Cascabel Community Wildfire Protection Plan

April 2006

Prepared by

Logan Simpson Design Inc.

Cascabel Community Wildfire Protection Plan

April 2006

prepared by
Logan Simpson Design Inc.
51 West Third Street
Suite 450
Tempe, AZ 85281

(480) 967-1343
www.logansimpsondesign.com

LOGAN SIMPSON
DESIGN INC.

TABLE OF CONTENTS

Acronyms and Abbreviations iii

I. Introduction 1
- A. Background 1
- B. Community Description 3
- C. Wildland-Urban Interface (WUI) 9
- D. Desired Future Condition and Relevant Fire Policies 12
- E. Specific Community Fuels Mitigation Projects 13
- F. Goals 14
- G. Planning Process 15

II. Community Assessment 17
- A. Fire Regime and Condition Class 17
- B. Fuel Hazards 19
- C. Community Values at Risk 28

III. Community Mitigation Plan 31
- A. Fuel Reduction Priorities 31
- B. Prevention and Loss Mitigation 36

IV. CCWPP Priorities: Action Recommendations and Implementation 39
- A. Administrative Oversight 39
- B. Priorities for Construction of Firebreaks 39
- C. Priorities for Protection Capability and Reduced Structural Ignitability 40
- D. Priorities for Promoting Community Involvement through Education, Information, and Outreach 41
- E. Requested Funding for Implementation of the CCWPP 42

V. Monitoring Plan 43
- A. Administrative Oversight and Monitoring 43
- B. Effectiveness Monitoring 43

VI. Declaration of Agreement and Concurrence 45

VII. References 46

VIII. Educational Resources 48

IX. Glossary of Terms 51

LIST OF TABLES

Table 1.1 Cascabel treatment projects 14
Table 2.1 Vegetation communities with associated fuel-model and fire-risk rating 20
Table 4.1 Action recommendations for construction of firebreaks. 40
Table 4.2 Action recommendations for wildland fire protection and reduced ignitability 41
Table 4.3 Action recommendations for enhanced public education, information, and outreach 42
Table 4.4 CCWPP proposed budget 42
Table 5.1 Performance measures to assess CCWPP progress. 44

LIST OF FIGURES

Figure 1.1 Process followed to produce the CCWPP 4
Figure 1.2 Analysis area 5
Figure 1.3 Wildland-urban interface 11
Figure 2.1 Vegetation types within the WUI 26
Figure 2.2 Flammability risk within the WUI 27
Figure 2.3 Cumulative risk analysis within the WUI 30

LIST OF PHOTOS

Photo 1.1 Cascabel Community Firewise Group meeting 2
Photo 1.2 Cascabel community WUI 6
Photo 2.1 Thistle invasions in riparian area of San Pedro 18
Photo 2.2 Riparian Mixed Deciduous vegetation association 21
Photo 2.3 Riparian Mesquite bosque 22
Photo 2.4 Mature Riparian Mesquite bosque 22
Photo 2.5 Mesquite Upland association 23
Photo 2.6 Semidesert Grassland community 24
Photo 2.7 Desert Scrub vegetation association 24
Photo 2.8 Cascabel Road 28
Photo 3.1 Existing firebreak within the WUI 31
Photo 3.2 Hazardous fuel reduction projects within the WUI 32
Photo 3.3 Fuel-break project within the WUI 33
Photo 3.4 Previously constructed and maintained fuel break within the WUI 35

ACRONYMS AND ABBREVIATIONS

ASLD	Arizona State Land Department
ATV	All-terrain vehicle
BLM	Bureau of Land Management
CCC	Cascabel Community Center
CCFG	Cascabel Community Firewise Group
CVFD	Cascabel Volunteer Fire Department
CWPP	Community Wildfire Protection Plan
CCWPP	Cascabel Community Wildfire Protection Plan
dbh	Diameter at breast height
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FS	Forest Service
FWS	United States Fish and Wildlife Service
GIS	Geographic information system
HFRA	Healthy Forests Restoration Act of 2003
NEPA	National Environmental Policy Act
NFP	National Fire Plan
NRCS	Natural Resources Conservation Service
RNRCD	Redington Natural Resources Conservation District
TFO	Tucson Field Office
TNC	The Nature Conservancy
USDA	United States Department of Agriculture
USDI	United States Department of Interior
WUI	Wildland-urban interface

I. INTRODUCTION

The Cascabel Community Wildfire Protection Plan (CCWPP) was developed for the "at-risk" community and private inholdings located in and around the community of Cascabel 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 US Departments of Interior (USDI) and Agriculture (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 USDA and USDI Secretaries to expedite the development and implementation of hazardous fuel reduction projects on lands managed by the Forest Service (FS) and the Bureau of Land Management (BLM).

HFRA emphasizes the need for federal agencies to collaborate with communities in developing hazardous fuel reduction projects and places priority on treatment areas identified by communities themselves through the development of a Community Wildfire Protection Plan (CWPP). Priority areas include the wildland-urban interface (WUI), municipal watersheds, areas 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 CCWPP was developed to assist the local governments, the fire department, and residents in the identification of lands—including public lands—at risk from severe wildfire threat. It also allows those entities to identify strategies for reducing fuels on wildlands while improving forest and rangeland health, supporting local industry and local economies, and improving public/firefighter safety and response capabilities.

Guidance for development of the CCWPP is based on *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities* (Communities Committee et al. 2004) and was collaboratively developed through consultation with the BLM Gila District using *The Healthy Forests Initiative and Healthy Forests Restoration Act: Interim Field Guide* (USDA and USDI 2004).

A. Background

The Cascabel Community Firewise Group (CCFG) was formed to create a CWPP that captured local interest and advanced understanding regarding the critical issues. The CCFG is composed of representatives from the community of Cascabel and Cochise County, the Cascabel Fire Chief, the BLM Gila District Fire Mitigation Specialist, the Arizona State Land Department (ASLD) Division of Forestry District Forester, Redington Natural Resources Conservation District (RNRCD), USDA Natural Resources Conservation Service (NRCS), local representatives from The Nature Conservancy (TNC), and other

interested individuals. The CCFG has been the core of the public involvement process for this CCWPP and meets all collaborative guidance criteria established by the Wildland Fire Leadership Council (Photo 1.1).

Photo 1.1. Cascabel Community Firewise Group meeting

The majority of wildfire starts around the community of Cascabel have occurred in the heavily vegetated San Pedro River bottom. Although landscape-scale fires have not been prevalent in the desert vegetation zones of the WUI, natural and human fire starts do occur and are suppressed and contained each year. 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 Cascabel community. As a result, the Cascabel Volunteer Fire Department (CVFD), a nonprofit organization, and governmental agencies have initiated fire preparedness enhancements and land treatment efforts (see Section I.D.2, Local Policies, of this plan) to deal with the types and densities of natural fuels that significantly threaten the community with potential catastrophic wildfire.

The CCFG 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. Several of these goals were achieved throughout the CCWPP area by implementing provisions from the BLM Tucson Field Office's (TFO) *Decision Memorandum on Action and for Application of Categorical Exclusion 1.12 and 1.7 G2 Cascabel Firebreaks and Road Maintenance* (2005).

To aid in the development of this plan and during the initial analysis for the proposed Cascabel firebreaks project, the CCFG reviewed the following additional documents:

- *Federal Register Vol. 66, No. 3* (2001)
- *Field Guidance Identifying and Prioritizing Communities at Risk* (National Association of Sate Foresters 2003)
- *Arizona Wildland Urban Interface Assessment* (Arizona State Forester 2004)
- *Arizona Communities at Risk Matrix* (Arizona State Forester 2004)
- *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan* (2001)

The CCFG also reviewed Section 101.16.B.iii of HFRA to determine the area required adjacent to an evacuation route for hazardous fuel reduction measures in order to provide safer evacuation from the at-risk community. Using the information gathered from these supporting documents, the Cascabel Fire Chief, the ASLD, and the BLM Gila District Manager agreed that the community of Cascabel qualifies as an intermix community (see *Federal Register*, January 4, 2001) at risk from wildland fire. The CCFG, therefore, will petition the Arizona State Forester to include the community of Cascabel within the *Arizona Communities A t Risk Matrix* (Arizona State Forester 2004) when amended.

Figure 1.1 summarizes the process that the CCFG followed to produce the CCWPP. 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 CCWPP and serve as a road map for the rest of this document.

B. Community Description

The intermix community of Cascabel is located in Cochise County, approximately 23 miles northwest of Benson along the riparian corridor of the San Pedro River (Figure 1.2). Access to the community is from Cascabel Road, traveling north of Interstate 10 from Benson or southeast along Redington Road from San Manuel. There are several secondary residential roads to the east and west of Cascabel Road within the WUI. The San Pedro River bisects the private lands within the community and provides irrigation and domestic water supplies to the community and habitat for threatened, endangered, and sensitive species.

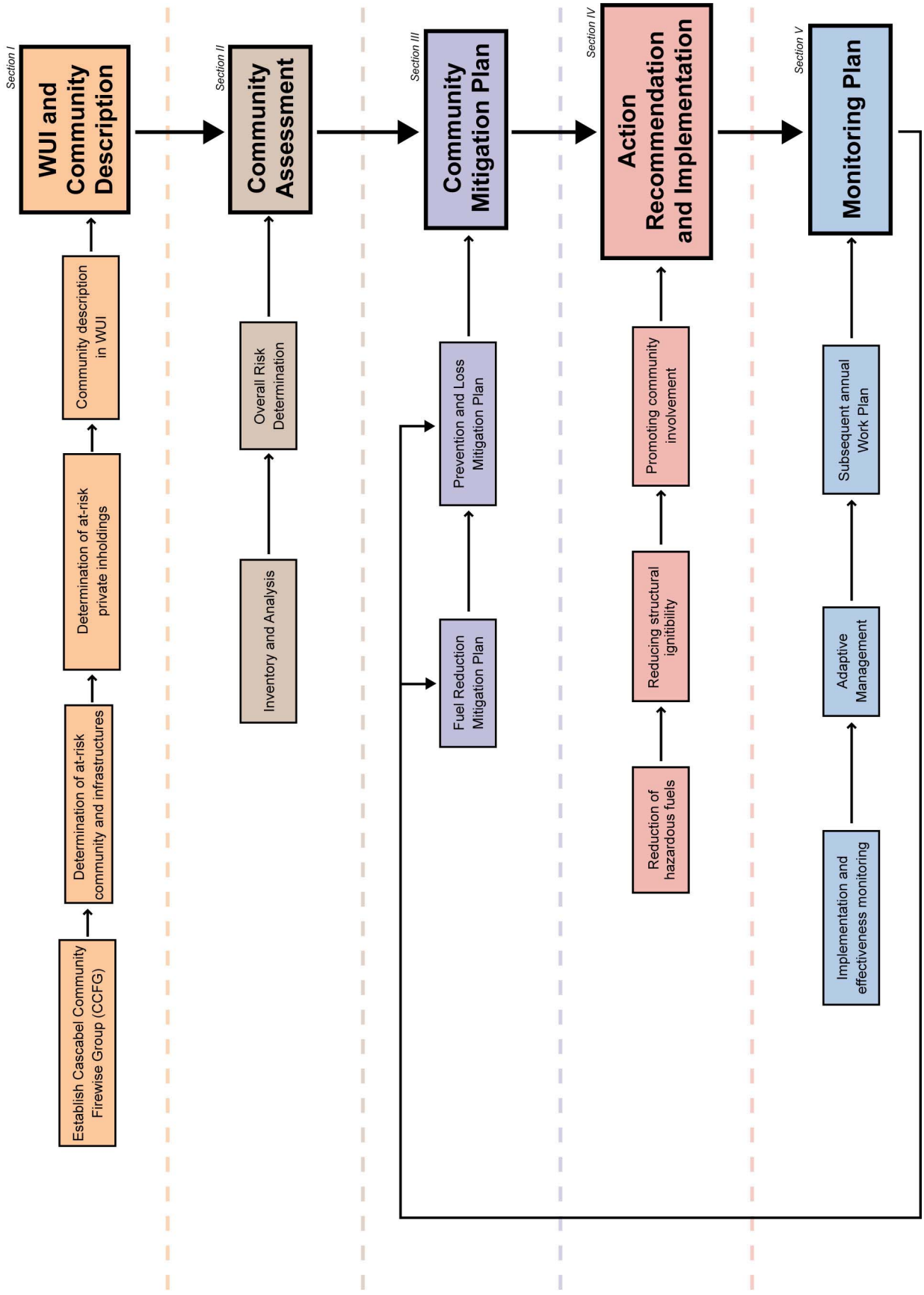

Figure 1.1. Process followed to produce the CCWPP

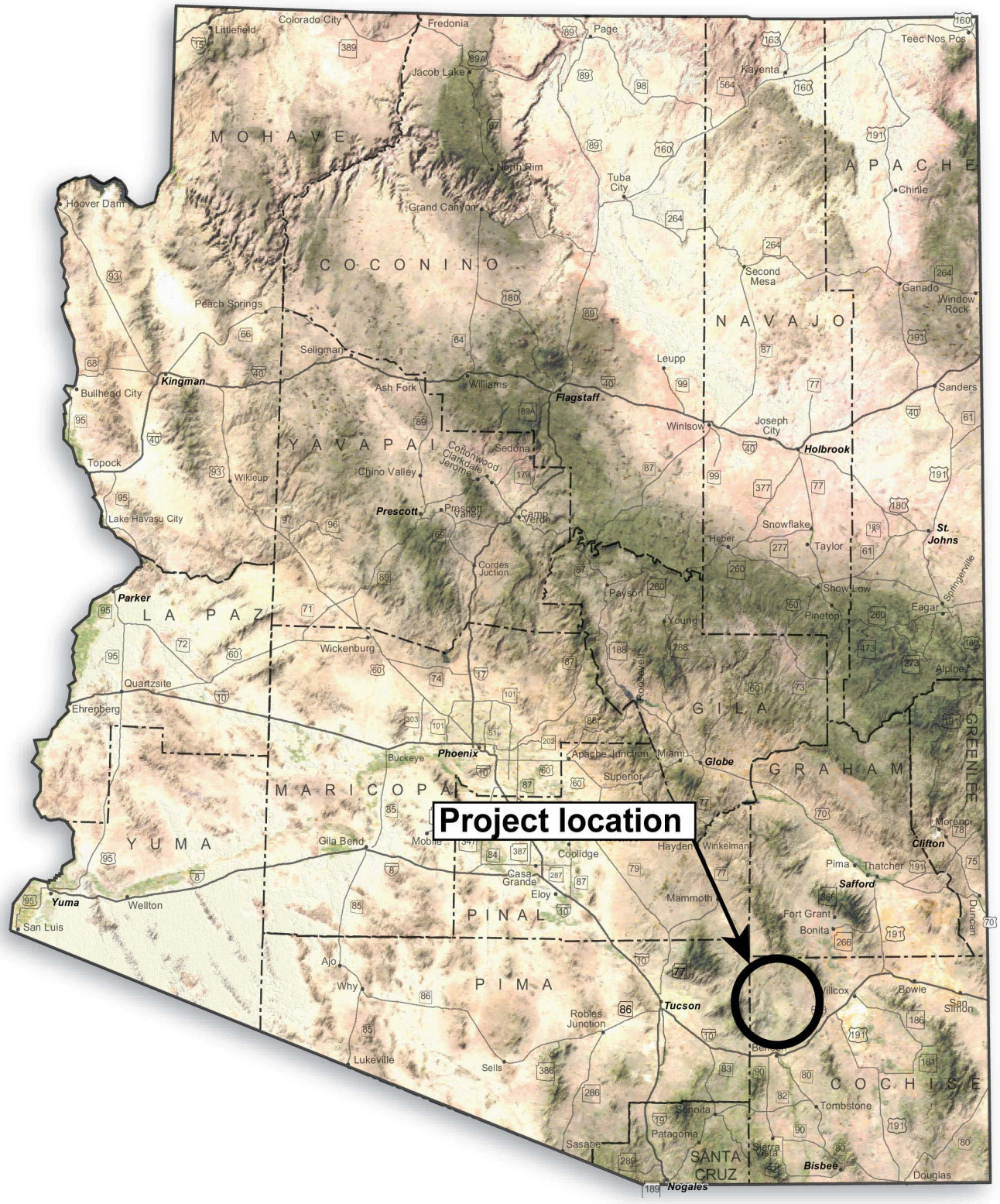

Figure 1.2. Analysis area

The community consists of 10,853 acres of private lands, 678 acres of public lands administered by the BLM Gila District, and 4,819 acres of State Trust Land administered by the ASLD. The area analyzed within the WUI includes 16,350 acres of wildland by all ownerships (Photo 1.2). The community is composed of approximately 120 residential dwellings and associated unoccupied outbuildings, as well as dwellings and buildings under construction.

Photo 1.2. Cascabel community WUI

Cascabel resident Mary Taylor has recorded the history and cultural heritage of Cascabel in her manuscript *Cascabel: A bare bones accounting of some significant happenings along the San Pedro River* (1995). Portions of her writings are incorporated here with the author's permission:

> *Cascabel is a place and a community. The place is an area about 40 miles long and ten miles wide along the San Pedro River, beginning about 8 miles north of Benson. There is no post office, no school, no service station, no quick mart and just the beginning of a general store. There is only one road in, through and out of the area with some ranch access roads. The Community is mostly made up of special, different "characters," independent, but cooperative when needed. Through cooperation and good will they have built a fine Community Center (1989) without government or private loans. Quilt making and raffling, bake sales, donations and other fundraisers along with lots of time, sweat, physical effort and expertise have made the Center a very special place.*

Historically, the area has a long and interesting background. When early explorers first came, Coronado in 1540 and Father Kino in 1706, they found a lush valley of green grass, running water, cottonwoods, abundant game, fish, and peaceful, farming Indians. By 1865, both Mexican and Anglo settlers had begun to farm in the area, but were driven out by the Apaches who had, by that time, driven out the farming Indians. In 1868, the Leach Wagon Road was built through the area to join military posts to the North and South, and to provide a less hazardous way for travelers going west. The Redfield family settled at Redington in 1875 and were followed by others who found it a great farming and ranching area. Soon there were so many families that a need was felt for a post office, which was established and called Redington. A year later and seven miles south, the Soza family of Tucson settled, created a farm and ranch, built a chapel and school, hired a teacher, and raised 14 children. Life was hard and uncertain.

Shortly after the Sozas came, Frank Pool from Tucson moved to a choice spot six or seven miles south of the Sozas, near Hot Springs Wash. He wrote in his journal, "It is one of the most beautiful valleys I ever saw. When I arrived, a few farms were already under cultivation, grass everywhere. Fine cattle ranged from the Mexican line to where the San Pedro joins the Gila River. There was wild game in abundance and the river teemed with fish."

The Bayless family of Tucson came to the Redington area in 1885. One of the descendants, Jack Smallhouse, and his family operate the ranch at this time (1995). In 1887, the year the Apache leader, Geronimo, was captured, a severe earthquake shook the entire area and part of Northern Mexico, causing many changes in stream flow and natural springs. People came and went, population fluctuated. In 1902 the Pool Post Office was established at Mr. Pool's ranch, but was discontinued in 1913.

Alex Herron had a ranch and a small store a short distance north of Hot Springs Wash. In 1916, when he applied for a post office, he wanted to call it Pool, after the former post office. The name was turned down by the authorities. Later, on the way to Benson, Herron met a Mexican with a rattlesnake the man had killed. Herron asked the man the name of the snake and the reply was "Cascabel." Herron decided to call his post office by that name.

The old school at the Soza ranch had been hauled down to a new location just north of the new post office, and another room was added to accommodate the increasing enrollment. The school also served as a community gathering place with box socials and "barn" dances. Many interesting stories are told about those times; in recent years two Pool School reunions have been held at the new Community Center. The school was disbanded and torn down in the 1970's. A bus comes from Benson now to pick up and return students living in the area.

The 20's and 30's saw hard times in many places, and Cascabel was no exception. For a while, people came to make a living along the river, with a garden, a few chickens, a goat or cow and wild game. Eventually these folks lost heart and moved back to towns where living was a little easier. By 1936 the Cascabel Post Office was discontinued. World War II caused a further decline in the population. All those work-hardened, ranch-raised boys joined up, saw the world, and decided when they came back that they could do better financially by going to college or working in town. Things were pretty quiet for a while until the late 50's when electric power was brought in, bringing with it

the convenience and luxury of coolers, refrigerators, better lighting and more convenient water pumping equipment. Housewives could even have a washing machine. In the early 60's the City of Tucson bought the old Pool place and some adjoining land along the river for water rights to the land. Officials had planned to pump water from the San Pedro watershed to Tucson. This was eventually pronounced illegal and the project was abandoned. In 1985 the acreage was sold at auction to developers. This land was divided into irregularly shaped, near 40-acre parcels and put up for sale. Choice lots went rather quickly and new faces were seen on the river, new marks on the land, and more cars on the road.

In 1970 a new State road was proposed through the area from Benson to San Manuel, to replace the old 1868 Leach Wagon Road. Surveys were made, some rights of way were purchased, four bridges were built, money was appropriated to finish it, then through some political convolution, the project was abandoned and money diverted to another area. Thus is our condition determined. Our road is called "primitive" (actually, Cascabel Road).

Portions of the lower San Pedro River were designated as one of the Last Great Places in 1990. The Bureau of Land Management purchased some of the local riparian river bottom acreage to preserve the wildlife habitat and perennial stream. Those who appreciate the unique qualities of the area are pleased that it will not be otherwise exploited. Phones, faxes, and more convenience arrived in 1993, provided by the Midvale Telephone Co. It is a service taken for granted by many, but doubly appreciated by those who had done without for so long.

The really interesting history of the area is in the stories of the people. Tales of tragedy abound, along with stories of floods, droughts, illnesses, murders, accidents, feuds, scandals, romances, wild cows, wild rides, screw worms, everyday entertainment, humor, attitudes and ways of doing things. Even today the neighbors tell of the mountain lion that recently held the community hostage for ten days. It is hoped that folks who have lived here or heard these stories will write them down so they will be preserved, perhaps as an addendum to this manuscript.

The emphasis of this CWPP is to improve community wildland fire protection and firefighter and public safety through the implementation of the *Decision Memorandum on Action and for Application of Categorical Exclusion 1.12 and 1.7 G2 Cascabel Firebreaks and Road Maintenance* (BLM TFO 2005). The community recognizes that firefighter and public safety are the first priority in all fire management events. The community further recognizes the value of re-establishing the natural fire regime to minimize the potential of catastrophic wildland fire. The CCWPP is also intended to assist in aligning wildland fire response with habitat component impacts to a level consistent with the resource values at risk, while striving for cost effective firefighter and public safety.

The Cascabel Volunteer Fire Department (CVFD) provides the primary response to wildland fire for the community. The CVFD is a nonprofit organization that does not constitute a fire district. The response area of the CVFD begins at the 7-mile marker on Cascabel Road, extends approximately 30 miles north along Cascabel Road, and encompasses an area of 1 mile on either side of Cascabel Road. Twenty-two CVFD personnel have been trained in basic wildland firefighting. The CVFD conducts two firefighting training sessions per month. Several CVFD personnel have completed coursework as specified by the Wildland and Prescribed Fire Qualification System Guide to meet requirements of state and federal agencies and

will complete additional training necessary for compliance with the Federal National Incident Management System.

The CVFD maintains a type 6 brush engine carrying 300 gallons of water and a water tender truck that provides 2,000 gallons of water for engine support. These two pieces of equipment are housed locally at Cascabel Ranch. The CFVD has both mobile and portable radio communication systems supported by a mountaintop radio repeater for better coverage throughout the response area. There are no fire hydrants within the CVFD response area; therefore, they must rely on domestic or irrigation wells as a water source during fire response. The CVFD has located and mapped 10 water supply locations for well or surface water drafting. The water source locations and well operating instructions are carried on both the engine and tender. In addition to these water sources, the CVFD has located and mapped, and currently maintains six predetermined helicopter landing zones for emergency response (see Figure 1.3).

The CVFD recognizes its limited capability to respond to catastrophic wildland fire events. Additionally, the CVFD does not provide structural fire protection to community residents. The San Manuel or Mescal Fire Departments provide response to structural fires in the WUI. The CVFD and the ASLD, Division of Forestry, have signed a cooperative agreement for the "protection of forest, wild and agricultural lands, and rural structures as provided for within the Cooperative Forestry Assistance Act, 16 U.S.C. Section 2106." In addition to the ASLD cooperative agreement, the BLM and the FS can also provide fire assistance. Through the existing Mutual Aid System as agreed on by local fire departments, the CVFD has received assistance from the Mescal, St. David, and Tombstone fire departments. The CVFD has provided firefighting assistance to the San Manuel, Willcox, Rural/Sunsites, and Pomerene fire departments. In an effort to provide faster initial attack to fire starts and because of the topographic nature of the CVFD response area, firefighting tools have been placed with a number of CVFD personnel living throughout the district. CVFD personnel responding from home or personal vehicles can provide the initial attack to an incipient fire before the arrival of engine support.

C. Wildland-Urban Interface (WUI)

A 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) 2004—a response to catastrophic wildfires—and *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan* (2001)—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 assessments, administrative appeals, and legal review for qualifying projects on federal land.

The CCWPP process of delineating the WUI boundary (Figure 1.3) involved collaboration between local, state, and federal governments; the Cascabel Fire Chief; and the CCFG. The CCFG represents the public interest through participating government officials, including the BLM Gila District Fire Mitigation Specialist and Fuels Management Specialist, natural resource specialists, nongovernmental organizations, special

interest groups, and other interested parties throughout the analysis area. The identified WUI is the minimum area needed to provide protection to the riparian corridor, to provide adequate evacuation, and to protect the community from wildland fire. It includes 10,853 acres of private land, 4,819 acres of state land,

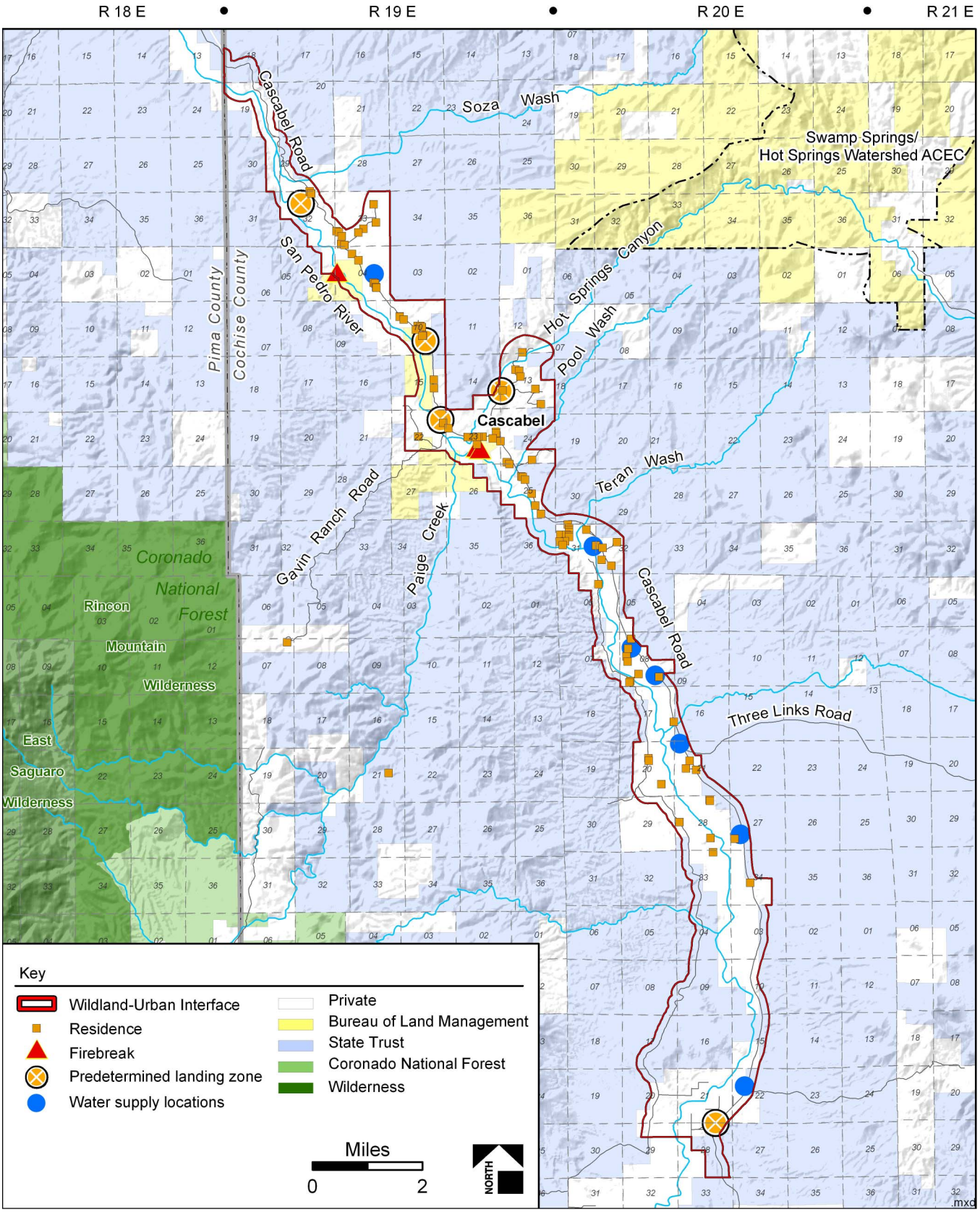

Figure 1.3. Wildland-urban interface

and 678 acres of public land for a total of 16,350 WUI acres. The lands that surround the community are in such condition that they are conducive to a large-scale wildland fire, and such a wildfire could threaten human life and property.

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

- Fuel hazards, consideration of local topography, fire history, vegetative fuels, natural firebreaks
- Historical fire occurrence
- Community development characteristics
- Local firefighting preparedness
- Infrastructure and evacuation routes

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 on habitat components. Once in this condition class, natural processes such as fire can be incorporated into long-term management practices to sustain habitat health. The desired future condition of nonfederal lands in the WUI is to have private land owners comply with Firewise standards recommended by the CVFD. Residential and other structures that comply with these standards significantly reduce the risk of fire igniting in the community and spreading to the surrounding habitat. Additionally, structures that comply with Firewise recommendations are much more likely to survive wildland fires that spread into the community.

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, it formally recognized the essential role of fire in maintaining natural systems (USDI and USDA 2001). The 1995 Federal Wildland Fire Management Policy was 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, and communication and to provide for adequate program evaluation.

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

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

Federal wildfire reduction policy on public lands (i.e., BLM) is planned and administrated locally through the BLM Gila District, which is the governing agency for the federal land associated in the CCWPP planning area.

Under the Proposed Action described in the *Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management Finding of No Significant Impact (FONSI) and Environmental Assessment* (BLM 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 2 includes areas not suitable for wildland fire use for resource benefit. With the exception of a small amount of semidesert grasslands, vegetation associations within the WUI fall into allocation 2.

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. Within Arizona the Firewise certification program is administered by the Arizona State Forester. CVFD personnel have made this information available to their citizens and encourage its application.

2. Local Policies

The Cascabel community is aware that wildland fuel accumulations and community growth in the WUI have produced areas at high risk from catastrophic wildfire. The community aspires to achieve a restored, self-sustaining, biologically diverse area of mixed open space and developed areas, which contribute to a quality of life demanded by local citizens. Cascabel residents that developed the CCWPP recognize protection from catastrophic wildland fire requires collaboration and implementation through all levels of government and through an informed and motivated public. The community considered ecosystem restoration, community protection, and public and firefighter safety while developing this CWPP.

To date, Cochise County has not developed community-based emergency evacuation plans. Limited access routes to many rural communities within the county restrict planning options for residential evacuation. Plans outlining emergency procedures in case of evacuation, essential items to take when evacuating, registration/reception centers, transportation planning, home security, family communication, and animal and pet evacuation suggestions could be developed by individual communities in cooperation with Cochise County in the future if initiated by the local community. The CVFD in accordance with the Cascabel BLM Ecosystem Management Plan (2002) does plan to work with the County in developing such a notification and evacuation plan for the Cascabel community.

E. Specific Community Fuels Mitigation Projects

Financial commitments required to reduce the risk of catastrophic wildfire can be extensive for the BLM, as well as for the small rural communities surrounded by public lands. The community of Cascabel and the BLM have implemented fuel mitigation projects for wildland fire suppression and are proposing to complete additional wildland fuel mitigation projects described in Table 1.1.

Table 1.1. Cascabel treatment projects

Project area location	Treatment name	Description	Acres treated
Fuels treatment projects in Cascabel	Site #1	Hazardous Fuels Reduction Firebreak around and inside BLM Mungia historic home	0.50
	Site #2	Elma Otter Ranch Firebreak throughout the homestead and around structures	1.50
	Site #3	Cascabel Ranch Firebreak west of homestead structures	1.00
	Site #4	Lot 37 North Firebreak	0.50
	Site #5	Lot 38 Central Firebreak	0.50
	Site #6	Lot 40 South Firebreak	0.50

Source: BLM TFO Decision Memorandum 2005.

F. Goals

The CCFG agreed on eight primary goals of the CCWPP:

- Improve fire prevention and suppression
- Reduce hazardous wildland fuels on both public and private lands
- Restore riparian health
- Promote community involvement and education
- Recommend measures to reduce structural ignitability in the CCWPP area
- Encourage stability in the community through protection of the ecosystem
- Identify funding needs and opportunities
- Expedite project implementation

In addition to the primary goals of the CWPP, both short-range and long-range goals for community wildfire protection have been developed.

Short-range Goals:

- Continue to raise the awareness of wildfire dangers within the community and assist in changing landowner apathy.
- Continue to raise the level of preparedness for
  - home inspections (stored on computer software),
  - dispatching and alerting capability within the present radio system (911 tie-in pagers),
  - service to the community (equipping wells for CVFD use, helicopter sites, fuel reduction/chipper, update mapping).

Long-range Goals:

- Assist Cochise County in developing an emergency notification and evacuation plan.
- Obtain funding/grants to secure the following:
  - chipper/shredder,

    - permanent quarters for vehicles,
    - new type 6 engine (severity patrols and mutual aid).
- Assist RNRCD, NRCS, and TNC where possible with watershed enhancement projects such as the Canyon Road Erosion Elimination Project and the removal of old tires.

Although the goals of this CWPP, as determined by the CCFG, are mostly strategic in a planning sense, the action recommendations designed to reach these goals are more prescriptive. In developing this CWPP it is not intended for each and every action recommendation to meet each and every goal; some action recommendations are specific to a single or few goals. For instance, wildland 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 directly "restore riparian health." However, the CCFG believes that the synergistic effects of implementing all action recommendations will eventually achieve the stated goals of the CCWPP.

The CCWPP meets all criteria of HFRA. It has been collaboratively developed and agreed on by the applicable local government, the CVFD, the state agency responsible for forest management, the BLM Gila District (the primary relevant federal entity), and other interested parties. The CCWPP establishes a coordinated, collaborative, performance-based framework of recommendations to meet its outlined goals.

G. Planning Process

Several County and BLM Gila District, including both the Safford Field Office (SFO) and the TFO, planning documents and studies have incorporated wildfire management guidelines and standards for the CCWPP 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 CCWPP. The studies, plans, and documents reviewed include the following:

- *Cascabel Environmental Assessment Cascabel BLM Ecosystem Management Plan.* 2000
- *Cascabel BLM Ecosystem Management Plan* (1996)
- *Governor's Forest Health Oversight Council* (2003)
- *Cochise County Comprehensive Plan* (2003)
- *Governor's Forest Health Guiding Principles* (2004)
- *Gila District Resource Management Plan* (BLM 1991)
- *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)
- *Decision Memorandum on Action and for Application of Categorical Exclusion 1.12 and 1.7 G2 Cascabel Firebreaks and Road Maintenance* (BLM TFO 2005)

Successful implementation of the CCWPP will require a collaborative effort among multiple layers of government and the local community. The CCFG must develop processes and systems that ensure recommended treatments and actions of the CCWPP comply with HFRA, the National Environmental

Policy Act, the Endangered Species Act, the National Historic Preservation Act, and other applicable federal, state, and local environmental regulations.

Upon approval of this CCWPP by the Cascabel Fire Chief and Cochise County Board of Supervisors and upon concurrence from the BLM Gila District Manager and the Arizona State Forester, action recommendations of the CCWPP will be forwarded to the Arizona State Forester and the BLM Gila District Manager for implementation of the priority action recommendations.

II. COMMUNITY ASSESSMENT

The community assessment is a risk analysis of the potential for catastrophic wildfire to the community of Cascabel as identified by the CCFG. This risk analysis incorporates the current condition class, wildfire fuel hazards, risk of ignition, wildfire occurrence, and at-risk community values. Local preparedness and protection capabilities are also factors that contribute to the delineation of areas of concern. The areas of concern for wildland fuel hazards, risk of ignition and wildfire occurrence, and community values are evaluated to determine areas of high wildland fire risk. Specific hazardous wildland fuel reduction projects are recommended to reduce the risk of wildfire spreading from areas of high risk into or throughout the community.

A. Fire Regime and Condition Class

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

	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]Less than 75% of the dominant overstory vegetation replaced.
[b]Greater than 75% of the dominant overstory vegetation replaced (stand replacement).

All of the lands analyzed within the WUI are consistent with Fire Regime III as described in *Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management* (Schmidt et al. 2002). The condition class of wildland habitats describes the degree to which the current fire regime has been altered from its historical range, the risk of losing key ecosystem components, and the vegetative attribute changes from historical conditions. For example, a habitat in Condition Class 1 is a habitat system in its natural fire range and at low risk for losing ecosystems components from wildland fire. A Condition Class 2 habitat has moderately departed from its historical fire-occurrence range and has a moderate risk of losing habitat components. Condition Class 3 habitats have significantly departed from their historical fire-regime ranges, and their risk of losing key habitat components is high (Fire Regime Condition Class 2004).

According to Schmidt et al. (2002) the lands within the WUI are categorized as Fire Regime III and in Condition Class 1. Because condition class categories are based on coarse-scale data that is intended to support national-level planning, any interpolation of this data for localized conditions may not be valid (Fire Regime Condition Class Guidebook 2004). Therefore, local agencies are asked to provide data for

localized conditions (USDA FS 2003). The amount of salt cedar invasion within the WUI riparian areas, proliferation of nonnative grasses, and increasing woody species invasion indicate that the riparian and mesquite bosque areas no longer conform to components of Condition Class 1 lands. In addition to the vegetative changes, past land management practices have also substantially altered the hydrologic function of the San Pedro River from a historical condition of a shallow floodplain dominated by sacaton grass to an eroding channel with a lowering water table (RNRCD 2003). As a result, local conditions indicate that the riparian area of the WUI actually falls within Condition Classes 2 and 3 (Photo 2.1).

Photo 2.1. Thistle invasions in riparian area of San Pedro River

The CCFG has recommended that the desired future condition for federal and nonfederal lands within the WUI should follow those developed by the BLM as follows:

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 creosote bush to non-hazardous levels.*

Riparian vegetation community 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):

> *Annual weed cover and density is controlled and ladder fuels and downed woody debris are limited or not present. Disturbances such as livestock grazing and mining and off road vehicle travel, that can potentially reduce natural vegetation cover and vigor, are managed to maintain adequate cover and mix of natural plant species.*

B. Fuel Hazards

The arrangement of fuel, relative flammability, and fire potential of vegetation varies in the WUI. Wildland fuel hazards consist of the 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. Table 2.1 identifies the total amount of land in the WUI that was evaluated for overall wildland fire risk because of increased wildland vegetative fuel hazards.

Table 2.1. Vegetation communities with associated fuel-model and fire-risk rating

CCWPP vegetative communities	Total land area (acres)	Fuel model	Wildfire-risk rating[1]
1. Agriculture	1,983	1–2	L
2. Apacherian-Chihuahuan Mesquite Upland Scrub	1,535	4	M
3. Apacherian-Chihuahuan Piedmont Semidesert Grassland and Steppe	4,498	1	L
4. Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	1,475	1–2	L
5. Chihuahuan Mixed Salt Desert Scrub	434	1–2	L
6. Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	137	1	L
7. Chihuahuan Succulent Desert Scrub	122	1	L
8. North American Warm Desert Bedrock Cliff and Outcrop	42	NA	L
9. North American Warm Desert Riparian Mesquite Bosque	293	4–6	M
10. Palustrine Emergent	4	NA	L
11. Palustrine Unconsolidated Bottom	8	NA	L
12. Palustrine Unconsolidated Shore	4	NA	L
13. Riparian Alkili Sacaton	22	3	H
14. Riparian Cottonwood	460	9	H
15. Riparian Mesquite	2,520	8–9	H
16. Riparian Mixed Deciduous	376	9	H
17. Riparian Salt Cedar	402	4–9	H
18. Riparian Willow	3	8–9	H
19. Riverine intermittent (flows part of the year)	111	NA	L
20. Riverine lower perennial (low gradient)	414	NA	L
21. Sonoran Paloverde-Mixed Cacti Desert Scrub	1,507	1	L
	Total	**H**	**M**	**L**
	16,350	**5,521**	**1,652**	**9,177**

[1] H = High potential for carrying wildland fire; M = Medium potential for carrying wildland fire; L = low potential for carrying wildland fire.

The vegetative associations found within the WUI were identified and mapped using BLM GAP analysis data for upland areas and data obtained from the Lower San Pedro River Riparian Assessment (RNRCD 2003). When merged, these data sets provided the greatest level of vegetative detail necessary for aligning flammability with existing vegetation. The existing arrangement and flammability of vegetation associations largely determines wildland fire behavior. Evaluation of the vegetative fuels on federal and nonfederal land in the WUI was conducted through spatial analysis using geographic information system (GIS) technology in a series of overlays that helped the CCFG to identify areas at risk from wildland fire. For the WUI, the vegetation type, density, and distribution were analyzed to help categorize areas of highest risk of fire ignition and spread from wildland fuels.

Vegetation in the community of Cascabel includes riparian mixed deciduous associations of cottonwood, willow, and salt cedar, intermixed with some alkali sacaton grasslands. This vegetation association includes communities 10, 11, 12, 13, 14, 16, 17, 18, 19, and 20 as described in Table 2.1. The Riparian Mixed Deciduous association accounts for 1,804 acres (11% of the WUI) contributing significantly to vegetation and wildlife biodiversity as well as to the principal recreational use areas within the WUI (Photo 2.2).

Photo 2.2. Riparian Mixed Deciduous vegetation association

The Riparian Mesquite bosque vegetation association includes communities 9 and 15 and is the largest vegetation association within the San Pedro riparian corridor, accounting for 2,813 acres (over 17% of WUI acres). The mesquite bosque associations vary from dense stands with canopies of 80% or higher (Photo 2.3) to areas of mature trees with canopy cover of 35% to 60% (Photo 2.4).

Photo 2.3. Riparian Mesquite bosque

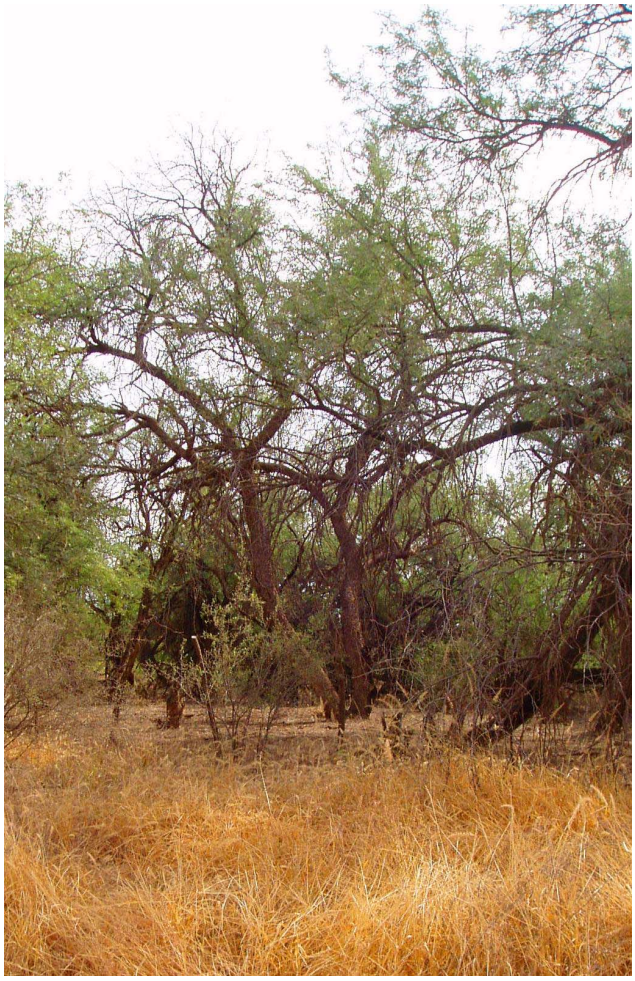

Photo 2.4. Mature Riparian Mesquite bosque

Stands of mature mesquite include trees with trunks and limbs greater than 6 inches diameter at breast height (dbh), providing habitat for a variety of cavity-nesting bird species. Many of the structures within the WUI are included within this vegetative association. The mesquite bosque areas within the WUI also provide recreational use, day use, and camping areas.

Agriculture associations (vegetation community 1 Table 2.1) along the San Pedro River include active farmed areas as well as fallow agricultural lands in early serial stages. Agricultural lands will vary in the ability to carry wildland fire depending on moisture and crop type. Agricultural lands, particularly fallow farmland consisting of heavy herbaceous fuels adjacent to receptive natural fuels, will create areas of high rates of spread and intensity of wildland fire. Agricultural lands constitute 1,983 acres (12%) of the WUI.

Adjacent upland vegetation associations include mesquite upland, semidesert grassland mix, and desert scrub (Figure 2.1). The Mesquite Upland association includes vegetative community 2 (see Table 2.1) occurring primarily along the adjacent benches of the San Pedro riparian corridor. The Mesquite Upland vegetation association includes a variety of herbaceous and scrub species (Photo 2.5).

Photo 2.5. Mesquite Upland association

The Mesquite Upland community constitutes 1,535 acres (9% of the WUI). The ecotone of the Mesquite Upland and Semidesert Grasslands (vegetation community 3, Table 2.1) provides movement corridors and foraging areas for a variety of wildlife species. The Semidesert Grassland association includes a variety of herbaceous, scrub, and shrub species, with a shrub canopy of generally less than 35% (Photo 2.6). This is an extensive area of the WUI, covering 4,498 acres (27% of WUI acres).

Photo 2.6. Semidesert Grassland community

The Desert Scrub vegetation association includes vegetation communities 4, 5, 6, 7, 8, and 21 (see Table 2.1). This vegetation association occurs on dryer upland sites and includes areas of bare ground and rock also supporting a variety of grass, herbaceous, scrub, and shrub species (Photo 2.7). The Desert Scrub vegetation association constitutes 3,717 acres (23% of the WUI acres) and is the second largest vegetation association within the CCWPP.

Photo 2.7. Desert Scrub vegetation association

The existing arrangement and flammability of vegetation associations largely determines wildland fire behavior. The use of vegetative data in predicting wildfire behavior has been quantified by developing descriptions of associated fuel properties that are described as fuel models. The fuel model (as described by Anderson 1982) and vegetation fuel fire-risk rating within the CCWPP are shown in Table 2.1. Vegetative and physical characteristics of the WUI include 21 vegetation associations. Each associated fuel model predicts the total fuel load, rate of spread, and flame length possible for each vegetation association. Assigning a fuel model to each vegetation association within the WUI will assist in predicting wildfire behavior and thus proper suppression response (see Anderson 1982 for detailed fuel model descriptions).

The greatest wildland fuel hazard resides within the riparian vegetation associations of the WUI. In riparian vegetation associations consisting of heavy salt cedar where dead fuels accumulate within the vertical plant column and where there are riparian mixed deciduous tree species, total wildland fuels can exceed 12 tons per acre and produce flame lengths greater than 5 feet above the overstory with a rate of spread of over 8 chains per hour. In addition, some grasslands, such as sacaton grasses, can produce wildfires of high intensity and high rates of spread, capable of igniting adjacent overstory vegetation associations. Moderate wildland fuel risk is associated with the ecotone of the riparian and desert upland vegetation associations. In areas where mesquite canopy exceeds 35%, light fuels produced by the herbaceous understory are reduced due to overstory shading and competition from overstory shrub species. Under extreme fire conditions, upland mesquite communities can carry crown fires with moderate intensities and high rates of spread. Lower wildland fire risk occurs in desert scrub and desert shrub communities in which total fuel loading is low with no continuous arrangement of ground or aerial fuels. Desert upland vegetation associations are not fire-dependent communities, and wildfires within desert vegetation associations will be suppressed. The wildland fuel hazard component influence was compiled to depict areas of high, moderate, and low wildland fire potential based on vegetation type, density, and arrangement and to show areas with higher wildfire risk and therefore of greater concern to the CCFG (Figure 2.2).

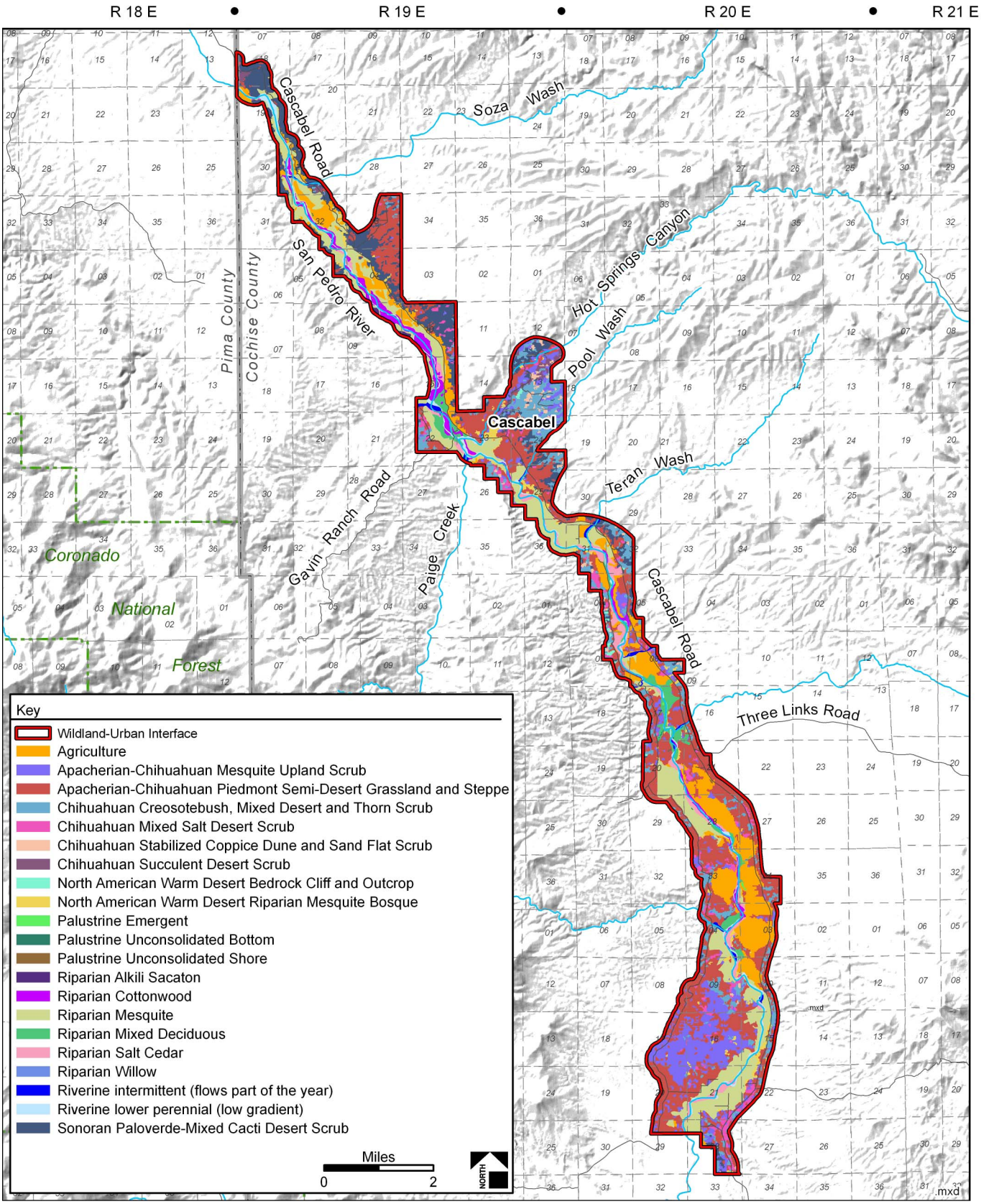

Figure 2.1. Vegetation types within the WUI

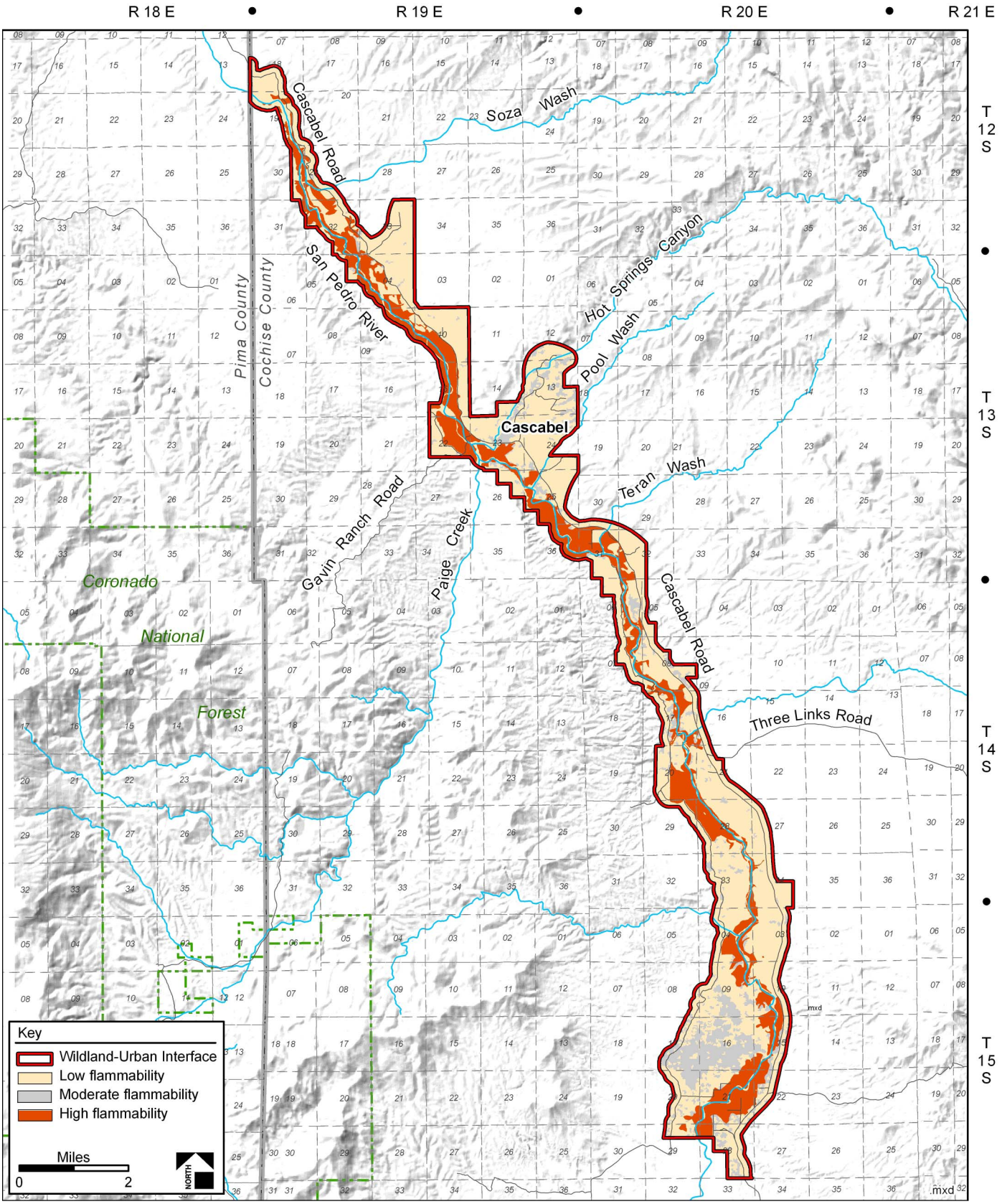

Figure 2.2. Flammability risk within the WUI

C. Community Values at Risk

Valued, at-risk community resources include private and community structures, communication facilities, power lines, local recreation areas, cultural and historic areas, sensitive wildlife habitat, watersheds, natural resources, and air quality. Community values were discussed by the CCFG and are shown in Figure 1.3. Developed land, Cascabel Road (serving as both an evacuation route and a responding resource travel route, see Photo 2.8), and other infrastructures within the area of highest flammability were given the highest priority for protection by the CCFG.

Photo 2.8. Cascabel Road

In areas where community values occur within or adjacent to areas of high risk due to the fuel hazards of vegetation associations, a cumulative risk from catastrophic wildland fire is created. These areas of cumulative risk are of greatest concern to the community and are depicted in Figure 2.3.

According to the CCFG and the CVFD, wildlife habitat and watershed enhancing treatments that reduce wildland fuel and lessen the threat of catastrophic wildland fire in the river corridor will assist in preserving sensitive riparian habitat and wildlife species in accordance with Section 102.a.5.B. of HFRA and will also protect the recreational values local residents associate with the San Pedro River. The proposed wildland fuel reduction projects within the WUI were found to have no adverse effects on species listed by the Endangered Species Act (ESA) as an endangered or threatened species, or no adverse effects on

designated critical habitat for these species (BLM TFO 2005). As discussed previously, a long-range goal of the CVFD is to assist the RNRCD, NRCS, and TNC, where possible, with watershed enhancing projects such as the Canyon Road Erosion Elimination Project.

The major concerns of the CVFD include (1) the delayed response time by available mutual aid fire departments, (2) obtaining additional firefighting equipment, such as a new type 6 engine, and (3) insufficient dispatch and communication capabilities. Additionally, many residences in the identified WUI were not designed with adequate ingress and egress or emergency vehicle access. Private structures without adequate access and readily available water supplies increase the risk of greater habitat and structural losses from large wildland fires.

A short-range goal of the CVFD in conjunction with the CCFG is completing individual wildland fire home assessments through use of the Redzone software, a commercially produced software package designed for use on handheld personal data recorders. The software is used to collect locations and data about structures, water sources, and other information (www.redzonesoftware.com). Recommendations to landowners for wildfire risk mitigation are included in Section III of this CWPP. Additional recommendations for remote private lands include identifying properties by name on placards or road signs along Cascabel Road and locating wells or surface water sources that could be used to replenish water supplies for fire response equipment—both ground-based drafting and aerial bucketing—by also placing identification placards or road signs along Cascabel Road.

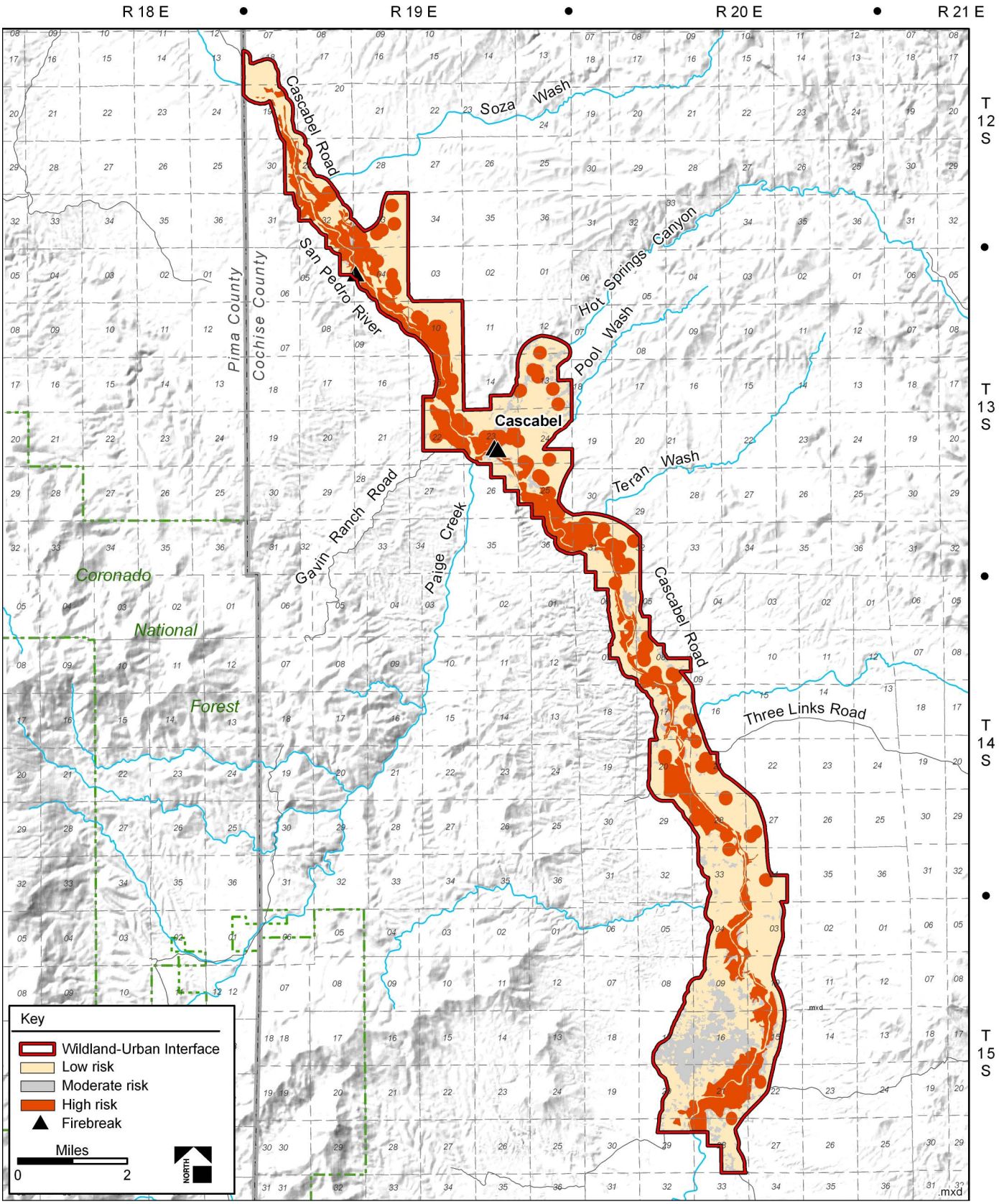

Figure 2.3. Cumulative risk analysis within the WUI

III. Community Mitigation Plan

Section III describes the area needing wildland fuel treatment and recommends methods of treatment and management strategies necessary to mitigate the potential spread of catastrophic wildland fire in the WUI. Also presented in this section is the community of Cascabel's recommendations for enhanced wildland fire protection capabilities, public education, information, and outreach.

A. Fuel Reduction Priorities

The proposed action is a fire mitigation project proposed by the BLM Gila District and the CCFG for public lands or private lands at risk from fire spread from BLM public lands. This project is focused on protection of life and property from wildland fire on BLM lands. Conversely, firebreaks will reduce the risk of fires spreading to BLM lands that originate on private property by creating a defensible space for wildland firefighters. The area of these projects is considered intermixed WUI. The projects will allow BLM fire managers to reduce the wildfire hazard on BLM land through the reduction of hazardous fuels. BLM crews or contractors are planning to remove live and dead fuel through thinning and pruning on BLM and private lands, so that firebreaks can be continuous across property boundaries, allowing for the most effective protection from wildfires. These firebreaks will complement fuel hazard reduction work that individual landowners have undertaken (Photo 3.1).

Photo 3.1. Existing firebreak within the WUI

Hazardous fuels reduction on BLM administered land varies among six firebreaks averaging 50 feet wide and 435–800 feet long, or 0.5–1.0 acres each in size. Additional firebreaks or hazardous fuels reduction projects may be developed over time and will conform to the mitigation measures and stipulations listed below. Vegetation would be cut, removed, or chipped. This includes the cutting, mowing, and removal of hazardous, flammable fuels in accordance with the Permit Stipulations noted below. All operations would be conducted according to ASLD regulations and in a manner that minimizes risk for the ignition of wildfire, erosion of soil, destruction of residual live vegetation, or other environmentally degrading activity (Photos 3.2 and 3.3).

Photo 3.2. Hazardous fuels reduction projects within the WUI

Photo 3.3. Fuel-break project within the WUI

1. Mitigation Measures/Stipulations as included in the *Decision Memorandum on Action and for Application of Categorical Exclusion 1.12 and 1.7 G2 Cascabel Firebreaks and Road Maintenance* (BLM TFO 2005):

a. Removal of hazardous, flammable fuels will only be permitted on BLM administered lands or private land identified in Figure 1.2.

b. The following hand tools could be used: weed eaters, hand saws, small chain saws, hand winches, and come-alongs are acceptable, or a mower, if it meets specifications listed below.

c. Dead vegetation less than eight inches in diameter may be removed, as per specific directions from authorized BLM officers. Removal of all dead vegetation in the firebreaks can be cut and removed.

d. Hazardous fuels reduction projects will stress tree spacing, by focusing on maintaining 15 foot spacing between leave trees.

e. Emphasis will be placed on maintaining the following species: Arizona Walnut, Arizona (Velvet) Ash, Net-leaf Hackberry, Buttonwillow, Cottonwood, Willows, and Mexican Elderberry. When possible, these species will not be removed: Graythorn, Condalia, Wolfberry, Sumac, Anisacanthus, Seepwillow, Willow-leafed Groundsel and Saltbush.

f. Emphasis will be placed at removing (thinning): Mesquite, Catclaw, Tamarisk, Snakeweed, Burroweed, Burro Brush, Rabbitbrush and Three-leafed Groundsel.

g. Live vegetation with basal diameters (4” stump height) no greater than eight inches may be removed, without authorization from the BLM TFO, Field Manager. Shrub and tree trunks will be severed four inches or less from the ground. Ladder fuels (limbs or branches) will be removed by pruning the lower third of trees and shrubs up to a maximum of eight (8) feet above the ground.

h. Live mesquites that are cut down will have their root balls removed within the project area.

i. Grasses and forbs may be cut with a mower, as long as stubble of at least four inches is remaining.

j. All severed material, except grasses and forbs, must be disposed of on the permittee's private property by the permittee.[1] Clearing of vegetation by mechanical vehicles or equipment is prohibited. Wheelbarrows and small four wheelers (all terrain vehicles [ATVs] will only be used by federal employees or federally contracted crews) with trailers, may be used if approved in advance by the TFO, Field Manager, as long as the use is compatible with decisions in the Resource Management Plan (e.g., sediment, erosion, root rot disease, aquatic conservation strategy, etc.). An effort to minimize visual effects of ATV tracks will be made as crew pull out ATV equipment from the project area. Fuels from these projects can not be sold as firewood.

k. Chain saws and ATVs will only be used by federal employees or contracted crews. All mechanized equipment must meet ASLD standards, and applicant must have an ASLD operations permit for approved spark arresters. The permittee must obtain an ASLD operations permit. Permittee must comply with all ASLD fire restriction requirements. Fire suppression tools will be kept at hand during all clearing operations, such as: ax, shovel, water, and bucket.

l. The uses of herbicides or pesticides are prohibited.

m. All survey monuments; witness corners, reference monuments, and bearing trees will be protected against destruction, obliteration, modification, or damage during the operation.

n. If the permittee discovers, encounters, or becomes aware of any objects or sites of cultural, historical, or paleontological value (grave markers, historical or prehistorical ruins, graves, old dumps, etc.) on the project area, the land owner will stop all operations and notify the authorized officer immediately. Prior to project work, archeologist will be notified, so that field review or clearance to proceed is granted.

o. Permittee will undertake every reasonable measure to minimize erosion, soil disturbances, ground disturbing activity, or the introduction of noxious weeds.

p. Permittee will undertake every reasonable measure to minimize disturbance to live vegetation not removed for fuel hazard reduction.

q. Permittee will not block or close roads or trails used by the public. Existing telephone, television cable, or electrical transmission structures and lines or existing fences, ditches, roads, trails, or other improvements on the public lands will be protected.

r. Clearing or cutting of any material within 10 feet of any stream on BLM land is prohibited to prevent the risk of accelerating erosion. Riparian areas are clearly defined on the attached maps, if applicable.

s. Burning on BLM land is not authorized within the Categorical Exclusion for hazardous fuels reduction.

[1] Permittee for implementation of the firebreaks include private landowner adjacent to BLM lands, ASLD Forestry Division personnel, BLM fuel crew personnel and private contractors

t. Permittee may reduce fuels from October 15 through March 31 and as long as fire danger is low or moderate.

u. This authorization is for reducing hazardous vegetation and dead organic material on BLM land that compliments similar work completed on the permittee's property.

The above fuel reduction and firebreak construction mitigation measures and stipulations meet the CCWPP goals of reducing hazardous wildland fuels on both public and private lands, improving fire prevention and suppression, restoration of riparian health, community involvement, ecosystem protection and expedited project implementation (Photo 3.4).

Photo 3.4. Previously constructed and maintained fuel break within the WUI

The wildland fire potential within the WUI has been identified, analyzed, and categorized according to potential risk from wildfire. The analyses of community values and fuel hazards were compiled into a single map depicting the WUI boundary and proposed fuel breaks described in Table 1.1, which are necessary for private property protection (see Figure 2.3).

Private land treatments in the WUI typically occur on small land parcels near power lines, structures, and other obstacles. In many cases, cut trees and slash cannot be piled and burned on small private land parcels or it is not the preferred slash treatment by the owner of a small residential lot or of the CVFD. Piling and burning cut trees and slash is not permitted on BLM lands under the Categorical Exclusion for hazardous fuels reduction; therefore, vegetation will be cut, removed, or chipped and transported to a disposal site. The CCFG also recommends that fallow agricultural lands be restored through the planting of native vegetation species in accordance with the *National Conservation Practice Standards, Range Planting, Code 550* (Natural Resources Conservation Service 2002). The CCFG also recommends that

firebreaks constructed on both public and private lands be maintained in accordance with the above mitigation measures and stipulations in a rotating one- to two-year interval to ensure the integrity of the firebreak through removal of fine and light vegetative fuels restricting wildland fire movement.

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 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 the USDI adopted two new categorical exclusions from the normal review steps of an environmental assessment or 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 public lands to be categorically excluded from documentation of the results of an environmental assessment, the project must meet specific requirements:

- 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.

The recommended treatment within the CCWPP has been evaluated and found to be compliant with Categorical Exclusion 10, Fuel Reduction. The purpose of Categorical Exclusion 10, Fuel Reduction, is “to facilitate efficient planning and decision concerning rehab of areas so as to reduce risks to communities caused by severe fires, and to restore fire-adapted ecosystems” (USDA FS 2000).

B. Prevention and Loss Mitigation

The CCWPP will be used as a resource to assist in the coordination of long-term interagency mitigation of catastrophic wildfire events in the community. The community’s goals of the CCWPP area are to

- improve fire prevention and suppression to protect private property,
- construct a series of fuel breaks to disrupt continuous hazardous wildland fuels adjacent to private lands,
- promote community involvement and education,
- recommend measures to reduce structural ignitability in the CCWPP area,
- preserve the aesthetics and wildlife values within the San Pedro riparian area,
- identify funding needs and opportunities,
- expedite project planning through partnerships with the BLM and other private and public entities in managing wildland fire risk within the WUI.

The CCWPP should be periodically reviewed and updated as needed. Successful implementation of this plan will require a collaborative process among multiple layers of government entities as well as a broad

range of community interests. The community of Cascabel has made the following action recommendations:

1. Improved Protection Capability and Reduction in Structural Ignitability

The community seriously considers the risks of wildland fire igniting and spreading in the WUI. The CVFD, the BLM Gila District, and the CCFG believe actions to reduce fire risks and promote effective responses to wildland fires must be undertaken. The following are recommendations to enhance protection capabilities in the community of Cascabel:

a. Additional comprehensive and frequent training for firefighters should be jointly conducted by the Southeast Zone, Arizona State Land Department; the Cochise County Fire Association; the BLM Gila District; and the CVFD. A common training activity should be conducted once a year before the fire season for the purpose of emphasizing tactics of WUI suppression and interagency coordination. Continuing WUI fire suppression training must be made available to volunteer firefighters of the CVFD.

b. Obtain a chipper/shredder for use by the CVFD for wildland fuel mitigation projects.

c. Obtain a new type 6 engine for wildland fire response by the CVFD.

d. Construct a permanent structure for housing CVFD firefighting equipment and engines.

e. Retrofit wells for CVFD use, maintain helicopter landing sites, and update mapping capabilities of the CVFD.

f. Improve dispatch and alerting capabilities by enhancing the existing radio system; this should be jointly investigated by the County, community, and federal and state agencies. The alerting system could additionally include the development of a “phone tree” community warning system.

g. Develop and deploy firehouse message signs including current fire danger sign, bilingual wildfire caution signs for camping areas within the riparian corridor, roadside identification and directional signage to residences, water sites for firefighting use, and helicopter landing sites.

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

The County and community will develop and implement public outreach programs to help create an informed citizenry. The goal is to have residents support concepts of Firewise landscaping and naturally functioning riparian systems through restoration management and rapid response to wildland fire. The CCWPP is intended to be a long-term strategic instrument containing prescriptive recommendations to address hazardous fuels. A grassroots collaborative structure of individual citizens, supported by local governments as full partners, will provide the most effective long-term means to achieve these goals and to maintain community momentum. Additional education resources are listed in Section VIII of the CCWPP. The components of such a structure include the following recommendations:

a. Expand the use of current public information tools for Firewise residential treatments as an immediate action step. This will be accomplished through information mailers to homeowners, presentations by the CVFD, continued use of the BLM Fire Prevention Public Information Trailer at community events, and the development of specific promotional materials. Use the resources of the University of Arizona, which has contracted with FS Region 3 to provide forest health analysis and

evaluation for all nonfederal lands in Arizona. The University of Arizona is tasked with Firewise program outreach throughout the state by the Arizona State Forester's office and assists in community outreach programs. Community bulletins and other public service announcements concerning wildfire threat and preparedness should be developed with assistance from the University of Arizona.

b. Complete the wildland fire home assessment through the use of existing Redzone software and submit wildland fire hazard mitigation strategies for each private property to landowners.
c. Establish and maintain roadside fire danger signs along Cascabel Road.
d. Replace and maintain fencing adjacent to the riparian corridor to prevent illegal off-road vehicle use.
e. Place and maintain bilingual wildfire caution signs within camping areas and access routes in the riparian corridor of the WUI.

3. Encourage utilization of woody material from WUI fuel mitigation programs.

The County and Community will continue to support and promote private contractors who perform fire-safe mitigation work. The community will continue to support and promote new businesses involved in the wildland fuel reduction market. The community of Cascabel is committed to employing all appropriate means to encourage the use of vegetative by-products available from the fuel management program within the WUI. Such possible uses encouraged by the community include the following:

a. Bagged mesquite wood for sale to visitor and larger community markets as "campfire cooking" for commercial or personal culinary uses.
b. Marketing of firewood to local residents, visitors, and adjacent communities.
c. Marketing of mesquite wood for artwork, furniture, and other specialty wood products.

IV. CCWPP Priorities: Action Recommendations and Implementation

The CCWPP community has developed action recommendations (Section III) necessary to meet the plan's objectives. A series of recommendations that will reduce structural ignitability and improve fire prevention and suppression has also been developed by the CCFG. A unified effort to implement this collaborative plan requires timely decision making at all levels of government.

To meet CCWPP objectives, the CCFG developed the following action recommendations. At the end of the fiscal year, projects implemented from these action recommendations will be monitored for effectiveness of meeting CCWPP objectives. For the life of the CCWPP, recommendations for additional projects will be made for each coming fiscal year on the basis of project performance from the previous fiscal year.

A. Administrative Oversight

Generally, the most efficient way to manage the mitigation of wildland fire threat in the WUI is through delegating and ensuring responsible authorities for implementing and monitoring the action recommendations of the CCWPP. Establishing a unified effort to collaboratively implement the CCWPP embraces adaptive management principles that enhance decision making and reduce inconsistency at all levels of government.

Therefore, the CCFG recommends that the Cascabel Fire Chief will be responsible for administering the community recommendations for outreach and structural ignitibility (fuel hazard removal on private lands within the WUI), while the BLM will be responsible for fuel mitigation projects on public lands within the WUI. The CVFD will submit requests for HFRA grant funds through the Arizona State Forester Fire Assistance Grant process to implement the action recommendations for private land treatments, mitigation features for reduced structural ignitibility, firefighting response, and public outreach. The BLM will pursue funding to construct and maintain six firebreaks within the WUI. Annual monitoring and reporting will provide information on additional measures necessary to meet CCWPP goals.

B. Priorities for Construction of Firebreaks

Table 4.1 displays the priority for construction of firebreaks within the WUI as recommended by the CCFG. This action recommendation will reduce wildfire potential to the community. All six firebreaks have "high" valuations for reducing risk.

Table 4.1. Action recommendations for construction of firebreaks

Firebreak area	Location and description	Project partners	Estimated treatment costs
Firebreak #1	BLM Mungia historic home	BLM and Cochise County	0.5 acre to be treated for $2,400.00
Firebreak #2	Corbett Ranch west of homestead structure	BLM and private landowner	1.0 acres to be treated for $4,200.00
Firebreak #3	Cascabel Ranch west of homestead structure	BLM and private landowner	1.0 acres to be treated for $2,300.00
Firebreak #4	Lot 37	BLM and private landowner	0.5 acre to be treated for $900.00
Firebreak #5	Lot 38	BLM and private landowner	0.5 acre to be treated for $900.00
Firebreak #6	Lot 40	BLM and private landowner	0.5 acre to be treated for $900.00
Firebreak maintenance	One- to two-year rotating maintenance of fine and light fuels in firebreaks 1 through 6	BLM and private landowner	2.0 acres to be maintained on two-year interval for $5,000.00

C. Priorities for Protection Capability and Reduced Structural Ignitability

The CCWPP communities will evaluate, maintain, and, where necessary, upgrade community wildfire preparation and response facilities, capabilities, and equipment. Table 4.2 lists the priority action recommendations.

Table 4.2. Action recommendations for wildland fire protection and reduced ignitability

Partners	Project	Equipment/expenses	Timeline
BLM, CVFD, and NRCD	Obtain one industrial-sized chipper	Portable manual-feed chipper: $25,000.00	Acquire in FY 2005/06 Implement use in FY 2007
AZ State Forester, Cochise County, and CVFD	Obtain one fully functional type 6 engine	Type 6 fire response brush engine: $60,000.00	Acquire in FY 2005/06 Implement use in FY 2007
AZ State Forester, Cochise County, and CVFD	Construct garage and housing facility for fire engines and response equipment	Four metal bay concrete floor maintenance building: $110,000.00	Construct in FY 2007/08
CVFD and private landowners	Retrofit existing wells for CVFD use and maintain well sites	Stand pipe installation and site maintenance: $4,000.00 annually	Begin in FY 2006/07 Maintain annually
AZ State Forester, Cochise County, BLM, and CVFD	Enhance dispatch and alerting capabilities	Enhancement of existing radio repeater for alert paging capabilities	Assess costs in FY 2006 Install in FY 2006/07
Southeast Zone, ASLD; Cochise County; Fire Association; BLM; and CVFD	Provide enhanced and coordinated firefighting training	Annual refresher and enhancement training and equipment for individual firefighters and annual multiagency training exercise: $10,000.00 annually	Training for 10 firefighters annually beginning in FY 2006/07

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

The Cascabel Fire Department will implement public outreach and education programs for residents to heighten awareness and understanding of the threat that wildland fire poses to the community.

Table 4.3 displays the CCWPP priority recommendations to promote community involvement. Additional programs that could be used or developed to enhance community outreach and education may be developed and implemented in the future.

- The University of Arizona is contracted with Region 3 to provide a lead role in the Firewise Communities outreach program. The CVFD will coordinate a community Firewise bulletin with the University of Arizona.

Table 4.3. Action recommendations for enhanced public education, information, and outreach

Partners	Project	Equipment/expenses	Timeline
CVFD, Cochise County, RNRCD, University of AZ, CCC, and BLM Gila District	Create and distribute community bulletin	Development, printing, and distribution costs: $5,000.00	Develop in FY 2006 Distribute continually
	Complete home fire assessment using Redzone software and implement fire-safe recommendations	Assessment completion: $2,000.00	Complete assessments in FY 2005/06 Implement recommendations in FY 2006/07
	Establish and maintain roadside fire danger warning signs and other informational and directional road signs along Cascabel Road	Construction and placement: $5,000.00	Construct and implement in FY 2006/07
	Encourage private businesses that perform fire-safe land treatments. Encourage market development of by-products of WUI vegetative fuel mitigation programs	Marketing plan to be developed	Initiate community marketing planning meetings in FY 2006

E. Requested Funding for Implementation of the CCWPP

Table 4.4 summarizes the total costs to implement the CCWPP action recommendations.

Table 4.4. CCWPP proposed budget

CCWPP objectives	Estimated costs
Wildland fuel mitigation	$16,600.00
Wildland fire protection and reduced ignitability	$209,000.00
Public education, information, and outreach	$12,000.00
Total requested implementation funds	$237,600.00

V. Monitoring Plan

Monitoring is essential to ensure that CCWPP goals are met. The CVFD and the BLM Gila District will monitor the effectiveness of ongoing and completed projects in meeting CCWPP objectives and will recommend future projects necessary to meet CCWPP goals.

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

A. Administrative Oversight and Monitoring

The CVFD Chief will be responsible for implementing and monitoring the CCWPP action recommendations for private land fuel modification treatments and community outreach objectives. The CVFD Chief 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 CCWPP. Grant information from federal sources (<www.fs.fed.us/r3/asnf>, <www.fs.fed.us/r3/partnership>, <www.fireplan.gov>, <www.nrcs.usda.gov>), state sources (<www.land.state.az.us>, <www.azstatefire.org>), and nongovernmental sources (<www.iwjv.org>, <www.azwildlife.org>, <www.sonoran.org>) should be routinely searched for updated grant application cycles. Reporting by the CVFD Chief will include necessary requirements of successful grant awards. Additionally, the BLM Gila District staff will monitor fuel hazard reduction work at least once a year, following fuels treatment. The CVFD and BLM Gila District staff will review annual monitoring results and will make recommendations to update the Community Mitigation Plan and the Prevention and Loss Mitigation Plan portions of the CCWPP. This information will ensure timely decision making for all levels of government and provide input necessary for the development of additional project recommendations. The CVFD will present any updated CCWPP to the signatories for their agreement and submission to Cochise County, the Arizona State Forester, and the BLM for their concurrence and will submit the action recommendations of the updated CCWPP for funding through all appropriate funding sources.

B. Effectiveness Monitoring

Table 5.1 outlines the performance measures the CVFD Chief will use to assess CCWPP performance against stated goals. To assist in tracking fuel treatments being planned and completed through Arizona fire assistance grant programs, the CVFD will cooperate with the Arizona State Forester's State Fire Mapping program by providing detailed mapping information as requested.

Table 5.1. Performance measures to assess CCWPP progress

Goal	Performance measure
Mitigate wildland fuel and improve fire prevention and suppression	Reduced wildland fire occurrence and acres burned (unplanned) in the WUI: • Number of firebreaks constructed • Effective monitoring of fire prevention and suppression will include - acres burned and degree of severity of wildland fire - percentage of wildland fire controlled on initial attack - number of homes and structures lost to wildland fire • Type 6 Fire engine obtained • Fire-equipment garage constructed • Water-source enhancements complete • Radio repeater upgraded to include firefighting pager • Number of firefighters trained each year
Promote community involvement	Community outreach programs initiated: • Community bulletin developed and circulated • Individual “home assessment” completed • Roadside fire warning signs constructed and installed

VI. Declaration of Agreement and Concurrence

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

Agreement

Richard Searle — Date
Chairman, Cochise County Board of Supervisors

Les Helfrich — Date
Chief, Cascabel Fire Department

Barbara Clark — Date
The Nature Conservancy in Arizona

Stephanie Smallhouse — Date
Chair, Redington Natural Resources Conservation District

CONCURRENCE

Kirk Rowdabaugh — Date
Arizona State Forester

Bill Civish — Date
Bureau of Land Management, Gila District

VII. References

Anderson, H. E. 1982. *Aids to Determining Fuel Models for Estimating Fire Behavior.* INT-122. National Wildlife Coordinating Group, Washington, D.C.

Arizona State Forester. 2004. Arizona Communities at Risk Matrix. www.azstatefire.org.

Arizona State Forester. 2004. Arizona Wildland Urban Interface Assessment. www.azstatefire.org.

BLM (*see* US Department of the Interior Bureau of Land Management)

The Report of the Governor's Arizona Forest Health Oversight Council. Executive order 2003-16 2005.

Cascabel BLM Ecosystem Management Plan. 1996.

Cascabel Environmental Assessment Cascabel BLM Ecosystem Management Plan. 2000.

Cochise County Comprehensive Plan. 2003. Cochise County, Arizona.

A Collaborative Approach for Reducing Wildland Fire Risks to the Communities and the Environment: 10 Year Comprehensive Strategy Implementation Plan. 2001. <www.fireplan.gov/reports/11-23-en.pdf. May.

Communities Committee, Society of American Foresters, National Association of Counties, National Association of State Foresters. 2004. *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities*.

Federal Register. 2001. Vol. 66, no. 3, p. 753. January 4.

Fire Regime Condition Class. 2004.<www.frcc.gov/docs/FrccDefinitionsFinal.pdf> accessed April 13, 2004.

Fire Regime Condition Class Guidebook. Fire Regime Condition Class Version 1.0.5. 2004.

FS (*see* US Department of Agriculture Forest Service)

Governor's Forest Health Guiding Principles. 2004.

National Association of State Foresters. 2003. *Field Guidance Identifying and prioritizing Communities at Risk.*

National Fire Plan. 2004. <www.fireplan.gov> accessed March 30, 2004.

Natural Resources Conservation Service. 2002. *National Conservation Practice Standards, Range Planting*, *Code 550*.

Redington Natural Resources Conservation District. 2003. *Lower San Pedro River Riparian Assessment.* Water Protection Fund Grant #0019.

RNRCD (*see* Redington Natural Resources Conservation District)

Schmidt, K. M., J. P. Menakis, C. C. Hardy, W. J. Hann, and D. L. Bunnell. 2002. *Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management.* RMRS-87. USDA Forest Service, Washington, D.C.

Taylor, M. 1995. Cascabel: A bare bones accounting of some significant happenings along the San Pedro River. Unpublished manuscript.

USDA (*see* US Department of Agriculture)

US Department of Agriculture Forest Service. 2000. USDA Forest Service Handbook Number 1909. Washington, D.C.

US Department of Agriculture Forest Service. 2003. *Fire Regime and Condition Class (FC) Field Procedures – Standard & Scorecard Methods.* FIREMON v1.1 – 10/30/03-1. Washington, D.C.

US Department of Agriculture Forest Service and US Department of the Interior Bureau of Land Management. 2004. *The Healthy Forests Initiative and Healthy Forests Restoration Act: Interim Field Guide.* FS-799. Washington, D.C.

US Department of the Interior Bureau of Land Management. 1991. *Gila District Resource Management Plan.*

US Department of the Interior Bureau of Land Management. 2004. *Proposed Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management Finding of No Significant Impact (FONSI) and Environmental Assessment.*

US Department of the Interior Bureau of Land Management Tucson Field Office. 2005. *Decision Memorandum on Action and for Application of Categorical Exclusion 1.12 and 1.7 G2 Cascabel Firebreaks and Road Maintenance.*

US Department of the Interior, US Department of Agriculture, et al. 2001 *Review and Update of the1995 Federal Wildland Fire Management Policy.*

VIII. EDUCATIONAL RESOURCES

Firewise Information and Web Sites

Firewise Communities/USA national recognition program.
http://www/Firewise.org/USA

The FireFree Program, sponsored by SAFECO Corporation, Wildfire Defense Get in the Zone, Reduce Your Risk of Wildfire pamphlet.
http://www.Safeco.com/Safeco/about/giving/firefree.org

Living with Fire—A Homeowners' Guide.
A 12-page tabloid, which is produced regionally by US Department of Interior agencies (Bureau of Indian Affairs, Bureau of Land Management, Fish and Wildlife Service, National Park Service), the USDA Forest Service, and state land departments. This is one of the most detailed pieces of Firewise information for landowners to reference when creating survivable space around their homes.
http://www.or.blm.gov/nwfire/docs/Livingwithfire.pdf

Fire Information Clearinghouse Web site from the San Juan Public Lands Center.
http://www.SouthwestColoradoFires.org

Grant Web Sites

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

US Fire Administration—Assistance to Firefighters Grant Program.
http://www.usfa.fema.gove/dhtml/inside-usfa/grants.cfm

National Association of State Foresters Listing of Grant Sources and Appropriations.
http://www/stateforesters.org/S&PF/FY_2002.html

Stewardship and Landowner Assistance—Financial Assistance Programs.
http://www.na.fs.fed.us/spfo/stewardship/financial.htm

The Fire Safe Council.
http://www.FireSafeCouncil.org

Pre-disaster Mitigation Program.
http://www/cfda/gov/public/viewprog.asp?progid=1606

Firewise.
http://www.firewise.org/usa/funding.htm

Environmental Protection Agency.
http://cfpub.epa.gov/fedfund

Arizona Wildfire and the Environment Series

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

Other

Federal Emergency Management Agency (FEMA) State Hazard Mitigation Officers.
http://www.floods.org/shmos.htm

National Fire Plan.
http://www.fireplan.gov/community_assist.crm

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

National Fire Lab.
http://www.firelab.org/fbp/fbresearch/WUI/home.htm

Protect Your Home from Wildfire.
Publications to help assist you with wildfire prevention. Colorado State Forest Service.
http://www.colostate.edu/Depts/CSFS/homefire.html

US Fire Administration, FEMA, US Department of Homeland Security.
http://www.usfa.fema.gov; http://www.fema.gov/regions/viii/fires/shtm; http://www.fema.gov/kidswldfire

Fire Education Materials.
http://www.symbols.gov

National Interagency Fire Center, National Park Sevice fire site.
http://www.nifc.nps.gov/fire

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

Pamphlets

Saving Homes from Wildfires: Regulating the Home Ignition Zone, by the American Planning Association (APA).
This May 2001 issue of the APA's Zoning News examines the wildfire threat to the wildland urban interface zone and shows how development codes can be used to save residential areas.

Books

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

Firewise Construction Design and Materials Publication, sponsored by the Colorado State Forest Service (CSFS) and the Federal Emergency Management Agency (FEMA).
This booklet is 38 pages of detailed home construction ideas to make a home Firewise. Various other publications are available from the CSFS on wildland urban interface issues.

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

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

Wildland Fire—Communicator's Guide.
This is a guide for fire personnel, teachers, community leaders, and media representatives.

CD ROM

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

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

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

Other Publications

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

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

IX. GLOSSARY OF TERMS

A

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

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

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

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

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

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

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

Aspect: Direction toward which a slope faces.

B

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

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

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

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

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

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

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

Glossary adopted from NIFC, http://www.nifc.gov/fireinfo/glossary.html.

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

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

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

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

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

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

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

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

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

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

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

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

C

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

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

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

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

Cold Front: The leading edge of a relatively cold air mass that displaces warmer air. The heavier cold air may cause some of the warm air to be lifted. If the lifted air contains enough moisture, the result may be cloudiness, precipitation, and thunderstorms. If both air masses are dry, no clouds may form. Following the

passage of a cold front in the Northern Hemisphere, westerly or northwesterly winds of 15 to 30 or more miles per hour often continue for 12 to 24 hours.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Curing: Drying and browning of herbaceous vegetation or slash.

D

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

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

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

Deployment: See Fire Shelter Deployment.

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

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

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

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

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

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

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

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

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

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

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

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

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

E

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

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

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

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

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

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

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

Environmental Impact Statement (EIS): EISs were authorized by the National Environmental Policy Act (NEPA) of 1969. Prepared with public participation, they assist decision makers by providing information, analysis and an array of action alternatives, allowing managers to see the probable effects of decisions on the environment. Generally, EISs are written for large-scale actions or geographical areas.

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

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

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

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

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

F

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

> Groups I and II include fire return intervals in the 0 - 35 year range. Group I includes Ponderosa pine, other long needle pine species, and dry site Douglas fir. Group II includes the drier grassland types, tall grass prairie, and some Pacific chaparral ecosystems.
>
> Groups III and IV include fire return internals in the 35 - 100+ year range. Group III includes interior dry site shrub communities such as sagebrush and chaparral ecosystems. Group IV includes lodgepole pine and jack pine.
>
> Group V is the long interval (infrequent), stand replacement fire regime and includes temperate rain forest, boreal forest, and high elevation conifer species.

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

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

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

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

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

Fire Storm: Violent convection caused by a large continuous area of intense fire. Often characterized by destructively violent surface indrafts, near and beyond the perimeter, and sometimes by tornado-like whirls.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

G

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

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

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

H

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

Hand Line: A fireline built with hand tools.

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

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

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

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

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

Helispot: A temporary landing spot for helicopters.

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

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

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

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

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

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

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

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

Hotspot: A particular active part of a fire.

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

I

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

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

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

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

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

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

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

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

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

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

J

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

Jump Spot: Selected landing area for smokejumpers.

Jump Suit: Approved protection suite work by smokejumpers.

K

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

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

L

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

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

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

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

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

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

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

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

M

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

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

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

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

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

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

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

N

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

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

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

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

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

O

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

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

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

P

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

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

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

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

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

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

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

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

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

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

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

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

R

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

S

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

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

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

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

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

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

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

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

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

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

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

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

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

Snag: A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.
Spark Arrester: A device installed in a chimney, flue, or exhaust pipe to stop the emission of sparks and burning fragments.

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

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

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

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

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

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

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

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

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

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

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

Surface Fuels: Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and medium shrubs, tree seedlings, heavier branchwood, downed logs, and stumps interspersed with or partially replacing the litter.

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

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

T

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

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

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

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

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

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

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

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

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

U

Uncontrolled Fire: Any fire that threatens to destroy life, property, or natural resources, and [definition completed from National Wildfire Coordinating Group, Glossary of Wildland Fire Terminology www.nwcg.gov/pms/pubs/glossary/] (a) is not burning within the confines of firebreaks, or (b) is burning with such intensity that it could not be readily extinguished with ordinary tools commonly available. (see Wildfire)

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

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

V

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

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

W

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

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

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

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

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

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

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

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

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

Wind Vectors: Wind directions used to calculate fire behavior.