatic habitats
Northern leopard frog *Rana pipiens*	SEN	Permanent waters with rooted aquatic vegetation from low to high elevations
Southwestern toad *Bufo microscaphus microscaphus*	SEN	Low- to mid-elevation rocky streams and canyons in the pine-oak belt and in lower deserts
Birds		
American peregrine falcon *Falco peregrinus anatum*	SEN	Steep, sheer cliffs overlooking woodlands, riparian areas, or other habitats supporting avian prey species in abundance
Bald eagle *Haliaeetus leucocephalus*	ESA LT, SEN	Large trees or cliffs near large bodies of water statewide at various elevations; wintering birds use various habitats
California brown pelican *Pelecanus occidentalis californicus*	ESA LE, SEN	Transient to lower Colorado River and other large bodies of water statewide at various elevations
Common black-hawk *Buteogallus anthracinus*	SEN	Forests, woodland edges, and canyons, usually near water
Mexican spotted owl *Strix occidentalis lucida*	ESA LT, SEN	Statewide in old-growth, mixed-conifer forests, canyonlands, or pine-oak forests on steep slopes from 4,500 to 10,000 feet above msl
Mountain plover *Charadrius montanus*	SEN	Short-grass plains and agricultural areas with flat, plowed, or fallow fields at various elevations
Northern goshawk *Accipiter gentilis*	SEN	Large tracts of mid- to high-elevation deciduous, coniferous, or mixed forests
Southwestern willow flycatcher *Empidonax traillii extimus*	ESA LE, SEN	Dense riparian vegetation near a permanent or nearly permanent source of water or saturated soil below 8,500 feet
Yellow-billed cuckoo *Coccyzus americanus*	ESA CA, SEN	Large blocks of riparian habitat below 6,500 feet
Mammals		
Black-footed ferret *Mustela nigripes*	ESA LE	Arid grassland plains north of Mogollon Rim below 10,500 feet, typically associated with prairie dog towns

(table continued on next page)

Appendix 1. Threatened, endangered, and sensitive species potentially occurring in the WUI (*continued*)

Jaguar *Panthera onca*	ESA LE, SEN	Sonoran desertscrub up through subalpine conifer forest
Mexican gray wolf *Canis lupus baileyi*	ESA LE, XN	Chapparal, woodland, and forested areas from 4,000 to 12,000 feet above msl
New Mexican jumping mouse *Zapus hudsonius luteus*	SEN	Mid- to high-elevation streamsides with dense herbaceous vegetation
Southwestern river otter *Lontra canadensis sonorae*	SEN	Rivers and streams
Springerville pocket mouse *Perognathus flavus goodpasteri*	SEN	Mid-elevation sandy, gravelly, or rocky grassland with generally sparse vegetation

[a]Status Definitions: ESA=Endangered Species Act, SEN=Sensitive, CA=Conservation Agreement, LT=Listed Threatened, PE=Proposed Endangered, LE=Listed Endangered, XN=Experimental Nonessential population.

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