

*Otero County
Community Wildfire
Protection Plan*



2004 WUI Areas

DRAFT: 11/3/2004

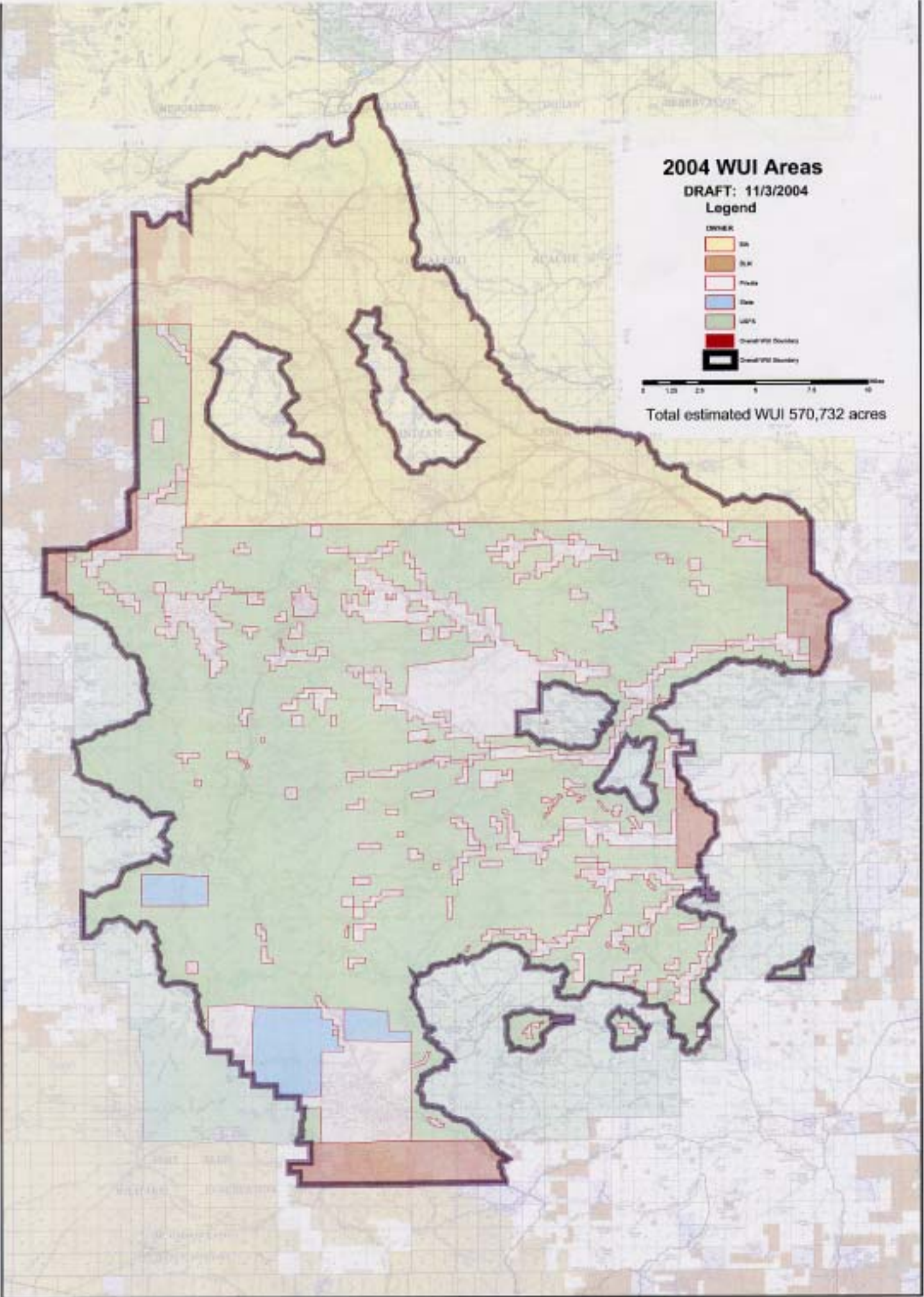
Legend

DRINK

-  SW
-  SW
-  Pubs
-  SW
-  WFS
-  County Boundary
-  County Boundary



Total estimated WUI 570,732 acres



COMMUNITY WILDFIRE PROTECTION PLAN

for jurisdictions and stakeholders located within the

Otero County Wildland Urban Interface

Vision Statement: *Our Vision is to promote community safety and social economic stability while accomplishing forest ecosystem health.*

Mission Statement: *Our mission is to integrate the best available science with a collaborative process to facilitate expeditious forest ecosystem restoration and wildfire hazard reduction efforts over multi-jurisdictional landscapes.*

In accordance with the requirements and guidelines set forth in the Healthy Forest Restoration Act of 2003, the land management agencies and entities represented below, have agreed to address the challenges of forest health and wildfire hazard risk reduction within the jurisdictions of the Otero County Wildland Urban Interface Working Group (Otero Working Group). This Community Wildfire Protection Plan (CWPP) represents a collaborative effort to address hazard mitigation, structure protection, and community preparedness.

COLLABORATION

Formal community-based forest planning and prioritization began in June of 2000 with the formation of the *Otero Working Group*. **Each month, state, local, tribal, and federal agencies, in addition to fire departments, private landowners, insurers, and local businesses convene. The group discusses, fire hazard mitigation and fire protection planning projects that are focused in the established priority areas.** The Otero Working Group has identified numerous values at risk, including public safety, community infrastructure, economic viability, real estate, soil and water resources, cultural resources and values, recreational opportunities, tourism, aesthetics, woody products, wildlife habitat, ecosystem health, research facilities, and historical sites. In addition, the Otero Working Group acts as a forum to share information regarding grant opportunities, public awareness themes, and system resources such as forest contractors and woody materials utilization enterprises.

Individual partners in the working group are included in the Appendix

PRIORITIZED FUEL REDUCTION

As indicated on the attached map, the Otero Working Group has established geographical boundaries where priorities and treatments are being applied. **The map is a multi-jurisdictional product showing the collaborations of planning and implementation.**

Priorities are further defined by the following list of criteria:

- Crown Fire Potential
- Slope
- Aspect
- Vegetation Type
- Juxtaposition of Values at Risk

Each individual community within the WUI will seek funding and implement projects within their jurisdiction. Forest health and watershed management issues, such as areas affected or susceptible to insect and disease outbreaks, will also be addressed.

Approximately 570,732 acres are encompassed within the Otero Wildland Urban Interface (WUI) including one incorporated community, numerous unincorporated communities, and federal, state, private, municipal, and tribal lands.

Treatment goals recognize the need for various management objectives within the different land owning agencies and entities. **Individual treatment prescriptions will vary, but the members of the Otero Working Group have agreed upon basic treatment goals and priorities.**

They are to:

1. Accelerate hazardous fuels reduction projects on public, private, state trust, and tribal lands in the identified areas utilizing the best available science regarding wildfire hazard reduction.
2. Identify and mitigate legal and policy barriers to fuels reduction and ecological restoration projects across jurisdictional boundaries. Develop means to streamline procurement, funding mechanisms, and administrative processes.
3. Promote and support existing and emerging forest-based utilization industries. Offset government spending on restoration and fuels reduction projects.

4. **Develop a protocol to integrate baseline data collection with short and long-term monitoring on fuels mitigation, forest restoration and fire rehabilitation projects. Create a mechanism for tracking outcomes and incorporating findings into the decision making process.**
5. **Support, maintain and develop a professional and technical labor force in governmental and private industries to accomplish ecological restoration and fuels reduction activities.**
6. **When designing Community Wildfire Protection Plan projects, integrate watershed management in the decision making process.**

Each community will build their own "piece of the puzzle," with regard to fuels management projects

TREATMENT OF STRUCTURAL IGNITABILITY


In addition to fuels management measures, the Otero Working Group recognizes the need to provide guidelines and recommendations to homeowners and communities within the WUI to reduce the potential of structural ignitability, through public awareness campaigns, such as Firewise Workshops and the Firewise Certification Program. The Otero Working Group will rely heavily on the recommendations of the ***"Emergency Plan for the Sacramento Mountain Region of Otero County, N.M."*** Key points of this plan include:


- **The adoption of comprehensive fire and building codes within Otero County utilizing NFPA 299, Protection of Life and Property from Wildfire.**
- **Identify Fire Service entities and partners to provide fire prevention education programs to residents.**
- **Fire Departments will perform hydrant inspections and monitor new construction and major renovations within their districts.**
- **Provide private landowners with opportunities to create defensible space and thinning around homes, through cost share programs and site visits.**

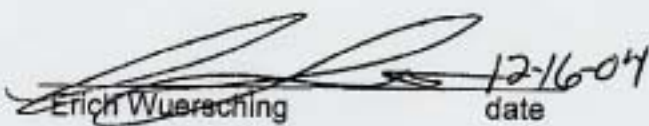
"We the undersigned endorse and support the Community Wildfire Protection Plan:"


Village of Cloudcroft

Mayor 
David C. Venable 12/14/04
date

Trustee 
Barbara Springer 12/14/04
date

Trustee 
Bradley Rasch 12-14-04
date

Trustee/
Fire Chief 
Erich Wuerschling 12-16-04
date

Trustee 
William (Andy) Olson 12-14-04
date

Notary
Village Clerk 
Trish Zendel 12-14-04
date

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BY: 24

"We the undersigned endorse and support the Community Wildfire Protection Plan:"

Mescalero Apache Tribal Council

President Mark Chino 12/21/04
Mark Chino date

Vice President Ferris Palmer 12/21/04
Ferris Palmer date

Secretary Glenda Brusuelas 12/29/04
Glenda Brusuelas date

Treasurer Alfred La Paz 12/21/04
Alfred La Paz date

Council Member Alta M. Branham 12-21-04
Alta May Branham date

Council Member Fredrick Chino Sr. 12-21-04
Fredrick Chino Sr. date

Council Member Albert Platta Sr. 12/21/04
Albert Platta Sr. date

Council Member Dorlynn Simmons 12/21/04
Dorlynn Simmons date

Council Member Larry Shay 12/21/04
Larry Shay date

Council Member Nadmi Sainz 12-22-04
Nadmi Sainz date

We the undersigned endorse and support the Community Wildfire Protection Plan:"

Otero County

Commissioner Michael Nivison 11-9-04
Michael Nivison date

Commissioner Clarissa McGinn 11-9-04
Clarissa McGinn date


Commissioner Doug Moore 11-9-04
Doug Moore date

Notary Mary Quintana 11/15/04
County Clerk Mary Quintana date

"We the undersigned endorse and support the Community Wildfire Protection Plan:"

New Mexico Forestry Division:

Capitan District Forester


Barbara E. Luna 11/14/04
date

Fire Departments:

Otero County Firefighters Association


Mark Klaene 11/22/04
date

Otero County Fire Services Coordinator


Gus Marker 11/15/04
date

"We the undersigned support the Community Wildfire Protection Plan:"

Collaborating Agencies

Bureau of Indian Affairs

Bernie Ryan 10-15-04
Bernie Ryan date

Lincoln National Forest
Forest Supervisor

Jose M. Martinez 10/15/04
Jose Martinez date

Lincoln National Forest
Sacramento Ranger District

Frank R. Martinez 10/15/04
Frank Martinez date

Bureau of Land Management
Las Cruces District

Ed Roberson 10-22-04
Ed Roberson date

New Mexico State Land Office

Jim Norwick 3-3-05
Jim Norwick date

Supporting Stakeholders:

Natural Resources Conservation Service

U. S. Fish and Wildlife Service

New Mexico Environment Department

**Northern Arizona University
Ecological Restoration Institute**

Timberon Development Council

Otero Soil and Water Conservation District

City of Alamogordo

South Central Mountain RC&D

Mescalero Forest Products

Mountain Monthly

Mountain Times

Nature Conservancy

APPENDIX DOCUMENTS (CHECKLIST):

- 1. CONSIDERATIONS FOR PLANNING PONDEROSA PINE VEGETATIVE TREATMENTS IN THE SOUTHWEST**
- 2. WILDLAND URBAN INTERFACE CODE**
- 3. WILDFIRE HAZARD RATING FORM**
- 4. OTERO COUNTY FOREST RESTORATION WORKING GROUP PARTNERS**
- 5. GLOSSARY OF TERMS**
- 6. FIREWISE LANDSCAPING CHECKLIST
FIREWISE CONSTRUCTION CHECKLIST**
- 7. REFERENCE MATERIALS**

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CONSIDERATIONS FOR PLANNING PONDEROSA PINE VEGETATIVE TREATMENTS IN THE SOUTHWEST

Research findings compiled by Charles W. Denton,
Ecological Restoration Institute, Northern Arizona University

I. RESTORATION:

Restoration of forest ecosystem health requires that the ecosystem function within its range of natural variability. This requires that the structure of the ecosystem be within the range of natural variability.

Historical Information (Woolsey, 1876):

A. Coconino National Forest: Average of 43 total trees per acre.

SIZE CLASSES (DBH)	PERCENT OF TOTAL STAND	TOTAL TREES
4-10 INCHES	32%	14
10-19.5 INCHES	42%	18
19.5-29 INCHES	19%	8
29+ INCHES	7%	3

B. New Mexico National Forests (Jemez NF, Gila NF, Cibola NF) Average of 73 trees per acre.

SIZE CLASSES (DBH)	PERCENT OF TOTAL STAND	TOTAL TREES
4-10 INCHES	48%	35
10-19.5 INCHES	37%	27
19.5-29 INCHES	12%	9
29+ INCHES	3%	2

Historical Information (White): 74% of the trees in the 1876 were under 100 years old.

- Structure was uneven-aged clumps and openings. Average clump size ranged from 0.05 to 0.33 acres (White).
- Structure was maintained over hundreds if not thousands of years.
- Consider long- term capacity of land.
- Stands survived several severe, protracted droughts.
- Stands survived several insect epidemics.

II. FIRE

Research has shown:

- Treatments work in reducing fire hazard.
- Newer treatments are better than older treatments.
- Mechanical treatment with pile and burning of slash are the best treatments for reducing fire behavior.
- Prescribed fires, by themselves, work well for one to three years, decreasing in viability each year until there is no effect after year ten.
- Thinnings from below are not effective in reducing crown fires if the crowns are still interlocked or in close relation to each other.
- Winds above 25 miles per hour can carry independent crown fire.
- Fuelbreaks by themselves are not effective. Spot fires can still occur.
- Lop and scatter slash treatments can cause problems for up to ten years after treatment.
- Leaving slash or chips can lock up available nitrogen.
- Treatments thus far have been too narrow, too small, and too few to be effective in reducing stand replacing fire behavior.
- Diameter caps and thinnings from below do not ensure a reduction in crown fire risk.

Considerations:

- What kind of fire are you looking to eliminate or reduce the possibility of? Crown? Catastrophic? Protection of the community and infrastructure?
- Catastrophic and crown fires in the southwest almost always have a wind component, so consider wind when designing prescriptions.
- In considering fire use or "letting fire play its role," realize that the fires in pre-settlement times were large, wind driven grass fires (90% in the spring). Also, consider all the values at risk (communities, recreation areas, private property, critical habitat, watersheds, and smoke issues (legal, social, medical)).
- "Natural fire" cannot play a role presently until stand densities are lowered significantly.
- Leaving clumps of dense trees reduces value of a project for fire hazard reduction. The clumps remain a risk to themselves, other clumps, and the entire project.
- Spotting in ponderosa pine is very common up to one-half mile and common up to a mile from a main fire. Recent fires have had active spot fires up to three miles.

III SILVICULTURE

Research has Shown:

- Fire perpetuated and maintained uneven-aged stands.
- Ponderosa pine needs bare soil and a lot of sunlight for regeneration.
- Moderate thinning neither releases trees for growth, nor allows for regeneration, and encourages shade tolerant tree species.
- Moderate thinning requires re-treatment within 10-15 years.
- Research at Taylor Woods has shown that 60 square feet of basal area (BA) is the breaking point for release of tree growth. Higher basal areas show significant reductions in diameter growth.
- A residual stocking level of 30-60 BA allows for the same growth amount as a stocking level of 60 BA but on fewer trees, i.e., wood volume accumulates at the same rate on fewer trees due to faster growing conditions in the more-open stands.
- Low BA must be maintained over time to continue tree growth.
- Vigor and health of individual trees of all ages are improved with full restoration thinnings.
- Dense stands of trees did not exist across the landscape (except for the possibility of seedlings and saplings at certain times which were then removed by wildfire).
- Thinnings from below, and diameter caps, can create even-aged stands while not reducing the wildfire hazard.

Consideration:

- A prescription which takes a stand to a low basal area (60 BA) and develops "clumps and openings" will result in a vegetative structural stage (VSS) of One and possibly a VSS of Two. Additionally, the action will concurrently create the likelihood of VSS Five or VSS Six in the future.

IV UNDERSTORY

Research has shown:

- Ponderosa pine grew in clumps and openings, especially on clay based soils.
- Openings were covered with grasses and forbs and occupied 70-80% of the landscape.
- After full restoration thinnings, the native grass stands re-establish themselves within two to three years (if there is seed in the soil bank).
- Although some invasive species appear after restoration thinnings, they are nowhere near the order of magnitude as the invasion of exotics after a wildfire.
- Some invasive species are temporary, leaving the treatment area after five to eight years.
- Some areas may need protection after treatment from livestock, elk, deer, people, off road vehicles, etc...
- Habitats of several species of mammals, birds, and insects, are improved by full restoration because of an increase in understory forage.
- Density, diversity, and vigor of understory species all increase in fully restored stands.

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VILLAGE OF RUIDOSO

ORDINANCE 2004-02 (INFORMATION VERSION)

"AN ORDINANCE AMENDING THE URBAN-WILDLAND INTERFACE CODE PRESCRIBING REGULATIONS MITIGATING THE HAZARD TO LIFE AND PROPERTY FROM INTRUSION OF FIRE FROM WILDLAND FIRE EXPOSURES, FIRE EXPOSURES FROM ADJACENT STRUCTURES AND PREVENTION OF STRUCTURE FIRES FROM SPREADING TO WILDLAND FUELS."

NOW, THEREFORE BE IT ORDAINED BY THE GOVERNING BODY OF THE VILLAGE OF RUIDOSO THAT Section 151 is hereby amended in Chapter 54 Land Use, Article 2 Zoning, Division 4 Development Standards, entitled Urban-Wildland Interface Code. (all new material is underlined, deleted material struck through, all is highlighted in green)

Sec. 54-151. Urban-Wildland Interface Code adopted; amendments.

1. *Adoption of Urban-Wildland Interface Code.* There is hereby adopted by the Village of Ruidoso for the purpose of prescribing regulations mitigating the hazard to life and property from intrusion of fire from wildland fire exposures, fire exposures from adjacent structures and prevention of structure fires from spreading to wildland fuels, that certain code known as the Urban-Wildland Interface Code (UWIC) published by the International Fire Code Institute, being particularly the 2000 edition thereof and the whole thereof, including all amendments thereto and all future editions thereof, save and except such portions as are hereinafter deleted, modified or amended by this ordinance. The same is hereby adopted and incorporated as fully as if set out at length herein, and from the date on which this ordinance shall take effect, the provisions thereof shall be controlling within the jurisdiction of the Village of Ruidoso, as provided by law.
2. *Establishment and Duties of Code Official.* The UWIC as adopted and amended herein shall be enforced by the Planning Director or his designee. In areas of overlapping jurisdictions, appropriate sections shall be enforced by either the Planning Director, Director of Forestry, or the Fire Chief, as applicable.
3. *Amendments to the UWIC.* The UWIC adopted herein is amended as follows: Section 504.3 is amended to read: Combustible eaves, fascias and soffits shall be enclosed. Any exposed material must be a minimum of one-hour-rated fire-resistive material. Appendix I-C is replaced with a new Fire Hazards Rating Form which shall reflect the standards in paragraph (7), below. Appendix I-B is repealed and in its place shall be adopted the Fuels Management Standards of The Village of Ruidoso found in Sec.42-80 of this code.

4. *Appeals.* Whenever the code official disapproves an application or refuses to grant a permit applied for, or when it is claimed that the provisions of the code do not apply or that the true intent and meaning of the code have been misconstrued or wrongly interpreted, the applicant may appeal the decision of the code official to the Planning and Zoning Commission and thereafter to the Governing Body and District Court, all as provided in this chapter.
5. *New materials, processes or occupancies which may require permits.* The Planning Administrator, the Building Inspector, Director of Forestry, and the Fire Chief shall act as a committee to determine and specify, after giving affected persons an opportunity to be heard, any new materials, processes or occupancies for which permits are required in addition to those now enumerated in said code. The Planning Administrator shall post such list in a conspicuous place at the Planning Department and distribute copies thereof to interested persons. Fees shall be assessed in accordance with the provisions of this section or shall be as set forth in the fee schedule of this code.
6. *Enforcement.* The provisions of the U/WIC shall be enforceable according to the provisions of this chapter.
7. Fuels Management Requirements (Sec. 42-80 of this Code) and the site related portion of the Fire Hazard Rating Form (Sec. 42-81 of this Code) must be assessed BEFORE issuance of a building permit.
 - a. Volume of forest debris to be removed from the building site (footprint) shall be estimated by the Director of Forestry and charged as per the Fee Schedule - Exhibit A of the Municipal Code.
 - b. Disposal of forest material, excluding tree stumps, must be at a minimum placed at curbside or approved locations for Village Solid Waste Department pick-up if the site is within the Village limits.
 1. Complete removal and disposal of tree stumps is the responsibility of the permittee.
 2. If outside the Village, see Sec. 54-133(f).
 - c. Fuels Management Standards (Sec.42-80) shall be completed and inspected prior to issuance of a Certificate of Occupancy or re-certification of the site plan.

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Sec. 42-81 Fire Hazard Ratings Form (revised 05-01-03)

Place an "X" next to most appropriate answer (see reverse) in each category, then total the numbers at bottom.

Name:

Subdivision Design

POINTS

Ingress/Egress

- Two ways to evacuate neighborhood within 1000' 1 ___
 One way to evacuate neighborhood within 1000' 3 ___
 One way to evacuate neighborhood > 1000' away 5 ___

Width of Primary Road @ driveway

- 20 feet or more 1 ___
 Less than 20 feet 3 ___

Accessibility

- Road grade 5% or less (avg. within 1000') 1 ___
 Road grade more than 5% (avg. within 1000') 3 ___

Secondary Road Terminus

- Not a dead-end 0 ___
 Loop roads, cul-de-sacs with an outside radius of 45 feet or greater 1 ___
 Cul-de-sac turnaround 3 ___
 Dead-end roads 200 feet or less in length 3 ___
 Dead-end roads greater than 200 feet in length 5 ___

Average Lot Size

- 10 acres or larger 1 ___
 Larger than 2.5 acres, but less than 10 acres 3 ___
 2.5 acres or less 5 ___

Street Signs

- Present 1 ___
 Not present 5 ___

Fuels Management

Fuel Types

- Light (grass, forbs, bare ground etc.) 1 ___
 Medium (scrub oak, shrubs, etc.) 5 ___
 Heavy (pine, fr, juniper) 10 ___

Defensible Space (what is possible?)

- More than 100 feet of treatment from buildings 1 ___
 Less than 100 feet of treatment from buildings 5 ___

Installed Landscape (within 10 feet)

- Xeriscape or dirt 0 ___
 Flame Resistant Plants 1 ___
 Flammable Plants 3 ___
 Flammable Ties and Timbers 5 ___

Topography

- Slope 10% or less 1 ___
 Slope more than 10%, but less than 20% 4 ___
 Slope more than 20%, but less than 30% 7 ___
 Slope 30% or more 10 ___

Fire Protection

POINTS

Fire Response

- Property located in Village of Ruidoso 1 ___
 Property located in County 5 ___

Water Supply

- Hydrant within 1,000 feet of structure 1 ___
 Hydrant farther than 1,000 feet or draft site 3 ___
 Water source 20 min or less, round trip 5 ___
 Water source farther than 20 min, round trip 10 ___

Utilities (electric service)

- Underground mains and service lines 1 ___
 Underground service lines only 3 ___
 Aboveground service lines 5 ___

Construction Materials

Siding

- Noncombustible 1 ___
 Combustible 5 ___

Deck

- Noncombustible 1 ___
 Decks over 6" w/noncombustible uprights 1 ___
 Combustible w/firesafe crawlspace 3 ___
 Combustible 5 ___

Sofits

- Parapet / Santa Fe style / 1hr. rated enclosed 0 ___
 Enclosed 1 ___
 Open 5 ___

Windows

- Low E 1 ___
 Double Pane 3 ___
 Single Pane 5 ___

Roof

- Class A Fire Rated 1 ___
 Class B Fire Rated 3 ___
 Class C Fire Rated 5 ___
 Non- Rated 10 ___

Stem Walls/Structural Support

- Non Combustible Enclosed 1 ___
 Combustible Enclosed 3 ___
 Non Combustible Post & Beam 5 ___
 Combustible Post & Beam 10 ___

Total the points here

Address:

Permit No.:

YOUR RATING: Med= ≤59; High= 60-74; Extreme= ≥75

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Partners in the Otero County Forest Restoration Working Group include:

Bureau of Indian Affairs Mescalero Agency	Lincoln National Forest	Natural Resources Conservation Service
Bureau of Land Management	County of Otero	US Fish & Wildlife Service
EMNRD Forestry Division	Mescalero Apache Tribe	Village of Cloudcroft
Cloudcroft Fire Department	Timberon Development Council	City of Alamogordo
Otero County Fire Services Coordinator	Otero County Firefighters Association	NAU Ecological Restoration Institute
The Nature Conservancy	Mescalero Fire Department	South Central Mountain Resource Conservation & Development Council
Otero Soil and Water Conservation District	Upper Cox Canyon Fire Department	High Rolls Fire Department
Mountain Monthly	City Bank New Mexico	Sacramento Mountains Water Restoration Corporation
Mountain Times	Mescalero Forest Products	Andy Olsen Thinning Contractor
City of Alamogordo	Cloud Country West Unit One	Robinhood Park/Estates
New Mexico Environment Department	New Mexico State Land Office	Ponderosa Pines Subdivision

Additional homeowners associations, local, state and federal elected officials and various thinning contractors.

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GLOSSARY OF TERMS:

Aspect: The direction that a slope faces. The orientation of a slope in relation to the sun. North aspects tend to be moister than southern exposures, since a south aspect receives more sunlight over time. Aspect can be used to predict potential fire behavior.

Collaboration: The art of involving all affected stakeholders in the decision-making processes that result in the support, implementation, and evaluation of ecological restoration and maintenance.

Canopy: The stratum containing the crowns of the tallest vegetation present, living or dead, usually above 20 feet in height.

Catastrophic Wildfire: A large, landscape-changing conflagration, which consumes anything in its path, including homes and improvements, and threatens the well being of residents in the affected area. Numerous long-term deleterious impacts result, including excess water runoff and erosion, sterilized soils, a loss of wildlife habitat and cultural resources, a loss of timber resources, damaged and destroyed homes and infrastructure, lost aesthetics, diminished recreation and tourism revenue, and depressed real estate values.

Crown Closure: The spacing between individual tree crowns. Closure is usually expressed as the percent of area covered by tree crowns in the forest canopy region as viewed from above. A higher percentage indicates a more-closed crown area and a greater potential for catastrophic fire behavior.

Crown Fire: A fire that advances from top-to-top in trees or shrubs. Crown fires are classified as passive, active, or independent to distinguish the degree of dependence on a surface fire.

Crowning Index: The wind speed required to maintain an active crown fire measured in miles per hour (mph). Crown bulk density is a critical variable. Low Hazard = wind speeds greater than 50 mph are needed to sustain a crown fire. Moderate Hazard = wind speeds between 25 and 50 mph are needed to sustain a crown fire. High Hazard = wind speeds less than 25 mph will sustain a crown fire.

Defensible Space: An area around the perimeter of structures or developments where native vegetation or combustible debris have been manipulated to reduce wildfire behavior. The area is used as a key point of defense/attack against encroaching wildfires or escaping structure fires.

Ecological Restoration: A broad framework of activities for returning ecosystems to healthy functioning or to an acceptable natural range of variability. Restoration incorporates past experience as a guide to sustainable futures, and includes, among other activities, reducing overly-dense woody vegetation, re-establishing native vegetation, improving soil conditions while managing erosion, restoring hydrological function, and monitoring all of these activities for effective long term maintenance.

Ecosystem: A community of plants, animals, and non-living components in a given area.

Forest Ecosystem: A complex of living organisms and their environment which are dynamic and continually changing in time and space within a forest setting.

Forest Health: The **perceived** condition of a forest derived from concerns about such factors as age (young, old, over-mature), structure (single or multiple storied, uniform, groups), composition (species makeup), function (disturbance regimes), vigor (productivity), unusual levels of insects and diseases, and the resilience to disturbance. Perceptions of forest health are influenced by land management objectives, spatial and temporal scales, the relative health of forest stands, and the overall appearance of the forest. Possible indicators of "unhealthy" forests include the introduction of exotic species, or an increase beyond the range of historic variability of agents of change, such as insects, parasitic plants, and fungi, to chronically high levels.

Forest Succession: The replacement of one plant association in a forested area with another. Succession can occur in slow integrating steps, or rapidly, after a major disturbance such as a fire or insect epidemic. **Primary succession** is the initial establishment of hardy "pioneer" plant species on previously non-vegetated areas such as zones of glacial retreat, rock surfaces, or lava flows. As vegetation becomes more established, conditions for survival improve, and other plant species move into the community. Generally the plants that move in later are more shade tolerant than the original pioneer species. If no major disturbances occur, this change in plant association will gradually slow or **climax**. Ponderosa pine and aspen are generally shade intolerant and are excellent primary successional pioneers; white fir and blue spruce are shade tolerant and are often considered climax species. In climax conditions in a mixed conifer forest, spruce and white fir will mature and achieve equal footing with the pine or aspen, or may actually dominate the forest community. **Secondary succession** involves a disturbance within an established community, which prevents or delays the establishment of a climax condition. Obvious disturbances, which can prevent a climax condition, include frequent wildfires and/or grazing. [The "Great American Desert" was once considered to be in a climax condition as a short grass prairie; it has been theorized that such areas were kept in a sub-climax condition or "grazing climax" condition due to heavy use by herds of buffalo].

Hazardous Fuels: Native vegetation, including grasses, forbs, shrubs, and trees, that are receptive to ignition and consumption during a wildfire event.

Historical Range of Natural Variability: The forest stand structures and plant species populations that existed for millennia, both spatially and temporally, before European and Hispanic settlement of the western United States.

Ladder Fuels: Vegetation and debris (fuels) that is found at or near ground level (brush, slash, forest litter, tall grass, lower limbs on trees, etc.); such material can grow and/or extend into larger, taller vegetation (trees) creating a continuous vertical pathway for fires to spread. Once a wildfire spreads from ground level into the canopies of the tallest shrubs or trees, it becomes a crown fire, which is often difficult or impossible to suppress.

Landscape: A spatial mosaic of several ecosystems, land forms, watersheds, and plant communities that are repeated in similar form across a defined area irrespective of ownership or other artificial boundaries.

Overstocked Areas: Areas where growth of trees is significantly reduced by excessive numbers of trees. Stands are considered overstocked when the stocking level is 133 percent or more, where 100 percent represents the minimum level of stocking required to make full use of the site.

Pre-settlement Conditions: The forest conditions that existed in the West before natural fire occurrence was halted by European and Hispanic settlement in the mid to late 1800s.

Structural Ignitability: The receptiveness of a structure or improvement to ignition by a wildfire due to factors such as location, building design and materials, and proximity to surface fuels, native flammable vegetation, or other flammable structures. Ignition sources include direct flame contact, radiant or convective heat, or rolling or windblown embers and firebrands.

Surface Fire: A fire that burns surface litter, debris, and small vegetation. Surface fire behavior is the primary process that sustains fire growth and is a major factor in the loss of structures and improvements. Surface fire behavior often dictates the potential for more serious fire behavior such as torching and crowning.

Sustainability: A comprehensive, multi-scale measure of an ecosystem's organization, resilience, function, and productivity. Sustainability should be expressed in terms of biodiversity, and resilience, as well as human values, uses, and expectations.

Torching: Fire burning principally as a surface fire that intermittently ignites the crowns of trees or shrubs as it advances.

Torching Index: The wind speed needed to move a surface fire into the crowns of shrubs or trees measured in miles per hour (mph). The height to live crown or canopy base height is a critical variable. Low Hazard = wind speeds greater than 50 mph are required to initiate torching. Moderate Hazard - wind speeds between 25 and 50 mph are required to initiate torching. High Hazard = wind speeds less than 25 mph can initiate torching.

Watershed: Any sloping surface, which sheds water into a drainage basin or catchment and redistributes the water into components of the hydrologic cycle. A drainage basin is a watershed that collects and discharges surface streamflow through one outlet or mouth. A catchment is a small drainage basin.

Watershed Management: The management of the natural resources of a drainage basin primarily for the production and protection of water supplies and water-based resources, including the control of erosion and floods, and the protection of aesthetic values associated with water.

Wildfire: A free burning wildland fire undeterred by fire suppression measures. An unplanned wildland fire requiring suppression action, or other action according to land management agency policy, as contrasted with a management-ignited fire burning within prepared lines enclosing a designated area, under prescribed conditions.

Wildfire Danger: The potential for wildfires to occur and become established in a given area. Fire danger ratings range from low to extreme and are based on time of season, precipitation levels, temperature, relative humidity values, wind conditions, fuel conditions, and the presence of ignition sources such as humans or lightning. Fire danger ratings in a given area will fluctuate significantly over time, based on the wide variation in weather conditions and activity in a forest.

Wildland Fuels: Any organic matter, living or dead, in the ground, on the ground, or above the ground, that will ignite and burn. Natural or introduced fuels include vegetation and debris such as trees, tree limbs, shrubs, brush, slash, needle litter, duff, cured grasses, and *structures*.

Wildfire Hazard: The overall potential for a given area to support extreme wildfire behavior based on existing topography and wildland vegetation type, loading, arrangement, and condition. Hazard ratings range from low to extreme and will vary by location and elevation. A given hazard condition remains relatively static over time, with drastic changes in hazard potential only occurring when vegetation is managed aggressively or after a major conflagration has consumed much of the available wildland fuel.

Wildland/Urban Interface: The boundary between large areas of contiguous native vegetation and developments or improvements. The developed areas can range in size from a single home or small subdivision, to a major village or city. The interface has a distinct break between native vegetation and improvements. Such areas are especially vulnerable to catastrophic wildfires. Examples include Ruidoso Downs, the midtown area of Ruidoso, and downtown Cloudcroft, all in south central New Mexico.

Wildland/Urban Intermix: An area where structures and improvements are intermingled with native vegetation and topography. There is no definitive boundary between the structures and the surrounding native landscape. The potential for a large, uncontrollable wildfire is high in such areas. Examples include Upper Canyon in Ruidoso, Deer Park Woods in Alto, and Sun Valley Subdivision, all in south central New Mexico.

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Firewise Landscaping Checklist



Landscaping

FIREWISE

When designing and installing a firewise landscape, consider the following:

- Local area fire history.
- Site location and overall terrain.
- Prevailing winds and seasonal weather.
- Property contours and boundaries.
- Native vegetation.
- Plant characteristics and placement (duffage, water and salt retention ability, aromatic oils, fuel load per area, and size).
- Irrigation requirements.

To create a firewise landscape, remember that the primary goal is fuel reduction. To this end, initiate the zone concept. Zone 1 is closest to the structure; Zones 2-4 move progressively further away.

- Zone 1.** This well-irrigated area encircles the structure for at least 30' on all sides, providing space for fire suppression equipment in the event of an emergency. Plantings should be limited to carefully spaced low flammability species.
- Zone 2.** Low flammability plant materials should be used here. Plants should be low-growing, and the irrigation system should extend into this section.
- Zone 3.** Place low-growing plants and well-spaced trees in this area, remembering to keep the volume of vegetation (fuel) low.
- Zone 4.** This furthest zone from the structure is a natural area. Selectively prune and thin all plants and remove highly flammable vegetation.

Also remember to:

- Be sure to leave a minimum of 30' around the house to accommodate fire equipment, if necessary.
- Widely space and carefully situate the trees you plant.
- Take out the "ladder fuels" — vegetation that serves as a link between grass and tree tops. This arrangement can carry fire to a structure or from a structure to vegetation.
- Give yourself added protection with "fuel breaks" like driveways, gravel walkways, and lawns.

When maintaining a landscape:

- Keep trees and shrubs properly pruned. Prune all trees so the lowest limbs are 6' to 10' from the ground.
- Remove leaf clutter and dead and overhanging branches.
- Mow the lawn regularly.
- Dispose of cuttings and debris promptly, according to local regulations.
- Store firewood away from the house.
- Be sure the irrigation system is well maintained.
- Use care when refueling garden equipment and maintain it regularly.
- Store and use flammable liquids properly.
- Dispose of smoking materials carefully.
- Become familiar with local regulations regarding vegetation clearances, disposal of debris, and fire safety requirements for equipment.
- Follow manufacturers' instructions when using fertilizers and pesticides.

Access additional information on the Firewise home page: www.firewise.org

Please see the other side of this sheet for the *Firewise Construction Checklist*.



Firewise Construction Checklist



FIREWISE Construction

FIREWISE

When constructing, renovating, or adding to a firewise home, consider the following:

- Choose a firewise location.
- Design and build a firewise structure.
- Employ firewise landscaping and maintenance.

To select a firewise location, observe the following:

- Slope of terrain; be sure to build on the most level portion of the land, since fire spreads more rapidly on even minor slopes.
- Set your single-story structure at least 30 feet back from any ridge or cliff; increase distance if your home will be higher than one story.

In designing and building your firewise structure, remember that the primary goals are fuel and exposure reduction. To this end:

- Use construction materials that are fire-resistant or non-combustible whenever possible.
- For roof construction, consider using materials such as Class-A asphalt shingles, slate or clay tile, metal, cement and concrete products, or terra-cotta tiles.
- Constructing a fire-resistant sub-roof can add protection as well.
- On exterior wall facing, fire resistive materials such as stucco or masonry are much better choices than vinyl which can soften and melt.
- Window materials and size are important. Smaller panes hold up better in their frames than larger ones. Double pane glass and tempered glass are more reliable and effective heat barriers than single pane glass. Plastic skylights can melt.
- Install non-flammable shutters on windows and skylights.
- To prevent sparks from entering your home through vents, cover exterior attic and underfloor vents with wire screening no larger than 1/8 of an inch mesh. Make sure under-eave and soffit vents are as close as possible to the roof line. Box in eaves, but be sure to provide adequate ventilation to prevent condensation.
- Include a driveway that is wide enough to provide easy access for fire engines (12 feet wide with a vertical clearance of 15 feet and a slope that is less than 5 percent). The driveway and access roads should be well-maintained, clearly marked, and include ample turnaround space near the house. Also provide easy access to fire service water supplies, whenever possible.
- Provide at least two ground level doors for easy and safe exit and at least two means of escape (i.e., doors or windows) in each room so that everyone has a way out.
- Keep gutters, eaves, and roofs clear of leaves and other debris.
- Make periodic inspections of your home, looking for deterioration such as breaks and spaces between roof tiles, warping wood, or cracks and crevices in the structure.
- Periodically inspect your property, clearing dead wood and dense vegetation at distance of at least 30 feet from your house. Move firewood away from the house or attachments like fences or decks.

Any structures attached to the house, such as decks, porches, fences, and outbuildings should be considered part of the house. These structures can act as fuel bridges, particularly if constructed from flammable materials. Therefore, consider the following:

- If you wish to attach an all-wood fence to your house, use masonry or metal as a protective barriers between the fence and house.
- Use metal when constructing a trellis and cover it with high-moisture, low flammability vegetation.
- Prevent combustible materials and debris from accumulating beneath patio decks or elevated porches. Screen or box-in areas below patios and decks with wire screen no larger than 1/8 inch mesh.
- Make sure an elevated wooden deck is not located at the top of a hill where it will be in direct line of a fire moving up slope. Consider a terrace instead.

Access additional information on the Firewise home page: www.firewise.org

Please see the other side of this sheet for the *Firewise Landscaping Checklist*.

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Otero County Community Wildfire Protection Plan

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