

# Gold Mountain Standards for Hazardous Fuel Treatment

The Covenants, Conditions, and Restrictions (CC&R's) of the Gold Mountain Homeowners Association's (GMHOA) require that all home and lot owners maintain the vegetation and fire fuels on their properties to prevent them from becoming a fire hazard.

Priority community goals for wildfire safety are: 1) public and firefighter safety, 2) protection of developed resources such as homes and infrastructure, and 3) protection of natural resources such as watersheds, mature tree stands, views, and habitats. Much fuel reduction work has been accomplished within the community since 2003. However all properties must be treated to the following minimum standards if we are to accomplish these goals.

These standards apply to all properties in Gold Mountain. Their goals are to reduce the intensity and rapid spread of wildfire and to enhance the resiliency of our forests to damage from wildfire. The aim is to accomplish these goals while strategically removing as only little vegetation as is necessary to meet these standards.

## **Minimum hazardous fuel reduction Standards for all Gold Mountain properties**

A fire safe condition requires that trees, shrubs, and other fire fuel sources are treated to reduce or arrange them in a way that makes it difficult for fire to transfer from one area to another.

These standards contain references to information and photos from "Gold Mountain Wildfire Hazard Assessment" by Deer Creek Resources, July 2014. Key excerpts and photos from that report are contained in the appendix to these standards. References below are by photo number - for example (P3) refers to photo 3 in the appendix.

**Surface fuels** spread fire horizontally across forest floors. Grass, brush, saplings, tree litter, small suppressed stands of trees, and slash all increase the speed of fire spread and fire intensity.

### **Surface Fuel Standards**

- Dead fuels such as brush, accumulations of down litter, and saplings are extremely hazardous and must be reduced, thinned, or removed. (P4, 7, 8, 15)
- Large brush fields should be separated horizontally so as not to be continuous with increased spacing on slopes. Future erosion should be avoided and taken into consideration when removing brush on steep slopes. (P9, 10, 17)
- Down logs that are over 4 inches in diameter do not need to be removed, however dead branches and smaller litter should be removed or scattered. (P1, 2, 4)

**Ladder fuels** allow the transfer of surface fires up into tree canopies. These 'ladder' or 'understory' fuels must be eliminated or modified in order to vertically separate surface fuels from fuels in tree canopies. Ladder fuels include brush, and small trees under mature trees, and low hanging limbs of mature trees. Ladder fuels must be removed within the drip line of larger over story trees.

### **Ladder Fuel Standards:**

- Where they exist under or down slope from mature trees (over 9" in diameter), remove saplings and mid-sized ladder trees, and remove brush. (P3, 4, 6, 7, 9, 12, 13, 14, 15)
- Stands of small suppressed trees must be aggressively thinned. (P3, 12, 14, 15)
- Lower branches of mature trees must be removed up to a height of 6 to 15 feet above the ground, depending on existing surface and other ladder fuels. (P1, 7, 8, 12, 17)

- For smaller retained trees (below 30 feet in overall height), remove lower limbs, but no higher than 1/3 of the tree's total height.
- To promote a future multi-generational forest, fill in gaps between mature trees by retaining healthy saplings using 10 to 15 foot spacing. (P4, 5, 7)

**Canopy fuels** burning in the crowns of mature trees transmit wildfire by sending embers flying through the air. These embers increase the speed of fire spread by causing new and uncontrollable spot fires within the community and beyond.

**Canopy Fuel Standards:**

- Trees must be thinned to create separation of canopy fuels within large contiguous stands of trees. Any over-story thinning needs to balance the risk of crown fire hazard against the benefits of shade that a closed-canopy provides. This standard does not imply that adjacent tree drip lines should not overlap. (P 2,3,5)
- Tall dominant trees should only be removed where it is determined that there is no other way to reduce the hazard of canopy fire. Removal of trees over 9 inches in diameter as measured 3 feet above the ground requires specific approval by the GMFWC or board designee.(P6)

**Additional wildfire fuel standards within 100 feet of homes and structures**

On all properties with a home or other structure, a defensible space zone surrounding the structure is legally required by California Public Resources Code 4291.

**Defensible Space Standards:**

- The current standards for this law mandate that two areas surrounding any home or structure be fuel modified:
  - a 30 foot “Lean, Clean, and Green” zone outward from the home (P16)
  - an additional 30 to 100 foot (or to the lot line) “Reduced Fuel” zone.
- For specific requirements see “General Guidelines for Creating Defensible Space”, as adopted by the State Board of Forestry: [http://bofdata.fire.ca.gov/PDF/Copyof4291finalguidelines9\\_29\\_06.pdf](http://bofdata.fire.ca.gov/PDF/Copyof4291finalguidelines9_29_06.pdf) or contact CALFIRE’s Lassen, Modoc, Plumas Unit’s Quincy Office at (530) 283-9322.

**On-going maintenance**

On-going maintenance is required once any of the above treatments have been successfully completed. Forests continue to grow and periodic clean up work is required by all property owners in order to maintain the fire safe forest conditions and separation of fuel sources that owners have created. The GMFWC or board designee will periodically survey properties and notify owners of the need for clean-up maintenance.

## **Appendix to Gold Mountain Standards for Hazardous Fuel Treatment**

Source: Gold Mountain Wildfire Hazard Assessment  
By Deer Creek Resources, LLC - July 2014

### **Treatment Priority Ratings:**

- Moderate - Minor Thinning and Regular Maintenance Required
- High - Thinning and Regular Maintenance Needed
- Critical - Significant Thinning and Brushing Needed

### **Wildfire Types:**

- Surface Fire spreads through surface fuels without consuming overlying canopy fuel.
- Passive Crown Fire or Torching - encompasses a wide range of crown fire behavior, from occasional torching of isolated trees to nearly active crown fire. Passive crown fire is also called torching or candling. An intermittent crown fire is similar to passive crown fire, but implies intermittent active crown fire rather than individual-tree torching.
- Active Crown Fire may also be also called a running crown fire or continuous crown fire. An active crown fire presents a solid wall of flame from the surface through the canopy fuel layers. Flames appear to emanate from the canopy as a whole rather than from individual trees within the canopy.

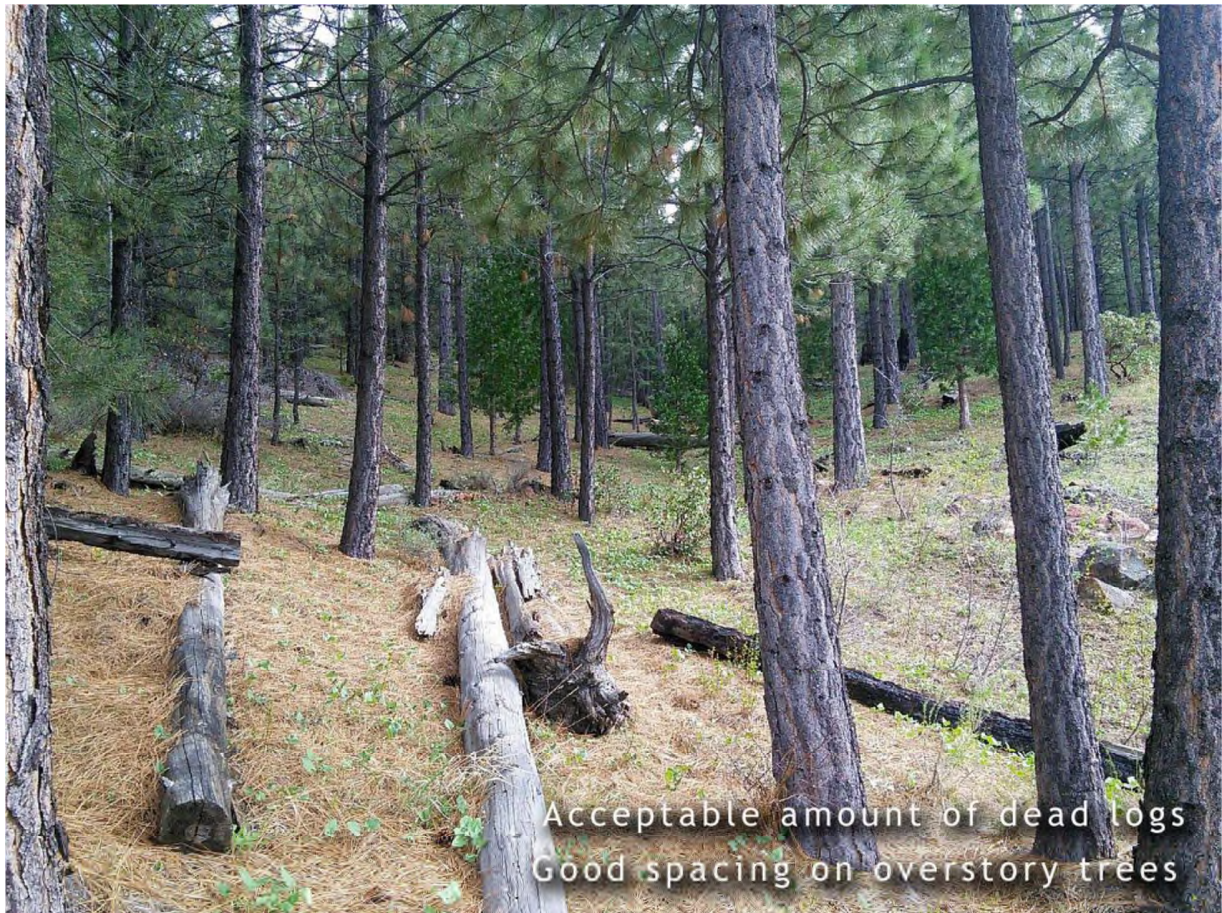
**Maximum Slope** – the maximum measured slope within the parcel as a percent of vertical.

**Elevation Range** – the change in elevation from lowest to highest point of a parcel in feet.

**Canopy Closure** – a measure of density of forest on a parcel expressed as a percentage of space containing trees using USDA National Agriculture Inventory Program aerial photography.

**Photo Series** - The following photographs and descriptions of wildfire fuel hazards and mitigation strategies are excerpted from Deer Creek Resources report: Gold Mountain Wildfire Hazard Assessment – July 2014. The pictures and text show examples of existing Gold Mountain forest conditions and illustrate solutions which have been included in 'Gold Mountain Standards for Hazardous Fuel Treatments'.

**Photo 1 – Low hazard pine forest area, thinned in last 5-10 years.**



The photo above provides a good example of forest stewardship that accomplishes wildfire hazard reduction while minimizing the impacts on other natural resource values. The down logs (which can be very expensive to remove) provide cover for wildlife and nutrients to the soil. Without smaller branches and twigs on the ground, the logs will not cause rapid rates of fire spread. The remaining trees provide good shade, lowering surface temperatures and reducing the drying affect of the sun on surface vegetation. This, in-turn, narrows the season within which surface fuels will be critically dry. Most of the ladder fuels have been removed and trees have been pruned to 8-10', making it unlikely that a surface fire will be able to get into the crowns of the trees.

**Photo 2 – Low priority for treatment: Open pine stand, moderate hazard.**



The area in this photo has well-spaced trees and a high canopy base height. The smaller branches on the down-tree in the center-right of the photo should be scattered or removed. Logs larger than 4” in diameter can be left in place.

- By providing both food and microhabitats for many species, coarse woody debris helps to maintain the biodiversity of forest ecosystems. Up to forty percent of all forest fauna is dependent on CWD. Studies in western North America showed that only five per cent of living trees consisted of living cells by volume, whereas in dead wood it was as high as forty percent by volume, mainly fungi and bacteria.
- Colonizing organisms that live on the remains of cambium and sapwood of dead trees aid decomposition and attract predators that prey on them and so continue the chain of metabolizing the biomass.
- The list of organisms dependent on down logs for habitat or as a food source includes bacteria, fungi, lichens, mosses and other plants, termites, ants, beetles, snails, and amphibians such as salamanders.

**Photo 3 - Critical priority for thinning: Pine and juniper with heavy ladder fuels**



This photo is similar to what photo #2 would look like without thinning. Here, small seedlings and saplings provide 'ladder fuels' that will allow a surface fire to burn up into the crowns of the largest trees. This is referred to as 'torching'. Any area with the potential for 'torching' should be a **Critical Priority** for treatment. Under windy conditions, (when most large fires have historically occurred in the Gold Mountain area) 'torching' causes ember showers that can start spot fires as far as ½ mile away. Spot fires dramatically increase the difficulty of fire control and are a primary agent that causes small fires to escape initial attack and become large.

Red Xs in the image above show trees or brush that need to be removed. In general, dense stands of trees should be thinned to a 10-15' spacing, though clumps of several larger trees are acceptable if smaller ladder-fuel trees or brush are removed. Small trees represent tomorrow's large trees, so great care should be taken to select and retain healthy small trees to fill in the gaps in the forest. As a general rule, retain any small trees that are more than 10-15' from the base of a larger, overstory tree, selecting Sugar Pine, Douglas Fir, or Ponderosa Pine in preference to Incense Cedar or White Fir.

**Photo 4 - Moderate treatment priority: Dry pine forest site in need of restoration**



The forest in the photo above shows signs of being heavily logged over the last 50 years. While its open character decreases the likelihood of a crown fire occurring, its open condition allows abundant sunlight and wind to reach the forest floor, desiccating the site, and increasing the number of days that fuel conditions will be critically dry. Forest thinning projects here should focus on removing ladder fuels while retaining as many overstory trees as possible. Any healthy small trees that are more than 10-15' from a larger tree should be kept. Shade is good!

Large down logs provide valuable cover for wildlife and supply nutrients to build the soil. Any limbs or logs over 4" in diameter can be retained.

**Photo 5 - Moderate treatment priority: Thinned site, needs minor maintenance**



This site has good spacing on the mainly large trees, and a high crown base that will prevent surface fires from entering the canopy. The many small, shade-tolerant incense cedar trees should be removed while they are still small, unless they are in a large opening 10' or more from an existing large tree.



**Photo 6 - Moderate treatment priority: Open Cedar stand, needs maintenance**

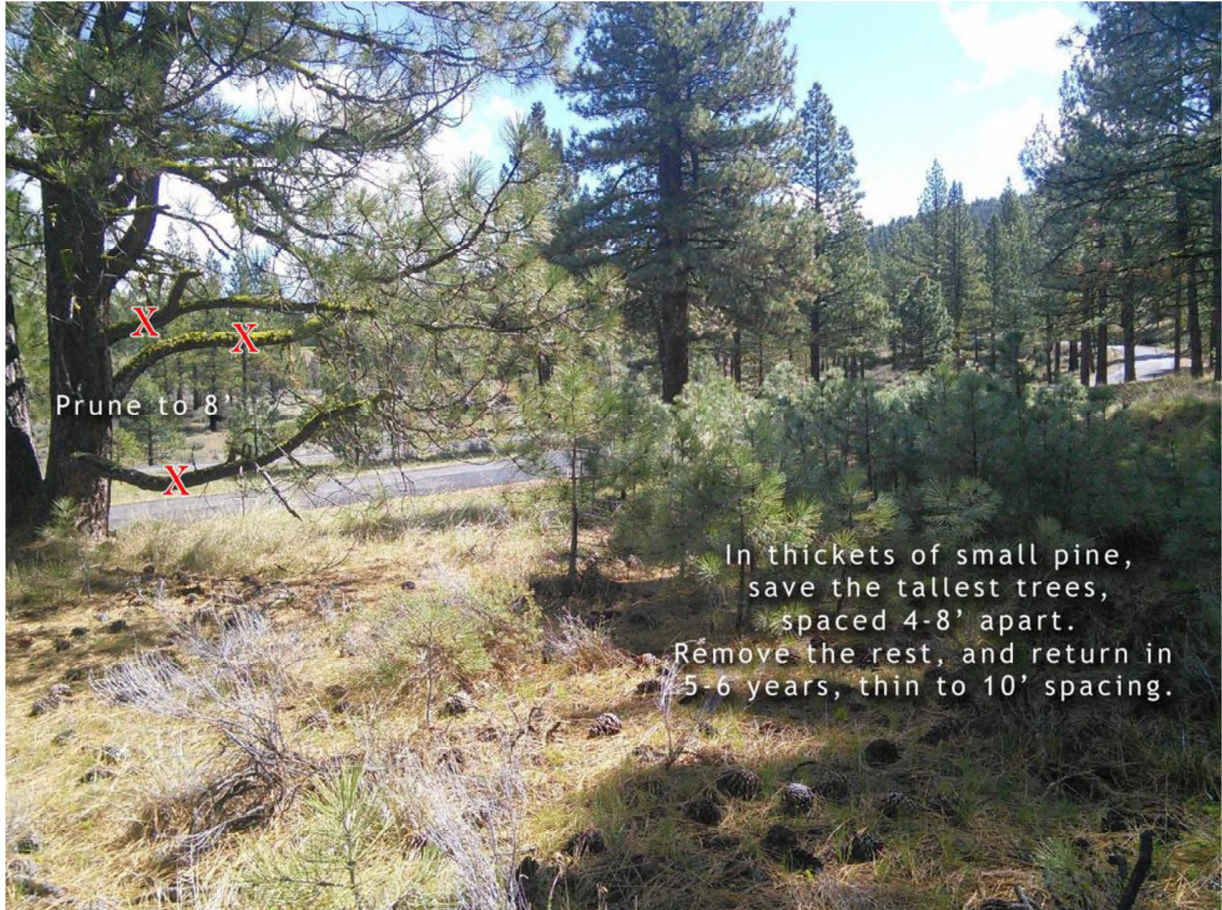


This stand would be a higher treatment priority if there were more surface fuels or it was on a steeper slope. Surface fuels (mainly needles and duff) are light in this area, and this, coupled with good shielding of surface winds from the closed overstory canopy, will help to keep fire spread-rates slow here.

However, many of the small saplings will soon create ladder-fuel problems, and these should be removed as soon as possible. It is much easier to spend an afternoon cutting them out now with an axe than to hire a crew with chainsaws and a chipper 5 years from now.

The amount of light vs. shade on the forest floor is a good, quick indicator of canopy closure. Any overstory thinning that takes place in Gold Mountain needs to balance the risk of crown fire hazard with the benefits that a closed- canopy provides. These benefits include: Shade, reduced drying of surface fuels, protection from surface winds.

**Photo 7 - High treatment priority: Pine thickets – restoration opportunity**



Pine regeneration is often very vigorous in areas where the soil has been disturbed (either by logging, fire, road-building, construction, or other grading). Thickets like the one in the photo above are common in the Gold Mountain area. While the trees are small, they are easily thinned. These thickets provide an opportunity to select a few of the most vigorous trees to retain for the future forest. Cut saplings should be removed from the site.

**Photo 8 - High treatment priority: Pine and cedar, high hazard.**

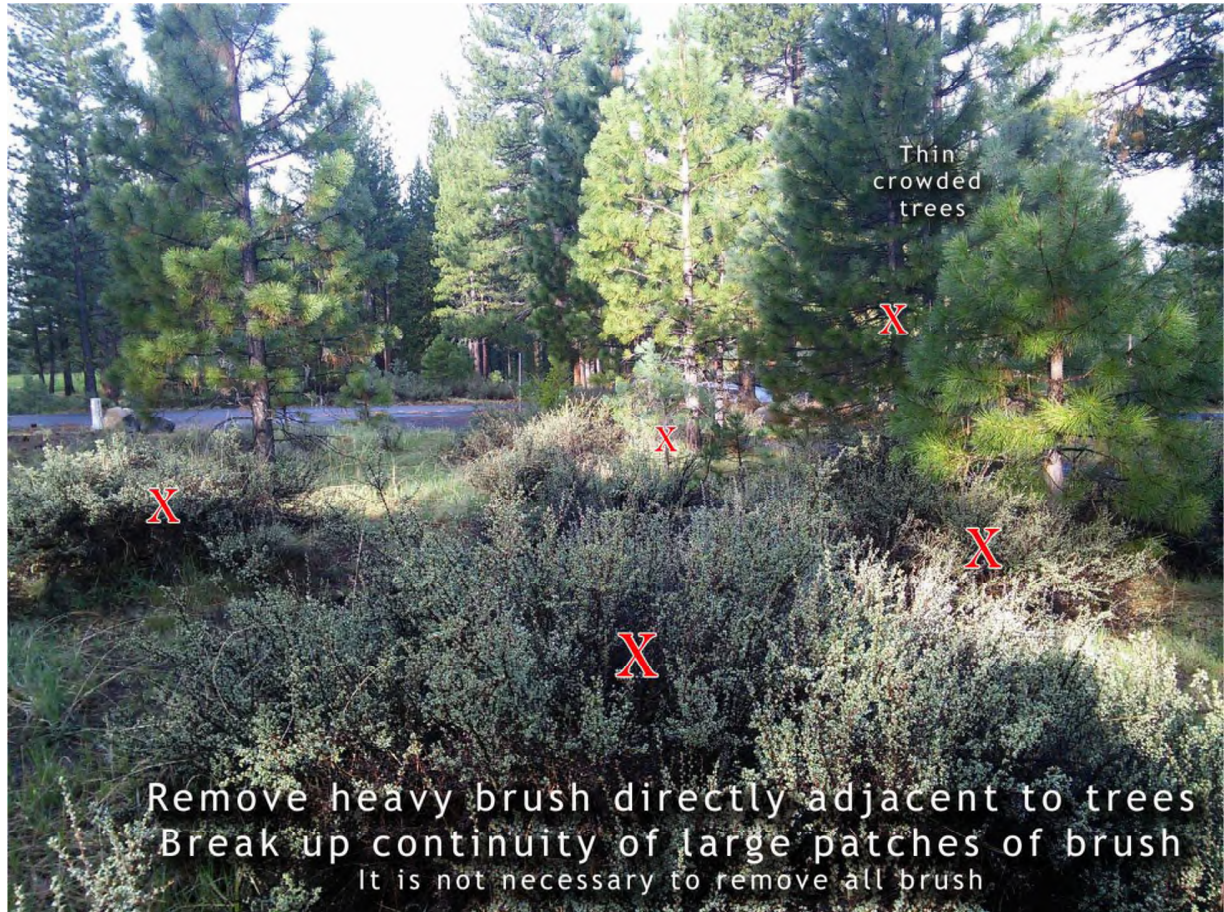


Large down logs provide important cover and habitat for wildlife. Hazardous fuel reduction in this photo should focus on pruning up the trees, and removing brush, ladder fuels, and branches less than 4" in diameter.

As in other photos of dry, exposed sites, a longer-term objective for this site should be to increase the number of large, well-spaced trees and shade.

This photo is typical of the high-priority lots in this survey.

**Photo 9 - High priority for treatment: Pine and brush, high hazard**



In bitterbrush fields, separate fuel continuity by isolating patches and creating mini fuelbreaks in a circumference around the patches. These isolated patches can be of varying shapes and sizes depending on the layout of the landscape. In addition to separating fuels into patches, individual plants can be selected to leave while cutting in between them at an average spacing of ten to fifteen feet.

Bitterbrush will both tip-sprout and stump-sprout; therefore, the cutting of bitterbrush be combined with a variation of two treatment methods where half of the brush is cut to the ground and the other half is cut three feet from the ground, allowing tips to sprout to create fresh wildlife browse.

Retain a diversity of shrub species throughout the site, especially species that are less abundant than bitterbrush such as curl-leaf mountain mahogany should be retained wherever possible, thinning around the patch to separate it from heavier fuels.

**Photo 10 - High priority for treatment: Pine and brush on a slope, high hazard**



The slopes in the Northeast corner of the community along Dancing Bears and Quail Run are exposed to full summer sun. The increased dryness of these South-facing slopes means that fires will spread uphill incredibly fast here. Especially in areas adjacent to homes, work should focus on annual weed-eating of the grasses within 200' of homes, removing dead brush, and reducing the continuity of live brush so that plants are at least 10 feet apart.

**Photo 11 - High priority for treatment: Gully topography, moderate hazard**



The contour of the land will help fires to burn uphill quickly in gullies and swales. Projects in these locations should focus on removing fine fuels and ladder fuels, and reducing continuity of brush. Near homes, grass areas down slope of the home should be trimmed after it has turned brown at the beginning of each summer.

On lots that have not yet been built, future builders should avoid siting homes or other buildings at the top of gully-type features.

The trees in this photo are well spaced and have a high canopy base. Fuel workers in this type of setting should concentrate on protecting homes upslope.

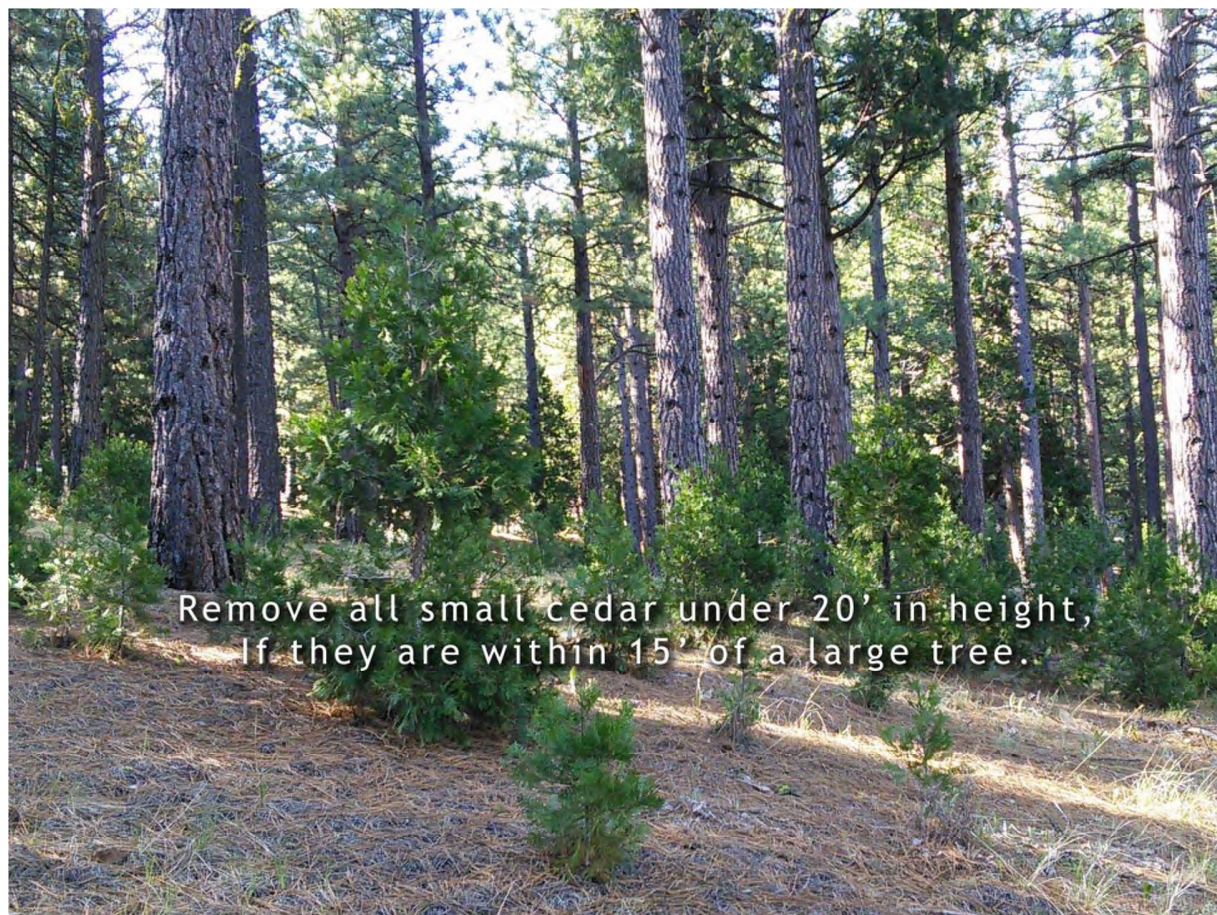
**Photo 12 - Critical treatment priority: Pine and brush, high hazard**



In areas with heavy brush, removal efforts should focus on areas with 10' of existing large trees, and the trees should be pruned at the same time. Brush provides important browse for deer and other animals. Outside of the 100' radius of existing homes, it is not necessary or preferable to remove all brush. Fuels treatment should focus on disrupting the continuity of the brush.

Bitterbrush has a long taproot or taproots that can be as long as 18 feet, as well as a few shallow roots. It is an important browse plant and is favored by deer.

**Photo 13 - Critical treatment priority: Thinned site in need of maintenance**

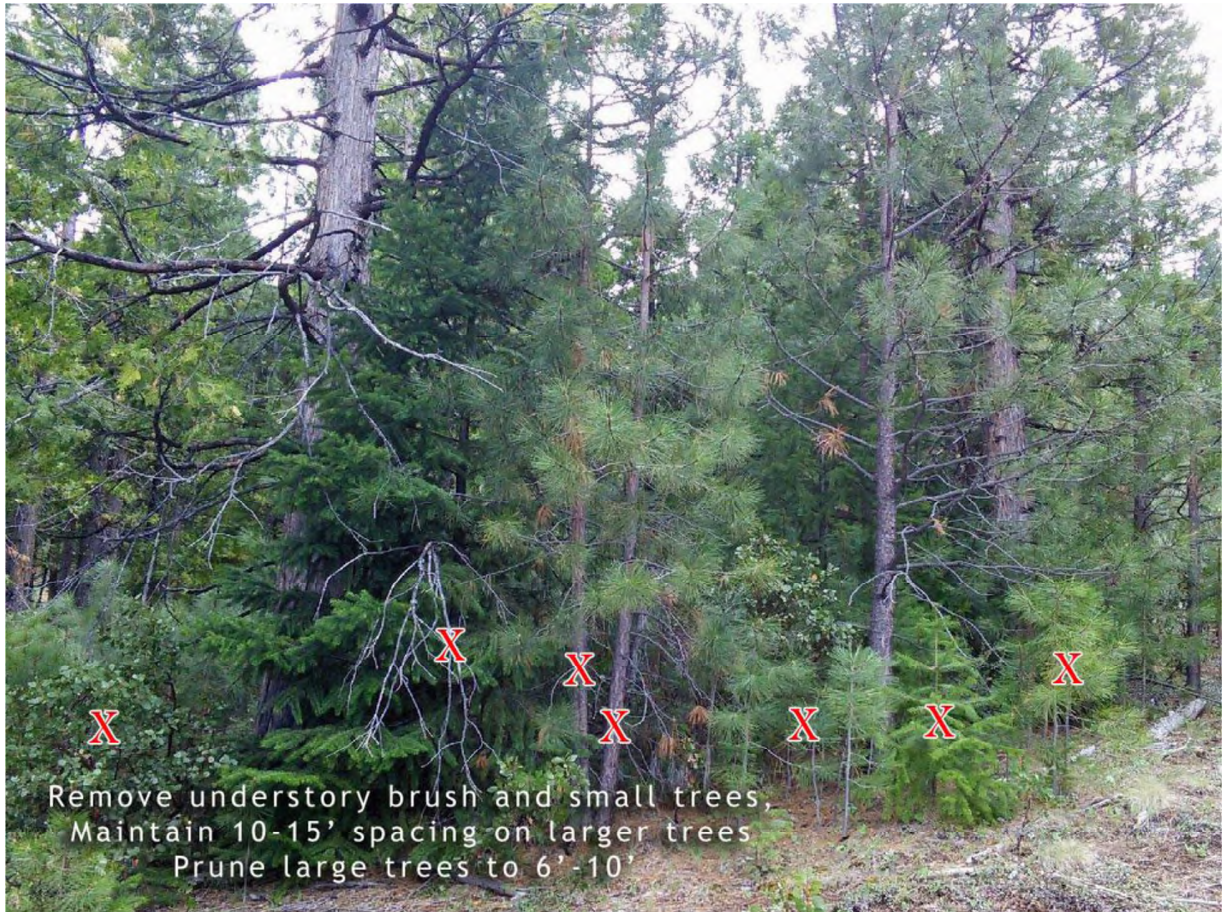


This site appears to have been thinned in the last 10-15 years. Shade-tolerant incense cedars are in the process of turning the understory into a dense thicket. Left untreated, the cedar will create conditions that support torching wildfire behavior that can kill the large, overstory trees and create long-distance spotting. Also, dense cedar can become drought-stressed and die.

Surface fuel loads are light in this photo, and this will slow the spread of fires burning into this lot, somewhat offsetting the ladder-fuel hazard posed by the small cedar trees.



**Photo 14 - Critical priority for treatment: Pine and fir on a slope, extreme hazard**



This photo typifies the 'Critical' fuel loading areas with the Gold Mountain community. The arrangement of the canopy fuels is such that any surface fire will almost immediately become an active crown fire. Under mid-summer weather conditions, flame lengths will be over 100 feet, and embers will start spot fires up to 1/2 mile away. Initial fire attack resources will be unable to contain all of the spot fires, as they will not know where they all are, and the fire will spread until weather conditions change, or the fire runs out of fuel.

These areas require significant thinning of understory ladder fuels and pruning of the larger trees. Effort should be taken to not over thin the larger trees, as they provide valuable shade and, if properly thinned and pruned, pose little threat during future fires.

**Photo 15 - Critical priority for treatment: Fir on heavily logged site, high hazard**



This photo shows another site which has been logged heavily over the last 50 years and is in need of restoration. The dead top and red slash in this photo are White Fir, a shade tolerant species that has increased in abundance in dry pine forests as a result of logging and fire suppression. White Fir are susceptible to beetle kill during drought events, and are less desirable than pine or Douglas Fir.

The many weak and scraggly White Fir trees in the understory should be thinned and the remaining trees should be pruned to 1/3 their height or 10', whichever is less. Logs over 4" diameter can be retained. All red slash should be removed.

Increasing shade and canopy-closure are important longer-term objectives in these stands. Transplanting of Douglas Fir or pine seedlings into the larger openings in the springtime is an economical and enjoyable way to accomplish this.

**Photo 16 - Critical treatment priority: Brush next to a home, extreme hazard**



Recent CAL FIRE defensible space inspections of the Gold Mountain community found an impressive level of compliance with Public Resources Code 4291, which requires 100' of Defensible Space around occupied structures. As vegetation never stops growing, maintaining compliance is an ongoing chore.

**Photo 17 - Critical treatment priority: Pine forest needing restoration**



Another site showing signs of logging-caused damage and in need of restoration work. Trees should be planted in large openings, small, crowded understory trees should be thinned, and remaining trees should be pruned.

Dead branches should be removed, and brush should be cleared from the bases of larger trees.