



MAINTAINING YOUR FOREST CARE PLAN

After completing Forest Care it is the landowner's responsibility to maintain a healthy, well-thinned, fire-safe forest. A properly thinned, privately owned forest only lasts as long as the landowner's efforts. This guide is intended for property owners to reference once they have thinned their forest. Included in this guide are an annual checklist for Forest Care maintenance tips for healthy and fire safe vegetation, soil erosion prevention tips, and other strategies for beautifying your property.

Annual Forest Health and Fire Safety

- ✂ Trees and shrubs are thinned (spaced at least 15-20 feet apart).
- ✂ Residual trees are pruned so that the lowest branches are at least 8 feet from the ground, but not pruned higher than half of the trees height.
- ✂ All slash from the thinning is either chipped or removed from the site.
- ✂ Excess pine needles and leaves are raked, but not all the way to the bare mineral soil.
- ✂ Only fire safe plants within 100 feet of home. (Small, dispersed shrubs and pruned trees without ladder fuels are okay).
- ✂ Roof and gutters are clear of pine needles, leaves and debris.
- ✂ Serious soil erosion is not occurring on your property as a result of plant removal.
- ✂ All branches within 10 feet of the chimney and the roof are cleared.
- ✂ The chimney screen is not heavier than ½" mesh and is both in place and in good condition.
- ✂ Dried grasses and other vegetation are mowed (less than 6" height) within 100 feet of structures.
- ✂ An outdoor water supply with a hose and nozzle can reach all parts of the house.
- ✂ Fire extinguishers are checked and in working condition.
- ✂ Your property is easily identifiable with road signs and house number clearly posted. We suggest reflective lettering.
- ✂ Rakes, hoes, axes and shovels are easily accessible for use in the event of a fire.
- ✂ The firewood pile is at least 15 feet away from and on the uphill side of any structure.
- ✂ Trees are healthy and have been monitored for signs of bark beetles.

“Lean, Clean, and Green”

Defensible space refers to a cleared area around your home and is required in the San Bernardino National Forest on every property with a structure. Forest Care can get you started with defensible space requirements, but you can maintain them. Forest Care is a cost-share program to help landowners afford the cost of initial forest health treatment on their property. It is the responsibility of the landowner to finish and maintain their Forest Care plan. By following defensible space tips, landowners demonstrate a willingness to protect their forest home and community.

Forest health and 100’ defensible space are easy to maintain by remembering “Lean, Clean and Green.” Forests are “lean” when ladder fuels and highly flammable plants are removed. Ladder fuels are trees and shrubs that grow underneath tall trees and serve as a “ladder” for fire to climb from the forest floor to the tree tops. They can threaten the larger trees and overcrowd the forest. Removing extremely flammable plants within 100 feet of structures also keeps the forest “lean” by reducing fuels. Removing dead vegetation and pruning the dead, dried limbs of trees and shrubs creates a “clean” property. Dead, dry fuels are more susceptible to burning than live trees. Lastly, maintain a “green” forest by keeping vegetation vigorous which helps prevent beetle attacks and dead fuels in the future. Check tree and plant health regularly and keep the forest thinned to keep all vegetation “green”.

Before Forest Care



After Forest Care



Landowners need to remember what a properly thinned and healthy forest looks like years following Forest Care. One easy way to do this is to take a picture before and after your Forest Care treatment. Reference these pictures in the years ahead to revisit your goal for responsible forest management.

Removing low tree branches and ladder fuels by thinning, pruning, and brush trimming are key components to defensible space and are covered through Forest Care. Other steps a landowner can take to create defensible space include moving firewood piles away from the house, reducing the number of highly flammable plants, and landscaping with a variety of less flammable plants that will both enhance the beauty of the landscape and help protect structures from fire. Weeds and dead vegetation should be cleared as needed in order to reduce dry material that is highly flammable. Homes are protected by making sure branches are always pruned at least 10 feet from the roof and the chimney. Follow the annual checklist to maintain forest health and defensible space requirements. Review this guide for more tips to having healthy trees, healthy plants, and less soil erosion.

Healthy Trees

It may be tempting to plant new trees after completing Forest Care. People may not be used to seeing a more natural and open forest. Before planting a new tree, consider how much space a tree will need once it has reached full size. Many large trees can require as much as 15 and 24 feet between other tree trunks for growing room! Tree spacing is important to reduce competition for water, reducing the chance of stress and tree mortality. Avoid planting trees next to driveways, buildings, or under power lines because they will eventually grow larger and roots and branches will become a nuisance.

A thinned out forest allows more sunlight to reach the floor. For years after thinning, there may be pine, cedar, juniper, and oak seedlings in high abundance. Seedlings do not always resemble the trees that they grow into. The best way to remove seedlings is to mow or hoe them. Pulling them out as if they are weeds will also work. The seedling "carpet" can nearly cover the ground completely. A high density of seedlings will result in stressed growth and less water and nutrients to go around.

Healthy Vegetation and Fire Safe Plants

Even though all plants are flammable, some plants are more flammable than others. Less flammable plants tend to have high moisture content, are low growing, have a low fuel volume, and a desirable chemical content. Wildflowers (such as lupine (*Lupinus* spp.) and yarrow (*Achillea* spp.)) tend to remain green all season, are 1-3 feet in height, and have low fuel content. These plants are given a low rating for flammability. Some highly flammable plants common in the San Bernardino National Forest are the manzanitas (*Arctostaphylos* spp.). Many manzanitas tend to be woody, have dry leaves, grow to be very large and emit a chemical that acts as lighter fluid on a hot day, encouraging fire to burn its leaves. These adaptations enhance the likelihood of fire to burn manzanita and are a result of manzanita needing the heat to germinate its' seeds.

Choosing plants on the low end of flammability scale will help protect and beautify your 100 feet of defensible space. Always avoid planting anything up against the side of a structure and make sure to keep highly flammable plants pruned back and away from homes and the branches of large trees. For a list of native and adaptive plants and their flammability rating visit the following website:
<http://www.lakearrowheadcsd.com/downloads/LACSDLandscapeGuide.pdf>

Native plants are well-adapted to the dry, hot, and low nutrient conditions in our area. Therefore, fertilizers are generally not needed if you plant native or adapted plants on your property. While fertilizers may help newly planted vegetation become established, they are not necessary once plants are established.

Water conservation is important to all of Southern California, including the San Bernardino National Forest. Landscaping with native plants is one easy way to conserve water. These plants rarely need water, although they may need a small amount during the seasonal drought plants. Soak plants at their base and soak larger trees under the tips of their branches. This will send water directly to the roots of plants, so less water will be wasted. Try not to water grass and plants during the hottest part of the day. Switching to low-flow drip irrigation systems can save water, time and money. Drip irrigation systems involve using small plastic tubing to water directly at the base of each plant. This system of watering ensures vegetation is well watered and "green" while also reducing water waste. Check with the local nurseries for more tips on using native and adaptive fire safe plants and low-flow drip irrigation.

Bark Beetles

Bark beetles colonize trees when females lay eggs between the bark and wood of a tree on its branches, twigs, and trunk. The eggs then hatch and larvae develop and bore into the cambium (the layer of the tree that is responsible for tree growth, nutrient flow and bark formation). As the insect larvae bore in and around the area between the bark and wood, they create tunnels that girdle this essential layer. This prevents the exchange of nutrients and water and can lead to tree mortality.

After larval development trees exhibit signs of beetle presence. Small holes with sap discharge and signs of frass (sawdust-like material) are two signs of beetle presence. Once trees have been attacked, prune and remove the infested branches. If the trunk is infested, remove the tree quickly to prevent the spread to other trees. Nearby trees that have not been infested can be treated by applying insecticide in the spring, when adults emerge from the infested trees to look for new boring sites. However, these sprays will not be effective if the trees are overcrowded and stressed as a result of too much competition.



Dr. Lloyd Glenn Ingles © California Academy of Sciences

This picture shows how the bark beetles burrow through the cambium, girdling the tree.

Prevention is the best method for mitigating beetle invasions.

By maintaining a healthy and thinned forest the trees on your property will be more resistant to invasion of this natural forest pathogen. Once a tree is attacked on your property, try to prevent it from spreading to other trees. Newly planted or transplanted pines and oaks are very susceptible to attack, especially when proper care is not given during the first years after planting. Maintain your healthy forest and you will increase the natural defenses of the trees on your property. For more information visit the University of California Statewide Integrated Pest Management Program: www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7421.html

Soil Erosion

While maintaining your Forest Care plan, protection against soil erosion is important. Soil erosion can negatively impact the environment, since exposed soil creates dust in a community through wind erosion. Rain can also cause exposed soil to enter local waterways. This directly impacts aquatic ecosystems by smothering fish eggs and clouding water. Soil also adds nutrients to water that can cause unwanted algae to grow. There are several things that can be done to prevent soil erosion while creating a healthy and fire safe forest. When removing vegetation, leave the roots behind. Until the roots have fully decomposed they will continue to hold soil in place and prevent erosion. Also, as the roots decompose they will add organic matter to the soil that will both keep the soil amended and provide nutrients for other plants to use.

Remember, 100 feet of defensible space does not require that every plant be removed within 100 feet of structures. Grasses, ground covers, low burning shrubs and wildflowers can grow in this zone. Vegetated soil will help prevent erosion from occurring. After removing flammable vegetation, plant exposed soil with less flammable plants. On steep slopes, break up the shrubs horizontally instead of vertically to prevent hillside erosion.

Always leave 2" of pine needles covering the soil. Leaves and pine needles naturally accumulate on the forest floor, break down under snow and rain, and provide nutrients to the soil. This material is important for preventing soil erosion. Some debris will also help the ground stay moist, which may slow fire and support plants and wildlife. However, too many leaves and needles can be a serious fire hazard. Therefore it is important to rake some of the excess leaves and needles on your property but always leave at least 2" of "duff" (or partially decomposed needles and leaves) on the ground.