ELK STREAM RANCH COMMUNITY WILDFIRE PROTECTION PLAN (CWPP)

August 1, 2008

IN CASE OF FIRE OR OTHER EMERGENCY:

CALL 911

GIVE YOUR LOCATION

GIVE OPERATOR THE GATE CODE!

DESCRIBE THE EMERGENCY

Section List and Rev date

Community Wildfire Protection Plan for Elk Stream Ranch Property Owners Association

Rev 8/1/08

This Community Wildfire Protection Plan is developed under the Healthy Forests Restoration Act (HFRA) of 2003, and as an extension of the Montezuma County CWPP which identified East Canyon as an area of Higher Concern for wildfire risk. East Canyon is where Elk Stream Ranch is located. The Elk Stream Wildland Urban Interface (WUI) is the area where houses meet or intermingle with undeveloped wildland vegetation. (The Elk Stream Ranch WUI is shown on Appendix J)

The elements of this Plan shall consist of

Education
Prevention
Evaluation
Firewise development & Fuel reduction
Evacuation & Emergency access preparedness

1) **Education-**
   - **a.** The Association shall in cooperation with the Southwest Colorado Firewise Ambassador program shall appoint a Firewise Ambassador who shall act as a liaison with the local Fire agencies for firewise educational outreach to Elk Stream Ranch.
   - **b.** A portion of each annual meeting of Elk Stream Ranch POA shall be set aside for Firewise education.

2) **Prevention-**
   - **a.** The Association shall post burn bans when conditions are not suitable for outdoor burns.
   - **b.** The Association rules for controlled burns are attached as Appendix A

3) **Evaluation-**
   - **a.** The Association and the Firewise Ambassador shall, in cooperation with local fire agencies, perform ongoing evaluations of the subdivision, inventorying its values at risks and hazards.
   - **b.** Owners of Improved Lots shall work with the Mancos Volunteer Fire Department and the Colorado State Forest Service to evaluate the defensible space and driveway requirements for their property.
   - **c.** The Ambassador shall maintain a map showing the general location of all improvements, safety zones and water sources. Copies shall be

placed at the Elk Stream gate and at the Elk Springs gate for firefighters and other emergency officials to use. This map is attached as Appendix B. The back of the map will have the contact information for the Ambassador and alternate fire liaisons.

d. The Ambassador shall oversee development of a map showing wildfire hazard level estimates to be used as an educational tool for owners in Elk Stream. This is Appendix C.

e. A map showing proposed and prioritized fuel break boundaries has been developed. This is appendix D.

4) Firewise development & Fuel reduction-

a. Owners of improved lots shall be responsible for maintaining a defensible space around the improvements conforming to Colorado State publication no. 6.302 "Creating Wildfire Defensible Zones" attached as Appendix E.

b. Owners of improved lots shall be responsible for construction and maintaining a driveway in accordance with the Colorado Firewise Driveway Standards, attached as Appendix F.

c. Owners constructing improvements on their property shall be responsible for building according to "Firewise Construction – Design and Materials" Peter Slack, Colorado State Forest Service.

d. The Association shall be responsible for maintaining the rights of way of roads 46 and G.3 in a manner which protects emergency ingress and egress to improved properties, including fuel reduction, and as improvements are made to the roads, adding sloping shoulders where possible to enable large vehicles to pass.

e. Owners and the Association shall cooperatively develop fuel breaks along the roadways over a ten year period with Association providing financial assistance through prioritized cost sharing. A 50% reimbursement at prevailing contractor rates, up to a maximum of $4000 per lot will be made for fuel break work within 150 feet of the centerline of the road. To qualify for cost share, the work should be on the Property Management Committee's current priority list and shall be constructed according to the guidelines of "Fuelbreak Guidelines for Forested Subdivisions & Communities By Frank C. Dennis –Colorado State Forest Service" (Attached as Appendix G.)

f. The Association and the Public Land Agencies shall cooperate in developing mutually beneficial fuel breaks on public lands within the Elk Stream Ranch Wildland Urban Interface. This plan is attached as Appendix J.

5) **Evacuation and Emergency access preparedness-**

   a. **The AMBASSADOR nor the ASSOCIATION do NOT declare evacuations. Evacuations are declared by Law Enforcement or Fire agencies.**

   b. Ambassador shall maintain a contact list and distribute to all owners, as well as having copies available for fire officials. This list will include special needs and animal evacuation instructions. The current list is attached as Appendix H

   c. Ambassador shall distribute a "Wildfire Checklist" to each improved lot every spring. The checklist **will be** attached as Appendix I.

   d. Ambassador shall coordinate a schedule for daily smoke patrol during fire season.

   e. Association will mark all streets with reflective signs. Association will mark all cisterns with a standard reflective symbol, (Blue sign with a "C" on it is suggested) by December 2008.

   f. Owners of improved lots shall be responsible for marking their driveway with a reflective address marker.

   g. Owners of improved lots shall be responsible for marking clearly any hazards such as underground tanks that may not support the weight of a fire truck, fuel tanks, etc.

   h. Owners should keep copies of the contact list, map and wildfire checklist in each of their cars at all times.

6) **Ambassador/Liaison responsibilities during wildfire**

   a. Lock gates open

   b. Make sure fire officials have the latest emergency contact list.

   c. Keep neighbors informed as information becomes available

   d. Be available to fire officials as needed. Wear Ambassador shirt and reflective vest when in incident area on request of agencies.

Approval

The Durango District of the **Colorado State Forest Service** has reviewed this Community Wildfire Protection Plan and approves its content and certifies that it meets or exceeds CSFS Community Wildfire Protection Plan minimum standards.

_____ _____

D. Kent Grant, District Forester Date

The following entities have received a copy of this Community Wildfire Protection Plan and agree with and support its content and recommendations.

_____ _____

HOA/POA Date

_____ _____

Fire Protection District Date

_____ _____

San Juan Public Lands (BLM/USFS) Date

_____ _____

County Office of Emergency Management Date

_____ _____

Board of County Commissioners Date

_____ _____

Firewise Council of Southwest Colorado Date

APPENDICES TO ELK STREAM RANCH COMMUNITY WILDFIRE PROTECTION PLAN

APPENDIX A
Elk Stream RanchProperty Owners Association
Community Wildfire Protection Plan
Open Burn Guidelines

Revised August 11, 2007

Elk Stream Ranch Property Owners Association discourages open burning except under carefully controlled circumstances and appropriate weather conditions. In the spring of each year, the Association will post a Fire Ban. The Fire Ban will run until conditions are such that open burning is again safe. A Fire Ban will also be put into place should Montezuma County issue a Fire Ban. Notice of a Fire Ban will be posted at the gate.

Although a wildfire may occur at anytime, the danger is normally lowest during the winter when snow is on the ground. Property owners needing to burn slash are encouraged to perform the open burn during the winter. Chipping is the preferred method of slash disposal during the remainder of the year. Responsibility and any subsequent liability for an open burn lies solely with the property owner.

Any resident/property owner conducting an open burn must comply with the following procedure:

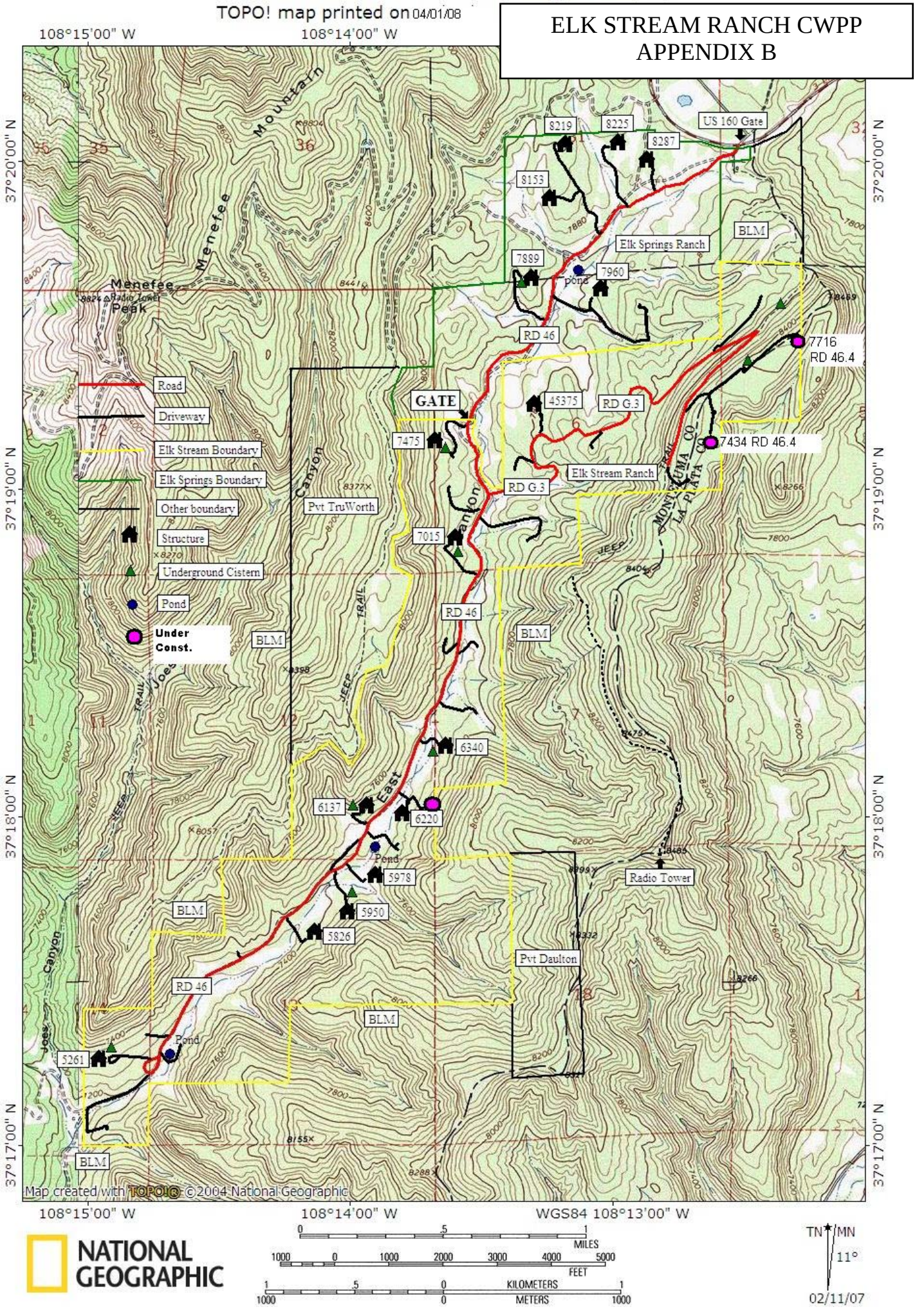
1. Call Cortez Dispatch at 970-565-8441 each day prior to beginning the burn. Let them know the place and time of the burn. Dispatch will ask for oyur name and telephone contact number. Request dispatch to advise you of any adverse burn conditions.
2. Keep the burn pile to a size that can be quickly extinguished if the need arises.
3. Have sufficient personnel, equipment and water on hand to ensure that you will be able to control the burn. The burn must have adult supervision on site until the burn is out. Proper equipment includes garden hose, fire extinguishers, rakes, shovels, etc. Have a cell phone at the burn site to call for help if necessary.
4. As blowing embers are the greatest threat, open burning must be extinguished prior to the winds coming up, in East Canyon winds typically come up late morning at approximately 11:00 A.M. Start the burn as early as possible in the morning when it is safest to burn. Extinguish the fire completely if windy conditions occur. All fires must be completely extinguished by nightfall. A fire is out when no embers exist and the fire materials are cool to the touch.
5. Keep abreast of weather forecasts. Do not burn if windy conditions are forecast. Be aware that approaching thunderstorms can cause strong and erratic winds, which will blow hot embers long distances potentially creating spot fires.

6. Do not conduct open burning within 35 feet of any structure or tree. Use a rake to remove forest litter and organic soil to establish a fire line or control line around the burn area. Use a shovel to scoop mineral soil onto any flare-ups.
7. Do not burn tires, rubbish or trash.

(over)

8. Be safe. Call for assistance immediately if the fire gets out of control. East Canyon is an isolated area; response from emergency agencies will take time.
9. After conducting an open burn, check the area for several days following the burn to make sure there is no smoldering material that could rekindle the fire.
10. Property owners are responsible for communicating the open fire guidelines to builders, subcontractors and guests.

ELK STREAM RANCH CWPP
APPENDIX B



ELK STREAM RANCH POA
SOUTH SUBDIVISION
EMERGENCY CONTACTS

These contacts have emergency contact data for all improved properties in Elk Stream Ranch.

Philip Walters-Firewise Ambassador & Liaison
6137 RD 46
970-533-7177 or cell 970-946-3806

Alternate liaison contacts:
Odin Christensen- 5261 RD 46
970-533-7047 or cell 970-946-9527

ELK SPRINGS RANCH
NORTH SUBDIVISION
EMERGENCY CONTACTS

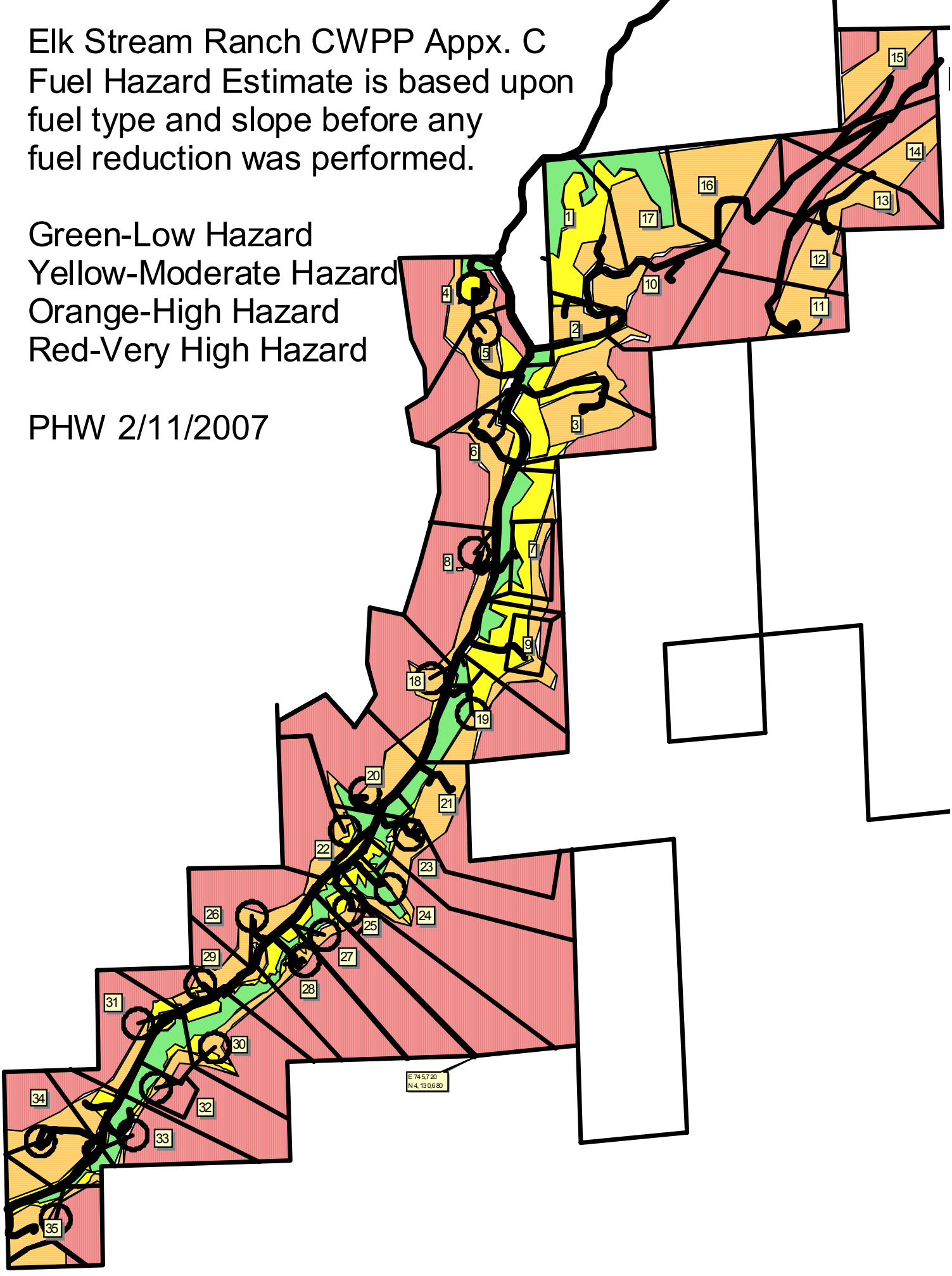
Clay Loving- Firewise Ambassador & Liaison
8225 RD 46
Cell 970-903-0909

Alternate liaison contacts:
Gary Harding: 8219 RD 46
970-533-7574 or Cell 757-710-4322

Elk Stream Ranch CWPP Appx. C
Fuel Hazard Estimate is based upon fuel type and slope before any fuel reduction was performed.

Green-Low Hazard
Yellow-Moderate Hazard
Orange-High Hazard
Red-Very High Hazard

PHW 2/11/2007



Appendix D
Elk Stream Ranch
Community Wildfire Protection Plan
Fuel Break Priority Map

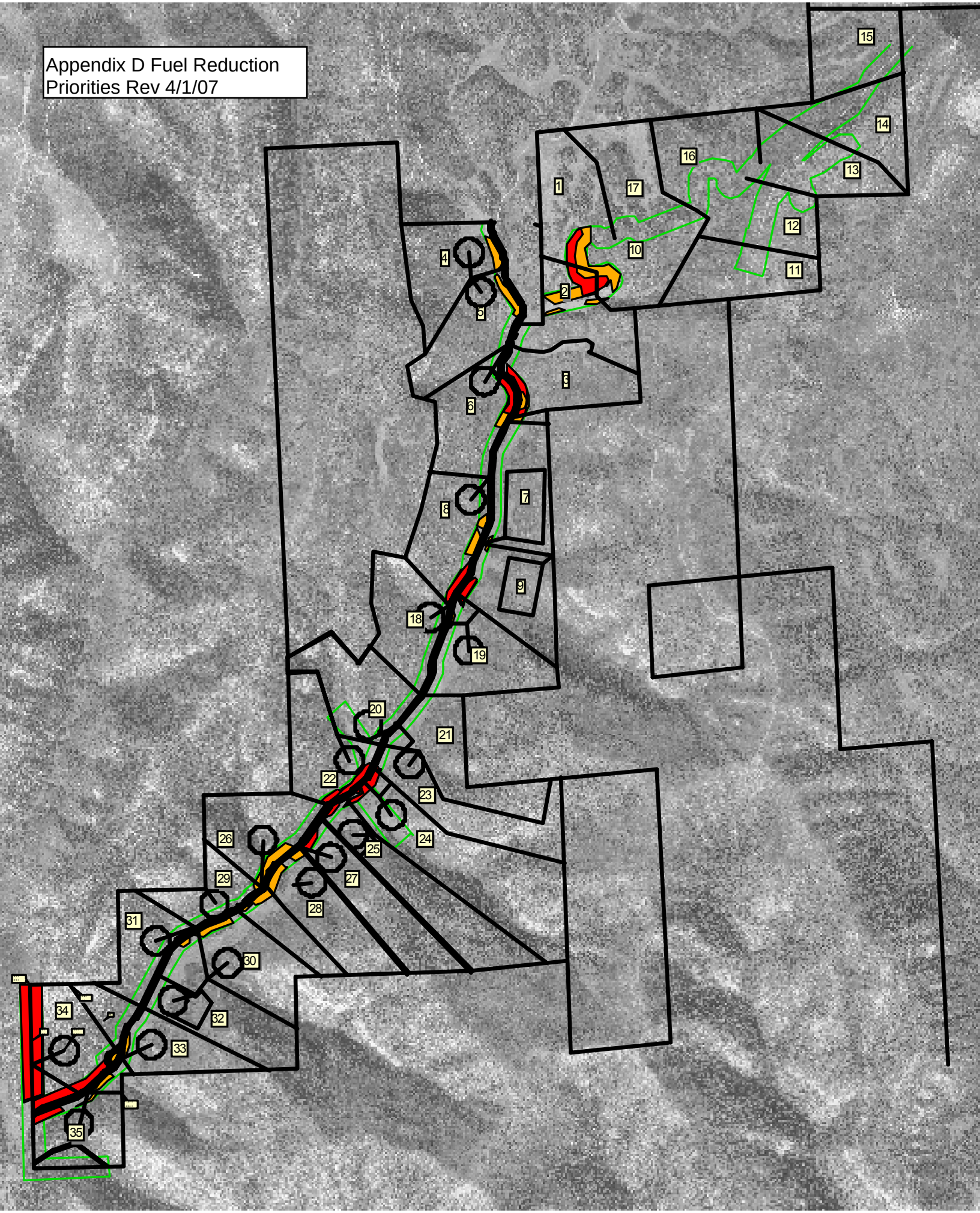
The map on the next page shows the current priority for Fuel Break Development.

Priority is based upon the number of completed improvements that are beyond a fuel load.

Red represents highest priority

Orange represents next highest priority

Green lines show 10 year plan target fuel break boundaries


Appendix D Fuel Reduction
Priorities Rev 4/1/07
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N A T S E R I E S

FORESTRY

Creating Wildfire-Defensible Zones no. 6.302

by F.C. Dennis [1]

Quick Facts...

Wildfire will find the weakest links in the defense measures you have taken on your property.

The primary determinants of a home's ability to survive wildfire are its roofing material and the quality of the "defensible space" surrounding it.

Even small steps to protect your home and property will make them more able to withstand fire.

Consider these measures for all areas of your property, not just the immediate vicinity of the house.

Fire is capricious. It can find the weak link in your home's fire protection scheme and gain the upper hand because of a small, overlooked or seemingly inconsequential factor. While you may not be able to accomplish all measures below (and there are no guarantees), each will increase your home's, and possibly your family's, safety and survival during a wildfire.

Start with the easiest and least expensive actions. Begin your work closest to your house and move outward. Keep working on the more difficult items until you have completed your entire project.

Defensible Space

Two factors have emerged as the primary determinants of a home's ability to survive wildfire. These are the home's roofing material and the quality of the "defensible space" surrounding it.

Use fire-resistive materials (Class C or better rating), not wood or shake shingles, to roof homes in or near forests and grasslands. When your roof needs significant repairs or replacement, do so with a fire-resistant roofing material. Check with your county building department. Some counties now restrict wood roofs or require specific classifications of roofing material.

Defensible space is an area around a structure where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire towards the structure. It also reduces the chance of a structure fire moving from the building to the surrounding forest. Defensible space provides *room for firefighters to do their jobs.* Your house is more likely to withstand a wildfire if grasses, brush, trees and other common forest fuels are managed to reduce a fire's intensity.

The measure of fuel hazard refers to its continuity, both horizontal (across the ground) and vertical (from the ground up into the vegetation crown). Fuels with a high degree of both vertical and horizontal continuity are the most hazardous, particularly when they occur on slopes. Heavier fuels (brush and trees) are more hazardous (i.e. produce a more intense fire) than light fuels such as grass.

Mitigation of wildfire hazards focuses on breaking up the continuity of horizontal and vertical fuels. Additional distance between fuels is required on slopes.

Creating an effective defensible space involves developing a series of management zones in which different treatment techniques are used. See Figure 1 for a general view of the relationships among these management zones. Develop defensible space around each building on your property. Include detached garages, storage buildings, barns and other structures in your plan.

The actual design and development of your defensible space depends on several factors: size and shape of buildings, materials used in their construction, the slope of the ground on which the structures are built, surrounding topography, and sizes and types of vegetation on your property. These factors all affect your

Colorado State University Cooperative Extension

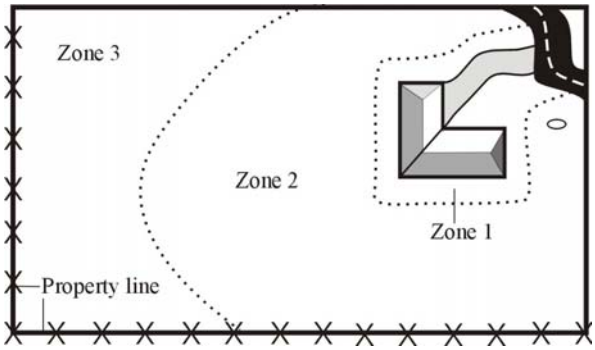


Figure 1: Forested property showing the three fire-defensible zones around a home or other structure.

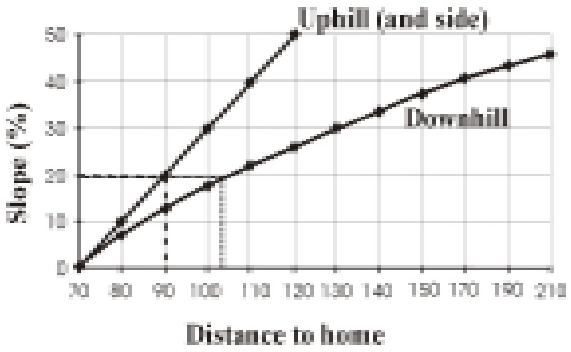


Figure 2: This chart indicates the *minimum recommended* dimensions for defensible space from the home to the outer edge of Zone 2. For example, if your home is situated on a 20 percent slope, the minimum defensible space dimensions would be 90 feet uphill and to the sides of the home and 104 feet downhill from the home.

design. You may want to request additional guidance from your local Colorado State Forest Service (CSFS) forester or fire department. (See the Special Recommendations section of this fact sheet for shrubs, lodgepole pine, Engelmann spruce, and aspen.)

Defensible Space Management Zones

Zone 1 is the area of maximum modification and treatment. It consists of an area of 15 feet around the structure in which all flammable vegetation is removed. This 15 feet is measured from the outside edge of the home's eaves and any attached structures, such as decks.

Zone 2 is an area of fuel reduction. It is a transitional area between Zones 1 and 3. The size of Zone 2 depends on the slope of the ground where the structure is built. Typically, the defensible space should extend *at least* 75 to 125 feet from the structure. See Figure 2 for the appropriate distance for your home's defensible space. Within this zone, the continuity and arrangement of vegetation is modified. Remove stressed, diseased, dead or dying trees and shrubs. Thin and prune the remaining larger trees and shrubs. Be sure to extend thinning along either side of your driveway all the way to your main access road. These actions help eliminate the continuous fuel surrounding a structure while enhancing homesite safety and the aesthetics of the property.

Zone 3 is an area of traditional forest management and is of no particular size. It extends from the edge of your defensible space to your property boundaries.

Prescriptions

Zone 1

The size of Zone 1 is 15 feet, measured from the edges of the structure. Within this zone, several specific treatments are recommended.

Plant nothing within 3 to 5 feet of the structure, particularly if the building is sided with wood, logs or other flammable materials. Decorative rock, for example, creates an attractive, easily maintained, nonflammable ground cover.

If the house has noncombustible siding, widely spaced foundation plantings of low growing shrubs or other "fire wise" plants are acceptable. Do not plant directly beneath windows or next to foundation vents. Be sure there are no areas of continuous grass adjacent to plantings in this area.

Frequently prune and maintain plants in this zone to ensure vigorous growth and a low growth habit. Remove dead branches, stems and leaves.

Do not store firewood or other combustible materials in this area. Enclose or screen decks with metal screening. Extend the gravel coverage under the decks. Do not use areas under decks for storage.

Ideally, remove all trees from Zone 1 to reduce fire hazards. If you do keep a tree, consider it part of the structure and extend the distance of the entire defensible space accordingly. Isolate the tree from any other surrounding trees. Prune it to at least 10 feet above the ground. Remove any branches that interfere with the roof or are within 10 feet of the chimney. Remove all "ladder fuels" from beneath the tree. Ladder fuels are vegetation with vertical continuity that allows fire to burn from ground level up into the branches and crowns of trees. Ladder fuels are potentially very hazardous but are easy to mitigate. No ladder fuels can be allowed under tree canopies. In all other areas, prune all branches of shrubs or trees up to a height of 10 feet above ground (or 1/2 the height, whichever is the least).

Zone 2

Zone 2 is an area of fuel reduction designed to reduce the intensity of any fire approaching your home. Follow these recommended management steps.

Thin trees and large shrubs so there is at least 10 feet between crowns. Crown separation is measured from the furthest branch of one tree to the nearest branch on the next tree (Figure 3). On steep slopes, allow more space between tree crowns. (See Figure 4 for *minimum recommended* spacing for trees on steep slopes.) Remove all ladder fuels from under these remaining trees. Carefully prune trees to a height of at least 10 feet.

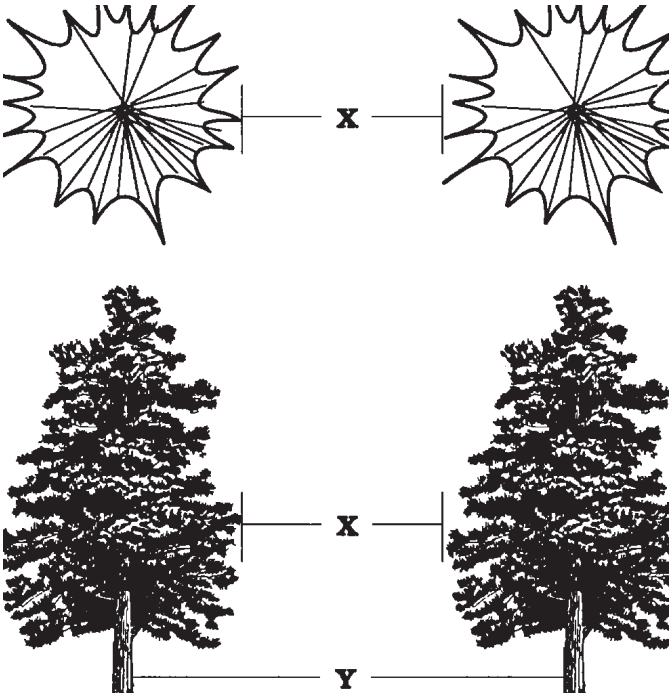


Figure 3: X = crown spacing; Y = stem spacing. Do not measure between stems for crown — measure between the edges of tree crowns.

Small clumps of 2 to 3 trees may be occasionally left in Zone 2. Leave more space between the crowns of these clumps and surrounding trees.

Because Zone 2 forms an aesthetic buffer and provides a transition between zones, it is necessary to blend the requirements for Zones 1 and 3. Thin the portions of Zone 3 adjacent to Zone 2 more heavily than the outer portions.

Isolated shrubs may remain, provided they are not under tree crowns. Prune and maintain these plants periodically to maintain vigorous growth. Remove dead stems from trees and shrubs annually. Where shrubs are the primary fuel in Zone 2, refer to the Special Recommendations section of this fact sheet.

Limit the number of dead trees (snags) retained in this area. Wildlife needs only one or two snags per acre. Be sure any snags left for wildlife cannot fall onto the house or block access roads or driveways.

Mow grasses (or remove them with a weed trimmer) as needed through the growing season to keep them low, a maximum of 6 to 8 inches. This is extremely critical in the fall when grasses dry out and cure or in the spring after the snow is gone but before the plants green up.

Stack firewood and woodpiles uphill or on the same elevation as the structure but at least 30 feet away. Clear and keep away flammable vegetation within 10 feet of these woodpiles. Do not stack wood against your house or on or under your deck, even in winter. Many homes have burned from a woodpile that ignited as the fire passed. Wildfires can burn at almost any time in Colorado.

Locate propane tanks at least 30 feet from any structures, preferably on the same elevation as the house. You don't want the LP container below your house — if it ignites, the fire would tend to burn uphill. On the other hand, if the tank is above your house and it develops a leak, LP gas will flow downhill into your home. Clear and keep away flammable vegetation within 10 feet of these tanks. Do not screen propane tanks with shrubs or vegetation.

% slope	Tree Crown Spacing	Brush and Shrub Clump Spacing
0 -10 %	10´	2 1/2 x shrub height
11 - 20%	15´	3 x shrub height
21 - 40%	20´	4 x shrub height
> 40%	30´	6 x shrub height

Figure 4: Minimum tree crown and shrub clump spacing.

Tree Diameter (in inches)	Average Stem Spacing Between Trees (in inches)
3	10
4	11
5	12
6	13
7	14
8	15
9	16
10	17
11	19
12	21
13	23
14	24
15	26
16	28
17	29
18	31
19	33
20	35
21	36
22	38
23	40
24	42

Figure 5: Minimum tree spacing for Zone 3.

Dispose of slash (limbs, branches and other woody debris) from your trees and shrubs through chipping or by piling and burning. Contact your local CSFS office or county sheriff's office for information about burning slash piles. If neither of these alternatives is possible, lop and scatter slash by cutting it into very small pieces and distributing it over the ground. Avoid heavy accumulations of slash. Lay it close to the ground to speed decomposition. If desired, no more than two or three small, widely spaced brush piles may be left for wildlife purposes. Locate these towards the outer portions of your defensible space.

Zone 3

This zone is of no specified size. It extends from the edge of your defensible space to your property lines. A gradual transition into this zone from defensible space standards to other management objectives you may have is suggested. Typical management objectives for areas surrounding homesites or subdivisions are: provide optimum recreational opportunities; enhance aesthetics; maintain tree health and vigor; provide barriers for wind, noise, dust and visual intrusions; support limited production of firewood, fence posts and other forest commodities; or grow Christmas trees or trees for transplanting.

Specific requirements will be dictated by your objectives for your land and the kinds of trees present. See Figure 5 for the *minimum* suggested spacing between "leave" trees. Forest management in Zone 3 is an opportunity for you to increase the health and growth rate of the forest in this zone. Keep in mind that root competition for available moisture limits tree growth and ultimately the health of the forest.

A high canopy forest reduces the chance of a surface fire climbing into the tops of the trees and might be a priority for you if this zone slopes steeply. The healthiest forest is one that has multiple ages, sizes, and species of trees where adequate growing room is maintained over time. Remember to consider the hazards of ladder fuels. Multiple sizes and ages of trees might increase the fire hazard from Zone 3 into Zone 2, particularly on steep slopes.

A greater number of wildlife trees can remain in Zone 3. Make sure that dead trees pose no threat to power lines or fire access roads.

While pruning generally is not necessary in Zone 3, it may be a good idea from the standpoint of personal safety to prune trees along trails and fire access roads. Or, if you prefer the aesthetics of a well-manicured forest, you might prune the entire area. In any case, pruning helps reduce ladder fuels within the tree stand, thus enhancing wildfire safety.

Mowing is not necessary in Zone 3.

Any approved method of slash treatment is acceptable for this zone, including piling and burning, chipping or lop-and-scatter.

Special Recommendations

Tree spacing guidelines do not apply to *mature* stands of aspen trees where the recommendations for ladder fuels have been complied with. In areas of aspen regeneration and young trees, the spacing guidelines should be followed.

Brush and shrubs

Brush and shrubs are woody plants, smaller than trees, often formed by a number of vertical or semi-upright branches arising close to the ground. Brush is smaller than shrubs and can be either woody or herbaceous vegetation.

On nearly level ground, minimum spacing recommendations between clumps of brush and/or shrubs is 2 1/2 times the height of the vegetation. Maximum diameter of clumps should be 2 times the height of the vegetation. As with tree crown spacing, all measurements are made from the edges of vegetation crowns (Figure 3).

For example: For shrubs 6 feet high, spacing between shrub clumps should be 15 feet or more apart (measured from the edges of the crowns of vegetation clumps). The diameter of shrub clumps should not exceed 12 feet (measured from the edges of the crowns). Branches should be pruned to a height of 3 feet.

Grasses

Keep dead, dry or curing grasses mowed to less than 6 inches. Defensible space size where grass is the predominant fuel can be reduced (Figure 5) when applying this practice.

Windthrow

In Colorado, certain locations and tree species, including lodgepole pine and Engelmann spruce, are especially susceptible to damage and uprooting by high winds (windthrow). If you see evidence of this problem in or near your forest, or have these tree species, consider the following adjustments to the defensible space guidelines. It is highly recommended that you contact a professional forester to help design your defensible space.

Adjustments: If your trees or homesite are susceptible to windthrow and the trees have never been thinned, use a stem spacing of diameter plus five instead of the guides listed in the Zone 3 section. Over time (every 3 to 5 years) *gradually* remove additional trees. The time between cutting cycles allows trees to "firm up" by expanding their root systems. Continue this periodic thinning until the desired spacing is reached.

Also consider leaving small clumps of trees and creating small openings on their lee side (opposite of the predominant wind direction). Again, a professional forester can help you design the best situation for your specific homesite and tree species. Remember, with species such as lodgepole pine and Engelmann spruce, the likelihood of a wildfire running through the tree tops or crowns (crowning) is closely related to the overabundance of fuels on the forest floor. Be sure to remove downed logs, branches and *excess* brush and needle buildup.

% slope	D-space size (uphill, downhill, sidehill)
0 - 20 %	30’
21 - 40%	50’
> 40%	70’

Figure 6: Minimum defensible space size for grass fuels.

Maintaining Your Defensible Space

Your home is located in a forest that is dynamic, always changing. Trees and shrubs continue to grow, plants die or are damaged, new plants begin to grow, and plants drop their leaves and needles. Like other parts of your home, defensible space requires maintenance. Use the following checklist each year to determine if additional work or maintenance is necessary.

Defensible Space and FireWise Annual Checklist

- ❑ Trees and shrubs are properly thinned and pruned within the defensible space. Slash from the thinning is disposed of.
- ❑ Roof and gutters are clear of debris.
- ❑ Branches overhanging the roof and chimney are removed.
- ❑ Chimney screens are in place and in good condition.
- ❑ Grass and weeds are mowed to a low height.
- ❑ An outdoor water supply is available, complete with a hose and nozzle that can reach all parts of the house.
- ❑ Fire extinguishers are checked and in working condition.
- ❑ The driveway is wide enough. The clearance of trees and branches is adequate for fire and emergency equipment. (Check with your local fire department.)
- ❑ Road signs and your name and house number are posted and easily visible.

FIREWISE is a multi-agency program that encourages the development of defensible space and the prevention of catastrophic wildfire.

- ❑ There is an easily accessible tool storage area with rakes, hoes, axes and shovels for use in case of fire.
- ❑ You have practiced family fire drills and your fire evacuation plan.
- ❑ Your escape routes, meeting points and other details are known and understood by all family members.
- ❑ Attic, roof, eaves and foundation vents are screened and in good condition. Stilt foundations and decks are enclosed, screened or walled up.
- ❑ Trash and debris accumulations are removed from the defensible space.
- ❑ A checklist for fire safety needs inside the home also has been completed. This is available from your local fire department.

References

Colorado State Forest Service, Colorado State University, Fort Collins, CO 80523-5060; (970) 491-6303:

- *FireWise Construction — Design and Materials*
- Home Fire Protection in the Wildland Urban Interface
- Wildfire Protection in the Wildland Urban Interface
- *Landowner Guide to Thinning*

Colorado State University Cooperative Extension, 115 General Services Bldg., Fort Collins, CO 80523-4061; (970) 491-6198; E-mail: cerc1@ur.colostate.edu:

- 6.303, *Fire-Resistant Landscaping*
- 6.304, *Forest Home Fire Safety*
- 6.305, *FireWise Plant Materials*
- 6.306, *Grass Seed Mixes to Reduce Wildfire Hazard*
- 7.205, *Pruning Evergreens*
- 7.206, *Pruning Shrubs*
- 7.207, *Pruning Deciduous Trees*

This fact sheet was produced in cooperation with the Colorado State Forest Service.

[1]*Wildfire Hazard Mitigation Coordinator, Colorado State Forest Service.*

ELK STREAM RANCH CWPP
APPENDIX F

Driveways Standards from the Colorado Firewise Web Site
Rev 07/09/07

Note: the following are general standards for driveways. Ensure that your driveway and signage complies with local regulations. Because your local fire department may have special equipment, please check with your **fire chief** for other specifics.

Driveway Standards

During a wildfire, firefighters will not drive their engine into your driveway if they feel it is unsafe for them to do so. What makes a safe driveway? Basically it is the same as defensible space around your home: Clearing and thinning vegetation from the roadway both horizontally and vertically, as well as providing a turnaround big enough for the engine, and turnouts to provide room for other vehicles to pass by safely.

Width of driveway: The all weather surface should be at least 12 ft. wide.

Vertical clearance: Engines and the equipment on them are tall. Prune tree branches to provide at least 15 ft. of clearance.

Turnaround: A turnaround near your house should be provided with at least a 50 ft. radius. A "Hammerhead - T" with a minimum of 60 ft. across the top, is an alternative.

Turnouts: A turnout is a wide place in your driveway that will allow another vehicle (or fire engine) to pass. It should be at least 10 ft. wide and 30 ft. long. If your driveway is over 400 ft. long, a turnout should be provided at least every 400 ft.

Other considerations:

Grade: Your driveway should not exceed 15% grade. Avoid a sharp change in grade.

Intersection: Where your driveway intersects the main road, the intersection should be as close to a 90 degree T as possible to facilitate turns from both directions. Is it signed?

Bridges & Culverts: Water hauling tenders are heavy (some in excess of 80,000 lbs.). Sign the rated capacity of your bridges & culverts.

Pipe crossings, Septic tanks & leach fields: These can collapse under a heavy engine, trapping it. Be sure you have signs ready to put up designating these hazards if you have to evacuate.

Ask your fire department for a driveway FireWise safety review!

ELK STREAM RANCH CWPP
APPENDIX G

Fuelbreak Guidelines for Forested Subdivisions & Communities

By

Frank C. Dennis

Colorado State Forest Service
Knowledge to Go Places

This publication was developed for use by foresters, planners, developers, homeowners' associations and others. Implementation of these measures cannot *guarantee* safety from all wildfires, but will greatly increase the probability of containing them at more manageable levels.

Inadequate fire planning can result in loss of life or property and costly suppression activities.

Colorado's forested lands are experiencing severe impacts from continuing population increases and peoples' desire to escape urban pressures. Subdivisions and developments are opening new areas for homesite construction at an alarming rate, especially along the Front Range and around recreational areas such as Dillon, Vail, and Steamboat Springs.

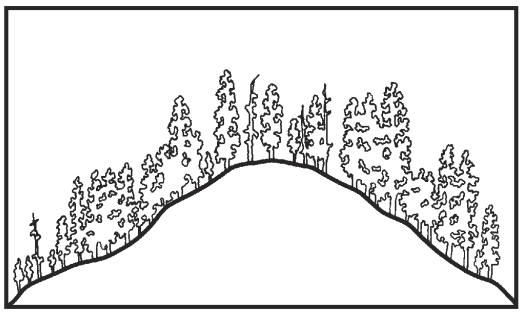
But with development inevitably comes a higher risk of wildfire as well as an ever-increasing potential for loss of life and property. Methods of fire suppression, pre-suppression needs, and homeowner and fire crew safety must all be considered in the planning and review of new developments as well as for the "retrofitting" of existing, older subdivisions.

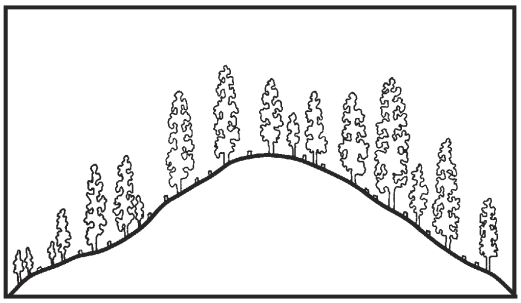
Fuelbreaks should be considered in fire management planning for subdivisions and developments; however, the following are guidelines **only**. They should be customized to local areas by professional foresters experienced in Rocky Mountain wildfire behavior and suppression tactics.

Fuelbreak vs Firebreak

Although the term fuelbreak is widely used in Colorado, it is often confused with firebreak. The two are entirely separate, and aesthetically different, forms of forest fuel modification and treatment.

• A firebreak is strip of land, 20 to 30 feet wide (or more), in which all vegetation is removed down to bare, mineral soil each year prior to fire season.





Above, cross section of mixed conifer stand before fuelbreak modification. Below, after modification.

• A fuelbreak (or shaded fuelbreak) is an easily accessible strip of land of varying width (depending on fuel and terrain), in which fuel density is reduced, thus improving fire control opportunities. The stand is thinned, and remaining trees are pruned to remove ladder fuels. Brush, heavy ground fuels, snags, and dead trees are disposed of and an open, park-like appearance is established.

The following is a discussion of the uses, limitations, and specifications of fuelbreaks in wildfire control and fuels management.

Fuelbreak Limitations

Fuelbreaks provide quick access for wildfire suppression. Control activities can be conducted more safely due to low fuel volumes. Strategically located, they break up large, continuous tracts of dense timber, thus limiting uncontrolled spread of wildfire.

Fuelbreaks can aid firefighters greatly by slowing fire spread under normal burning conditions. However, under extreme conditions, even the best fuelbreaks stand little chance of arresting a large

Before and after photos of a forest stand thinned to reduce fuel loads.

fire, regardless of firefighting efforts. Such fires, in a phenomenon called "spotting," can drop firebrands 1/8-mile or more ahead of the main fire, causing very rapid fire spread. These types of large fires may continue until there is a major change in weather conditions, topography, or fuel type.

It is critical to understand: A fuelbreak is the line of defense. The area (including any homes and developments) between it and the fire may remain vulnerable.

In spite of these somewhat gloomy limitations, fuelbreaks have proven themselves effective in Colorado. During the 1980 Crystal Lakes Subdivision Fire near Fort Collins, crown fires were stopped in areas with fuelbreak thinnings, while other areas of dense lodgepole pine burned completely. A fire at O'Fallon Park in Jefferson County was successfully stopped and controlled at a fuelbreak. The Buffalo Creek Fire in Jefferson County (1996) and the High Meadow Fire in Park and Jefferson Counties (2000) slowed dramatically wherever intense forest thinnings had been completed. During the 2002 Hayman Fire, Denver Water's entire complex of offices, shops and caretakers' homes at Cheesman Reservoir were saved by a fuelbreak with no firefighting intervention by a fuelbreak.

Burned area near Cheesman Reservoir as a result of the Hayman Fire. Note the unburned green trees in the middle right of the photo, a treated fuelbreak.

The Need For A Fuelbreak

Several factors determine the need for fuelbreaks in forested subdivisions, including: (1) potential problem indicators; (2) wildfire hazard areas; (3) slope; (4) topography; (5) crowning potential; and (6) ignition sources.

Potential Problem Indicator

The table below explains potential problem indicators for various hazards and characteristics common to Colorado's forest types. All major forest types, except aspen, indicate a high potential for wildfire hazard.

Fuel Type	Characteristics			Hazards			
	Aesthetics	Wildlife	Soil	**Wildfire**	Avalanche	Flood	Climate
Aspen	2	3	3	**2**	4	3	2
Douglas-fir	2	2	3	**5**	2	2	3
Greasewood-Saltbrush	4	2	2	**2**	1	3	3
Limber-Bristlecone Pine	3	2	4	**3**	4	2	5
Lodgepole Pine	2	2	3	**5**	4	2	4
Meadow	5	4	4	**2**	3	4	3
Mixed Conifer	2	1	1	**5**	3	1	3
Mountain Grassland	5	3	4	**3**	3	2	4
Mountain Shrub	3	5	4	**4**	2	2	3
Piñon-Juniper	2	3	4	**4**	2	3	2
Ponderosa Pine	2	3	1	**5**	2	2	3
Sagebrush	4	4	3	**3**	3	2	3
Spruce-Fir	2	3	3	**4**	5	**3**	4

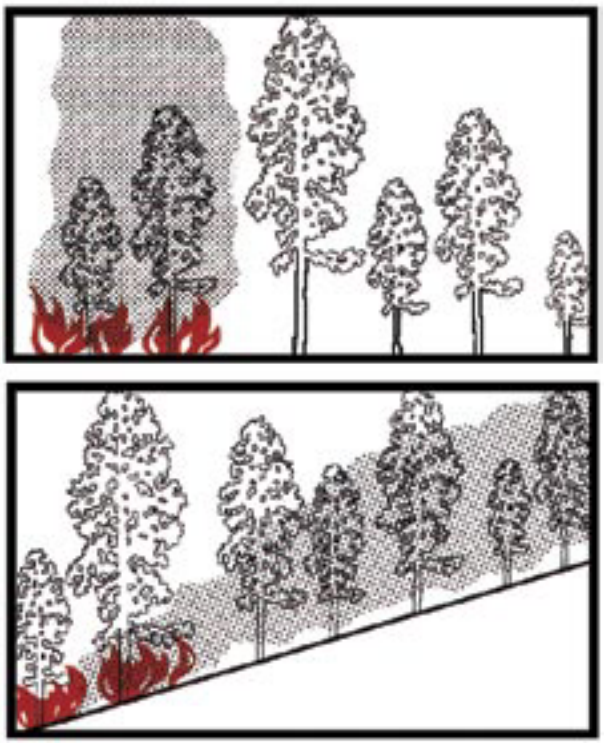
Legend: 5 – Problem may be crucial; 4 – Problem very likely;
3 – Exercise caution; 2 – Problem usually limited;
1 – No rating possible

Wildfire Hazard Maps

The Colorado State Forest Service (CSFS), numerous counties and some National Forests have completed wildfire hazard mapping for many areas within Colorado, particularly along the Front Range. These maps typically consider areas with 30 percent or greater slope; hazardous fuel types; and hazardous topographic features such as fire chimneys. Wildfire Hazard Ratings may be depicted in several ways. Whatever system is used, areas rated moderate or higher should be considered for fuel modification work.

Slope

Rate of fire spread increases as the slope of the land increases. Fuels are preheated by the rising smoke column or they may even come into contact with the flames themselves.



Fire effects, flat vs steep terrain. Note preheating of fuels on steep ground from passage of smoke column.

At 30 percent slope, rate of fire spread doubles compared to rates at level ground, drastically reducing firefighting effectiveness. **Areas near 30 percent or greater slopes are critical and must be reviewed carefully.**

Topography

Certain topographic features influence fire spread and should be evaluated. Included are fire chimneys, saddles, and V-shaped canyons. They are usually recognized by reviewing standard U.S.G.S. quad maps.

• Chimneys are densely vegetated drainages on slopes greater than 30 percent. Wind, as well as air pre-heated by a fire, tends to funnel up these drainages, rapidly spreading fire upslope.

Chimney.

• Saddles are low points along a main ridge or between two high points. Like chimneys, they also funnel winds to create a natural fire path during a fire's uphill run. Saddles act as corridors to spread fire into adjacent valleys or drainages.

Saddle.

• Narrow, V-shaped valleys or canyons can ignite easily due to heat radiating from one side to the other. For example, a fire burning on one side of a narrow valley dries and preheats fuels on the opposite side until the fire "flashes over." The natural effect of slope on fire then takes over and fire spreads rapidly up drainage and uphill along both sides of the valley.

Flashover in V-shaped valley.

Crowning Potential

An on-site visit is required to accurately assess crowning potential. A key, below, helps determine this rating. Fuel modification is usually unnecessary if an area has a rating of 3 or less.

Crowning Potential Key

	Rating
A. Foliage present, trees living or dead — B	
B. Foliage living — C	
C. Leaves deciduous or, if evergreen, usually soft, pliant, and moist; never oily, waxy, or resinous.	0
CC. Leaves evergreen, not as above — D	
D. Foliage resinous, waxy, or oily — E	
E. Foliage dense — F	
F. Ladder fuels plentiful — G	
G. Crown closure > 75 percent	9
GG. Crown closure < 75 percent	7
FF. Ladder fuels sparse or absent — H	
H. Crown closure > 75 percent	7
HH. Crown closure < 75 percent	5
EE. Foliage open — I	
I. Ladder fuel plentiful	4
II. Ladder fuel sparse or absent	2
DD. Foliage not resinous, waxy, or oily — J	
J. Foliage dense — K	
K. Ladder fuels plentiful — L	
L. Crown closure > 75 percent	7
LL. Crown closure < 75 percent	4
KK. Ladder fuels sparse or absent — M	
M. Crown closure > 75 percent	5
MM. Crown closure < 75 percent	3
JJ. Foliage open — N	
N. Ladder fuels plentiful	3
NN. Ladder fuels sparse or absent	1
BB. Foliage dead	0

The majority of dead trees within the fuelbreak should be removed. Occasionally, large, dead trees (14 inches or larger in diameter at 4 1/2 feet above ground level) may be retained as wildlife trees. If retained, all ladder fuels must be cleared from around the tree's trunk.

Ignition Sources

Possible ignition sources, which may threaten planned or existing developments, must be investigated thoroughly. Included are other developments and homes, major roads, recreation sites, railroads, and other possible sources. These might be distant from the proposed development, yet still able to channel fire into the area due to slope, continuous fuels, or other topographic features.

Fuelbreak Locations

In fire suppression, an effective fire line is connected, or "anchored," to natural or artificial fire barriers. Such anchor points might be rivers, creeks, large rock outcrops, wet meadows, or a less flammable timber type such as aspen. Similarly, properly designed and constructed fuelbreaks take advantage of these same barriers to eliminate "fuel bridges." (Fire often escapes control because of fuel bridges that carry the fire across control lines.)

Since fuelbreaks should normally provide quick, safer access to defensive positions, they are necessarily linked with road systems. Connected with county-specified roads within subdivisions, they provide good access and defensive positions for firefighting equipment and support vehicles. Cut-and fill slopes of roads are an integral part of a fuelbreak as they add to the effective width of modified fuels.

Fuelbreaks without an associated road system, such as those located along strategic ridge lines, are still useful in fire suppression. Here, they are often strengthened and held using aerial retardant drops until fire crews can walk in or be ferried in by helicopter.

Preferably, fuelbreaks are located along ridge tops to help arrest fires at the end of their runs. However, due to homesite locations and resource values, they can also be effective when established at the base of slopes. Mid-slope fuelbreaks are least desirable, but under certain circumstances and with modifications, these too, may be valuable.

Fuelbreaks are located so that the area under management is broken into small, manageable units. Thus, when a wildfire reaches modified fuels, defensive action is more easily taken, helping to keep the fire small. For example, a plan for a subdivision might recommend that fuelbreaks break up continuous forest fuels into units of 10 acres or less. This is an excellent plan, especially if defensible space thinnings are completed around homes and structures, and thinning for forest management and forest health are combined with the fuelbreak.

When located along ridge tops, continuous length as well as width are critical elements. Extensive long-range planning is essential in positioning these types of fuelbreaks.

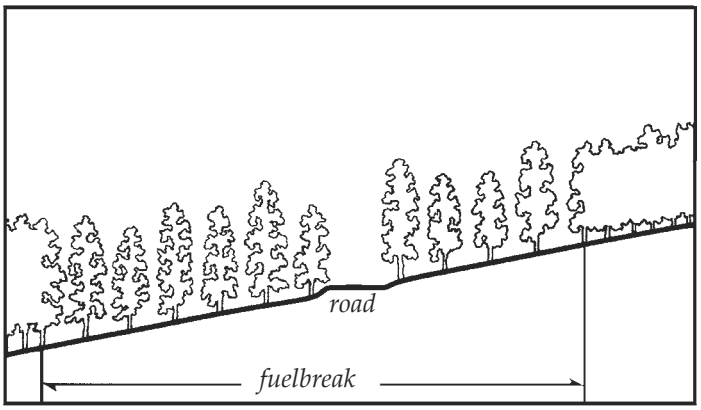
Aesthetics

Improperly planned fuelbreaks can adversely impact an area's aesthetic qualities. Careful construction is necessary when combining mid-slope fuelbreaks with roads involving excessive cut-and-fill.

These photos, far- and near- views of the same site, illustrate that forest can be thinned without impacting aesthetics.

Care must also be taken in areas that are not thinned throughout for fuel hazard reduction. In such cases the fuelbreak visually sticks out like a "sore thumb" due to contrasting thinned and unthinned portions of the forest. (Especially noticeable are those portions of the fuelbreak above road cuts).

These guidelines are designed to minimize aesthetic impacts. However, some situations may require extensive thinning and, thus, result in a major visual change to an area. Additional thinning beyond the fuelbreak may be necessary to create an irregular edge and to "feather," or blend, the fuelbreak thinning into the unthinned portions of the forest. Any thinning beyond the fuelbreak improves its effectiveness and is highly recommended.



Cross-section of a typical fuelbreak built in conjunction with a road.

Constructing the Fuelbreak

Fuelbreak Width and Slope Adjustments

Note: Since road systems are so important to fuelbreak construction, the following measurements are from the toe of the fill for downslope distances, and above the edge of the cut for uphill distances.

The minimum recommended fuelbreak width is approximately 300 feet for level ground. Since fire activity intensifies as slope increases, the overall fuelbreak width must also increase. However, to minimize aesthetic impacts and to maximize fire crew safety, the majority of the increases should be made at the bottom of the fuelbreak, below the road cut.

Widths are also increased when severe topographic conditions are encountered. Guidelines for fuelbreak widths on slopes are given below:

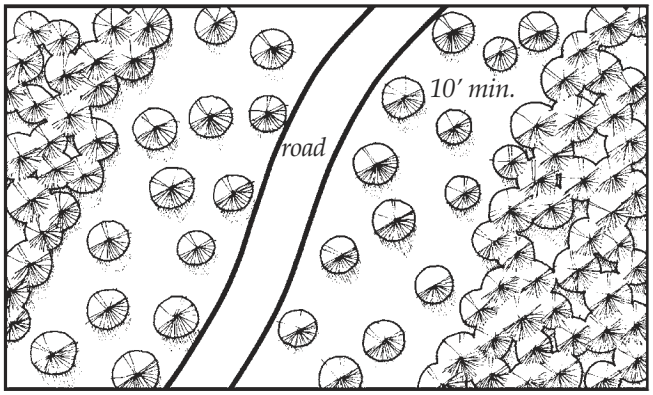
Fuelbreak Width/Slope

Percent Slope (%)	Minimum Uphill Distance (ft)	Minimum Downhill Distance (ft)	Total Width of Modified fuels (ft)*
0	150	150	300
10	140	165	303
20	130	180	310
30	120	195	315
40	110	210	320
50	100	225	325
60	100	240	340

*As slope increases, total distance for cut-and-fill for road construction rapidly increases, improving fuelbreak effective width.

Stand Densities

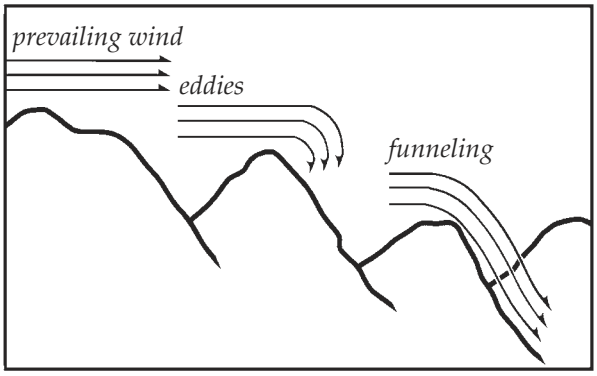
Crown separation is a more critical factor for fuelbreaks than a fixed tree density level. A *minimum* 10-foot spacing between the edges of tree crowns is recommended on level ground. As slope increases, crown spacing should also increase. However, small, isolated groups of trees may be retained for visual diversity. Increase crown spacing around any groups of trees left for aesthetic reasons and to reduce fire intensities and torching potential.



Plan view of fuelbreak showing minimum distance between tree crowns.

In technical terms, a fuelbreak thinning is classified as a heavy "sanitation and improvement cut, from below." Within fuelbreaks, trees that are suppressed, diseased, deformed, damaged, or of low vigor are removed along with all ladder fuels. Remaining trees are the largest, healthiest, most wind-firm trees from the dominant and co-dominant species of the stand.

Because such a thinning is quite heavy for an initial entry into a stand, prevailing winds, eddy effects, and wind funneling must be carefully evaluated to minimize the possibility of windthrow. It may be necessary to develop the fuelbreak over several years to allow the timber stand to "firm-up" — this especially applies to lodgepole pine and Engelmann spruce stands.



Topography affects wind behavior – an important consideration during fuelbreak construction.

Area-wide forest thinnings are recommended for any subdivisions. Such thinning is not as severe as a fuelbreak thinning, but generally should be completed to fuelbreak specifications along the roads (as outlined on page 6.) In addition, "defensible space thinnings" are highly recommended around all structures (see CSU Coop. Extension Fact sheet 6.302, *Creating Wildfire-Defensible Zones*).

Debris Removal

Limbs and branches left from thinning (slash) can add significant volumes of fuel to the forest floor, especially in lodgepole pine, mixed-conifer, or spruce/fir timber types. These materials can accumulate and serve as ladder fuels, or can become "jackpots," increasing the difficulty of defending the fuelbreak during a wildfire. **Slash decomposes very slowly in Colorado and proper disposal is essential.** Proper treatment reduces fire hazard, improves access for humans and livestock, encourages establishment of grasses and other vegetation, and improves aesthetics.

Three treatment methods are commonly used. These are lopping-and-scattering, piling and burning, and chipping. Mulching of small trees and slash using equipment similar to Hydro-axes or Timbcos equipped with mulching heads are becoming a popular method of treatment. Size, amount, and location of slash dictates the method used, in addition to cost and the final desired appearance. The method chosen will also depend on how soon an effective fuelbreak is needed prior to construction in new developments.

Lop and scatter: slash should be no deeper than 12'' above ground surface.

Chipping is the most desirable, but also the most expensive method of slash disposal.

Piled slash can be burned but only during certain conditions, such as after a snowfall.

Fuelbreak Maintenance

Following initial thinning, trees continue to grow (usually at a faster rate). The increased light on the forest floor encourages heavy grass and brush growth where, in many cases, where little grew before. The site disturbance and exposed mineral soil created during fuelbreak development is a perfect seed bed for new trees that, in turn, create new ladder fuels. Thus, in the absence of maintenance, fuelbreak effectiveness will decrease over time.

Fuelbreak maintenance is essential. Ingrowth, shown above, will minimize the effectiveness of this fuelbreak within a few years.

Fuelbreak maintenance problems are most often the result of time and neglect. Misplaced records, lack of follow-up and funding, and apathy caused by a lack of fire events are some of the major obstacles. In addition, the responsibility for fuelbreak maintenance projects is often unclear. For example, control of a fuelbreak completed by a developer passes to a homeowner's association, usually with limited funds and authority to maintain fuelbreaks.

If fuelbreak maintenance is not planned and completed as scheduled, consider carefully whether the fuelbreak should be constructed. An un-maintained fuelbreak may lead to a false sense of security among residents and fire suppression personnel.

Conclusion

An image of well-designed communities for Colorado includes:

• Forested subdivisions where the total forest cover is well-managed through carefully planned, designed, and maintained thinnings. This contributes to reduced wildfire hazards and a much healthier forest — one that is more resistant to insects and disease.

• A system of roads and driveways with their associated fuelbreaks that break up the continuity of the forest cover and fuels. These help keep fires small, while also providing safer locations from which to mount fire suppression activities. In addition to allowing fire personnel in, they will allow residents to evacuate if necessary.

• Individual homes that all have defensible space around them, making them much easier to defend and protect from wildfire, while also protecting the surrounding forest from structure fires.

Creation of such communities is entirely feasible if recognition of the fire risks, a spirit of cooperation, an attitude of shared responsibility, and the political will exists.

Colorado's mountains comprise diverse slopes, fuel types, aspects, and topographic features. This variety makes it impossible to develop general fuelbreak prescriptions for all locations. ***The previous recommendations are guidelines only.*** *A professional forester with fire suppression expertise should be consulted to "customize" fuelbreaks for particular areas.*

Appendix H redacted from web posting for privacy reasons

ELK STREAM RANCH CWPP APPENDIX I
WILDFIRE PLANNING CHECKLIST Rev 08/01/08

Introduction

Fire Hazard Mitigation involves actions to reduce the risk of destructive fires within the Elk Stream Ranch. Fire Response Planning addresses actions to be taken in anticipation of an actual fire event. Effective Fire Response Planning will facilitate a rapid and effective response to an emergency fire situation and reduce the danger to people, property and place.

The first priority in case of wildfire is to assure the safety of every person in the community. Every home should have an evacuation plan, and every person should understand that saving a life is more important than saving property. In case of wildfire, our priorities should be:

1. Protect lives. Generally, this means evacuate quickly.
2. Obtain assistance. Call for support from professional fire fighters.
3. Protect property only if this can be done safely.

Actions to be taken before the beginning of fire season:

- Every homeowner should develop their own household evacuation plan and should review this with all household members and guests.
- Residents should maintain a list of emergency contact numbers near to their phone and in their vehicles.
- Homeowners should maintain a list of items to be taken in case of emergency evacuation. During extreme fire conditions, these items should be kept in portable containers for immediate evacuation.
- Residents should maintain a disaster supply kit containing:
    - a supply of drinking water
    - a change of clothes and footwear for all family members
    - a blanket or sleeping bag for all family members
    - a first aid kit that also includes any personal medications
    - battery powered radio, flashlight and extra batteries
    - an extra set of car keys and credit cards or cash
    - an extra pair of special need items, such as eyeglasses
- Residents should be aware of the location of the fire safety areas within the Elk Stream meadows, which can be used for refuge in case the access roads are blocked (see map).
- Each homeowner should maintain their access driveway in a condition suitable for the safe ingress and egress of multiple fire fighting vehicles.
- The ESRPOA shall maintain road signs on CR 46 and CR G.3 to guide fire support personnel not familiar with this area.

- The ESRPOA will arrange for annual community visits and meetings with local fire officials to ensure that they are familiar with our community and we are aware of their capabilities and limitations.

EMERGENCY FIRE RESPONSE

In case of wildfire:

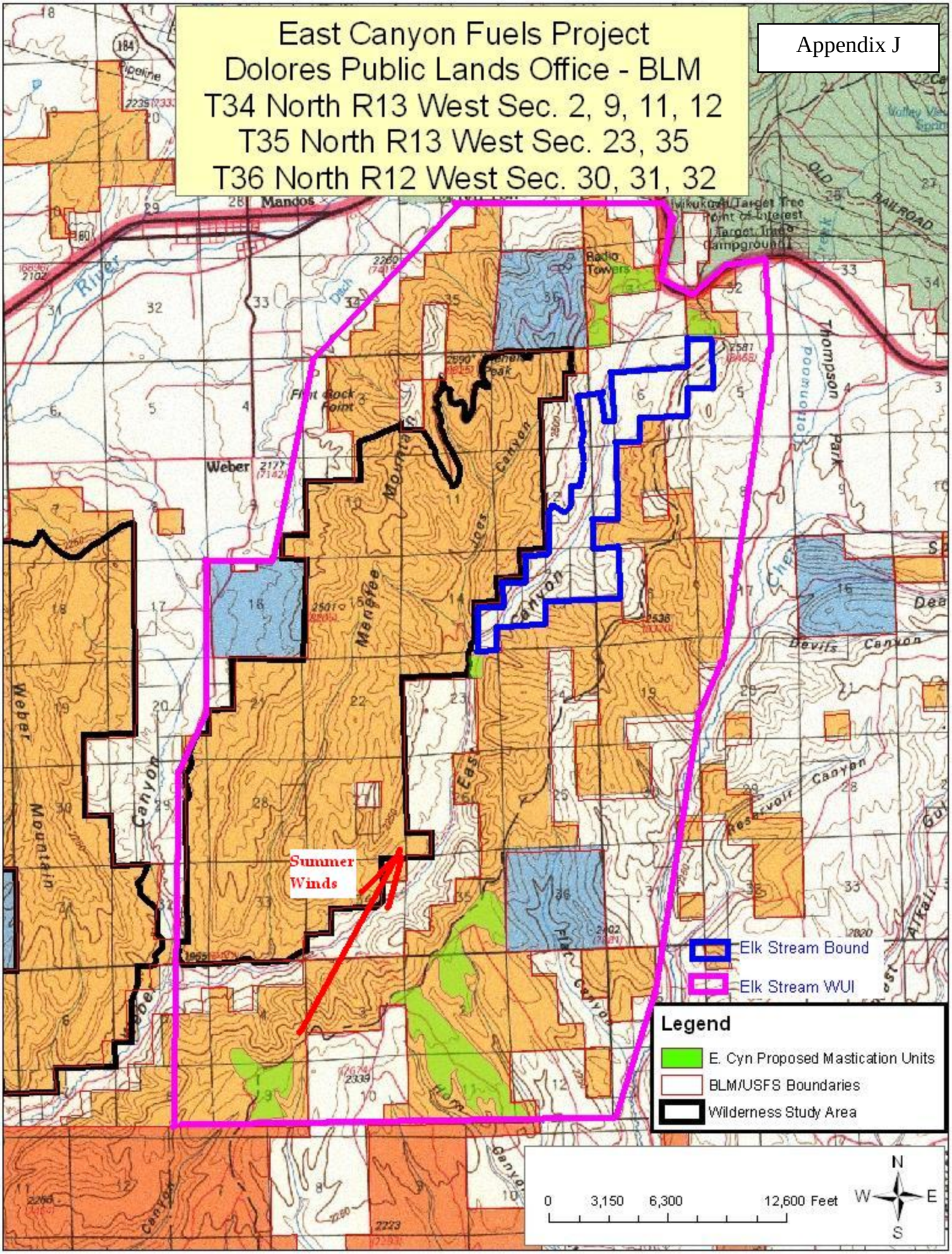
- **DO NOT JEOPARDIZE LIFE.** Homes can be rebuilt, people not.
- Assess the gravity of the situation and respond accordingly.
- CALL FOR ASSISTANCE – 911.
- Call your neighbors to alert them to the danger.
- Prepare to evacuate. Place valuables and your disaster supply kit in your vehicle, place keys in ignition, park facing out, and be ready to go.
- Keep your cell phone with you.
- Remove combustible material from around structures.
- Close windows, vents and shutters.
- Connect garden hose to outside spigot and charge the hose with water. Utilize enough hose to reach the entire house.
- Place a ladder against the house on the side opposite to the approaching fire.
- Turn on interior and exterior lights even during daylight hours.
- Fill tubs, sinks and other containers with water.
- Place portable pumps near to water supplies, such as cisterns or ponds.
- Shut off propane at the meter or tank.
- Remove material curtains from all windows and close Venetian blinds.
- Move overstuffed furniture away from windows and glass doors.
- Close house doors, but leave them unlocked.
- Close the garage door, but leave it unlocked and disconnected from garage door opener.
- Leave a note in a prominent place in your home that tells where you will be and how you can be contacted.
- Take small pets with you. Leave gates open for livestock to escape.

LAW ENFORCEMENT

Law enforcement in Elk Stream Ranch and unincorporated Montezuma County is the responsibility of the Montezuma County Sheriff's Department. The sheriff is the best contact in case of "unusual" emergencies (plane crash, fuel spill, flood …)

Contact numbers are:

- EMERGENCY 911
- Non-emergency business 565-8444
- Dispatch 565-8441


East Canyon Fuels Project
Dolores Public Lands Office - BLM
T34 North R13 West Sec. 2, 9, 11, 12
T35 North R13 West Sec. 23, 35
T36 North R12 West Sec. 30, 31, 32
Appendix J
Summer Winds
Elk Stream Bound
Elk Stream WUI
Legend
E. Cyn Proposed Mastication Units
BLM/USFS Boundaries
Wilderness Study Area
0
3,150
6,300
12,600 Feet
N
W
E
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