Thinning for Defensible Space

Determine your goals

Before deciding which trees to cut, it is important to start with determining the **goals** for your property and setting objectives to accomplish your land management goals. For example, in the **Defensible Space Zone** the primary goal is to reduce fire intensity and severity on your property. To accomplish this goal, landowners can modify vegetation structure by breaking up the vertical and horizontal continuity and distribution of fuels, understory vegetation, and trees (Figure 1). Landowners might also want to consider secondary goals like tree and forest health (i.e., improve tree growth and resistance to drought, fire, insects, and diseases), removing dead trees that are safety hazards and/or enhancing the visual aesthetics of your property.

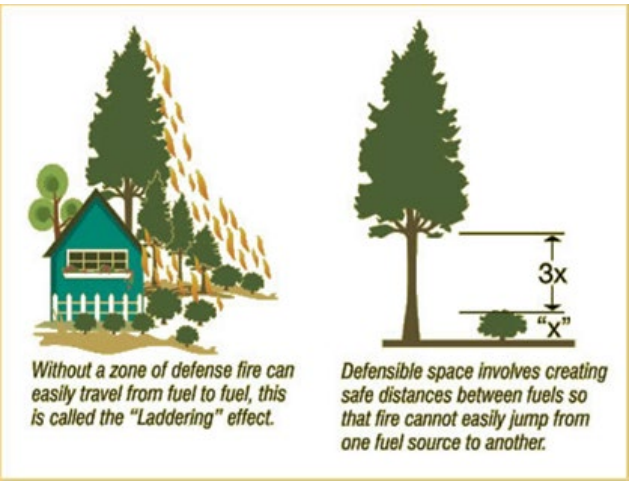

*Figure 1: The continuity or connectivity of surface and ladder fuels with tree crowns can result in high fire intensity and severity. In the **defensible space zone** around your home, common fuel reduction objectives include reducing surface and ladder fuels and breaking up the vertical and horizontal connectivity of surface, ladder, and tree crown fuels. (Credit: USFS)*

Set your objectives

Objectives should be goal-oriented and based on how you change existing conditions towards the desired conditions representative of your goals.

Goals	Common Potential Objectives
Defensible Space	• Reduce the *horizontal continuity* of surface fuels (e.g., leaves, tall grasses, shrubs) • Break up the *vertical continuity* by removing ladder fuels (e.g., large shrubs and small trees that can connect to the canopy trees)
Tree and Forest Health	• Retain healthy and vigorous large and medium sized trees. • Thin/remove unhealthy or diseased medium and large trees to reduce overall tree density and capture future mortality • Maintain species diversity
Safety	• Remove dead & dying trees within striking distance of structures, roads, etc.
Aesthetics	• Promote visual depth, diversity of textures, or fall colors • Maintain and highlight high value trees or landscape features

Laws and regulations

Effective January 2005, **maintaining 100 feet of defensible space around your forested home is required by California Public Resources Code 4291**. Tree harvest and removal in California are regulated by the Forest Practice Act and the California Forest Practice Rules, which are enforced by CALFIRE. Landowners may remove trees without a Timber Harvest Plan (THP) or exemption if the wood *is not* sold, bartered, exchanged, or traded and there is no conversion of land use from forest to other use (e.g., structure, agriculture, driveways, septic, etc.). If the wood is to be sold, bartered, exchange, or traded, or if the landowner intends to remove trees for land uses other than the growing of commercial tree species, then a THP or exemption (e.g., structure protection, less than 3-acre conversion, or forest fire prevention exemptions) will be required. Contact CAL FIRE or a Registered Professional Forester (RPF) for assistance and information.

Develop your prescription and guidelines to meet your objectives

A prescription is developed to describe the treatment, or a series of treatments, designed to modify existing forest structure and composition to meet the landowner goals and objectives. It involves creating a **tree designation guideline** that provides direction on prioritizing the selection of trees to retain or remove in alignment with the various landowners' goals and objectives.

Prescription: In general, tree removal will focus on reducing the connectivity between surface fuels and larger tree crowns by cutting ladder fuels and increasing the spacing between retained trees. Consider the following prescription criteria with higher priority criteria taking precedence over the next higher priority:

Tree Species and Size:

Retain healthy, larger diameter conifers and hardwoods species like CA black oak, sugar pine, ponderosa pine, Douglas-fir, and incense cedar. **Remove** shrubs and small to medium trees that have vertical and horizontal continuity between surface fuels, ladder fuels, and the to the upper canopy.

Tree Crown Characteristics:

Retain trees with full healthy tree crowns. This includes long "pointy" crowns with greater than 30% live crown ratio. Crowns should be full of green, healthy foliage and have good form (i.e., straight without forks or crooks). **Remove** trees with poor crowns with less than 30% live crown ratio, thinning or discolored "chlorotic" foliage.

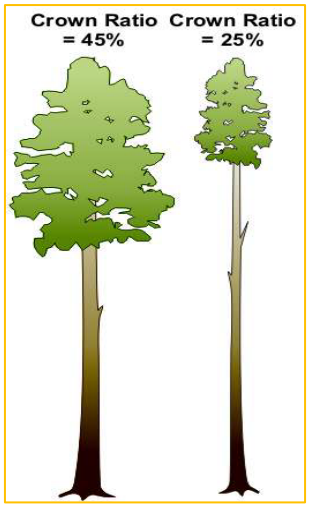

Figure 2: Live Crown Ratio (Credit Timberland Advisors)

Disease or Damage:

Remove trees that display signs of insects (e.g., pitch tubes, frass), disease e.g. (cankers, mistletoe, etc.), dead tops, excessive limb dieback, or other damage (e.g., forked stems, crooks, broken tops).

Creating a Prescription – Suggestions:

1. Start with identifying the trees you want to keep and why you want to keep them. These serve as good "**anchors**" or foundations for deciding which trees to remove based upon spacing to the "**anchors**".

2. Use flagging to delineate which trees you want to keep so you can better visualize the end result *before* you cut.

3. Remove your trees in phases starting with the highest priority goals and easiest decisions so you can adjust your selection criteria if need be.

Tree Spacing:

Retain largest, healthiest, most desirable trees and base tree spacing off of these selected trees. Historically resilient forests in the Sierra Nevada only had 20-30 conifers per acre greater than 6 inches diameter; this is equivalent to 35-45 feet between mature trees on average. However, uniform or "even" spacing is not necessary; adequate spacing can be achieved by leaving clumps of the largest most desirable fire tolerant trees within network of intermingled openings and individual trees. **Remove** conifer trees of equal or lesser size to create crown separation around desirable leave trees.

Further Reading & Resources:

Defensible Space Zones, CAL FIRE

Tree Growth and Competition, UCANR Forest Stewardship Series 5

Planning and Permitting Forest Fuel Reduction Projects on Private Lands in CA, UC ANR Publication 8716

North, Malcolm P., Ryan E. Tompkins, Alexis A. Bernal, Brandon M. Collins, Scott L. Stephens, and Robert A. York. "Operational resilience in western US frequent-fire forests." Forest Ecology and Management 507 (2022): 120004. https://doi.org/10.1016/j.foreco.2021.120004

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