COMMUNITY WILDFIRE PROTECTION PLAN UPDATE

LOS ALAMOS, NEW MEXICO
2022

LOS ALAMOS
where discoveries are made

CONTENTS

EXECUTIVE SUMMARY

STATEMENT OF PURPOSE

In response to Cerro Grande and other large wildland fires in the spring and summer of 2000, the Departments of Agriculture and Interior developed the National Fire Plan. Under the guidelines set forth in the National Fire Plan and the Healthy Forests Restoration Act of 2003, this Los Alamos Community Wildfire Protection Plan (CWPP) emphasizes:

- A long-term commitment to maintaining the essential resources for implementation
- Landscape-level vision for restoration of fire adapted ecosystems
- The importance of using fire as a management tool
- Continuing to improve collaboration among the multiple land management agencies within and surrounding Los Alamos County

In addition, this document shares the common goals as stated in the National Wildland Cohesive Strategy:

- Restore and maintain landscapes: Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
- Fire-adapted communities: Human populations and infrastructure can withstand a wildfire without loss of life and property.
- Wildfire response: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

The original Los Alamos CWPP, approved in 2009, updated in 2016, initiated long term planning to reduce the threat of catastrophic wildfire; to protect the lives and safety of citizens and firefighters; to protect residential and commercial infrastructure; and to promote ecosystem health. This updated CWPP addresses changes in the community, in the local fire regime, and in the current climate over the past five years. This plan re-evaluates risks based on those changes, and creates a new, prioritized implementation strategies for the wildland/urban interface in Los Alamos. The plan redefines the forested area that, with an uncontrolled ignition, has the potential to threaten life and property in Los Alamos and White Rock, as well as Los Alamos National Laboratory (LANL). It assesses the wildfire risk of individual neighborhoods and describes priority actions for the reduction of fuels through forest thinning, prescribed fire, and mitigation actions within home ignition zones.

Rather than a standing document designed to last ten years, this CWPP will adhere to the principles of adaptive management. The plan will be reviewed at a minimum every 5 years and revised based on changes in climate, residential and commercial development, unexpected delays in

implementation, citizen response, and available funding.

FUEL MANAGEMENT GOALS OF THE LOS ALAMOS CWPP

- To the extent feasible, reduce the risk to human health, human safety, to homes, other structures in Los Alamos and LANL from future forest fires by reducing hazardous fuels on county and federal lands within and adjacent to the wildland urban interface, along highways, forest roads, and trails

- Minimize the risk of crown fires entering Los Alamos, White Rock, LANL, important natural areas such as Bandelier National Monument and Santa Fe National Forest

- Reduce the fire risk from firebrands in Los Alamos neighborhoods

- Improve conditions for suppression efforts in the event of a wildfire

- Utilize the opportunities and progress made in the wake of the Cerro Grande and Las Conchas fires to continue active management of fuel loads on wildlands, to foster interagency cooperation, to promote forest health, improve watershed conditions, and to increase public awareness of and involvement in protection against wildland fire

MITIGATION ACTION PLAN SUMMARY

1. Continue fuel reduction projects on public lands, on all jurisdictions through mechanical and hand thinning.

2. Where and when appropriate, continue prescribed burning through broadcast and pile burn operations on public lands on all jurisdictions.

3. Provide education to homeowners on the home ignition zone through site visits and public information campaigns.

4. Continue community outreach through public schools, local nature centers, public events, print media and social media.

COMMUNITY AND ECOLOGICAL CHANGES SINCE 2016

COMMUNITY CHANGES

1. The commercial district of Los Alamos has expanded along the south rim of Los Alamos Canyon and to the east on the mesa between Los Alamos and Pueblo canyons.

2. The community population is stable and although new home construction has taken place. New residents live in existing housing that was mostly constructed from 1946 through the 1970s. Recent projects have included the Mirador subdivision in White Rock along with new apartment communities in Los Alamos.

3. With transfers from the Department of Energy and purchase of parcels from the United State Department of Agriculture Forest Service, Los Alamos County has acquired about 850 acres of undeveloped land.

ECOLOGICAL CHANGES AND CHANGES IN WILDLAND FIRE FUELS

1. In June 2011, the Las Conchas fire burned over 100,000 acres to the south, west, and north of Los Alamos. Ignited by a fallen power line, the fire burned 43,000 acres during the first 12 hours. The fuel treatments of the previous decade allowed fire crews to push the fire around the borders of Los Alamos and Los Alamos National Laboratory, effectively using the Cerro Grande burn scar as a massive firebreak. In the spring of 2022, the Cerro Pelado fire spread to within a few miles of Los Alamos County.

2. Precipitation patterns in the Los Alamos area have been altered by global changes in climate and by the presence of the huge, contiguous burn scars to the west of the community. While total annual precipitation stays at about 18 inches, the delivery pattern has changed. Prolonged dry periods are interrupted by locally intense storms that on average should occur only once every 50 to 100 years, but now occur each year. This pattern produces increased runoff and reduces the total moisture available to plants as compared to more frequent but less intense storms.

3. Overall mean temperature has increased by at least one degree F, and summer high temperatures average 2 degrees F above normal.

4. Mortality from drought stress and/or continues to hit pockets of ponderosa pine, particularly on south-facing slopes and at lower canyon elevations. Recent wind events have also contributed to ponderosa mortality.

5. Mortality in Douglas fir at the lower elevations—within the townsite—continues and the number of standing dead has increased significantly.

6. Of the 1,200 acres that were mechanically thinned from 2003 to 2022, about 675 acres have been treated with prescribed fire (see Map 1):
   - 98 acres of broadcast burning
   - 579 acres of pile burning
   - more than 6,000 piles burned
   - about 18,000 tons of fuel removed

7. Slash from the 2001-2002 piñon die-off in the White Rock area is half decayed and is unlikely to carry fire. Red-needled piñon, once a significant fire threat, are scattered.

8. Significant grasslands are developing on the western edge of the developed area.

Prescribed Burn Operations Through 2015

Pile burn acres in various colors
Labeled with date of burn
All acres hand or mechanically thinned before burning

Legend

- contour40ft
- Broadcast Burns
- Mechanical Thinning 2003-2005, no burn

579 pile burn acres treated
98 broadcast burn acres
more than 6000 piles burned
70 burn days

N

0 500 1,000 2,000 Feet

Los Alamos Parks

I. INTRODUCTION AND BACKGROUND

A. DESCRIPTION OF LOS ALAMOS COUNTY

Los Alamos County, New Mexico contains two communities, Los Alamos and White Rock, with more than 8,000 residences, seven schools, a hospital, and other infrastructure to support a population of more than 18,000; a branch campus of a state university; state highway links between the Jemez Mountains and the Rio Grande Valley; internationally significant historic sites related to the development of the first atomic weapons during World War II; hundreds of cultural sites of the Ancestral Pueblo people; almost 150 miles of recreational trails; and the Los Alamos National Laboratory, a scientific facility that employs over 7,000 people and holds hundreds of structures.

Sitting on the eastern flank of the Jemez Mountains, the townsite of Los Alamos has one of the largest wildland-urban interfaces in New Mexico. The townsite is located on the boundary of the Pajarito Plateau and the foothills of the Sierra de los Valles, which is the easternmost extension of the Jemez range. Neighborhoods are built on finger mesas that are separated by deep canyons carved into soft volcanic rock. This disjointed, linear arrangement of housing creates an unusually high proportion of homes located at the border of forest or woodland.

Eight miles to the southeast and about 1,000 feet lower in elevation, the community of White Rock sits on the canyon rim above the Rio Grande. White Rock is surrounded by piñon-juniper woodland, and some portions of the community, notably Pajarito Acres and La Senda, are built in the heart of dense stands of this forest type. White Rock has a different but equally extensive wildland-urban interface as the townsite.

Los Alamos, New Mexico

White Rock, New Mexico

Most of the relatively level land on the mesa tops and in the foot- hills is privately owned. However, only about six percent of the land within the County is in private land; the remainder of the land is managed by various local and federal agencies. The canyons in between the mesa tops, as well as the majority of the town's western perimeter, are managed by the Incorporated County of Los Alamos as open space. The western and northern perimeters of the townsite neighbor the Santa Fe National Forest. A few miles further south and southwest, Bandelier National Monument holds several major forested drainages that head in the high Jemez Mountains and flow to the Rio Grande. Los Alamos National Laboratory, heavily forested with ponderosa pine in the higher elevations and piñon-juniper in the lower country, lies to the south of downtown and Western Area along a shared border. The eastern border of the County lies mainly against the San Ildefonso Pueblo.

Ponderosa pine forest dominates the foothills of the Sierra de los Valles and this plant community extends into the townsite. The finger mesas reach eastward toward the Rio Grande Valley and slope gently away from the mountain front. Because the mesas are at a lower elevation than the mountain front, piñon-juniper woodland dominates the mesa tops. The steep-walled canyons between the mesas hold a mix of vegetation communities. The drier, south-facing slopes hold sparse piñon-juniper woodlands. The moister, north-facing slopes support a mixed conifer community that includes ponderosa pine, limber pine, and Douglas fir. Lower elevation canyon bottoms are dotted with ponderosa pine, and the narrower upper canyon bottoms are lined with mixed conifer.

B. FIRE ECOLOGY OF PONDEROSA PINE FORESTS

Los Alamos is in a ponderosa pine forest. Ponderosa pine (*Pinus ponderosa*) is the most common and widespread pine in North America. Ponderosa forests developed in this part of the Southwest about 8,000 years ago as the climate warmed at the end of the last ice age. These forests were open with individual trees, or small clumps of trees, spread widely apart. Tree densities were from about 50 to 150 trees per acre. Locally, ponderosa forests occur from about 7,000 to about 8,500 feet above sea level.

Open stands of ponderosa pine dominate the vegetation in and around Los Alamos

Fire is a keystone ecological process in these forests: if fire is removed, the system collapses. Ponderosa pine is a fire-adapted species with thick, scaly bark that insulates the tender growing tissue beneath. The trees are self-pruning, losing their lower branches so that a fire burning on the ground does not have a "fuel ladder" to climb into the crowns. The species has long needles, which protect the growing branch tips from drying out.

Prior to about 1890, ponderosa pine forests had the highest fire frequency of all forest types found in the Jemez Mountains. But these fires were much different than what we see today. Frequent low intensity surface fires burned through the grassy understory of these open forests about every seven to ten years. These fires, mostly ignited by the abundant lightning that occurs during the spring and summer months, kept the forests open by thinning out young trees. They also consumed old wood and needles on the forest floor, recycling nutrients, especially nitrogen, in the process. Plant species, wildlife habitat opportunities and food sources for animals and birds were numerous.

Due to the combined effects of overgrazing, high-grade logging, fire suppression, and a highly variable climate, the forests became much denser, choked with ground, ladder, and crown fuels in a continuous blanket across the landscape. Locally, tree densities increased from 50 to 150 trees per acre to between 400 and 1,300 trees per acre or more. Dead fuel loads have increased from a few tons per acre to as much as 20 tons per acre of needles, branches, and logs.

These largely human-induced changes in the composition and structure of the ponderosa pine ecosystem resulted in changes to ecosystem processes, most notably the role of fire. When coupled with a warmer, drier climate, crown fires became increasingly frequent, larger, and more destructive, leading up to the Cerro Grande fire in 2000 and the Las Conchas fire of 2011.

C. LOCAL FIRE HISTORY

Strong evidence for the past role of fire in the Los Alamos area is held in its place names. Two prominent landscape features to the west of the townsite are named for fire. Burnt Mountain overlooks the North Community, and although the event that gave the feature its name is unrecorded, the name has been in use since at least the 1950s. In addition, a canyon, ridge, trail, and housing area share the name Quemazon, which translates from Spanish as "burned." In this instance, the name has been in use for over a century.

A period of large, fast-moving crown fires in ponderosa pine forest around Los Alamos County began in 1954 with the Water Canyon fire. Within hours after it started, the fire raced through the trees from the south and threatened the townsite. The Water Canyon fire was significant for being the first to require the evacuation of Los Alamos. The 15,000 acre La Mesa fire in 1977 spread rapidly from Santa Fe National Forest, across Bandelier National Monument toward Los Alamos. Many considered this fire a wakeup call for changing fire behavior in the area, but little effort went into prevention of another such event. Nineteen years later, the 1996 Dome fire created another threatening smoke column on the southern horizon of Los Alamos. The extreme fire behavior exhibited by this blaze did serve as motivation to begin fuel treatments in the area. Two years later, the Oso fire burned north of town. The fires in the late 1990s were dwarfed by the 43,000-acre Cerro Grande fire. On May 10, 2000, the fire entered the townsite and destroyed more than 400 homes. The unthinkable happened again in June 2011 when Los Alamos was evacuated for a third time as the Las Conchas fire burned 148,000 acres to the west and north of town. Other local fires, (Thompson Ridge 2013, Cajete Fire in 2017, San Antonio Fire 2019 and the Cerro Pelado fire in 2022), were contained near Los Alamos County borders.

North Community in Los Alamos following the Cerro Grand fire

The well-documented high frequency of lightning strikes in the Jemez Mountains has played a role in the fire frequency of the Los Alamos area. However, most of the large fires occurring over the past 50 years were human caused.

D. HISTORY OF FUELS TREATMENT IN LOS ALAMOS

In response to the 1977 La Mesa fire the Santa Fe National Forest initiated construction of fuel breaks along New Mexico Highway 501 and behind Arizona Avenue in North Community.

The Western Area Perimeter Master Plan, included in the 1987 Los Alamos County Comprehensive Plan, acknowledged the need for a fuel break development in this highly vulnerable and dense area of ponderosa pine forest. In 1995, the Forest Service conducted a prescribed burn in the foothills west of Los Alamos that was met with a vocal outcry from residents. In 1996, Forest Service community liaison Robert Remillard documented his recommendations for fuel mitigation measures on Department of Energy (DOE) and County lands between the National Forest boundary and residential neighborhoods of the townsite in a document titled Western Perimeter Tract Fuels Management Recommendations. His recommendations included identifying fire access roads, areas for priority treatment, recommendations for clearing around structures, and a combination of fuel treatments including expansion of existing firebreaks and creation of shaded fuel breaks, followed by slash pile burning and understory broadcast burns along the Western Perimeter area of the townsite. The portion of this work on Forest Service administered lands was already underway and was completed in 1998. As Remillard noted, "The problem is not one of finding new solutions to an old problem, but of implementing known solutions". (Simpson, 1996)

Prescribed burn in the Western Perimeter, 1996

In April 1996, the Dome fire burned 16,000 acres on the Santa Fe National Forest and Bandelier National Monument south of LANL. Dry conditions led to a one-day run of 6,000 acres. The fire spread rate and intensity of the Dome fire convinced resource specialists that fuel breaks alone would not be sufficient to protect the Lab and town from a crown fire. The Dome fire demonstrated that crown fires, which burn through the crowns of trees rather than through surface fuels such as grass or litter, are extremely difficult and dangerous to suppress. If a fire can be kept on the ground, fire suppression crews have a chance of controlling it. Once a ground fire transitions into a crown fire, most suppression actions are ineffective.

The Dome fire led to an effort to consolidate suppression actions. Claudia Standish of the Forest Service developed an Inter-Agency Fire Management Plan that outlined cooperative arrangements for communication and fire suppression between the LAFD, the County, LANL, Forest Service and Park Service. The report made recommendations for fuel mitigation efforts. The Inter-Agency Wildfire Management Team (IWMT) was formed in May 1996 and began regular bi-weekly meetings.

Land and fire managers from the LAFD, the Santa Fe National Forest, Bandelier National Monument, and Los Alamos National Laboratory (LANL) addressed this issue in the late 1990s.

The Fuel Mitigation/Forest Restoration Project greatly reduced fuel loads at the wildland-urban interface

William Armstrong (1998, 1999) of the Santa Fe National Forest modeled fuel in the Sierra de los Valles and predicted a 38% chance of a crown fire reaching the townsite or LANL structures over the ensuing five years. Other modelers outlined the scenario: a lightning or human caused ignition expanding into a fire that would maintain itself for several days in the heavy surface fuels, and then intensify with increasing wind speed. Using low branches and small trees as a ladder, this fire would jump into the tree crowns and be pushed by the prevailing southwest winds, enter the townsite (Balice et al., 1999).

In January 1998, the Santa Fe National Forest began studying the advisability of treating portions of the Española Ranger District adjacent to Los Alamos to reduce the risk of catastrophic forest fires. In early 2000, the Forest Service prepared to release the results of that study as the Valle Fuels Management Project Environmental Assessment. The plan was approved for release on May 2, 2000 (Bandelier National Monument and Santa Fe National Forest, 2001).

Within Los Alamos, a fuel reduction program in Pueblo Canyon was initiated by LAFD under the direction of the Fire Marshal. Known as the Pueblo Shelf Project, the 10-acre effort removed small diameter trees and ladder fuels in the canyon below Ridgeway and Urban Streets. This project was directly responsible for a change in fire behavior during the Cerro Grande event that dropped the fire to the ground and saved as many as 400 homes. Also in 1998, the Department of Energy treated about 8 acres on the north slope of

Los Alamos Canyon directly below the Ridge Park neighborhood.

On May 4, 2000, a Bandelier National Monument crew ignited a prescribed fire on the slopes of the highest peak in the monument, Cerro Grande. Unexpected conditions blew the fire across established fire lines and into the Santa Fe National Forest. Persistent spring winds carried the fire northeast, and on May 10, 2000, with wind gusts up to 70 miles per hour, the fire reached the Los Alamos townsite. Over the next 16 hours, over 400 families lost their homes to the wildfire.

The Cerro Grande fire burned a large portion of the Valle study area in which the Forest Service planned fuels management actions. Since virtually all of the area proposed for treatment was burned, the Environmental Assessment was never issued.

On June 26, 2011, Las Conchas wildfire began. The fire started when a tree fell on a power line. On the first day the fire had reached 43,000 acres. Las Conchas Fire, a fire driven by high winds by June 30 increased to 103,000 acres which is over 160 square miles. The fire was contained on August 3, 2011, after burning more than 155,000 acres.

Fuel Treatment Summary (See Maps 2,3 and 4)

Los Alamos County Fire Department: Completed in 2021, the Los Alamos County Fire Department has developed the Los Alamos County Wildfire Mitigation and Public Education Project to reduce the threat of catastrophic wildfire, protect the lives and safety of citizens and firefighters, create defensible space around residential areas and critical facilities, and to promote ecosystem health. Specifically, the project thinned vegetation on approximately 114 acres of land managed by the County and would conduct home assessments on adjacent private lands that are within the Home Ignition Zone (HIZ) in Los Alamos County, New Mexico. The areas identified to be treated through the project are all within the Wildland Urban Interface (WUI)and would promote defensible space from a wildfire threat for approximately 750 residential homes, as well as two schools and the Los Alamos National Laboratory Pueblo Complex. Another component of this dual phased project was the completion of over 420 wildfire risk home assessments. The home assessments completed were to homes that directly bordered the project areas. The data from these home assessments also gave LAFD pre-action plans with trigger points for Los Alamos neighborhoods.

Los Alamos County Open Space: Community planning after the Cerro Grande fire resulted in the *Los Alamos County Long-Term Recovery, Redevelopment, and Hazard Mitigation Plan* (2001). This document identified the development of a fuels modification program for unburned County lands as the highest priority item. As a result of this recommendation, the Federal Emergency Management Agency (FEMA) provided a grant to Los Alamos County for the establishment of a fuel mitigation project. The FEMA grant enabled the County to immediately begin fuel reduction, proceed at a faster pace, and treat a larger area than it could have otherwise.

Initiated in December 2000, the Los Alamos Fuel Mitigation/Forest Restoration Project (FMFR), under the direction of LAFD, was designed to reduce the risk of crown fire entering the community of Los Alamos, restore forest health and wildlife habitat, and improve the County

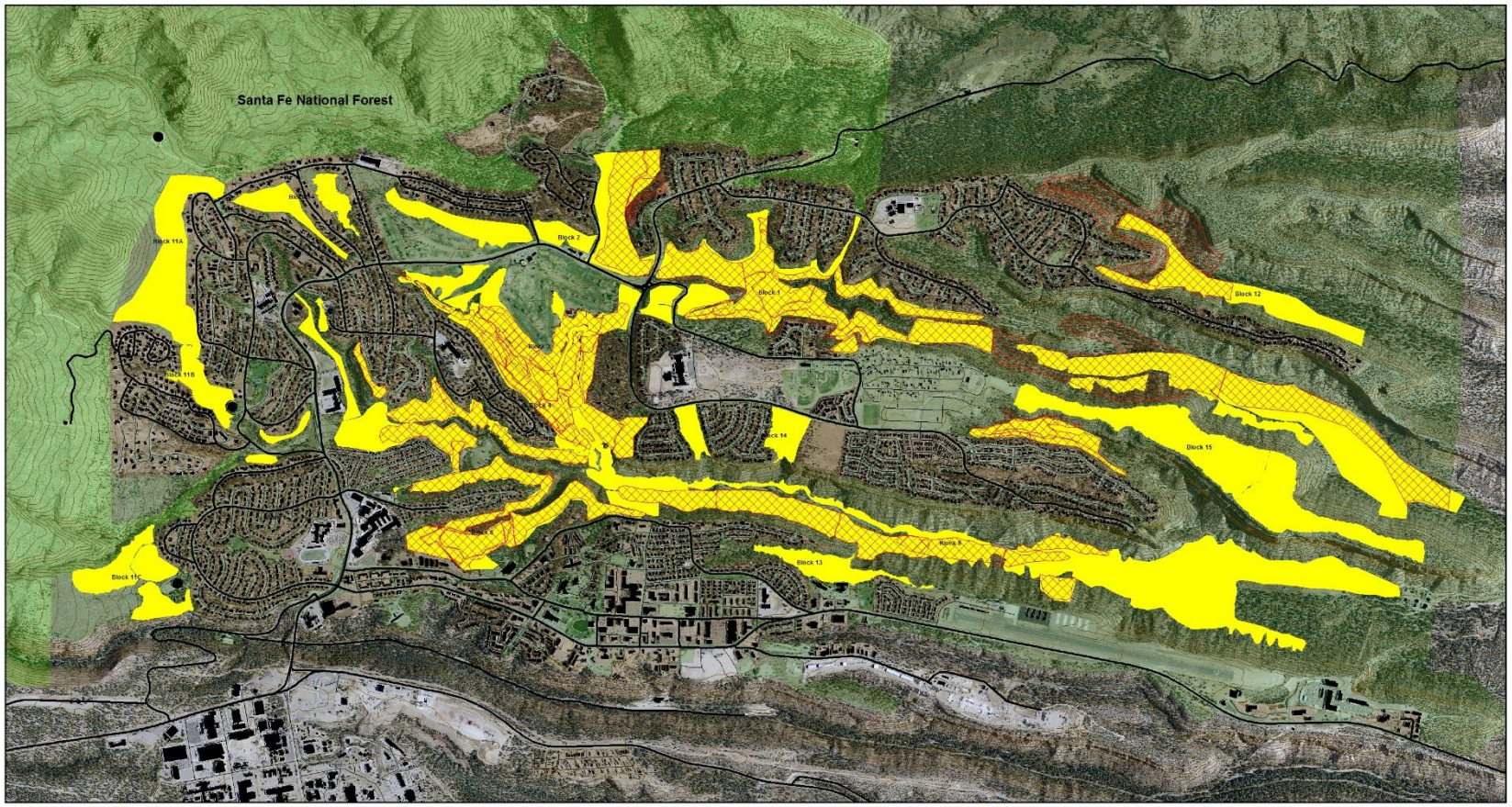
trail network. Through December 2021, the project has treated over 1,400 acres. The majority of the work was mechanical thinning with material hauled away, masticated or chipped on site. Hand treatment was completed on steep slopes and in areas inaccessible to mechanized equipment. Pile burning and broadcast burning were implemented on about 400 acres. (See Hogan and Martin, 2009.) Prescribed fire continued as a tool to treat a total of 680 acres through 2015 with about 6,000 piles burned and 98 acres of broadcast burning.

Bandelier National Monument: A revised fuel reduction plan, the Valles II Project, was developed in 2003 by Bandelier National Monument and Santa Fe National Forest personnel. To supplement the plan, Bandelier fire staff released their Fire Management Plan in 2005. Implementation began in 2005. In the upper Frijoles watershed at Bandelier, thinning was accomplished along New Mexico Highway 4 and Forest Road 289 in preparation for prescribed burning on the mesa to the west of Frijoles Canyon. In November 2007, Bandelier fire staff implemented a long-anticipated and necessary burn in the Upper Frijoles Watershed that reduced extreme fuel loads on about 1,500 acres. A 100-acre broadcast burn in Frijoles Canyon near the visitor center was carried out in fall 2008. During the winter of 2008-2009, pile burning on the monument took place in the upper Frijoles watershed. This work was critical during the first 24 hours of the Las Conchas fire when fuel breaks created under the 2005 plan were used to anchor backfire operations that steered the blaze away from LANL and the town of Los Alamos. To meet the new conditions, Bandelier fire management staff revised their management plan again in 2013.

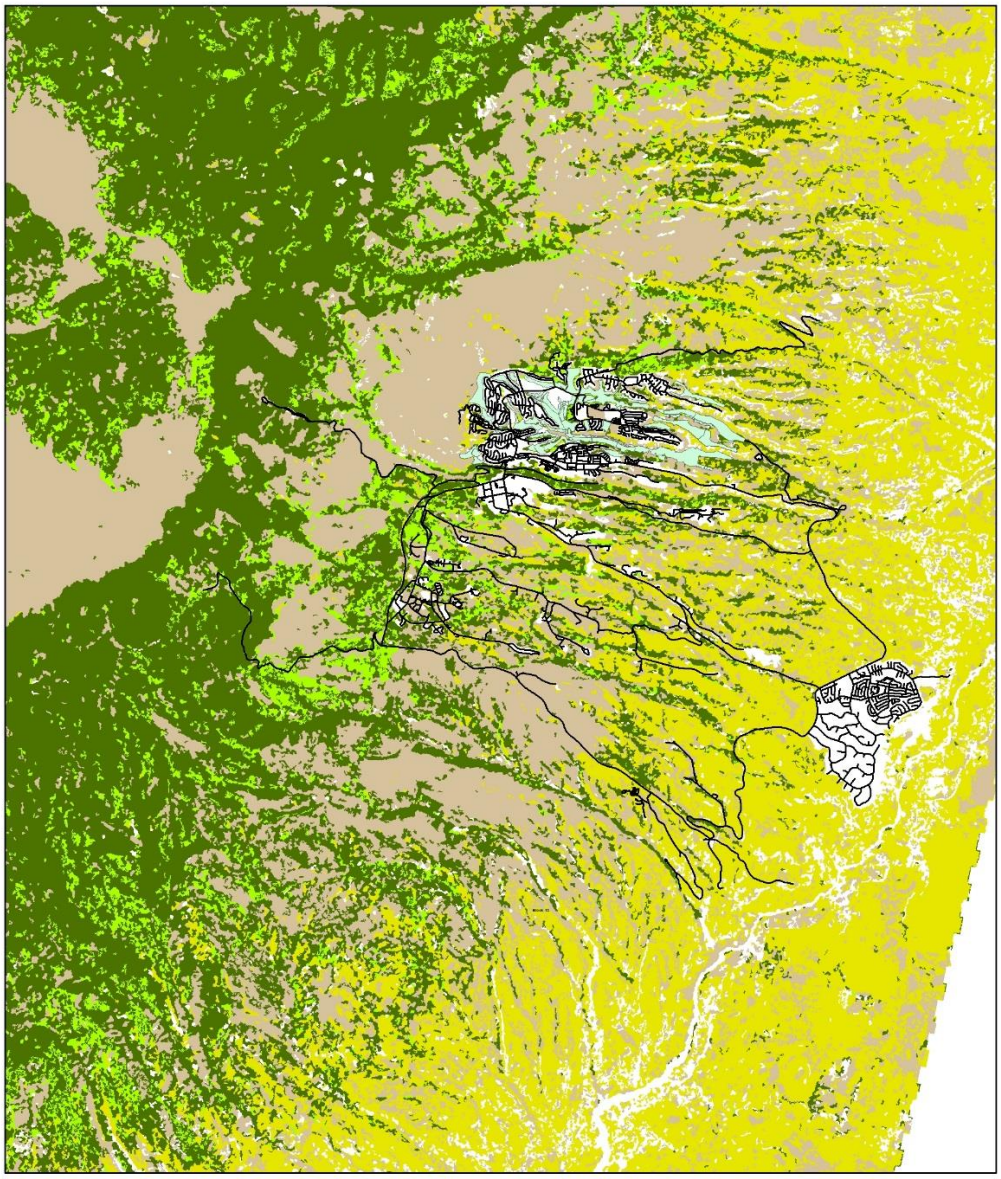
Santa Fe National Forest: On the Santa Fe National Forest, mechanical thinning along the north side of Arizona Avenue took place in 2004, and cut, pile, and burn operations continued below Barranca Mesa through 2009. Mechanical thinning and firewood collection reduced fuels in the American Springs area on the national forest and about 300 acres were broadcast burned in 2007.

Los Alamos National Laboratory: LANL initiated fuel reduction with a small project in Los Alamos Canyon immediately adjacent to residences along the canyons' north rim in 1998. In 2002, LANL implemented a large-scale thinning project in the southern half of the County adjacent to White Rock. Thinning on several hundred acres in the interior of the laboratory was implemented from 2001 to 2004 as part of the Cerro Grande Rehabilitation Project. In 2007, LANL accomplished a fuel reduction project on a critical parcel in Los Alamos Canyon below Fairway Drive. LANL reduced fuels on about 15 acres in Los Alamos Canyon adjacent to Ridgeway Drive. Fuel reduction in DP Canyon began in 2009. From 2010 to 2013, firebreaks were created around much of the perimeter of the laboratory.

San Ildefonso Pueblo: Pueblo fuel reduction projects were implemented in the New Mexico Highway 4 corridor as well as in canyon areas of middle Los Alamos County.



CWPP All Treatments 2003-2014



Los Alamos County
Community Wildfire Protection Plan
Vegatative Fuel Types

N

0 8,250 16,500 Feet

Legend

- Grassland
- Piñon-Juniper
- Ponderosa Pine, treated
- Ponderosa Pine, untreated
- Mixed Conifer
- Mixed Conifer, treated

Los Alamos Parks

I. BASELINE ASSESSMENT OF FIRE HAZARDS AT THE WILDLAND-URBAN INTERFACE IN LOS ALAMOS COUNTY

A. DEFINING THE WILDLAND-URBAN INTERFACE

The wildland urban interface (WUI) is the zone where two classes of flammable materials meet: the natural landscape and structures. In the WUI, structures and vegetation are sufficiently close so that a wildland fire could spread to structures, or a structure fire could ignite vegetation.

In Los Alamos County, geography, vegetation patterns, and the ponderosa pine ecosystem combine to create a widespread WUI. Due to the interlacing neighborhoods, forest, extensive winding canyon rims, frequent lightning strikes and high winds, the entire community lies within the WUI. Ninety percent of the County is undeveloped land and much of this land has the potential source for a fire that moves into the urban area.

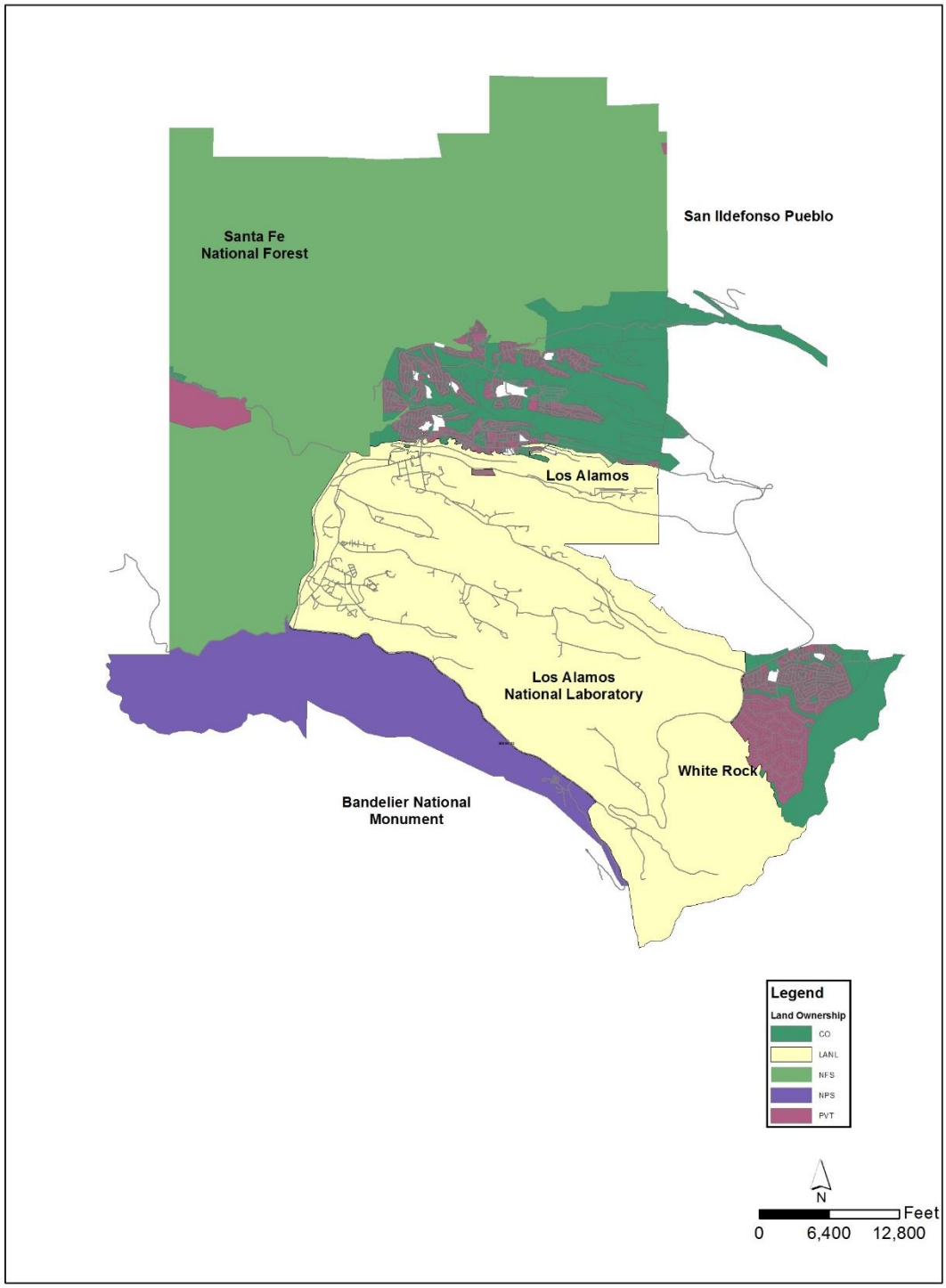
For this CWPP, the boundaries of the WUI are drawn to include surrounding areas where fuel buildup and fire could threaten the community. As demonstrated in the La Mesa, Dome, Oso, Cerro Grande and Las Conchas and Cerro Pelado fires, wind-driven wildfire spreads from southwest to northeast and can cover several miles in a single day. Thus, heavily forested land to the south, southwest and west of the urbanized area of Los Alamos are included in the WUI (see Map 4).

Baseline conditions of the wildlands, urbanized areas of Los Alamos County have been thoroughly studied and documented. The following assessments are broken down to present conditions that were used in formulating priority treatment areas. Implementation actions will be applied within the treatment areas, plans for reducing structural ignitability and strengthening preparedness.

B. ASSESSMENT OF WILDLAND FIRE HAZARDS

This overview of the characterization of existing wildland conditions in Los Alamos County looks at the three components of wildland fire behavior: fuels, weather, and topography. Data was drawn from the Fuel Mitigation/Forest Restoration Project by the United States Geological Survey (USGS); the Southwest Environmental Consultants' (SEC) report on defensible space in Los Alamos; from the Bandelier National Monument Fire Plan and from Geographic Information System (GIS) analysis by the Los Alamos County Parks Division (see Map 5).

To make sense of the data, a variety of methods can be used to assess fire hazard or to make general predictions about fire behavior. A computer simulation was used to predict future forest conditions and visually display the effects of past forest restoration treatments. A fire model was used to generate scenarios of fire threat based on present conditions. Fire predictions were generated by Behave Plus3 and by the Forest Vegetation Simulator, both of which are commonly used fire modeling applications produced by the USDA Forest Service. Also, GIS was used to synthesize a variety of data and generate maps of areas of greatest potential threat from wildland fire.



Los Alamos County
Community Wildfire Protection Plan
Jurisdictions

Los Alamos Parks

Los Alamos County GIS
Craig Martin
February 20, 2008

Los Alamos County
Community Wildfire Protection Plan
Los Alamos Neighborhood Risk Analysis

N

0 1,700 3,400 Feet

Developed using the weighed sum tool in ArcGIS 10.2.
Risk factors are housing density, neighborhood access,
street width, aspect, slope, proximity
to untreated forest land, and proximity to ponderosa pine forest.

I. Assessment Criteria: Vegetative Fuels

Conditions of Existing Plant Communities in Los Alamos

Los Alamos County supports five distinct fire affected ecosystems. Each plant association type offers distinct characteristics of potential fire intensity, fire rate of spread, and probability of fire ignition. The extent of each of these plant communities was mapped, placed in GIS, and used in fire hazard modeling. Additional details on vegetation characteristics in Bandelier National Monument can be found in the Bandelier Fire Management Plan (2013); for LANL lands, see Balice, et. al. (1997); and for County open space, see Hogan and Martin (2009).

Two types of ponderosa pine forest. Above, a thinned forest stand in Pueblo Canyon holding about 80 trees per acres; below, an untreated dog-hair thicket with as many as 800 trees per acre

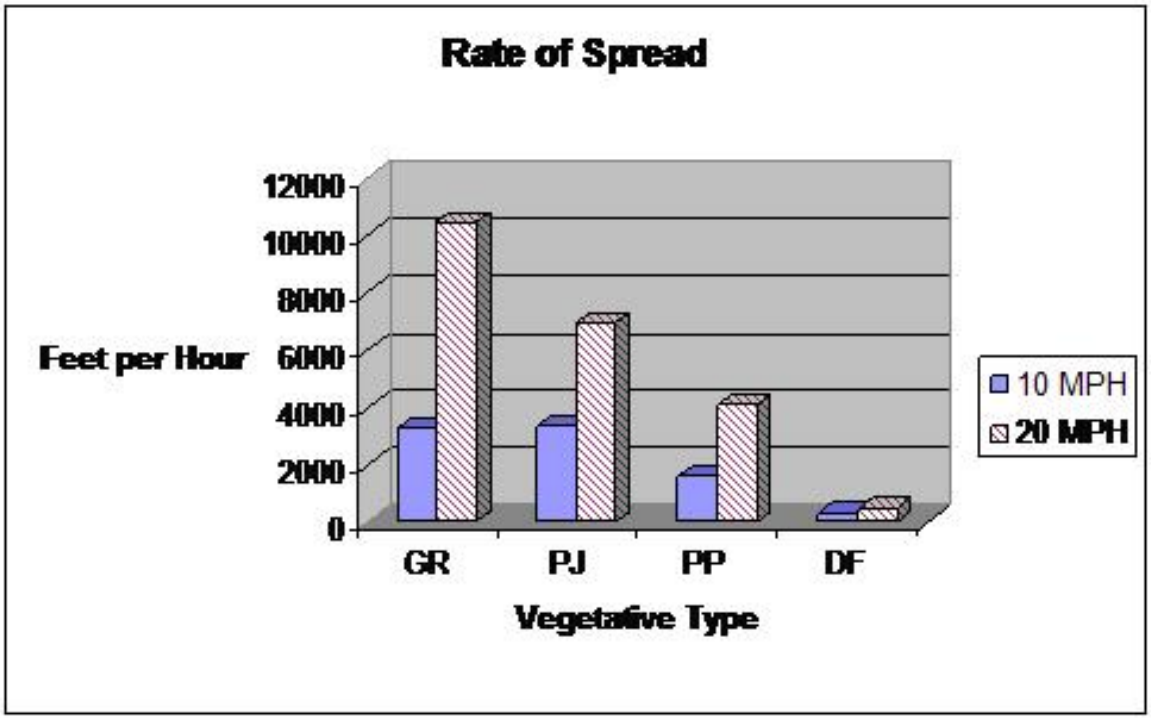
Key Point: Changes in forest structure from wildfire or thinning operations have altered the type of wildfire Los Alamos will see in the future. In contrast to pre-existing conditions that would support a crown fire, fast moving, low intensity, low flame length fires will likely be experienced in the treated and burned areas. However, crown fire remains possible in areas that have not yet received treatment.

Fire Behavior Characteristics in Ponderosa Pine Forests

As shown above, historical ponderosa pine forests were open stands with a grassy understory. These forests were transformed into dense stands with high fuel load that are prone to crown fire. Over the past twelve years, the LAFD Fuel Mitigation/Forest Restoration (FMFR) Project greatly reduced fuel loads on forest stands that lie immediately adjacent to housing areas. Both the Forest Service and the National Park Service have successfully treated densely forested areas further from the townsite but no less critical in terms of landscape-scale fuel management.

There are currently two types of ponderosa pine forest in the Los Alamos area with vastly different fire hazard characteristics. Untreated ponderosa pine stands around Los Alamos present a high fire risk. Surface fires in these stands display short flame length, low rate of spread, but high heat output. Stand density often exceeds 1,000 stems per acre; also, ladder fuels are abundant. Concentrations of dead and down woody debris contribute to torching of trees and spotting. These factors would readily carry a wind-driven fire into the tree crowns. The canopy of these dense stands is often continuous, which would allow fire to spread through tree crowns. Fuel treatments on County lands have eliminated all but a few small stands of high-density forest. Existing high-density stands are found in Los Alamos and Rendija canyons.

Computer models can compare the predicted rate of spread and flame length for treated and untreated forest stands. For wind speeds up to 60 mph, the models predict that burning surface fuels would have a flame length less than the crown base height, which would likely keep fire out of the tree crowns. Compared to untreated forest, the rate of spread of a surface fire would increase but the intensity of the fire is greatly reduced. Untreated forest areas in the townsite exhibit a possible rate of fire spread of 800 feet per hour, and a flame length of 17 feet. Large amounts of woody debris, dense pine stands, and the universal presence of ladder fuels account for the high flame length. Most areas were classified in Fuel Model 9.



Areas that received mechanical treatment during the County's FMFR Project and other thinning projects have modified fire characteristics. The stated objectives of the FMFR Project were to reduce the threat of crown fire in Los Alamos by reducing stand density and reducing ladder fuels by increasing the crown base height, which is the distance of the lowest flammable material above the surface. Pretreatment tree density in the project area ranged from 200 to 800 trees per acre. After

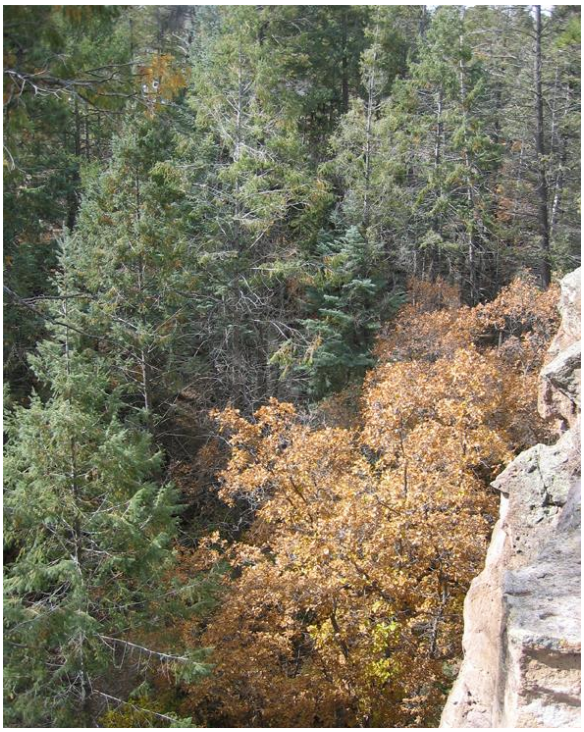
thinning, that number was reduced to between 60 and 80 trees per acre. The average crown base height was raised from 8 feet to more than 20 feet.

Due to the reduction of canopy cover, thinned stands of ponderosa pine are more open, warmer, windier, and slightly drier than untreated stands. The open canopy encourages the growth of grasses and forbs. Open forest structure with a heavy understory of grass leads to quickly spreading surface fires. However, the fires burn with lower intensity than fires that involve denser stands and a large volume of woody debris.

Desired Future Conditions: Desired future conditions for this forest community exhibits ponderosa pine as the dominant tree overstory but encompassing both a wide range of cover values (from open savanna with approximately 5% mature tree cover to nearly closed canopy) and mixed age structure (i.e., seedlings, mid-story trees, overstory trees, dead snags, and dead and down logs). Trees in excess of several hundred years would be scattered throughout with understories of grass-forb, shrub, and other tree species variable depending on aspect, elevation, and time since last fire. Overstory tree canopy cover and understory ladder fuels would generally be broken and patchy, effectively mitigating opportunities for continuous crown fire runs, while allowing limited torching of closed canopy patches. Accumulations of surface fuels (litter, duff, slash, logs, etc.) would be consumed periodically by low intensity, surface fire avoiding widespread damage to soils, mature canopy root systems, and perennial herbaceous cover.

Fire Behavior Characteristics in Mixed Conifer Forests

The high peaks to the west, and many of the north facing slopes in the canyons, support mixed conifer forest. Because of their aspect, these mixed conifer stands receive reduced direct sunlight and are less arid than adjacent forests. Douglas fir, ponderosa pine, and South- western limber pine grow with Gambel oak and aspen. The stands are often dense. In lower canyons, the Douglas fir component is susceptible to drought and the species has seen almost 100 percent mortality over the past ten years. Historically, high-elevation mixed conifer forests burned in mosaic patterns with crown fire taking out large patches of forest during different events. This was demonstrated locally by the Thompson Ridge fire in 2013 that burned in a mosaic pattern of high to low intensities. Fire frequency is variable and ranges from 12 to 300 years. Fire return interval for townsite mixed conifer, primarily on north aspects of the interior canyons, ranged from 12 to 25 years from the 1600s until 1883, which marked the last recorded fire at all sample sites. Overstocking and buildups of large woody debris have created high fire hazards in most of the mixed conifer stands in the Los Alamos area. Fuel loads have increased due to drought related Douglas fir mortality and infestations of insects, particularly the spruce budworm. The high elevations areas of Bandelier National Monument sustain mixed conifer stands as do the upper reaches of canyons on LANL lands.



Typical mixed conifer stand with continuous fuels from ground to tree canopy

Most of the mixed conifer stands on north facing slopes within the townsite have undergone hand thinning operations followed by pile burns. Behave Plus simulations indicate low rates of spread and low flame lengths can be expected from ignitions in treated areas. Untreated mixed conifer stands are classified in Fuel Model 10. Fires burning in surface litter spread with moderate intensity and speed. Because of the presence of high surface woody fuel loads, torching, spotting and crown fire is more frequent than in ponderosa pine stands.

Desired future conditions: Desired future conditions for most mixed conifer forests exhibit several species sharing dominance and with a full range of age classes. Trees in excess of several hundred years would be scattered throughout with understories of grass forb, shrub, and other tree species variable depending on aspect, elevation, and time since last fire. Over story tree canopy cover and understory ladder fuels would be broken and patchy, effectively mitigating opportunities for continuous crown fire runs, while allowing limited torching of canopy patches. Accumulations of surface fuels (litter, duff, slash, logs, etc.) would be consumed periodically by low intensity, surface fire avoiding widespread damage to soils, mature canopy root systems, and perennial herbaceous cover.

Fire Behavior Characteristics in Mid-Elevation Grasslands

Much of the area within the perimeters of the Dome, Cerro Grande, and Las Conchas fires has been converted to open grasslands with an oak and New Mexico locust over story. These open areas often support about 70 percent ground cover in the form of with bunch grasses and forbs dominated by slender wheatgrass, little bluestem, and mountain muhly. The grasslands are concentrated to the west of the townsite where they cover about 10,000 acres and along the southern boundary of the County in Bandelier National Monument and adjacent areas of LANL.

The fire regime of these areas was radically altered. Formerly this area was covered with dense timber that supported crown fire. Currently, the primary fire threat is from flashy fuels that would generate much shorter flame lengths but the rate of spread along the surface is greatly increased. BehavePlus modeling predicts in moderate winds a flame length of 8 feet with a rate of spread of more than 7,000 feet per hour.

Grasslands within the Cerro Grande fire perimeter

Desired future conditions: The return of ponderosa pine forests in these areas will take many decades. To ensure the re-creation of healthy pine stands showing the desired characteristics detailed above, these areas should experience periodic fire disturbance.

Fire Behavior Characteristics in Piñon-Juniper Savannas and Woodlands

The lower portions of the major canyons extending from the Sierra de Los Valles and the town of White Rock are located on extensive plains covered with piñon- juniper savanna or woodland. Drought conditions in 2001 and 2002 caused 98 percent mortality in piñon in many areas, leaving areas of the landscape covered in juniper savannah. The vegetation community is characterized by an over story of piñon pine and one seed juniper with a groundcover of perennial grasses and forbs. Dominant shrubs are wavy leaf oak, mountain mahogany, and big sagebrush.

The historical frequency and type of fire in this woodland is not clearly understood. In general, the plant community is classified as Fuel Model 6. Surface fire is carried through the shrubs, but the fuel continuity is sparse. Under low wind speeds fire will not carry, but high winds may push fire through low canopy.

Piñon-juniper woodlands cover much of the lower elevations in Los Alamos

About 600 acres of woodlands at Bandelier, LANL and County lands has seen ecological restoration or fuel reduction projects. In each case, most of the standing dead piñon, some juniper has been lopped and scattered on the surface or masticated and scattered on site.

Desired future conditions: Woodland areas exhibit tree dominated communities with canopy

coverages generally exceeding 30%; herbaceous under- stories are sparse with fire return intervals in excess of 25 years.

1. Assessment Criteria: Topography

Terrain

Key point: Terrain factors influencing fire behavior cannot be modified. In conjunction with the urban structure of Los Alamos about one of every seven houses in Los Alamos lies on a canyon edge, slope is a critical criterion for evaluating fire risk.

Topography is a primary component of wildfire behavior patterns. Steep terrain, canyons, aspect, and elevation range all play a role in the direction and rate of spread of a wildfire. Fires often run rapidly up steep slopes and are often pushed up or down canyons by daily cycles of wind direction. Because Los Alamos and White Rock are dissected by numerous canyons, fire hazards for neighborhoods are strongly influenced by distances from steep canyons. (See Map 6.)

Forested Areas Inaccessible to Firefighters

Key point: Despite active maintenance of fire access roads and trails, difficult terrain makes direct suppression attack impossible on a wildfire ignition in many locations in Los Alamos.

Although Los Alamos and White Rock are laced with an extensive road and trail network, many locations within the county are inaccessible by vehicle or difficult to reach on foot. Due to steep terrain without escape routes, suppression of a wildfire ignition in many canyon areas would put firefighters at great risk. Inaccessible areas adjacent to structures are a priority for treatment.

2. Assessment Criteria: Climate and Weather

Climate

Key point: Continuing climate changes increase the likelihood of wildfire in Los Alamos.

Although Los Alamos and White Rock sit at about 7,300 and 6,300 feet above sea level respectively, the climate of both sites is generally warm and dry. Precipitation averages about 18 inches per year in the townsite, and about 8 inches per year in White Rock. Fire risk is influenced by characteristically dry periods from April to July. The majority of large fires have occurred in these months. Following the dry spring, seasonal wind patterns bring moisture to the area in July and August. Daily heating and rising air along the mountain fronts combine with this moisture to produce frequent thunderstorms. The summer storms provide the area with more than 50 percent of its annual precipitation.

Drought is a recurring climate condition in New Mexico. The increase in large fires in the past two decades is related to extended dry periods. Recent climate data suggests long-term drought

conditions will continue in the southwest, increasing fire risk and altering fire behavior.

Historically, large wildfires in northern New Mexico occur in mid- to-late spring (with a peak in June) and are driven by prevailing spring winds out of the southwest. With each passing cold front, spring winds blow strongly and can reach up to 70 mph. Thus, housing areas with forested terrain to the southwest are most vulnerable to direct fire spread and to showers of firebrands.

Prevailing Winds

Key point: Fuel treatments on all jurisdictions should pay special attention to the prevailing wind direction, especially during the critical spring and summer months of southwest to northeast.

The most recent example of a wind-driven fire, the Cerro Pelado fire, moved steadily to the northeast, and at times advanced as much as two miles an hour in that direction. The wind factor is complicated by the concentration of dense forest areas in addition to heavy ground fuel loading from large wind events to the south and west of Los Alamos. As a result, fires originating in the forests southwest of the townsite and White Rock have the potential to be readily driven into the community.

3. Assessment Criteria: Fire Ignition Risk

Key point: The Jemez Mountains have an unusually high number of lightning strikes each year, but human-caused fires have burned more acres.

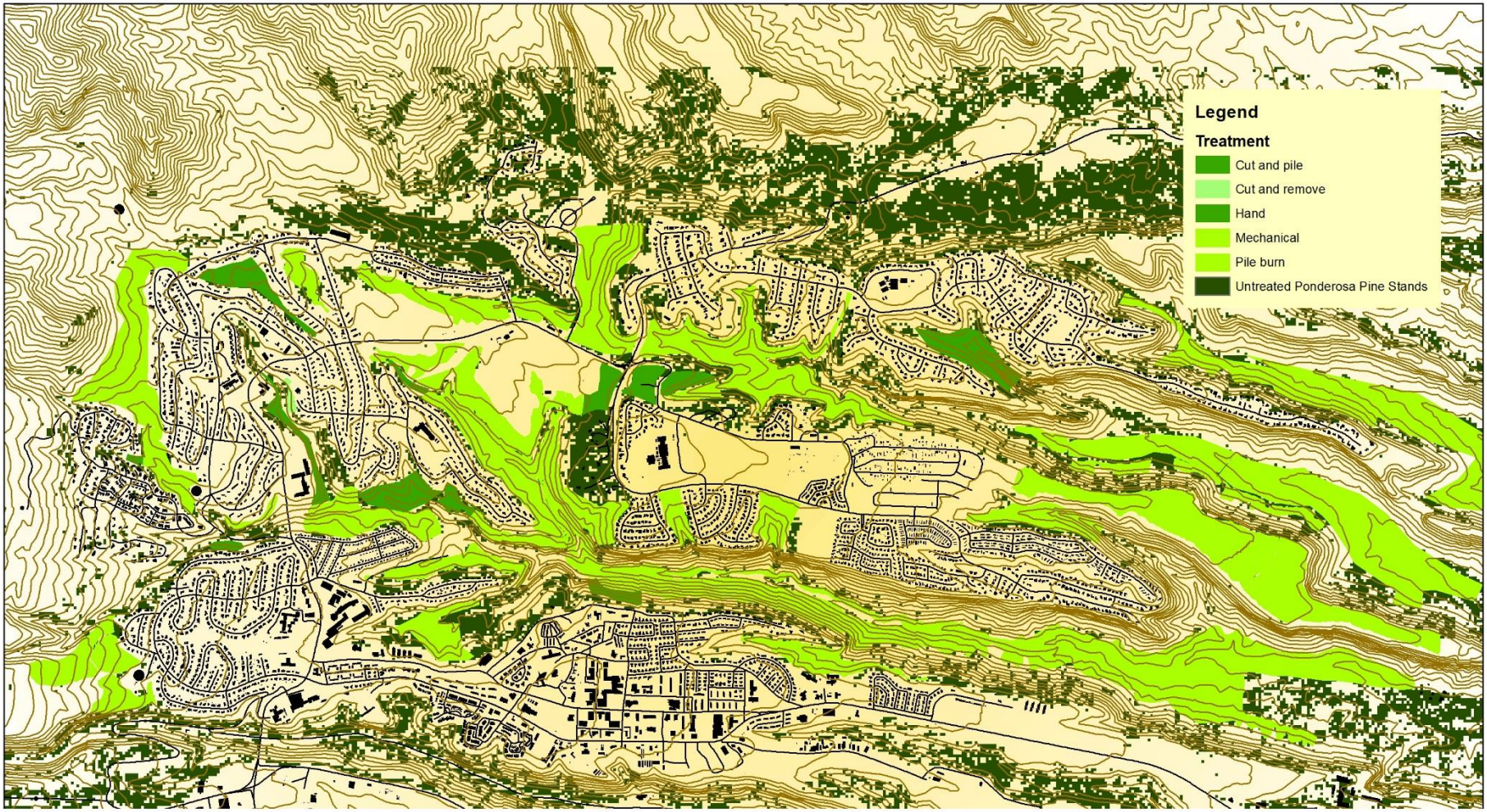
Studies of lightning strikes in the Jemez Mountains reveal between 9,000 and 23,000 strikes per year in the range. The highest risk is from June 12 to July 4 when frequent dry storms develop before there is enough atmospheric moisture to produce precipitation.

More than 5,500 historic fires have been mapped in the range since 1909. Since 1977, several fires have burned more than 5,000 acres with the largest fire, Las Conchas, burning over 155,000 acres. Despite the abundance of lightning, the five largest fires were human-caused.

4. Results: Wildland Wildfire Hazard Rating from GIS Analysis

Using GIS mapping of open space data, aerial photographs, and GIS spatial data, forested and woodland areas in Los Alamos and White Rock were assessed for four characteristics and rated for the risk factor for each of the characteristics. The data were generated with a pixel size of 20 feet. Analysis was done in ArcGIS 10.2 using the weighted overlay function in Spatial Analyst.

Wildlands were rated for fuel model, aspect, slope, and inaccessibility to fire suppression equipment. The resulting map indicates areas adjacent to the townsite and White Rock where additional fuel reduction treatments are required.



Los Alamos County
Community Wildfire Protection Plan
Los Alamos WIldland Risk Analysis

PRIORITY WILDLAND AREAS

1. Los Alamos Canyon: Western area south of the large water tank, the south-facing slope on Department of Energy property

2. Between Walnut Street and the south side of the golf course.

3. DP Canyon between DP Road and New Mexico 502

4. Rendija Canyon on the north side of Barranca Mesa on Forest Service and County owned lands

5. North of Arizona Avenue and west of Ponderosa Estates

6. School Canyon from its confluence with Pueblo Canyon to the Cerro Grande fire burned area

ASSESSMENT OF STRUCTURAL IGNITABILITY

1. Assessment Criteria: Neighborhoods

Key point: The original design of the government-built houses and street layout in Los Alamos make it expensive for homeowners to reduce the fire hazard in some neighborhoods.

Because most of Los Alamos was built by the Atomic Energy Commission (AEC) in the 1940s and 1950s, neighborhoods in Los Alamos have characteristic housing styles, densities, construction materials, and road widths. Based on these characteristics and neighborhoods' relation to the surrounding forest land, the townsite and White Rock were divided into distinct neighborhood districts. Assessment criteria were analyzed on the neighborhood level. The following factors were rated for each neighborhood in the townsite and in White Rock.

Housing density is high in many of the government-built neighborhoods in Los Alamos

Accessibility based on street width, number of access roads, and cul-de-sac length. Most streets in Los Alamos and White Rock are 24 feet or wider. Streets less than 24 feet are generally congested with parked vehicles, creating difficult access for firefighters. All neighborhoods in Los Alamos include cul-de-sacs with narrow turning areas, and only four streets are cul-de-sacs with more than 200-

foot areas.

Housing density and average distance between structures. The cliff-and-canyon topography of Los Alamos places severe constraints on the availability of land for development. As the town grew after World War II, this was immediately apparent in the urban design of the many community additions constructed by the AEC. Houses are tightly packed on the streets of many of the older neighborhoods. Throughout the Eastern and Western areas, and North Community the distance between houses is consistently less than 40 feet. More recent developments—notably the Quemazon Communities and Hawk's Landing—also exhibit densely packed homes. Fire in structures 50 feet or less from adjacent structures is likely to generate sufficient radiant heat to ignite the second structure. Thus, housing density plays an important role in the calculation of fire hazard in Los Alamos neighborhoods.

Structural ignitability based on dominance of flat roofs and flammable building materials. Los Alamos was built as a government town with an eye toward economy. Thus, many government-built housing areas have flat roofs that can act as repositories for firebrands during a wildfire.

2. Assessment Criteria: Defensible Space

Key point: The average fire hazard rating for Los Alamos in 2007 was 71, which NFPA considers a high-risk rating. In a 2003 study, the average risk rating for Los Alamos was 81.

In 2007, the Los Alamos County Defensible Space Project summarized data collected at about 40 random intersection points within the County. The objective of the study was to determine a fire risk rating for houses in the wildland-urban interface zone. Using the risk rating value generated by the form, intersection ratings were developed by averaging the rating of each subject house.

Of 16 intersections evaluated in Los Alamos, six were rated high, four high-moderate (scores in the upper 60s), five moderate, and one low. In the previous study, the same intersections rated 14 high and two moderate ratings.

The average intersection rating in White Rock in 2007 was 43, which is considered a moderate risk. In the 2003 study, White Rock received a rating of 63, which is also in the moderate category.

Many of the treatments of homes during the Defensible Space project have not been maintained of the past ten years. Also, about 30% of the population of Los Alamos is new since the Cerro Grande fire and did not receive the educational components of defensible space provided immediately post fire. Thus, there is a strong need for a new emphasis on homeowner responsibility education.

3. Assessment Criteria: Torching Trees and Firebrands

Key point: Most neighborhoods in Los Alamos and White Rock have several streets that will be exposed to showers of firebrands when a wildfire occurs.

Fire Scientist Jack Cohen toured Los Alamos the week following the Cerro Grande fire. His findings were not unlike those he found after dozens of fires in the previous years: direct flame contact from crown fire was not the principal cause of the loss of homes, but rather the shower of wind-driven firebrands from burning trees or nearby houses (Cohen, 2000).

Using fire models for 30 mph winds and crown and stand data for County open space areas, many neighborhoods could be exposed to firebrands during moderate-intensity fires.

4. Results: Identifying High Risk Neighborhoods

Key point: In Los Alamos, neighborhoods with a high percentage of perimeter lots remain in the high-risk category. The risk in reconstructed neighborhoods in North Community is moderate. Fire risk in White Rock is low but remains moderate in Pajarito Acres and La Senda.

Apart from the Denver Steels neighborhood, all roadways in Los Alamos County are more than 20 feet wide, which is considered adequate access for fire protection vehicles. All roads are paved and signed, and response times for the fire department are within industries best practice. However, the risk factor is increased, in many neighborhoods that are located on mesas with only one access road.

In all neighborhoods many wildland fire risk factors cannot be changed. All the high-rated intersections involved perimeter lots. Most are adjacent to steep slopes and ponderosa pine forests. With the existing lot sizes common in Los Alamos, a 300-foot vegetation-free buffer is not possible.

The neighborhood design of the government-built neighborhoods in North Community and the Western Area greatly contribute to WUI fire risk factors. These neighborhoods have houses spaced less than 40 feet apart. Most houses are constructed with at least partial wood siding, no enclosed eaves, and flat roofs.

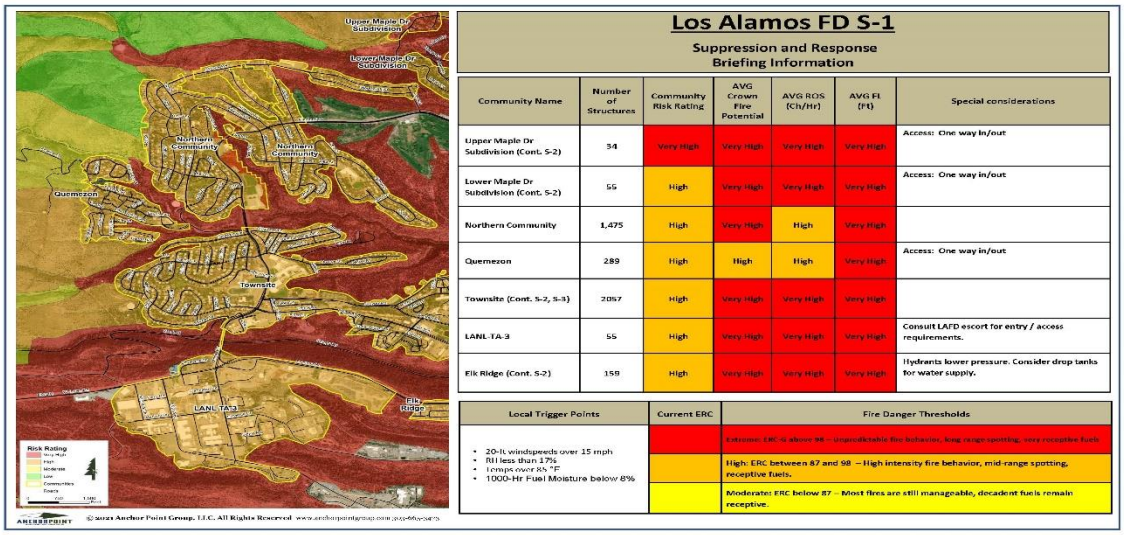
In areas with new construction, particularly in the Cerro Grande burned area, the revised building code and undergrounded utilities help lower the rating one level, from high to moderate or moderate to low. Out of sixteen intersections, six had at least one newly constructed or remodeled house and all the intersections dropped at least one rating level between the 2003 and 2007 surveys.

In White Rock, the 2003 study was done during drought conditions when dead juniper piñon trees carried highly flammable red (dried) needles. When these needles dropped to the ground, the fire hazard risk was reduced. On perimeter lots and in the Pajarito Acres and La Senda neighborhoods, needle drop accounts for the reduction in risk rating.

Neighborhood Wildfire Hazard Rating from National Hazard and Risk Model (No-Harm)

The National Hazard and Risk Model (No-HARM) is a decision support tool for wildfire hazard and risk assessment. Incorporating the predicted severity (hazard) and the predicted frequency (risk) of wildfire in each location, No-HARM gives a comprehensive view of the threat context a structure is exposed to

No-HARM divides the data up into “Fire Sheds” that are based on the topography (hills and valleys) of the landscape. These Fire Sheds tend to correlate to the vegetation and the directions that fires will burn in the absence of wind. This means that Fire Sheds divide the landscape up into like planning units. The wildland and intermix modules of No-HARM (see below) use Fire Sheds to aggregate the landscape.



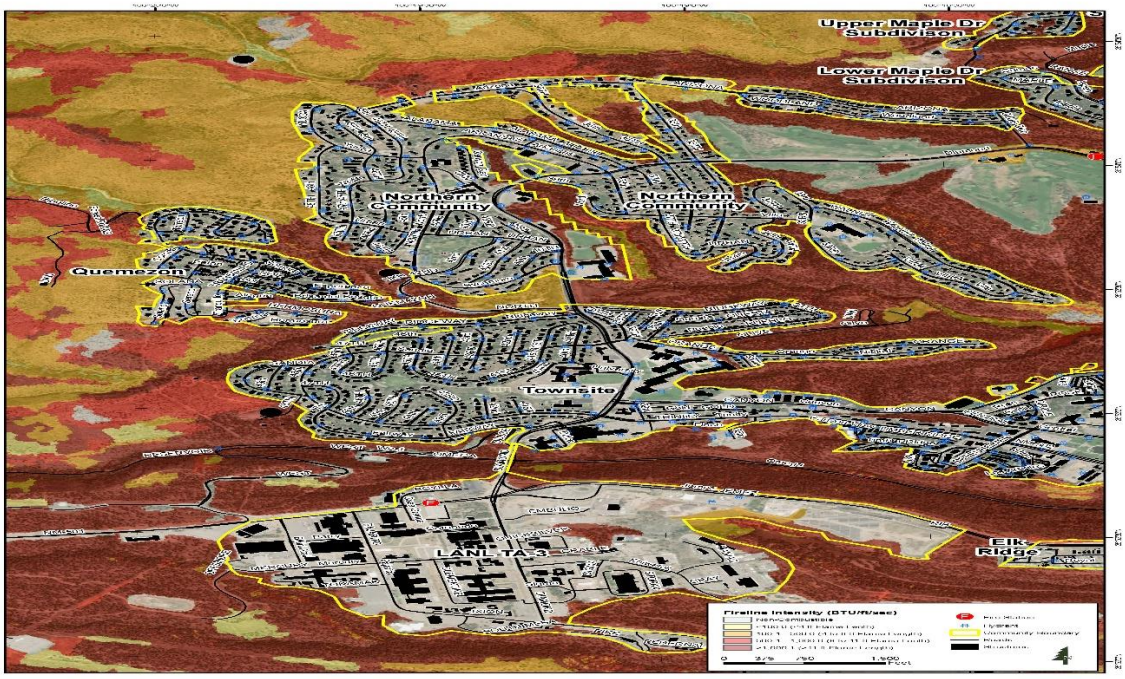
Los Alamos FD S-1

Suppression and Response Briefing Information

Community Name	Number of Structures	Community Risk Rating	AVG Crown Fire Potential	AVG ROS (Ch/Hr)	AVG FI (Ft)	Special considerations
Upper Maple Dr Subdivision (Cont. S-2)	34	Very High	Very High	Very High	Very High	Access: One way in/out
Lower Maple Dr Subdivision (Cont. S-2)	55	High	Very High	Very High	Very High	Access: One way in/out
Northern Community	1,475	High	Very High	High	Very High	
Quemezon	289	High	High	High	Very High	Access: One way in/out
Townsite (Cont. S-2, S-3)	2057	High	Very High	Very High	Very High	
LANL TA-3	55	High	Very High	Very High	Very High	Consult LAFD escort for entry / access requirements.
Elk Ridge (Cont. S-2)	159	High	Very High	Very High	Very High	Hydrants lower pressure. Consider drop tanks for water supply.

Local Trigger Points	Current ERC	Fire Danger Thresholds
• 20-ft windspeeds over 15 mph • RH less than 17% • 1-mph over RH °F • 1000-Hr Fuel Moisture below 8%		Extreme: ERC-G above 98 – Unpredictable fire behavior, long range spotting, very receptive fuels.
		High: ERC between 87 and 98 – High intensity fire behavior, mid-range spotting, receptive fuels.
		Moderate: ERC below 87 – Most fires are still manageable, decadent fuels remain receptive.

No-HARM also accounts for the fact that Fire Sheds experience wildfire hazard and risk from outside their boundaries. A Fire Shed may contain mostly grass meadow but be surrounded by dense forest. If a house is built in the meadow, it is not only subject to the threat from the grass fuel in the meadow, it is also subject to the threat from the timber fuel in the surrounding Fire Sheds. Because of this, No-HARM incorporates the threat from surrounding Fire Sheds into the threat profile for every adjacent Fire Shed. No-HARM uses the concept of dividing the landscape based on the relative amount of built environment (structures, roads and other infrastructure) vs. wildland fuels. The rationale for this distinction is that wildland fires behave differently when burning in pure wildland fuels than when burning through fuel interrupted by structures and roads. Similarly, suppression of wildland fires is conducted differently, and with varying degrees of success, when in remote areas compared with densely populated areas. These differences are captured in No-HARM by categorizing the landscape into three separate threat types, each of which is modeled with its own individual set of inputs and associated methodology. The three threat types are divided into the following modules of the model: Wildland, Intermix and Interface.



II. EXISTING PROTECTION CAPABILITIES

A. SUPPRESSION CAPABILITIES

1. Interagency Wildfire Collaboration

Beginning with the charter of the Interagency Wildland Management Team (IWMT) in 1996, LAFD has collaborated with local and federal partners. Currently, LAFD interacts with its partners daily versus the bi-weekly meetings that occurred with the IWMT. This close collaboration has resulted in LAFD sending resources for interagency wildland training, prescribed burning, fuels mitigation projects, severity patrol and mutual aid for neighboring partners when requested. Since 2016, Los Alamos County is party the New Mexico Resource Mobilization Plan (RMP).
LAFD has enjoyed a very productive relationship with LANL Wildland Fire Management Division. Both agencies have collaborated on training opportunities for other federal agencies, gave joint briefings to the DOE Field Office and gave joint public presentations. This relationship is vital for an in-step approach to property located within Los Alamos County. LAFD will continue to seek out opportunities to work with LANL Wildland Fire Management in the future.

2. Fire Protection Resources

The Los Alamos County Fire Department (LAFD) is an all-hazard, municipal fire department that includes wildland suppression. LAFD provides wildland fire suppression for both LAC county and LANL. Beginning in 2017, LAFD began sending personnel and county-owned apparatus to out of county wildland fires. This opportunity provided additional experience for LAFD personnel to bring back to the department, the county and LANL. As a result, LAFD responds more safely and

effectively to wildland fires.

Out of five fire stations and one training station, LAFD deploys six type 1 engines, 2 Smeal 105-foot aerial trucks, six ambulances, six NWCG, type 2 tactical water tenders, seven, NWCG type 6 brush engines, a light and heavy rescue truck, a mobile command unit, a HAZMAT truck and an aircraft rescue truck.

3. Fire Protection Personnel

The LAFD has 130 combat firefighters assigned to three shifts at five stations. Supervision is provided by eleven Chief Officers and a Training Captain.

When fully staffed during fire season, the Interagency Fire Center at TA-49 and Bandelier National Monument are host to:

- A NWCG Type 3 interagency helicopter with crew with a total staff of nine Forest Service and National Park Service firefighters
- A NWCG Type 6 wildland fire engine with a National Park Service crew of five firefighters
- A Fire Use Module with seven firefighters
- A Fire Management Officer, Assistant Fire Management Officer, Fire Program Assistant and Fire Ecologist are on duty year-round
- A fire effects monitoring staff is available during fire season. Most are firefighter qualified or higher.

4. Training

All uniformed LAFD members are required to complete

- IS-700.a – NIMS An Introduction
- IS – 800B – National Response Framework, An Introduction
- IS – 100.a – Introduction to Incident Command System
- IS – 200.a – ICS for Single Resources in Initial Action Incidents
- IS – 804 – Emergency Support Function (ESF) #4 – Firefighting

Chief Officers have advanced qualifications that include.

- ICS – 300 – Intermediate ICS
- ICS – 400 – Advanced ICS

Initial Wildland training consists of the following courses:

- ICS 100 – Introduction to ICS
- L-180 – Human factors on the Fire Line
- S-190 – Introduction to Wildland Fire Behavior
- S-130 – Fire Fighting Training
- S-131 – Firefighter Type I
- S-133 – Look up, Look down, Look around

Refresher training consists of the following course:

- RT-130 – Annual Fire Line Safety Refresher and Shelter Deployment

Specific Requirements: NFPA 1051, NWCG, and Skills Crosswalk Wildland Training for Structural Firefighters

5. Water pressure

An important improvement to the water delivery system has increased the capability of Los Alamos to suppress large-scale fire. A 7.75-million-gallon water tank was relocated to high ground in North Community to provide adequate pressure in water lines. LAC has committed considerable resources to improve the existing water system as evidenced by the upgrade to Class 1 ISO designation in 2021.

B. EMERGENCY PREPAREDNESS

- In 2003 Los Alamos County added an emergency management coordinator to its staff. In 2017, another assistant emergency manager position was added. The manager coordinates activities that facilitate preparation for, response to, recovery from, and mitigation against disasters, both naturally occurring and man-made. Protection capabilities include:

- Hazard Mitigation Plan, adopted by the County Council in March 2006. The plan evaluates all potential hazards in the County and ranks wildfire at the top. The plan recommends continuing fuel mitigation projects and developing a 20-year plan for managing fuels on County-owned open space.

- Emergency Operations Plan, adopted by the County Council in March 2006. The plan includes details on evacuation of the town under various scenarios such as wildfires at specific locations. It divides the community into zones, each with specific routes and sequence for evacuation.

- Emergency Alert Advisory Radio. To facilitate emergency public warning and notification, the County completed the installation of an Emergency Alert Advisory Radio system in 2006. Los Alamos Emergency Management Radio operates 24/7 from two transmit sites (White Rock and the town site) and includes National Weather Service information as well as local traffic advisories and community announcements.

- Emergency Mass Notification system. Fast and targeted emergency notification is a critical public safety tool. This system places telephone calls to inform citizens and first responders of pending dangers and public safety issues. It allows the Office of Emergency Management to efficiently identify, notify and provide instructions to citizens in minutes. It permits notification to highly targeted areas. Public safety officials can map the affected area, record a message and send it via text, email, or phone

- Training. During 2007 and 2008, all command level staff for both the Los Alamos Police Department and the Los Alamos Fire Department completed ICS 300 AND ICS 400 advance-level Incident Command courses.

C. COUNTY CODE AND HOMEOWNER RESPONSIBILITY

1. Building Code

In the aftermath of the Cerro Grande fire, the Los Alamos Fire Department brought the County Council a proposal to adopt the Uniform Fire Code section related to Wildland/Urban Interface Code. Despite the recent losses due to fire, a surprising number of the public opposed the changes. The Council supported the fire department and adopted a modified version of the code (see Appendix B).

LAFD will continue to work with homeowners, developers, LAC Council, LAC Building Code officials, the New Mexico State Fire Marshal's Office on developing codes and ordinances that benefit all involved.

2. Homeowner responsibility for the home ignition zone

Home ignitions can be prevented by reducing home ignitability. Most houses destroyed by wildfires are ignited by firebrands and not by direct flame contact. The home ignition zone is the area around a house where falling firebrands could lead to a structure ignition. Coincident with the County's and other land management agencies continued work to reduce fuels must be the realization by homeowners that their land and property are their responsibility. Not only do they need to protect

their own safety and belongings, but they must be responsible neighbors, and not unduly put firefighters at risk by expecting their house to be defended against fire under all circumstances.

Rather than exposed eaves, the current interface code requires new construction to include eave protection from firebrands.

III. MITIGATION IMPLEMENTATION PLAN

Key point: This CWPP acknowledges that wildfire is a part of the landscape of Los Alamos. Surrounded by ponderosa pine forest, it is not possible to exclude fire. However, by careful management of forest ecosystems and with thoughtful homeowner preparation, we can choose the type of fire that we will face in the future. The following strategies are designed to reduce the threat of crown fire in surrounding forests and reduce the structural ignitability of the buildings within the community.

A. IMPLEMENTATION STRATEGIES: WILDLAND

1. Continue appropriate mechanical or hand thinning operations on untreated lands within the CWPP boundary.

Treatment is required not only in areas immediately adjacent to urban areas, but also the nearby forested areas that lead or might directly carry fire to urban developments. Fuel treatments, create areas that will be less likely to sustain a crown fire that enters or originates within it. Much of this type of work is required outside the immediate interface area. Also, as Los Alamos County continues to acquire forested parcels of land through purchase, exchange, or land transfer from the Department of Energy and USDA Forest Service, these parcels will need to undergo fuel reduction treatment.

Actions:

- Continue fuel reduction treatments on County-owned lands.

Pile burning operations in Pueblo Canyon, December 2007.

- Reduce fuel loads, stand densities, raise live crown base, create new and reinforce existing fuel

breaks to the west and southwest of the community, the direction from which wildland fires are most likely to approach Los Alamos.

- Continue to reduce fuels on public lands that change ownership.

2. Continue initial entry into areas with heavy accumulations of dead and down wood and burn the material when conditions are appropriate.

Remove pockets of high fuel loads: Many contributing factors for the past 100 years have resulted into accumulations of fuel (i.e., dead and downed trees) up to 20 tons per acre. This amount of ground fuel greatly contributed to the spread of the Cerro Pelado fire in May 2022. Initial fuel treatments in these areas require the removal of huge amounts of material. Although many of the forested areas in Los Alamos County have been thinned, these initial entries are faced with large volumes of dead and down timber lie scattered on the surface. Although not a threat for a crown fire, the fuel jackpots could be the source of firebrands carried into neighborhoods by high winds.

Actions:

- Continue to concentrate treatments on areas with heavy ground fuel loads that are inaccessible to fire vehicles.

- Pile material and burn the piles when it is safe to do so, preferably during cool, wet periods. Ideal conditions would typically be during winter months with snow on the ground.

Continue hand thinning and pile burning: Not all the rugged canyons within Los Alamos have received fuel reduction treatments. Steep canyons such as Barrancas and its tributaries remain a threat to housing above.

Actions:

- Identify steep slopes below housing areas with heavy standing or dead and down fuel loads.

- Treat with hand thinning crews and pile and burn the slash under safe conditions.

3. In areas pre-treated by thinning, pile burning, or other operations, continue broadcast burning according to federal agency-approved prescribed fire standards.

Continue broadcast burns: Once forests have been pre-treated by thinning and the removal of ladder fuels, continued fire resistance requires periodic burning of ground fuels and litter accumulation. Low intensity surface fire releases nutrients into the system and provides a natural mechanism for reducing the number of ponderosa pine seedlings and saplings per acre. Adult ponderosa pines are adapted to such fires and are not harmed by them. Native shrubs benefit from period burning and rapidly re-grow by sprouting from extensive roots. Prescribed fire provides a safe, cost-effective, and ecologically sound mechanism to maintain fire resistance for the long-term.

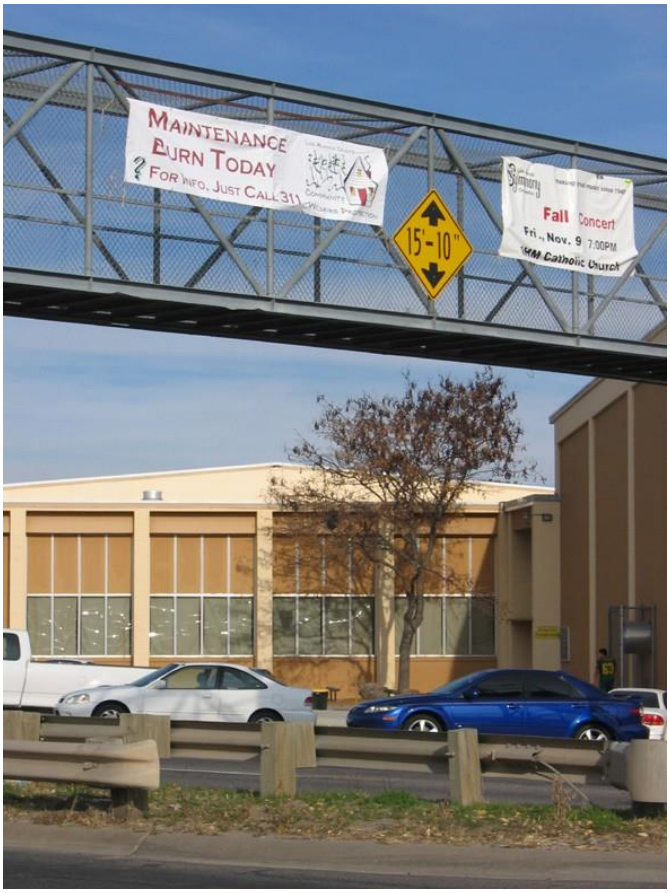
Actions:

- Establish a plan for periodic, routine broadcast burning on all priority treatment areas.

Provide public information for all burning operations through all possible means. The sight of wildland smoke still educes an emotional response in many Los Alamos residents. Recent escaped prescribed fires have added to a negative public perception. LAFD will closely monitor burn windows for small broadcast burn operations or pile burning. In accordance with national standards, LAFD shall have a qualified burn boss in charge of the prescribed fire, in addition to having the burn plan technically reviewed off-site, on-site resources, contingency resources to reinforce on-site personnel, and sufficient resources for patrol and monitoring.

Action: Provide burn day information through print, broadcast, social media, County and Los Alamos National Laboratory Intranets, doorknob hangers, commercial area bulletin boards, road signs, and overpass banners.

While pursuing an active burn program, mitigate the impacts of smoke on neighborhoods and individuals. Smoke from burning operations impacts the health and comfort of County residents. This is particularly true during initial entry burns where downed logs and stumps are often pitch laden and produce disproportionate volumes of smoke.



Actions:

- Provide adequate warning of upcoming burns to smoke-affected residents via a phone or email list.

- When burning within 200 yards of houses, limit the number of piles or acres burned in one day to limit smoke production.

- Rotate the burn areas through the season so that individual Neighborhoods are not exposed to smoke more than two consecutive days or for more than five days over a fall and winter burn season.

4. Regularly inspect and maintain designated fire access roads and trails.

Much of the forested area of Los Alamos is isolated and far removed from paved roads. Access to these areas is by unpaved roads or by trail. In many areas, fire or insect-killed trees regularly fall across the access corridors. To always maintain access, the roads and trails should receive regular inspection and maintenance.

Actions:

- Establish a periodic inspection routine, particularly before and during the fire season.
- Maintain the surface of the roads and trails, clearly mark them, and keep them clear of obstructions.
- Provide trail and road maps to public safety personnel.
- Provide field training for safety personnel to acquire knowledge of the location and names of County roads and trails.

B. IMPLEMENTATION STRATEGIES: COMMUNITY

1. Continue the free wildland fire home assessment program for assessing and treating problems within individual home ignition zones.

   Actions:

   - Offer home ignition zone assessments to all homeowners in high and moderate hazard areas.
   - Develop strategies for assisting elderly or indigent homeowners with correcting problems within the home ignition zone.
   - Provide information on wildfire protection for homeowners through real estate agents and insurance companies.
   - Develop active participation in homeowner associations and neighborhood groups.
   - Generate and distribute a list of available services and providers for fuel reduction work.
   - Offer tax break incentives for retrofits with ignition resistant building materials for homes in the high and moderate risk areas.
   - Work with local youth-oriented agencies and groups to develop a paid work force for providing services in home ignition zones.

2. Encourage cleanup of debris piles accumulating along property lines: Many Los Alamos residents dump yard waste over their back fences onto County-owned land. These debris piles are often the largest pockets of fuel in the canyons within the townsite.

   Actions:

   - Monitor the boundary between open space and private land. Enforce the County code in reference to unlawful accumulation of flammable debris.

   - Provide residents with prompt removal of slash and debris from County-approved private fuel mitigation projects.

C. IMPLEMENTATION STRATEGIES: Interagency Collaboration

1. Continue Interagency cooperation efforts.

   Continue to engage land management agencies in community-based fire protection: Jurisdictions within the Los Alamos region must continue to ensure that a landscape scale approach to fuel management is taken. The broad outlook provided by this CWPP should be reviewed as required every 5 years or sooner to adapt to changing environmental, climatic, and management conditions. The strategies for planning, prioritizing, and implementing positive steps toward continuing fire protection should reflect changes in the landscape.
   In January 2022, LAFD took part in a fire department exchange (FDX) in Lake Travis, TX. Other departments that have wildfire threats held a forum where best practices, pitfalls, and networking were discussed in hopes to further mitigation programs nationally.

   Action:

   - The CWPP shall updated at minimum of every 5 years as recommended by NM State Forestry or when significant mitigation efforts have been completed.

2. Utilize mechanisms already in place and generate new agreements to achieve fuel load reduction across jurisdictional boundaries.

   Actions:

   - Use the existing resource order system to provide all jurisdictions with proper staff to implement individual components of fuel reduction projects.

   - Expand the interagency fire suppression agreements to fuel reduction projects as staff and funding permit.

3. Institutionalize continued fuel management on Los Alamos County lands: Continued protection of life and property from wildfire requires a long-term commitment on the part of the community. Maintenance burning should be a part of the responsibilities of the County as a land manager. Private owners should revisit the issues in the home ignition zone annually and make a commitment to annual maintenance to reduce the likelihood of a home ignition. A funding commitment must accompany the commitment to on-the-ground fuel reduction.

   Action:

   - Establish a single point of contact with adequate time and funding for effectively implementing fuel management on Los Alamos County lands and advising private owners on reducing the ignition potential around their homes.

D. RECOMMENDED IMPLEMENTATION ACTIONS

Hand thinning remaining pockets of overstocked forest stand: Small pockets of untreated forest remain on County owned land. Candidates for thinning projects can be found in the priority treatment areas of this CWPP, Los Alamos and Rendija canyons.

Broadcast burning: Maintenance treatments are required to continue the fuel reduction benefits of thinning projects. The most effective and beneficial method of maintaining treated blocks is broadcast burning. Initial treatments prepare stands for the reintroduction of fire: stem densities are greatly reduced, ladder fuels removed, and dead and down material collected and piled. Under specific weather conditions, wildland firefighters use drip torches to ignite surface fuels. Pine litter, grasses, and dead and down wood are consumed. Some mature trees are scorched, but usually none are killed in the burning operation. The most recent example of this type of prescribed burning was completed in 2015, north of the Larry Walkup Aquatic Center.

Pile burning: In steep sided, narrow, and inaccessible canyons, fuel loads of live or dead and down wood can exceed 20 tons per acre. Material can be cut, piled, and then under prescribed conditions burned on site. Standing dead ponderosa pines and Douglas firs are felled and the branches lopped and piled. Small diameter boles are bucked and added to the piles. Large boles are bucked and scattered. Large snags are left for wildlife habitat. Small live Douglas firs and ponderosa pines are thinned to open up the stands and reduce ladder fuels. Piles are sometimes covered with heavy waxed paper to keep them dry. The pile burning prescription calls for fall and winter burning.

1. Specific Implementation Actions: Wildland Treatments

Los Alamos Canyon below the townsite from the Los Alamos Reservoir to DP Canyon: Los Alamos Canyon holds dense mixed conifer stands that could be a source of firebrands during a wind-driven wildfire. Portions of the canyon could be treated mechanically, but much of the steep terrain would require hand treatment.

North aspect of Rendija Canyon below Barranca Mesa: A 35-acre parcel of the Santa Fe National

Forest has been slated for purchase by the County of Los Alamos as part of the San Ildefonso land settlement case; an additional 100 acres is slated for transfer from the DOE to the County of Los Alamos. These parcels are densely forested and lie directly below homes on Barranca Mesa. Presently caught between owners, only limited treatments have been done on this critical parcel. About 10 acres of this parcel could be treated mechanically, but the remainder requires hand thinning. Pile burning and a broadcast burn on the lower slopes should follow thinning operations.

North of Arizona Avenue and west of Ponderosa Estates: This area of the Santa Fe National Forest has been slated for treatment for about 10 years but has not yet been completely thinned. The area should be hand thinned, and materials piled and burned when appropriate.

School Canyon from its confluence with Pueblo Canyon to the Cerro Grande burned area: This small but densely forested canyon has significant Douglas fir mortality. Hand thinning and pile burning should be implemented.

2. Specific Implementation Actions: Home Ignition Zones

Critical to the success of the Los Alamos CWPP is the acceptance of responsibility for the Home Ignition Zone (HIZ) by individual homeowners. Although ultimately up to the individual, the community can provide education about increasing structural resistance to firebrands and provide services that benefit a segment of the community by reducing the threat to HIZ.

In 2002 and 2003, Los Alamos County offered a Defensible Space program. About 1,500 homes received some defensible space work. An opinion survey three years later indicted that most participants felt they would benefit from periodic reevaluations of their property. Also, many respondents indicated that due to health issues, they were unable to maintain the gains that the program had made on their property. To create fire-resistant neighborhoods, mechanisms need to be in place to continually educate, reevaluate, and perform work in the home ignition zone.

About 1,700 homes in Los Alamos border open lands. These homeowners would benefit from periodic HIZ inspections. Many willing homeowners are physically unable to perform the work necessary to maintain an ignition resistant property. The community should institutionalize continuing assessments of HIZs, and where work is desired but not possible, provide service or incentives to accomplish the work.

Provide Homeowner Wildfire Risk Assessments for HIZ: LAFD will continue to offer free home assessments at the public's request. Currently, over 435 home assessments have been completed.

Continue Annual Spring Cleanup Days: Since 2002, the County has sponsored clean up days that in part focuses on reducing fire threat. This includes providing refuse pickup, work gloves, and volunteer assistance on projects.

Provide On-Site Organized Chipping of Large Woody Debris: To effectively encourage home-

owners to reduce fuels on their properties, the County should provide a mobile chipping service. The chipper would visit neighborhoods either on request or as part of a rotating schedule. Chips would be distributed to the homeowners for erosion control or used on County projects.

Sponsor Fuel Reduction Services for the Elderly and Infirm: To assist those who are willing but physically unable to perform fuel reduction work on their property, the County should provide or support some type of coordination services of volunteers from the community.

3. Specific Implementation Actions for Priority Neighborhoods

Southwest downtown: Los Arboles, Timber Ridge: These high housing density neighbor- hoods are located on the north rim of Los Alamos Canyon. Steep terrain and untreated forests lie directly below. Wildfire in the canyon or on the slopes would quickly pass into the neighborhoods. HIZ evaluations are essential in this area.

Ponderosa Estates: The newer house construction in Ponderosa Estates is a great asset to the HIZs in the neighborhood. However, the subdivision has an average ponderosa pine stem density over 200 trees per acre. HIZ assessments, particularly related to vegetation and debris management, should be offered to all residents.

Quemazon: This is a new neighborhood on the edge of forested lands. Most houses were built under the new wildland interface code regulations. HIZ assessments should concentrate on fuel continuity, vegetation management, and the condition of the many flat roofs in the area.

Del Norte and Del Sol: These two subdivisions on North Mesa are surrounded on three sides by forested land. Many houses are located on the rim of Pueblo Canyon. The primary threat from wildfire lies in firebrands. HIZ assessments should be offered to all residents.

Pajarito Acres and La Senda: This large lot subdivision is located entirely within piñon-juniper woodland. Many of the piñons are insect killed. Because the lots are large, each property owner is faced with a large volume of potential fuel to remove. The neighborhood would benefit from an assistance program for fuel removal and transport. HIZ assessments should be offered to all residents.

Denver Steels: Because the AEC established the neighborhood as temporary housing in the mid-1940s, the Denver Steel area has a high housing density, narrow streets, and one access/egress road. A defensible space approach would benefit the neighborhood, specifically for the esstimated 60 homes on the edge of the surrounding forest. Backyard cleanup, enforcement of the County code in relation to increasing fire hazard by improper disposal of yard waste, and careful management of vegetation should be implemented for at least the perimeter houses.

Big Rock Loop/San Ildefonso: The southern edge of this neighborhood lies on the rim of Pueblo Canyon. Firebrands from a wildfire in the ponderosa pine or mixed conifer forests below are the primary threat. HIZ assessments related to firebrands should be offered to all residents.

4. Education and Outreach

Public outreach with Los Alamos Schools: Los Alamos Open Spaces Division and Los Alamos County Fire Department have partnered on several occasions with local schools to educate and involve students. Focus topics have included project design, planning, and implementation. LAFD plans on continuing this practice of promoting stewardship of the surrounding environment.

Annual Wildfire Day: Every April, LAFD hosts Wildfire Day, which is held in conjunction with the Ashley Pond Easter Egg Hunt. This event brings together many of the fire departments local and federal partners. The public has a rare opportunity to talk to wildland fire agencies on a multitude of topics. LAFD will continue to champion the growth of this event.

Ready, Set, Go! Program: The Ready, Set, Go! (RSG) Program seeks to empower fire departments to engage the residents they serve in wildland fire community risk reduction. The RSG program provides free tools and resources for fire departments to use as they help residents gain an understanding of their wildland fire risk and actions individuals can take to reduce that risk. Engaging in this dialogue is particularly important for the fire service as national studies have shown that firefighters are uniquely respected in their communities and can project a trusted voice to the public preparedness appeal. They can also explain what fire resources are available during an event and the role that individuals should play in preparedness and early evacuation – if called for by their local officials – to increase the safety of residents and first responders. In May of 2022, LAFD and LAC Emergency Management personnel joined International Association of Fire Chiefs (IAFC) staff to perform an audit of the fire department's RSG program. Based on the audit, the fire department will be customizing RSG material to make it unique to Los Alamos County. LAFD will also be updating its internet site to give the public access to much more wildfire related information.

Bandelier Fire Management Newsletter: Each year Bandelier National Monument produces a newsletter to update the public on past and upcoming prescribed burns on their land. The newsletter is sent to the community of Los Alamos and is available on the Bandelier website.

Tours of Burn Units: Annually offer tours of burn units immediately following treatment. Ensure that the local press is invited and attends the tour.

IV. Monitoring

Rigid fire and fuel management plans often result in dire consequences. Thus, any plan for community wildfire protection must be constantly re-evaluated. Changes in environmental, political, or social factors can redirect the focus of management strategies over the course of a single year.

Rather than a standing document, this CWPP will adhere to the principles of adaptive management. The plan will be reviewed quinquennially and revised based on changes in climate, environmental developments, residential and commercial development, unexpected delays in implementation, citizen response, and available funding.

A. Quinquennial review and update

Prior to the recommended CWPP update every 5 years or significant mitigation work, LAFD will consider the following:

- Update risk assessment with new data, new development, or changing conditions
- Re-assess priority treatments and revise prioritization based on existing conditions
- Document completed project areas, homeowner assistance contacts, education programs
- Monitor conditions of fire roads, trails, and pre-established firelines
- Track grant opportunities and funding
- Review emergency management procedures in light of community changes

Following the meeting, drafting of an update will be assigned to the Fire Department. IWMT will issue an update to jurisdictional managers and County officials by February 1. If substantial changes are proposed, a public meeting will be held before the start of the next fire season, preferably by March 15.

B. Ecological Monitoring

In the scientific community of Los Alamos, there is never a lack of data. The first phase of the Los Alamos Mitigation HMGP was the completion of an environmental assessment (EA). Those standards are set forth by the prescription in the Los Alamos County EA. This tool provides a road map of best practices for an effective mitigation program.

1. Ecological Monitoring Capabilities

- Bandelier National Monument: Bandelier staff includes a fire ecologist and a fire effects monitoring staff. This vegetation monitoring program uses the best available information (such as data collected on-site, scientific journals, and knowledge from resource specialists) to formulate realistic objectives for desired future resource conditions. It involves Monument staff at many levels, as well as local scientists from universities or cooperating/neighboring agencies. Data is used to evaluate if fire and resource management objectives are being met.
- Los Alamos National Laboratory: Over the past decade, LANL ecologists have collected and reported on baseline data for laboratory lands. Fire managers continue to collect new data for

establishing fuel management objectives.

2. Annual Review of Monitoring Results

Monitoring results from all jurisdictions will be presented for review at the fall meeting of the East Jemez Resource Council, a multi-jurisdictional group of land managers focused on landscape-scale management strategies for the eastern Jemez Mountains. This group will make recommendations for adaptive management strategies to be considered for future projects or updates to this CWPP.

APPROVALS

I approve this Community Wildfire Protection Plan for the County of Los Alamos:

Troy Hughes Fire Chief, Los Alamos County	Date
Randall Ryti Chairman Los Alamos County Council	Date
Lawrence Crane District Forester EMNRD Forestry Division	Date

APPENDICES

ARTICLE IV. LOS ALAMOS COUNTY CODE. WILDLAND-URBAN INTERFACE AREAS

Sec. 22-131. Wildland urban interface and fuels management.

The fire code official shall have the authority to promulgate rules, regulations, policies, guidelines, fee schedules, forms and processes to supplement the county's fire codes to provide for mitigation of the fire and life safety hazards associated with the wildland urban interface areas.
(Ord. No. 85-291, § 3, 2-13-2001; Ord. No. 02-313, § 12, 5-25-2021)

Sec. 22-132. Application of requirements.

Any rules, regulations, policies, guidelines, fee schedules, forms and processes by the fire code official related to the enforcement of wildland urban interface requirements herein, shall have the force of law as adopted by the county council.

(Ord. No. 85-291, § 2, 2-13-2001; Ord. No. 02-313, § 13, 5-25-2021)

Sec. 22-133. Reserved.

Editor's note(s)—Ordinance No. 02-313, § 14, adopted May 25, 2021, repealed § 22-133, which pertained to construction requirements and derived from Ord. No. 85-291, § 4, 2-13-2001; Ord. No. 459, 3-25-2001; Ord. No. 85-294, 5-15-2001.

APPENDIX E
SILVICULTURAL STANDARDS FOR THE WILDLAND-URBAN INTERFACE GOALS

1. Reduce the threat of wildland fire in Los Alamos County through a combination of forest thinning, disposal of burnable materials, and prescribed fire.

2. Improve overall forest ecosystem health.

3. Maintain diversity of plant and animal species while reducing the invasion of alien species.

4. Maintain scenic beauty, visual screening, and appropriate vegetation at the interface.

OBJECTIVES

1. Reduce fuel ladders by maintaining average crown base heights to between 15-20 feet or higher.

2. Maintain average crown bulk density to <.02-.05kg/m3.

3. Maintain average crown spacing from less than a few feet to a minimum of 15-20 feet.

4. Maintain canopy cover to less than 30%.

5. Maintain SDI max to 15-20% or less.

6. Maintain dead fuel loading to less than 5 tons/acre.

7. Carefully manage the snag component, especially adjacent to homes.

8. Encourage deciduous species along drainages to break up fuel continuity.

9. Protect old growth ponderosa pine.

CUTTING TECHNIQUES

- Stumps should be cut as close to the ground as possible.

UTILIZATION

- To the extent possible, all wood products from thinning or maintenance operations should be utilized. Dependent on the location, this may be through firewood
- Collection, small-diameter stem harvest and removal, or when appropriate, timber harvesting.

SLASH TREATMENT

- Whenever possible, slash material should be mechanically treated on site.

- Mastication: In areas accessible to mechanized tree harvesting equipment, small diameter material should be ground and left on site.

- Lop and scatter: This may be appropriate in piñon-juniper woodlands with light slash where future burning will not take place.

- In hand-thinned area where material cannot be safely removed, pile burning is appropriate.

APPENDIX G
LIST OF REFERENCED DOCUMENTS

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