

**COMMUNITY PLAN FOR WILD FIRE AND FOREST RESOURCE MANAGEMENT
BETWEEN ARROYO HONDO AND GLORIETA, NEW MEXICO**

December 2002

Project Sponsor: Earth Works Institute

APPENDIX C MAK YOUR HOME MORE FIRE RESISTANT

A. Home and Home Site Improvement

A.1. Retrofitting Homes for Fire Protection

One of the most important things you can do on your own is to make your home more fire resistant. This means that you need to replace or protect all flammable construction materials, such as wood shake roofs, wood siding and paneling, protruding vigas and beams, wooden balconies, and decks.

Specific Techniques, Materials and Guidelines for Home Retrofitting

Recommended non-flammable materials include stucco, gypsum, masonry, adobe, concrete siding, and fire resistant or non-combustible roofing material rated class A (ceramic, tile or metal). Other things you can do include the installation of spark arresters in chimneys and vents that serve fire places, redesign of vents to prevent flames from entering the house, redesign of windows and doors to be more fire retardant, and the installation of sprinkler systems in the house. Redesign of doors and windows may include the addition of external shutters, the addition of spark-proof screens, the selection of inflammable moulding and door panes, and the installation of double or triple glaze windows.

You can obtain building code guidelines from the Santa Fe County Land Use Department and consult the County's Wildland Urban Interface Ordinance (No. 2001-11) for recommended fire retardant building materials and home reconstruction rules.

Consequences of Home Retrofitting

Retrofitting your home to make it more fire proof may be a costly undertaking, but may be well worth it if the result is that you greatly increase your chances of saving your home during a wildfire.

Home reconstruction (renovation or modification) activities that affect or increase the existing roof or existing exterior walls in excess of 49% of the square footage of such roofs and walls will trigger the need for compliance with the Santa Fe County Wildland Urban Interface Ordinance (No. 2001-11). This ordinance requires homebuilders to take stringent measures for fire protection.

Sources of Assistance for Home Retrofitting

- **Santa Fe County Land use Department 986-6225**
- **Santa Fe County Fire Department: non-emergency 992-3070**
- **Santa Fe Area Home Builders Association: 982-1774**

A.2. Creating Defensible Space around Homes

“Defensible Space is an area either natural or man-made where material capable of allowing a fire to spread unchecked has been treated, cleared, or modified to slow the rate and intensity of an advancing wildfire and to create an area for fire suppression operations to occur.”

Specific Techniques, Materials and Guidelines for Creating Defensible Space

The area around homes can be made more fireproof by removing vegetation that could immediately spread wildfire to the structure and replacing it with vegetation or ground cover that slows the speed and intensity of advancing wildfire. National fire safety education materials advocate clearing an area of up to 100 feet around your home of vegetation that is prone to fire. In the mountain area Southeast of Santa Fe, this may lead to drastic measures, while replacement vegetation is difficult to establish and nearly impossible to maintain in a dry year without unleashing serious runoff and soil erosion during thunderstorms. Therefore, any intermediary solution may be best. Professional landscapers and permaculture specialists in Santa Fe are trained to give you advice on the most appropriate design and plant selection for a safe “defensible space” around your home.

Many people resist creating defensible space around their homes because they believe these areas will be unattractive and unnatural. This is far from true. With careful planning, landscaping can be aesthetically pleasing while reducing potential wildfire fuel. It can actually enhance beauty and property values, as well as personal safety. Examples of techniques and procedures for the creation of defensible space are included on Appendix 2. For more information, you can visit many websites with useful guidelines, examples and figures.

One such website, which provided the information for the following paragraph, is www.ext.colostate.edu/pubs/natres/06305.html. This website describes that plants that are more resistant to wildfire have one or more of the following characteristics:

- They grow without accumulating large amounts of combustible dead branches, needles or leaves (example: aspen)
- They have open, loose branches with a low volume of total vegetation (examples: currant and mountain mahogany).
- They have low sap or resin content (examples: many deciduous species).
- They have high moisture content (examples: succulents and some herbaceous species).
- They grow slowly and need little maintenance (do not need frequent pruning).

- They are short and grow close to the ground (examples: wildflowers and ground covers).
- They can resprout following fire, thus reducing landscaping costs (example: aspen).

Some general guidelines for creating defensible space include obvious measures such as pruning of branches that touch your home or hang over roofs, porches, portals, canvas canopies, decks and balconies. It also includes the clearing away of vegetation, structures, and objects that hinder fire suppression operations. Furthermore, you can create defensible space by redesigning your driveway and gates to provide access and turn-around space for fire engines.

In addition, it is very important to fireproof your storage structures and yard structures. Wooden fences or sheds that lean against the house and firewood stacks against the wall should be removed and placed at a safe distance (preferably 30 feet) from the building to limit chances of fire spreading from these structures to your home. It would be better even to replace any combustible materials of fences and sheds with non-flammable ones. Propane tanks and storage places of toxic or flammable household chemicals should be sited away from any building and evacuation routes.

Be aware of the growth habits of the plants on your land and of the changes that occur seasonally. Keep a watchful eye for the need to reduce fuel volumes and fuel continuity. Rake dead needles, dead twigs and leaves, while leaving the duff layer and some mulch to reduce evaporation, runoff and erosion. Last but not least, take note of the predominant wind direction on your property. Plan landscaping appropriately and prepare firebreaks accordingly.

Consequences of Creating Defensible Space

Creating defensible space may cause erosion if it is done too rigorously and/or on steep slopes. It may also cause greater visibility in the neighborhood and from a distance, which may be useful in some circumstances and a nuisance in other. In addition, it will largely follow the impacts listed for stem density reductions listed above.

Sources of Assistance for Creating Defensible Space

Appendix D provides an overview of procedures for creating defensible space and references to websites with more information. For local assistance, consult the yellow pages or call EWI (982-9806) for references from its Earth-Friendly Contractors list.
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B. Forest Management Improvements

B.1. Doing Nothing

This alternative maintains the status quo in wildfire and forest management. No preventative precautions are being taken and no management planning for fire management is being developed. In case of wildfire, conventional measures are being employed to respond to the fire.

Consequences of Doing Nothing

Given the current forest conditions in many parts of the plan area, the 0-action option will result in increased wildfire hazard levels and increase the chance of catastrophic wildfire. The devastation caused by a catastrophic fire in this area will be enormous. Not only hundreds of homes, public buildings and facilities are likely to be destroyed, lives are at stake as well. In addition, wildfire may impact a much larger region, as it will unleash tremendous soil erosion on the steep, unconsolidated slopes in the canyons. The sediment will choke arroyos in Eldorado, Rancho Viejo, Canonicito, and Lamy, and cause flooding in these subdivisions. Fire may also spread to the north into the Santa Fe watershed or to the east in the Glorieta area, which are also listed as high-risk fire areas. This puts Santa Fe's municipal water source at stake, as well as valuable wildlife habitat and many recreational trails. Finally, the visual exposure of the area will leave a view of a blackened mountain area visible from as far as Galisteo, Lamy, Santa Fe, Eldorado, and many miles of the I-25.

Fire specialists mention a serious concern with the potential loss of lives as a result of the lack of evacuation routes in the area and the large number of homes. Difficult road and terrain conditions make it extremely difficult, if not extremely dangerous for the fire department to intervene. The fire department will conduct a triage of homes and neighborhoods that it will fight for with the principle that fire fighters will fight for people's lives but not for the preservation of structures. That means that a significant number of homes will remain out of reach of fire fighting efforts.

B.2. Increasing Forest Humidity

Increased forest humidity may reduce the incidence of a wildfire outbreak and the change of any fire to spread. In addition, increased humidity levels in the forest will increase soil moisture, which benefits watershed health and wildlife habitat. Yet, there are also serious downsides to increasing forest humidity (see below under Consequences).

The Apache Creek Ranch in the Apache Canyon has done a considerable amount of work in constructing earth structures and permaculture installations to harvest water and slow down the rate of soil erosion on the slopes of the property. The ranch periodically organizes workshops and tours to demonstrate the structures.

Specific Techniques, Materials and Guidelines for Increasing Forest Humidity

Measures to increase forest humidity may include:

- Introducing beaver
- Building artificial beaver dams
- Soil improvements (with sludge, compost, minerals, fungi)
- Building wildlife ponds/tanks
- Contour felling, swales and berms
- Increased undergrowth and grassy openings (thinning and small patch cuts)

Consequences of Increased Forest Humidity

Increases in forest humidity may actually have limited effect on the reduction of wildfire hazard. High to extreme wildfire hazard occurs in years with accumulated drought conditions in the soil and vegetation. In such circumstances, increased capacity for forest humidity does not relate to actual increases in humidity. In fact, increasing forest humidity capacity will lead in normal and wet years to more vegetation growth. In turn, this leads to an accumulation of fuels in dry years. Increased forest humidity may postpone the incidence of fire (increase the fire interval), but will increase fire severity.

Treatments that increase forest humidity will lead to more vegetation growth in a certain period of time, and will also lead to increased evapotranspiration and runoff. Ponds, tanks and dams of adequate size may help store water for fire fighting, but will not significantly increase forest humidity in a way that it reduces the fire hazard. The reintroduction of beaver may help increase forest humidity in canyons, but also reduce forest access (fallen logs and wet spots) and species diversity (mainly aspen and cottonwoods are felled and conifers may invade the canyon floor).

The construction of swales and other water carrying structures is useful at a small scale. At the scale of the national forest, such structures are too costly and require too much maintenance to be effective.

Sources of Assistance for Increasing Forest Humidity (select list)

<p>Regenesis 505-986-8338 or regenesis@reginesisgroup.com Green Edge 982-8257 Plants of the Southwest 438-8888 Santa Fe Permaculture 424-4444</p>

B.3. Reducing Forest Density: Pruning, Thinning, Logging, Burning

This option can be subdivided in many different alternatives. For purposes of simplification, we will divide it into:

- C.1. Pruning with lop & scatter technique (branches and saplings are cut and spread to cover the soil)
- C.2. Pre-commercial thinning (wood remains in forest or is occasionally harvested for non-commercial uses, such as local firewood permits)
- C.3. Non-commercial, selective thinning/logging (logs remain in the forest and is placed on contour; slash is lopped and scattered and/or piled and burnt)
- C.4. Commercial, selective thinning/logging (wood is hauled out for commercial uses)
- C.5. Patch cuts and firebreaks (wood is removed or piled and burned on site)
- C.6. Prescribed, broad-cast burns

These techniques can be combined with mushroom inoculations of wood, creation of wildlife habitat, road and trail closures, and soil and water conservation measures to improve soil and water conditions in the forest.

Specific Techniques, Materials and Guidelines for Reducing Forest Density

Thinning on homeowners' and watershed properties should entail:

- Recognizing dominant vs. suppressed trees.
- Inspecting tree canopies.
- Breaking up continuous canopies by thinning around and between trees and creating a grove type appearance.
- Removing diseased trees: best to cut and remove from property or stack in 4'x 4' stacks and cover with clear plastic to keep disease from spreading to healthy trees.
- Clearing out debris that is on the ground – keep greater distances between ground and treetops.

Strategies:

- Assess property
- Investigate what has been done in other communities
- Create demonstration area so others can see the benefits
- Identify critical areas: downhill/down wind
- Better understanding of how wildfires travel
- Create lines of defenses/firelines within and surrounding communities
- Create 30' spaces around houses
- Eliminate ladders
- Separate tree canopies
- Remove ground fuels
- Mow weeds around property perimeters and keep lawns short

- Landscape with firewise plants and grasses
- Identify drainages (in addition, slow the flow of water and create meanders to prevent erosion)
- Agreements to maintain boundaries between public and private lands
- Clean-up assistance from Federal and State agencies
- Recycle materials from clean-up
- Investigate how other communities are dealing with clean-up
 - Firewood permits on Federal and State Lands
 - Recycling materials for consumer products

Consequences of Reducing Forest Density

This technique in all its variations offers opportunities for fire hazard reduction. Impacts of logging, thinning, and burning are related to site-specific circumstances, the season of the treatment operation, the intensity of the treatment, the size of the treatment, and the cumulative effect of several treatments in a larger area over time. Short-term impacts may include:

- an increase of runoff and soil erosion,
- a temporary increase in streamflow sediment transport and potential algae growth in streams (for one or two years),
- a temporary invasion of native and non-native pioneer and weed species, such as mullein,
- a change in wildlife abundance and diversity, and increase in ground covering vegetation,
- a decrease in fire hazard (if fuel loads have been decreased and fuel ladders have been broken up effectively),
- a potential increase in off-road vehicle use and other unregulated land use as a result of great visibility and access between the trees,
- a decrease in evapotranspiration (air humidity goes down),
- an increase in wind throw of trees, and
- increased visual quality (you can see through the forest, old trees are visible, you may have views, you may spot some wildlife and birds) and also decreased visual quality (you see debris from logging and burning, tire tracks, burn marks, you may see structures/homes, you may no longer see specific kinds of wildlife that need cover).

Long term impacts may include:

- Decreased fire hazard
- Regeneration of soils, micro-organisms and fungi, ground covering vegetation and forest structure
- Increased diversity of plant/tree species
- Increased levels of undergrowth and ground cover
- Increased infiltration, and
- Increased levels of wildlife diversity

B.4. Use of Multiple Techniques (at one location, spread over time)

A combination of the options mentioned above allows for site-specific and diversified treatments. Such treatments may be useful and appropriate for small landowners. The Forest Service may be able to apply such techniques in collaboration with local organizations.

Consequences of using Multiple Techniques

Combinations of treatments may be highly effective, but may be more costly and time consuming to arrange. In general, combinations of treatment will allow for more site specific approaches and for back-up provisions for fire prevention, which lead to higher levels of fire safety than can be achieved by applying only one method.

C. Participating in Community Education and Outreach Activities

C.1. Increasing Community Collaboration and Involvement in Fire Prevention Planning

Discussions during the Wildfire Wisdom Symposium of June 1, 2002 at Glorieta Conference Center generated a series of recommendations for effective resident participation in community education and neighborhood outreach activities on fire prevention. The following suggestions may help increase community collaboration.

1. Take any message to communities during specific events and activities:
 - Activities for the family, that meet family needs, such as daycare.
 - Events that include activities for everyone.
 - Existing events such as the Farmer's Market, 4th of July celebrations, etc.
 - Piggy-back with fire department events and collaborate with them on outreach through informative door hangers and other notices.
2. Collaborate with local non-profit groups, such as EWI and the Santa Fe Watershed Association to generate money for people to do wildfire work and to write grants.
3. Apply for funding for materials, site visits, implementation and consultations from FEMA and the National Fire Plan (Forest Service and NM State Forestry Office).
4. Build one-on-one relationships in the community.
5. Go door-to-door to deliver fire safety messages.
6. Organize outreach by clustering homes and designating leaders in each cluster who have the same outreach information. (Clusters could be based on geographic location and on criteria other than geography, such as economic group or language).

C.2. Education and Outreach Approaches

Practical lessons and approaches for local education and outreach include:

1. Repeat the message and don't give up.
2. Be active and use pilot projects (demonstration sites) to make it real.
3. Different people will come to each meeting but eventually leaders will emerge.
4. Focus on one activity versus trying to present all issues/activities at once.
5. Inform public institutions and public services of events and plans (for example, talk with the fire department and invite them to events).

C.3. Incentives and Support for Community Collaboration

Community collaboration and people's involvement in activities such as fire prevention planning must be nurtured in order to sustain through time. In many cases, it is important to offer people specific incentives to be involved and provide support to collaborative activities. For example, people may need incentives and assistance with the removal and disposal of slash and trimmings or with the selection of less flammable construction

materials. Incentives and support may be provided by government agencies and by establishing a pattern of neighbor help in the community. For example:

Incentives may include:

1. Working with Santa Fe County solid waste managers to facilitate the drop off of yard waste and to negotiate reduced fees for depositing debris.
2. Contacting the Santa Fe County Fire Department to bring a chipper and set up a public wood chipping day.
3. Collaborating with the Forest Service and the State Forestry Division for information and technical assistance.
4. Contacting businesses that own chippers and negotiating whether they take away dead and down materials.

Support may include:

1. Obtaining technical assistance from EWI and public agencies.
2. Looking at lists of people who are already involved, such as through EWI.
3. Forming a steering committees made up of representatives from the various cluster groups.
4. Organizing clean-up days by housing cluster.
5. Organizing open houses so neighbors can come see what others are doing to be safe.
6. Working with and on inconsistencies in County ordinances. (Identify those that are barriers to community fire safety and bring them to the attention of lawmakers).

C.4. What collaborative problem-solving strategies have worked, not worked?

Responses stemmed from workshop participants' experiences in collaborative problem-solving in fire safety initiatives. Participants made the following suggestions and observations:

1. Collaboration takes time!
2. Successful collaboration is often the result of a core group of diligent leaders.
3. Success breeds success!
4. Implementation follows recommendations.
5. Find funding to do it!
6. Link people with resources and other people who can do the work. Match skills with those who want it done for them.
7. Make information and events attractive.
8. Don't take "NO" for an answer when working on ordinances, etc.
9. Bring together decision-makers when possible.
10. Set up demonstration projects in the community to inspire and teach people what's possible.