Making and Keeping a Fire Safe Home Site

What do I have to do to comply with LACFD Defensible Space Codes?

This series of guides offers advice and information so that the residents of Rolling Hills can bolster their safety during a wildfire. While no action can insure safety, the recommendations in this series will advance the chances damage and stress during a wildfire is reduced.

Vegetation management can reduce damage from wildfire

The body of this Guide to Brush Clearance Code Compliance covers where the vegetation management is to take place, and who is responsible for the management. It enumerates those actions to take; and details standards suggested for creating and maintaining defensible space, along emergency access ways and in easements.

This guide is one of a series of 5 that describe the steps recommended to create and maintain fire safe vegetation in Rolling Hills. Please also refer to the:

- How to Get the Work Done
- Creating Fire Safe Canyons
- Best Practices for Fuel Reduction
- Choosing Fuel Treatment Methods

Three Ways to Minimize Fire Damage

In order of decreasing effectiveness, there are three ways to minimize fire damage:

1. Reduce the amount of fuels available to burn;
2. Arrange the horizontal and vertical spacing of vegetation so that the fire cannot spread;
3. Reduce the flammability of fuels by increasing moisture in the current vegetation or by changing to a less flammable vegetation type.

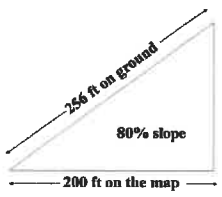
This guide offers specific actions that reduce total fuel volume, re-arrange the fuels and reduce their flammability

Areas Addressed

1. 200-ft from structure (defensible space)
2. Easements (both Roadside and Perimeter Easements)
3. Canyons

WITHIN 200-FT OF STRUCTURES

Because the entirety of Rolling Hills is in a Very High Fire Hazard Severity Zone, LACFD requires creation and maintenance of 200-ft of defensible space - a space where firefighters can take a stand to stop a fire. The distance is measured from a map, and not on the ground; this results in a much longer distance as measured on the ground.

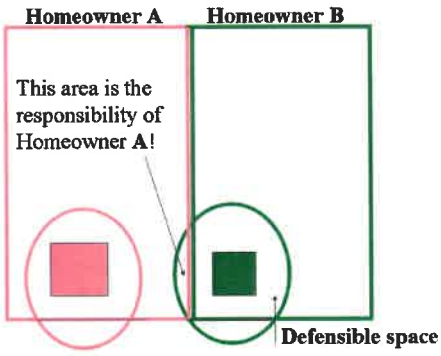


Slopes require wider distances be treated

The first 10 feet from the structure, then from 10-30 feet from the structure, are most important in determining the (potential) survival of the structure, in terms of wildfire risk. The primary cause of destruction of homes by wildfires is ignition from flying embers. These may originate in vegetation surrounding the home or from a more distant but powerful fire whose wind-driven embers drop into dry fuel on or around structures. Vegetation, including landscaping, can produce intense fire behavior that also can doom a structure. Reducing the volume of vegetation that is apt to burn decreases the fire intensity so the house is more likely to survive. Maintaining an "ignition-free zone" surrounding the structure increases its survivability.

Responsibility

The property owner is responsible for maintaining defensible space for a distance of 200-ft from a structure, even if it the neighbor's structure. Stated differently, the property owner with the vegetation within 200-ft of a structure is responsible for maintain the vegetation in a fire-safe condition.



Each owner is responsible for the maintenance of all grass, shrubs and trees in this zone so that is in compliance with local fire safe regulations.

Specifically owners should avoid the creation of a "ladder fuel situation" where a fire can climb from one vegetation layer to the next. Thus, the vertical distance between the ground and the lowest tree branches should be 3 times the height of any shrubs planted beneath the trees or 8 feet whichever is higher.

The Los Angeles County Fire Department is responsible for inspecting the property annually.

Planting Types and Location

At all times the property should be free of prohibited plants. New landscaping and that associated with new construction are to be approved by the Landscape Committee of RHCA before implementation. While an owner is free to propose planting any size plant and any density of planting owners are encouraged to plant fire resistant and native plants and to plant them in a location and density that is fire safe.

- Keep plant fuels away from windows and vents and under eaves. Mature shrubs should be no closer to windows or vents than twice the height of the shrub. Shrubs should be no higher than one-half the height to the eave.

Shrubs should be less than one-half the height to the eave

- In groups of large trees next to structures, easements or roadways, one or more may need to be removed.
- Do not plant shrubs under or within 6-ft of a tree canopy. Creation of ladder fire situations where a fire can climb from on vegetation layer to the next is prohibited. Size, density and location of plantings should be such that access for fire personnel and equipment is not compromised.

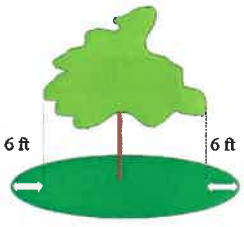
Well-spaced and well-pruned trees

- New or replacement plants should be fire resistant in nature.

Dead Material

All dead plants and dry vegetation should be removed to establish and maintain a defensible space. Dead material will be removed from the site or chipped and spread as mulch (not to exceed 6 inches depth).

1. Cut grass and weeds within 70 ft from the structure to a height of less than 4 inches yearly, before June 1. Mow from under the tree to 6ft from dripline of tree canopy.



Mow under trees for the entirety of 200-ft from

2. Re-cut the grass if late season rains promote grass growth after first cutting. Cutting of native grass and wildflowers may be delayed until seed set if they do not form a means of rapidly transmitting fire to any structures.
3. Dead material that drapes over ground cover should be removed yearly, before June 1. This includes leaves, bark and branches.
4. Remove from mature trees all vines, loose papery bark, all dead branches smaller than 3 inches in diameter, to 8 feet from the ground. If the entire tree is dead, remove the entire tree.
5. Remove all dead branches from shrubs and immature trees.
6. Remove dead material from roof, gutters, deck, patios, etc.

Pruning Trees

Trees and tall shrubs (e.g. sugar bush, toyon, myoporum oaks,) should be pruned to provide clearance of 3 times the height of the understory material or 8 feet whichever is higher. See Figure 1 on following page.

Limbs which are smaller than 3 inches in diameter should be pruned up to 8 feet off the ground, and in young trees, the lower one-third of the height of the tree. Thus, if a tree is 10 feet tall, the lower 3-4 feet will be pruned up and understory plant material kept to less than one foot in height. Then as it grows to 24 feet in height the eight foot distance from the ground can be achieved and the understory material is allowed to reach 2.5 feet in height.

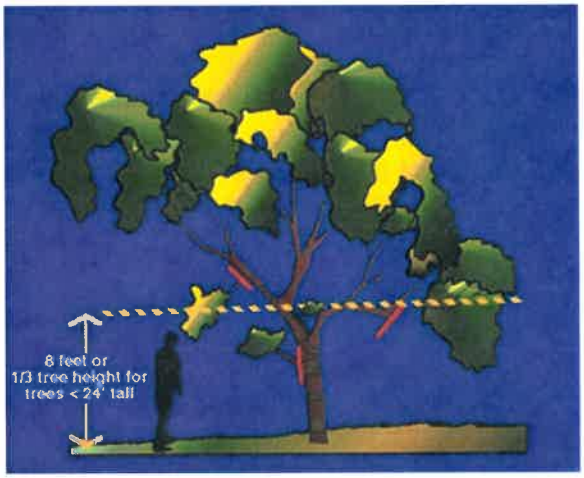


Figure 1 - Prune branches to a height of 8 ft above the ground. In young trees, prune branches on the lower one-third of the height of the tree. Do not disturb or thin the tree canopy. This promotes growth in the understory, which is more easily ignited.

Trees must be trimmed away from chimneys by at least 10 feet.

Trees and shrubs should be pruned so that the vents are 2 times the plant height.

The tree canopy should not be disturbed or thinned except by a licensed arborist as improper trimming can promote growth of more flammable vegetation.

"Volunteer" pines, eucalyptus and pepper trees should be removed when they are shorter than 3 feet.

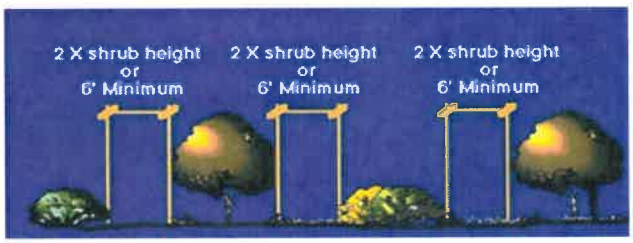
Pruning Shrubs

The goal for trimming shrubs is to maintain vertical and horizontal separation so that fire is unlikely to climb into the tree crowns. It is not desirable to remove all understory vegetation, but to trim back desirable species, or selectively remove flammable ones.

Shrubs under trees should generally be shorter than 18 in height. For example, myoporum shrubs that grow under eucalyptus or pine trees should be kept to an 18-inch height, which may be accomplished by cutting them to the ground periodically or trimming them slightly lower than 18 inches.

Alternatively, where shrubs are to be used for privacy under trees, trees should be pruned of lower tree branches to a height 2.5 to 3 times the height of the shrub

In open areas without trees, a mosaic of shrubby patches may be developed to accomplish the fire protection, habitat protection and aesthetic goals. Shrubs or shrub patches must be separated from each other by at least two times (2X) the height of the shrub patch and must be separated from the edge of the tree canopy by at least six feet.



Spacing between shrubs and trees: Design groups of plants small enough to provide for open spaces between the trees and shrubs when they mature.

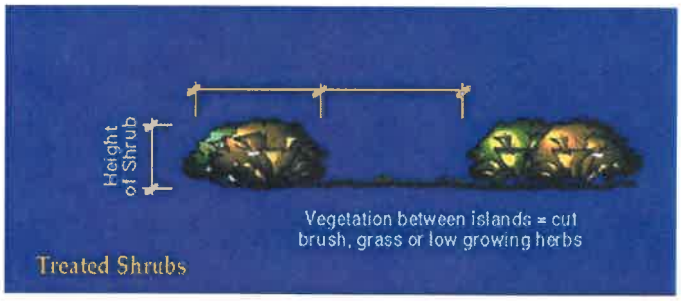
Desirable shrubs should be left for interest and diversity where trees occur, provided they are healthy. All dead branches should be removed from within any desirable shrubs.

For shrubs in the defensible space zone, the following actions will help meet fuel management goals:

- Shorten shrubs to be no taller than the item to be screened. In some cases the shrubs can be shorter than the item to be screened, with equally good effect.
- Minimize the shrub's volume by trimming it to be thin and wispy. Reduce the shrub's canopy and outer dimensions.

Pruning shrubs of lower branches is effective here

- Consider replacing older, massive shrubs with smaller ones that can be kept wispy, thin, and free of dead fuel.
- Trees of short stature may also be a suitable replacement for taller mature shrubs.
- Prune from the edge of the building out, so that the distance between the shrub and wall is maximized. A distance of 5 feet is advisable.
- Shrubs and short trees serve better as screening material than larger trees, as the limbs of taller trees may need to be pruned.
- Design groups of plants small enough to provide horizontal separation between groups. This allows proper maintenance and helps slow the spread of fire. The space between groups should be greater than three times the height of the tallest shrubs.



Special Areas

Special attention must be given to areas within 10 feet of a structure. In addition to fuel considerations, vegetation serves other vital purposes:

- Privacy – in front of windows, at entrances
- Screening and softening – large structural masses, heating/cooling devices, etc.
- Buffer – between roads and structures, between neighboring structures

When vegetation is located in small spaces, management requires greater attention to detail.

EASEMENTS

Perimeter Easements

Rolling Hills is unique in that it has easements that surround each parcel. The treatments within easements are different than the rest of the property; the roadsides require special attention.

Property owners are responsible for vegetation management in the easements. Within the perimeter easements no vegetation that requires irrigation can be installed. Similarly,

vegetation that blocks access between properties is prohibited.

This easement is free of trees and shrubs

The width of shrubs should be limited in the easements.

Trees should not block movement within the easement.

Roadsides

While the roadsides and even the roads themselves are privately owned, these routes provide a vital community function enabling fire response vehicles to enter and residents to leave. As such, they need to be kept in a fire-safe condition.

Well pruned and well spaced eucalyptus along roadside easement

Mow grass for 15 feet from both sides of the pavement of roads and driveways; a vertical clearance of at least 16.5 feet must be maintained for trees in this zone.

In the roadside area the required actions for the Defensible Space apply. Grasses must be mowed and surface fuels must be managed. Because roadside vegetation also serves as a privacy buffer between the road and structures, pruning must minimize fuel volume while still providing a thin screen.

Trees and shrubs must be pruned to be thin layers of wispy vegetation.

CANYONS

Canyon management is addressed in more detail in the Canyon Management Guide. Vegetation management beyond 200 feet from a structure is not required by codes regulating defensible space.

However, canyons do serve to accelerate fire spread to structures above, and unmanaged vegetation can pose a hazard that can overwhelm the best fire suppression forces.

The homeowner is responsible for any and all fuel management on their property, including the area in canyons.

Steep-sided canyons pose special hazards not directly regulated by defensible space code

Typically fire hazard reductions measures within the canyons focus on areas closer to structures (even though they are beyond 200 feet from a structure).

HOW TO GET THE WORK DONE

This guide is one of a series of 5 that describe the steps recommended to create and maintain fire resistant vegetation in the City of Rolling Hills. Please also refer to the:

- Making and Keeping a Fire Safe Home Site
- Creating Fire Safe Canyons
- Best Practices for Fuel Reduction
- Choosing Fuel Treatment Methods

The Los Angeles County Fire Department and other organizations offer many brochures and booklets on complying with fire safety regulations.

However, little guidance is offered regarding how to reach compliance -- what steps are needed or whose services could be employed.

This guide provides information regarding the process of selecting a contractor or gardener so that fuel management can be as easy as calling for pool service.

Overview of Desired Results

You know you have reached the goal of fuel management when:

1. No **dead material** remains other than mulch.
2. Any **shrubs or trees that are close to structures** do not create "**fuel ladders**" to your home or decks.
3. The fire department has access entirely around your home

The following information provides more details regarding the scope of work required to achieve the desired results.

Tips for Achieving the Desired Results: Who and When

- **Consider what you can do yourself and where a specialist could help.**
- Budget for an arborist to prune your specimen trees or a landscape designer to make your yard more beautiful and easier to maintain.
- **Think about a timeline to approach the work.** *For example:* if mature shrubs are to be removed, small groups of shrubs may be selected for removal the first year, and replacement planting installed. Adjacent shrubs may be removed the following year. This stepped approach allows you to transition the changes in your landscape so it never looks barren. **All work doesn't have to be done in one year.**
- **Late fall to early spring** is the best time to prune pines and eucalyptus. This reduces the spread of pests or disease and is healthier for the trees.
- **Fall planting is best.** This promotes strong root growth. Plantings in spring require **regular watering**.
- **Allow time for Landscape Committee review.** If re-landscaping large areas or landscaping is associated with new construction is included the Los Angeles County Fire Department and the Rolling Hills Landscape Committee will need to review and approve your plans.

Types of Professional Services Available for Fuel Management

There are several types of professional services that assist in fuel management around your home. Who you might call depends on the vegetation to be treated, slope steepness and special concerns.

Grass management can be done by a gardener, landscape maintenance or fire hazard reduction company. Steep slopes or numerous obstacles (including trees) may require that the work be done with weed whippers. Flat or gentle sloping areas can be treated more rapidly with a large, professional mower.

Shrub or tree work can be done by a landscape maintenance or gardening service. Aesthetics and the health of the plants should be preserved.

Brush in canyons may not be managed by some landscape maintenance firms. You may need to contact a fuel management or fire hazard reduction company. These companies may use crews of workers, mechanical equipment, or grazing animals to treat your property.

Who are You Going to Call?

The Rolling Hills Community Association and Rolling Hills City maintain a list of firms that have attended a presentation on fire safety requirements. This list is a logical first step for choosing a company to provide professional services.

Any work above the cost of $500 for labor and materials requires either a tree trimming or landscaping license be on file with the Contractors State License Board. Go to www.cslb.gov or call 1-800-321-2752 (CSLB) for further information. In California, both landscaping firms and tree service firms can do tree work, according to the Contractors State License Board.

When getting bids from various firms, obtain a written bid to cover the exact scope of work. Will they haul away the debris, will they grind the stump down? Request certificates of insurance. If the project is costly consider bonding to insure the work gets done.

How to Select a Contractor

1. Refer to the list of firms that attended the contractors workshop on wildfire safety requirements available at the RHCA or RHC offices
2. The LACFD has lists of firms that provide services at http://www.fire.lacounty.gov/Forestry/BrushManagementHazardReductionContractors.asp. A list of goat herders is available at http://www.fire.lacounty.gov/Forestry/VegetationMgmt_GoatContractors.asp
3. Get bids from several companies. Make sure you ask them to detail their scope of work and what their price does and does not include.

4. Obtain recommendations from neighbors.
5. Ask to see examples of previous work. Call their references to see if those homeowners would hire the company again.
6. Ask for certification – a certified arborist should be involved if tree work is needed. To find a certified arborist, refer to www.isa-arbor.com or www.asca-consultants.org.
7. Ask about professional organization affiliations and special training of supervisors and field crews: California Landscape Contractors Association (CLCA), Association for Professional Landscape Designers (APLD), International Society of Arboriculture (ISA) are three of the most common organizations.

Safety is Key

All operators should follow Cal-OSHA requirements and carry workers insurance. Look at the workers personal protection equipment. While there is room for personal preferences, do their workers look dressed for the job? Are they wearing helmets and goggles/masks, overalls, gloves and foot protection (e.g. heavy boots suitable for steep slopes)?

Motorized tools need to comply with Cal Fire regulations. Have your contractor explain about their equipment's spark arrestors, and where they plan to fill fuel tanks. Knowledgeable contracts will be pleased to share their skills. If your contractor doesn't know the answers to these simple questions, perhaps you should consider another contractor. You don't want them to start a fire on your property while doing compliance work.

Do not have work done on Red Flag Days, which occur in hot, dry, windy conditions. If it's hot, windy or dry, have the contractor call the local fire station every day prior to work. Alternatively, have work done in the morning. Remember that tree pruning and brush reduction can be done the late autumn/winter BEFORE the next fire season.

Insurance Requirements

Check that the firm has liability insurance and workers' compensation insurance. This protects you and your home should something happen during the work.

A homeowner's insurance policy is likely to cover the removal of a tree that fell or became uprooted because of storm damage. Check with your insurance carrier before you do any removal work.

Tree Services

The do-it-yourself approach is understandable, but it is best to call a professional when there is a need to cut down a tree or remove large branches. The same advice holds for pruning branches larger than three inches, and for all work that requires standing on a ladder and holding heavy equipment , such as a chain saw, above the head.

Be prepared to see a wide range of prices charged by local companies. For example, the cost to remove a poplar tree, cut the stump to grade and haul away the wood and debris ranged from $1,945 to $6,300 with the average price being $3,316.

Why do you need a certified arborist?

1. The service will know the local requirements for obtaining permits for removing or pruning trees.
2. The health of the tree and safety of the operator and property will be preserved.
3. The end result will be beautiful. It's easy for a nonprofessional to make a bad cut that could permanently hurt the beauty of a tree. Tree pruning is a long-term effects – unlike a bad haircut it take years to re-grow a major branch.

When tree branches or other vegetation comes into contact with a powerline, customers should contact Southern Edison, at 800-655-4555, or go to https://www.sce.com/forms/ServiceTreeTrimming.aspx.

Livestock Managers

Livestock can be used to reduce the volume vegetation. The animals are available through a contractor who usually offers the service. The following are items that should be included in an agreement for the service:

1. The contractor should supply, use and care for the animals to graze the areas agreed upon.
2. The contractor is completely responsible for and should pay costs necessary to ensure the health and safety of the animals.
3. The contractor will need to comply with federal and state animal health requirements.
4. Operators should be carried out according to best animal husbandry practices. The animals should be healthy, well-nourished and few of parasites, and current on vaccinations and disease prevention.
5. The contractor should survey the site for poisonous plants so that they can be isolated or removed. You should also identify any plants you wish to have protected from grazing and ensure the contractor installs protection measures (e.g., additional fencing).

6. If being grazed in areas without weeds, you can ask to have them fed weed-free feed for 3 days.
7. The herder should have a cell phone for constant communication. Arrangements for housing and working conditions should be agreed-upon prior to start of work.

Herbicide Applicators

For any contractor who applies herbicide ask to see the copy of the State-issued pesticide applicator license. Ensure that the chemicals are used according to its label.

CREATING FIRE SAFE CANYONS

The open canyons of Rolling Hills play an important role in the community. These canyons provide wildlife habitat, visual backdrops, recreational opportunities, and increased fire hazards. Canyons serve as a chimney, drawing the heat of a fire up to the top of the canyon.

This guide offers recommendations for managing the canyons to reduce fire hazards while supporting the benefits the canyons provide to the community. Each homeowner is responsible for any fuel management on the full extent of their property, including those areas in the canyon. Because the canyons are owned by many, management can also be advanced through collaboration. Costs can be reduced and the resulting scene more unified, and natural-looking if many owners work together. The steps are the same whether a group of owners are working together or if the work is to be done by an individual owner.

This guide is one of a series of 5 that describe the steps recommended to create and maintain fire safe vegetation in Rolling Hills. Also refer to the other guides:

- How to Get the Work Done
- Making and Keeping a Fire Safe Home Site
- Best Practices for Fuel Reduction
- Choosing Fuel Treatment Methods

Step 1. Consider the desired uses of the canyons:

- Is the canyon used for pasture?
- Is grass or brush the preferred vegetation?
- What is the initial effort desired? Are you going to treat the entire area at once or make incremental improvements?
- What frequency cycle of maintenance preferred? A little every year? More intensive treatments periodically?

Step 2. Identify features that limit potential treatment options.

- Is there a history of slides and surface erosion that would preclude use of machinery?
- How steep are the slopes?
- What access is present?
- Do riparian corridors run within the canyon?
- What invasive exotic plants are common?

Only dead material can be removed in riparian areas

Erosion and landslides limit treatment methods and timing

Remove invasive exotic plants – like mustard – first.

Step 3. Now you are ready to identify the goals of your canyon's fire fuel treatment. By changing the vegetative fuels in the canyons you can change fire behavior. The intent of fire fuel treatment is to reduce fire intensity and rate of fire spread. Choose the appropriate goals for your canyon:

- Removing dead vegetation
- Reducing volume of vegetation in trees, shrubs and grass
- Reduce height of brush and grass
- Removing connections in vegetation
  - From vegetation to structures
  - Between brush groupings
  - Between brush and trees
  - From grass to brush on roadsides

Step 4. Choose a strategy for managing your canyon

There are three strategies for managing the canyons. Chose the best for your canyon by thinking about what you want for the finished result:

A. Shaded fuelbreak - Trees with no shrubs. Only grass or very short shrubs beneath the tree canopy.

- Bare underneath tree canopies – chips (cutting and distributing fuels is not as good as chipping below trees)
- Must be done by hand
- Ok-looking from above and side
- Moderate effect on invasives
- Maintenance is longer interval (5-7 years) but harder to do as the separation from the underside of a tree canopy and the top of the shrubs below must be maintained

B. Mosaic groupings – clusters of similar vegetation with grasslands separating groupings of trees from groupings of shrubs.

- Can mimic natural openings
- Edge effect may be detrimental to wildlife
- Can be done with small machines
- Maintenance interval is annually for grass between shrubs, approximately 5 years within shrubs)

C. Shortened shrubs - only shrubs, with no grass or trees

- Keeps ground intact
- May not work in some shrub species (sage)
- Will look ugly first year
- Best soil protection
- Maintenance interval is 3-5 years

Step 5. Determine a schedule managing your canyon

Vegetation can be managed over time, with progress made each year, or you may wish to treat large areas all at once. Chose the best schedule, keeping in mind a few aspects:

1. The most significant effort consists of the initial treatment. Initial treatment can be accomplished on a portion of the canyon each year until all the intended area to be treated has been so. If only some of the canyon is to be treated, start at the area closest to a structure.

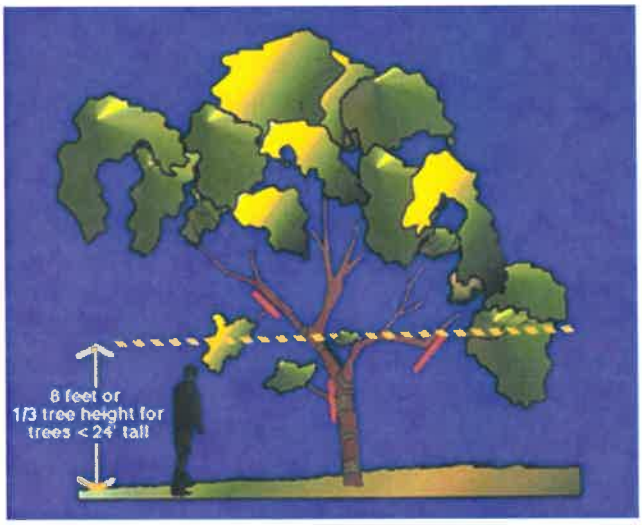
2. Vegetation grows back. Maintenance is relatively easy and low-cost, but necessary. Grass will need to be mowed annually, shrubs re-trimmed every 3-5 years, and trees branches trimmed every 5-7 years.

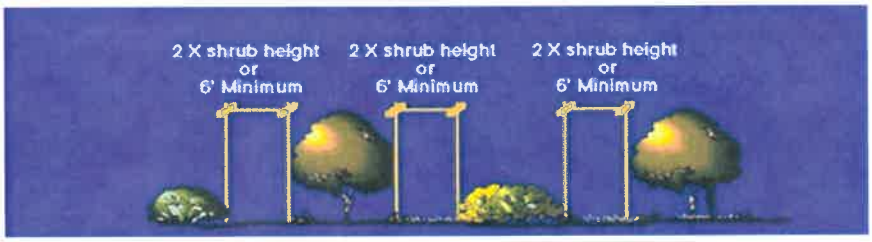
Once you or your group has selected your strategy for managing your canyon you are ready to use the other guides in this series to get the fire fuel treatment done.

Practices to Follow, Regardless of Strategy

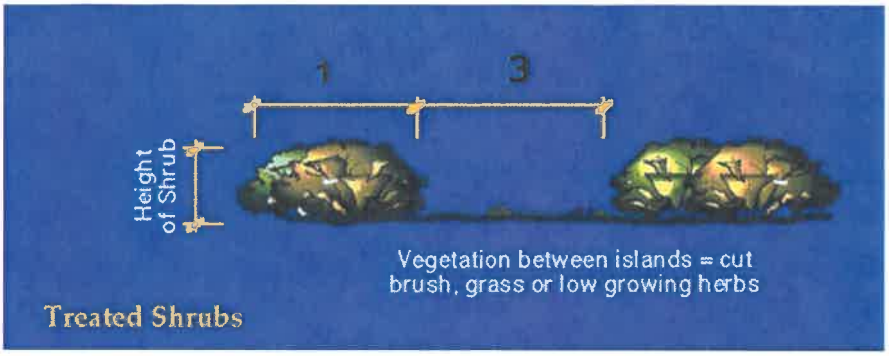
1. Provide for less fire hazard closer to structures – leave more vegetation further away
2. Remove exotics first (mustard, castorbean, volunteer Aleppo pine and pepper trees)
3. Then focus on more flammable native species
4. Protect the unusual & distinctive plant species and remove the common species
5. Retain groundcover
    - Leave grass stubble up to 4" tall
    - Distribute natural leaf litter or mulch evenly up to 2 inches
    - Smaller patches better than big patches
    - Orient bare patches horizontal to the slope

Prune branches to a height of 8 ft above the ground. In young trees, prune branches on the lower one-third of the height of the tree. Do not disturb or thin the tree canopy. This promotes growth in the understory, which is more easily ignited.





Create spaces between shrubs and trees



Create shrub islands, mosaics, or groups. Design groups of plants small enough to provide horizontal separation between groups. This allows proper maintenance and helps slow the spread of fire. ***The space between groups should be greater than three times the height of the tallest shrubs.***

The shrubs and trees in this canyon are well-spaced

Techniques To Use

Several types of treatments are possible to treat the vegetation to reduce fire hazard. These span hand labor (including the use of power tools), mechanical equipment (walk-behind tractors or full-sized tractors), livestock (horses, sheep or goats), and spot application of herbicides.

A Guide to Fuel Management Treatments describes these Techniques in more detail. However, the nature of canyons makes some techniques easier or harder to use:

- Because of the larger area occupied by the canyons and higher costs of hand labor, this techniques is generally cost effective and is reserved for canyon areas closer to homes, stables or other structures.
- Grazing may be more suitable in canyons because of the larger area encompassed by fencing. Fencing is generally the greatest cost.
- Mechanical treatments are applicable, but not in areas prone to landslides, nor in riparian corridors.

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BEST PRACTICES FOR FUEL REDUCTION

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Several policies, laws, and regulations limit vegetation management actions, even though you may be trying to comply with the laws regarding fire hazard reduction. The following best practices provide a suitable level of fire safety in an environmentally sensitive manner. These best practices strive to balance fire protection needs with the protection of sensitive species and their habitats, water quality, and aesthetic values. Trained landscape professionals, biologists and fire department representatives will gladly help you determine plant material that should be retained, removed or modified. Refer to The Process of Reducing Fire Hazards through Vegetation Management to determine the experts to call on.

Four goals of managing vegetation are to:

1. Allow for a potential flame height to be no greater than two-feet tall within 30 feet from the structure,
2. To reduce fire intensity in the canyons,
3. Minimize the ability of a fire to burn in a tree's canopy, and
4. Provide for safe access and egress from the home.

The following are general fuel management best practices for Rolling Hills:

When to do the Work

Fuel management actions should be timed and refined to take into consideration the bird breeding season in the spring, elevated fire conditions in the summer and erosion-related issues during the rainy season. In many cases trimming and thinning vegetation in the fall in preparation for the next summer is poses less conflict with wildlife habitat.

The Los Angeles County Fire Department is available to consult on specific actions related to timing and refinements of recommended fuel treatments to avoid potential environmental impacts. Considerations may include:

- Prune eucalypts and pines from November to April to avoid attracting pests such as eucalyptus borer beetle or pitch pine canker.
- Mow annual grasses within 70-ft of structures and around trees before June 1.
- A second mowing treatment may be necessary after grasses cure in late spring (mid-May) to maintain the desired four-inch height.

- Delay cutting of native grass and wildflowers until after seed set (late spring to early summer), as long as these do not form a "wick" of fuel to the structure.
- The area to be mowed should be surveyed for ground-nesting birds. If found, the immediate 100' area of the nest need not be mowed until nesting is complete, provided it does not form a means of rapidly transmitting fire to any structure
- Cut back chaparral and/or scrub once every 3-5 years to eliminate woody build-up of stems and dead materials.

Vegetation Disposal

Compost, mulch, or dispose offsite all vegetation materials cut during fuel treatments. Cut material may either be chipped and spread so the chips are no deeper than 6 inches. If cut materials are not chipped they must be hauled from the site.

Spread chips to be no more than 4 inches deep.

Bare Earth

At the completion of fuel treatments there should be no more than 50% of the site where bare earth is exposed. No one bare patch should be larger than 15 square feet. If you are working during the rainy season. spread native seed by hand on the exposed patches before the end of the day. If bare earth is exposed during the dry season, dirt will need to be covered shortly after October 1 with mulch, grass, or live vegetation. Keep in mind, however, native bees require bare dirt for nests, so keep some small patches open for this purpose.

If using livestock, the average grass height should be 2 inches.

Haul Routes

Haul routes for removal of debris should be designated prior to the start of work. When the work is completed these routes should be repaired so that only small patches of bare earth is exposed, that rainwater runoff will not cause erosion, and that native vegetation or landscaping is restored.

Large dead material

Large dead material, such old logs, may remain on the site if isolated from small, "kindling-sized" dead branches. No large dead material may remain within the area100 ft from the structure and under any tree canopy. The dead material will need to be distributed or removed when it rots to the point where it crumbles when kicked.

FINESSES NEAR STRUCTURES

The areas within 10-ft of a structure call for special attention because vegetation can serve vital purposes that need to be balanced with fuel considerations. Plants in these locations might also provide:

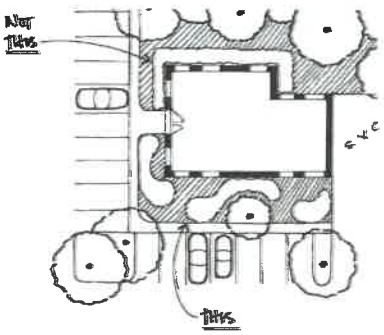
- Privacy – in front of windows or at entrances
- Screening of unsightly large elements such as, heating/cooling devices, or to soften structural features
- Buffering feature between roads and structures

Because in some cases these vegetated spaces are constrained, fuel management has to be done with greater attention to detail.

Shrub Treatments

For shrubs directly adjacent to structures, the following types of actions can meet fuel management goals:

Shorten shrubs to be no taller than the item screened



- Shorten shrubs to be no taller than the item to be screened. In some cases due to the angle of the sight lines, the shrubs can be shorter than the unsightly item and still provide effective screening.
- Minimize the shrub volume by removing portions of the interior of the plant. Reduce the shrub canopy and make the outer dimensions of the shrub smaller, while retaining the screening or other aesthetic properties
- With older, woody shrubs filled with dead material, consider replacing them with another plant species that can be kept wispy, thin, and free of dead fuel.
- Prune from the edge of the building out so that the distance between the shrub and wall is maximized. A distance of 5-ft is advisable.
- Keep plant fuels away from windows and vents. Distance form edge of mature shrub to window/vent: 2X height of mature shrub (unless kept pruned to a smaller size)

- Short-stature trees may also be a suitable replacement for mature, tall shrubs
- Choose plants with a mature size that fits in the planting space

Vegetation near Decks

While decks are not common in Rolling Hills, vegetation near decks pose another area of potential conflict between fire safety: privacy and aesthetics.

The spacing between the deck and shrubs should be proportional to the size of the shrub. In general there should be a five-foot setback from the deck to any shrubs.

Shorter shrubs may be closer than 5-feet, but they may require annual treatment in order to be kept short.

Tree Treatments

If your home is surrounded by several large pines or eucalyptus trees, consider removing one or more to preserve the remaining trees' health and the structure foundation's integrity. In some cases selection of the larger tree is advised, but not always; in other situations removal of the smaller tree is the better option.

When these trees are used for privacy, match the tree size with the item to be screened so they do not unnecessarily block views. Crown thinning is advisable for fire safety only when there is an avenue for fire to reach the tree crown. Shrubs and short trees serve better as screening material than larger trees

The row of trees on the left are more fire-safe than the ones on the right because of the arrangement of the lower branches and the density of the trees. The trees on the left have most lower branches removed, and the density of the vegetation is less.

Exotic Invasive Species

Remove exotic species first. When using livestock, request they be fed weed-free feed for 3 days prior to being brought to the site.

CHOOSING FUEL TREATMENT METHODS

This guide is one of a series of 5 that describe the steps recommended to create and maintain fire resistant vegetation in the City of Rolling Hills. Please also refer to the:

- How to Get the Work Done
- Creating Fire Safe Canyons
- Best Practices for Fuel Reduction
- Making and Keeping a Fire Safe Home

Goal of Fire Fuel Treatments and Available Methods

Effective fire fuel treatment results in fewer, smaller, and less damaging fires. The goal of fuel treatment is to reduce damage from a future fire by targeting the ignitability, rate of spread, and potential fire intensity. Specific techniques, equipment requirements, advantages, and additional considerations such as timing, limiting factors, and Best Practices are described for each of the following fuel reduction methods:

- Hand labor,
- Mechanical treatment,
- Chemical treatment, and
- Grazing.

A combination of techniques is often used to reduce fire hazard in a particular area. This section provides a comparison of methods and guidance regarding the most appropriate treatment types for your zone and habitat type.

Fire Fuel Treatment Zones

Treating fuels helps to reduce the risk of fire hazard to our homes, infrastructure, and communities. Fuels are anything that can burn – our homes and the vegetation that surrounds them. Fuels treatment is aimed at changing the fuels to calm a fire by altering the volume, size-class distribution, arrangement, moisture, or chemical content of these fuels. In Rolling Hills, vegetative fuel treatment is typically done by modifying the trees, shrubs and groundcovers immediately around structures, by roadways, and in canyons. Treatment zones addressed in this guide are defined as follows:

1. Defensible Space
2. Easements and Bridle Trails
3. Canyon Areas

Size of Treatment Area Matters in Selecting a Fire Fuel Treatment

It is important to consider the size of the area when selecting a fuel management treatment. Some treatments, such as those using mechanical, are appropriate only in large, open spaces. Other management options, such as the use of skilled labor or re-vegetation, are only cost-effective in small areas, such as in the area within 200 feet of a structure. Small area treatments can be executed with a greater degree of refinement than those in more extensive areas.

Hand Labor Treatments

Hand labor treatments involve pruning, cutting or removal of trees, shrubs, and grasses by hand or using hand-held equipment. Other hand labor methods include bark pulling, removing dead wood and litter, mulching, and planting new fire resistant or low-risk plants.

- Hand labor is typically used for spot application on small areas or areas with difficult access, where heavy equipment move-in costs may be high.
- Hand labor is also the treatment of choice for areas with sensitive environmental concerns.
- Hand labor may be dangerous for workers when use of sharp tools is required on steep and/or slippery terrain, or where poisonous plants are abundant.
- Hand labor generates debris from pulling, pruning, and cutting vegetation, which will have to be hauled away or chipped on site

Hand labor is enhanced with a include a variety of tools:

- shovels,
- weed whips (different blades are available to match to materials being treated)
- machetes,
- loppers.
- "weed wrenches" (tools that pull both shrub and root system out),
- chain saws,
- hand saws,
- pruning shears, and

Chippers are often used in conjunction with hand labor to cut materials into mulch for onsite distribution.

The actions, tools, advantages, and additional considerations for the various hand labor techniques are compared in a table at the end of this guide.

Mechanical Treatments

Mechanical treatment cut grasses, weeds, shrubs, and trees up to 24 inches in diameter through the use of a tractor or other machinery. Mechanical treatments include such operations as rototilling mowing, disking, and crushing. Heavy machinery is often used where the terrain and number of trees permit.

Heavy machinery can be used where shrubby vegetation is quite dense. It is best to match this treatment method to a site where the aesthetics of the immediate finished result are not the top concern.

- Heavy machinery for mechanical treatment is faster than hand labor and relatively inexpensive.
- There is limited selection over which plants are cut during these operations.
- Machines can be guided around isolated areas of concern that are marked prior to beginning treatment (with collateral damage to small vegetation, such as stripped tree bark or broken shrub crowns that may permanently disfigure plant materials).
- Heavy machinery can also create excessive disturbances to surface soils when the ground is soft; leaving ruts and exposed soil that could cause erosion or sediment in nearby streams.

Timing

- This technique can be used almost any time of year when the topsoil is dry.
- It is faster when done in the summer or fall when brush is brittle and grass has cured.
- They should be used with special precautions during high fire danger periods because the machines have motors and metal blades that can start fires.

Vehicles and equipment undercarriages should be cleaned prior to removal from the work site to reduce the risk of transferring unwanted material, disease vectors, or seeds to other areas.

Mechanical treatments need to be selected according to a site's topography, access, vegetation type, and potential for negative environmental impacts. This technique requires supervision and specialized training to ensure the desired results and minimize negative impacts. Several agencies own specialized equipment and have staff trained in its operation.

A variety of types of equipment can be specified for mechanical treatment techniques, as needed. These include:

Specific techniques, which are compared in the table below, can break apart or cut up vegetation into small pieces, tear up and bury the resulting debris, or remove plants entirely and pile the debris for burning or removal.

- Chippers,
- Mowers,
- Brush cutters,
- Grinders,
- Roller-cutters, and
- Tub grinders

Chemical Treatment (Herbicides)

Chemical treatments include the use of herbicides to kill plants or prevent their growth. Using herbicides to control invasive, fuel-laden plants can be an efficient and cost-effective method but should be used sparingly. Usually herbicides are used as part of an Integrated Pest Management (IPM) program. Chemical treatments are best used in as a follow up to other treatment measures (e.g., mowing, and hand removal), or cutting. Further concerns regarding water quality and other potential environmental impacts that may occur with prolonged use of and exposure to herbicides and other chemical applications further limit their frequent or widespread use as a treatment.

Hand Application: Application of herbicides and other chemicals is typically performed by hand, and can include sponging, spraying, or dusting chemicals onto unwanted plants.

Hand application provides flexibility in application and is ideally suited for small treatment areas.

Roadside application of herbicides may employ a boom affixed to or towed behind a vehicle.

Herbicides are often used to prevent plants from sprouting after they are cut. Herbicides can be specific regarding the type of plant (broadleaf or grass, thistle-type plants).

Herbicides do not remove any vegetation from an area's fuel load. The dead plant matter continues to exist at the site and could continue to be a fire hazard if not collected and disposed.

Timing is critical

- Needs to be applied while the grasses and weeds are still actively growing.
- Application following another treatment method in which plants are trimmed or shortened can increase the plants' intake of the herbicide and the effectiveness of the chemical treatment.

- Spray treatments aimed at foliage are generally not applied within seven days prior to significant rain because the herbicide may be washed off before it is effective.
- Foliar treatments also should not occur on windy days because of concerns for spray drift.

Licensed personnel is required

- Herbicide application requires specific storage, training and licensing to ensure proper and safe use, handling, and storage.
- Only personnel with the appropriate license are allowed to use chemicals to treat vegetation.
- Herbicide application is also only applied per a prescription prepared by a Pesticide Advisor licensed in that county.
- Personal protection equipment is essential to limit personnel exposure to chemicals, and includes long pants and long-sleeved shirts, gloves, safety goggles, hard hats, sturdy boots, face masks and, in some instances, respirators.

Grazing

This treatment method uses grazing animals to consume vegetation and reduce the amount or density of fuels. Grazing as a fire fuel treatment is most effective in grasslands (horses, cattle or sheep) or shrublands (goats).

Types of Animals: Rolling Hills has a rich history of grazing; cattle grazed Rolling Hills for several decades prior to development. More recently, horses graze several pastures throughout the City. Elsewhere, goats and sheep are used for fire fuel management. Although the concept of grazing is the same regardless of which type of animal is used, how each animal type conducts its grazing varies significantly. As a result, not all animals will be ideally suited for grazing treatments in all areas. To make this method effective it is critical that the plants are palatable to the animals selected.

- Goats can be used to create and maintain a fuel break.

- Horses, sheep and cattle do not effectively create fuel breaks in shrubby areas, but they can be used to maintain these features by shortening grasses and grazing the grasses or forbs within tree stands.

If the intent is to reduce grassland fuels in highly where accidental ignitions may occur, grazing should be used annually. As a fire fuel reduction technique, grazing does not need to be conducted each year if the intent is to control shrubs or maintain fuels under trees.

Grazing can be a relatively inexpensive treatment method. Success of this treatment method is dependant upon control of livestock movements and prevention of the impacts of overgrazing, such as increased erosion from groundcover loss. Using professional herders or portable fences may be an alternative to fixed fencing where the treatment is ephemeral. Additional controls are also needed for protection of selected plant materials and riparian zones, and to prevent erosion, sediments in nearby streams or other undesirable environmental impacts.

Livestock grazing include removes small diameter fuels and prevents the invasion of grasslands by brush. Livestock grazing can also benefit native grassland, wildflowers and habitat for wildlife which prefer short grasses, such as ground squirrels, and can improve habitat for amphibians. Grazing reduces thatch and increases nutrient cycling.

What are the most suitable vegetation management treatments for my vegetation type?

The frequency and type of treatment depends upon the vegetation in the area. The effectiveness and suitability of these treatment types and specific techniques within the different habitats found in Rolling Hills vary depending on vegetation structure and habitat sensitivity.

Hand thinning and grazing treatments are suitable for all habitat types, while the use of mechanical and chemical treatments should be avoided to the extent possible in riparian habitats due to concerns regarding water quality, soil erosion and temperature.

Tree removal and some thinning in shrublands can reduce vegetative cover, which can increase water temperature and drastically alter aquatic systems.

The following tables provide further information to help you determine which treatment types and specific techniques are appropriate for the habitat type in which you are working. More specific guidelines regarding these techniques should be reviewed before determining the best treatment for your needs.

COMPARISON OF HAND LABOR TREATMENTS FOR FUEL REDUCTION

Technique	Action	Tools	Advantages	Additional Considerations
Removal of small volunteer trees	Cut saplings and short trees of invasive species	Hand saws, loppers, chain saws	Effective in reducing ladder fuels. Avoids costs of removal in future after tree has grown	
Weed Whipping	Reduce the height of the fuel, without creating areas of bare soil, as the vegetation is not completely removed	Hand held tool (often gas powered) that cuts grass and very small shrubs with plastic line or cutting blade	Often the only type of "mowing" treatment possible if in steep wooded areas or landscaped slopes. Rate of weed shipping is low.	Using a steel cutting blade allows debris to be 'multi-cut' into a mulch. Worker safety is a concern. Can be used in some landslide-prone areas.
Chaparral/ Scrub Branch Removal	Masticate or chop off chaparral branches and break apart brittle materials that can act as ladder fuels	Machetes, chainsaws and other instruments	Fallen branches and material cut from chaparral can be further broken into compact mulch and distributed across the site or removed for disposal.	
Hand-Pulling	Weeds pulled three year in a row generally will be controlled in an area because of the repeated depletion of seeds or sprouting vigor	Pull weeds by hand	Often the greatest amount of control among hand labor techniques, but it is also very time-intensive	Most weeds pulled can be left on site as mulch; however, larger weeds, such as mustard, should be removed. To limit the spread of seeds, care should be taken to bag weeds securely if viable seeds are present.
Vista Pruning	Remove under-story shrubs, small trees and lower limbs of trees to a height of 8-10 feet to create a vertical separation between surface fuels and the tree canopy overhead.	Pole saws, loppers and hand-held chainsaws	Vista pruning lowers ignitability, decreases available fuel, decreases the potential for spotting and reduces heat output from understory fires, which in turn reduces the potential for fires to move from the ground to the tree crown.	Certified arborist recommended
Mosaic Thinning & Drip-line thinning	In mosaic thinning, shrub "clumps' alternately thinned to varying degrees to create a mosaic of plantings. Drip-line thinning removes shrubs and smaller trees within the drip lines of overhead trees.	Pole saws, loppers and hand-held chainsaws	Because the material removedduring these operations typically consists of smaller tree and shrubs that result in larger debris sizes, chipping or offsite hauling is usually required	Used in shrubby areas. It works best where trees are infrequent.
Black Plastic Coverage	Plastic fixed to the top and sides of a cut stump to prevent photosynthesis, which in turn prevents new sprout form forming	5 mm or thicker plastic, rocks, stakes, nails or staples	As an alternative to herbicide application, securing black plastic over cut or treated tree stump can prevent sprouting	Black plastic can also be placed over surface areas to prevent germination of weeds, although groundcover growth is prevented as well. Remember to take the plastic off when prevention of sprouting or seeding is complete.
Mulch Application	Application of mulch, such as wood chips form pruning operations	Protective masks and gloves should be worn in distributing wood chips because fungus is typically present.	Can slow the growth of grasses, shrubs and saplings for up to one full season and acts as an effective temporary fuel reduction method	Mulches burn slowly and produce low flame lengths, but burn for a long time in any one place. This condition transfers considerable heat into the soil and can have longer term detrimental effects to the area. Keep a portion of the soil bare to preserve native bee habitat.

COMPARISON OF MECHANICAL TREATMENTS FOR FUEL REDUCTION

Technique	*Action*	*Tools*	*Advantages*	*Additional Considerations*
Mowing	Cut herbaceous and woody vegetation above the ground, often along roadways and using hand powered mowers, around homes	Mowers on wheeled tractors or other equipment or straight edged cutter bar mowers, or flails. Mowers may be walk-behind equipment	Reduces fuel height which in turn reduces the flame length and possible the rate of spread of a grass fire. Using a tractor-based mower approximately 1 acre per hour can be mowed, depending on surface topography and slope of the site. A walk-behind mower can cut approximately 2 acres per day	Mowing at the appropriate time to a height of approximately 4 inches minimizes weed and brush encroachment and reduces the amount of manual work needed to maintain the site. Slope instability should be absent to use a tractor-based mower.
Mechanical Cutting Crushing or Removal of Dead Material Only	Cut or crush shrubs and trees into small pieces that are scattered across the ground to act as mulch	Tractor with a variety of attachments or blades. Masticating equipment installed on Bobcats, wheeled or crawler type tractors, or other specialized vehicles.	Equipment that can carry large loads, can effectively remove large volumes of dead material, often with large pieces of material still intact. Particularly applicable in burned areas.	The soil surface is disturbed slighty where the tractor travels and when some shrubs are uprooted; however the surface is not scraped.
Chipping or Mulching	Use subsequent to other removal techniques and reduces the size of materials by passing them through a series of high speed blades.	Grinder	Small-sized materials produced may be removed form the site or redistributed as mulch. Natural compaction of this layer presents a fuel structure that is less likely to ignite	Mulch layers should be kepts to less than 4 inches deep. Retain up to 30% bare soil - in patches - as habitat for native bees

Checklist of Actions

- ❑ Identify any protected species, erosion concerns or other special considerations before beginning work

- ❑ Remove all dead plants and material that is not mulch. This includes dead material that drapes over ground cover, all dead bark, leaves, needles, parts of vines, and branches. Remove dead material from roof, gutters, deck, patios, etc.

- ❑ Mow grass to a height of 4 inches within 70-ft of structure, under trees and within 6-ft of dripline of tree canopy within 200 ft of any structure. Mow annual grasses before they set seed; mow perennial grasses and wildflowers after they set seed.

- ❑ Remove volunteer invasive trees (Aleppo pine, eucalyptus, pepper trees).

- ❑ Prune to remove all small branches of trees (<3 inches diameter) to 8-foot height, or 2.5 times the height of understory plants, whichever is higher. Prune lower branches of short trees to 1/3rd the tree height, up to 8-feet.

- ❑ Cut shrubs under trees to 18 inches or shorter. This includes all shrubs under tree canopies and within 6-ft of tree canopy. Alternatively, where shrubs are to be used for privacy under trees, trees should be pruned of lower tree branches to a height 2.5 times the height of the shrub.

- ❑ Outside of tree canopies, create groupings of shrubs by cutting the shrubs between patches to create an open area 2 times wider than the plants are tall, with a minimum of 6-feet between groupings. Select to retain sage (because they are protected), or other unusual plants.

- ❑ For shrubs retained for screening, shorten shrubs to be no taller than the item to be screened.

- ❑ Trim shrub's volume so that it is thin and wispy. Prune shrubs starting from the edge of the building out, so that the distance between the shrub and wall is maximized. A distance of 5 feet is advisable.

- ❑ Leave large logs on site if 100-ft away from structures and 6-ft from under any tree canopy. Isolate logs from kindling-sized branches (<1" in size). Remove log if it crumbles when kicked.

- ❑ Dispose of vegetation from landscaping offsite. Otherwise, chip and spread cut materials within the fuel management zone, or haul from site.

- ❑ Maintain at least 50% cover on soil, with any bare patch smaller than 15 sq. ft. Cover with mulch or broadcast native seed by hand on exposed patches before the end of the day if working during wet conditions, otherwise shortly after October.