

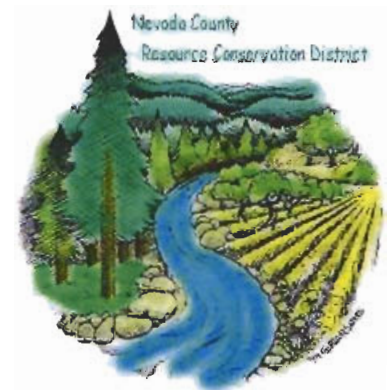
How To Manage The Vegetation On Your Property

Natural
Resource
Guide



MODIFY
REDUCE
MANAGE
ENHANCE

Learn the different techniques for reducing the brush and unwanted vegetation on your property. This brochure offers several alternatives to achieving your goals while being thoughtful of the natural resources on your land and adjacent properties. The aim is to increase forestland and grassland health and reduce the severity of wildfires while protecting soil, water and air quality and enhancing wildlife habitat and plant communities.



**Pacific Gas and
Electric Company**



Fire evolved ecosystem...What does this mean?

Fire used to move naturally throughout forest and grassland areas approximately every ten years, depending on the area, weather patterns, topography and types of dry vegetation. Lightning often started fires and winds would carry them throughout the landscape. This natural phenomenon kept brush from growing out of control and competing with other plants and trees while thinning dense, young stands of trees. Some plants actually need disturbance, such as fire, to stimulate their germination and growth.

With the increase of home building in rural and forested areas, a natural or man-made fire is now suppressed to save human lives and structures. As a result, heavy accumulation of dead vegetation exists while brush and trees have grown very dense and tall. With over crowding, these species are competing for sunlight, water and nutrients in the soil to survive. Many plants and trees are weakened as a result and lose their ability to withstand diseases. Therefore, it becomes the task for humans to mimic nature as best we can and manage the vegetation as naturally as possible. There is need to reduce the amount of vegetation and tree density in our forests to improve their health and protect human lives and property. This also means understanding the types of wildlife present in your area along with the type of habitat they require for food, shelter, nesting and protection.

Some areas still allow “controlled or prescribed burns” but they should be done by a professional and only on permissible burn days. Due to air quality concerns and the increase of home building, there are fewer “burn days” allowed and permits may be required.

This brochure will discuss the following:

- * Reducing or modifying the vegetation on your property
- * Creating defensible space around your home– it’s the law!
- * Pros and cons of methods for removing unwanted vegetation
- * Annual management and maintenance of vegetation
- * Considerations when removing vegetation:
 - A. Minimize soil disturbance and protect water quality
 - B. Allow low growing plants or mulch to remain on the ground
 - C. Chipping or composting– recycling is good!
 - D. Leave mosaics of vegetation and some brush piles for wildlife
 - E. Be careful not to remove plants that allow Threatened Species to survive
 - F. Plant native grasses and forbs whenever possible; this limits invasive weeds

- * Plant the right plant for the right space and plant “power-line friendly” trees under power lines that will not exceed 25 feet in height.



DEFENSIBLE SPACE



What is defensible space? California law currently requires a minimum of a 100 foot clearance (defensible space) around all structures. Defensible space is the area that lies between your house or structure and an oncoming wildfire where the vegetation has been modified to reduce the threat of fire and to provide an opportunity for firefighters (and the homeowner) to safely defend a structure.

Researchers who have studied past wildfires found that homeowners on a level property have a much better chance of saving their homes if flammable vegetation is greatly reduced within 100 feet of all structures and if fire-resistant roofing is used. Examples of defensible spaces are green, irrigated backyards, brush reduction and community greenbelts.

According to Forest Service studies, the chances of a home igniting during a wildfire is determined almost entirely by what happens within a 100 feet of the home. The width of defensible space needs to be greater on steep slopes.

Structures located on steep slopes or at the tops of steep slopes require Management of flammable vegetation up to 400 feet downslope and 200 feet to the sides and upslopes. Defensible space doesn't have to mean bare ground. Bare ground would create erosion problems and probably would not be very aesthetically pleasing to the landowner.

No plants are completely fire resistant. Avoid plants that have resinous, oily or waxy plant parts. Even the best fire resistant plants can become a fire hazard if not maintained. Any plant can burn during extreme fire conditions. However, there are plants that are harder to ignite, burn slower, produce less heat when burning and/or produce a shorter flame length.

Make sure your property address is clearly marked. Green reflecterized address signs work great and are very inexpensive.

THE THREE R'S OF DEFENSIBLE SPACE

HOW DO I CHANGE THE VEGETATION ON MY PROPERTY TO REDUCE THE THREAT OF WILDFIRE?

The objective of defensible space is to reduce the wildfire threat to a home or structure by changing the characteristics of the adjacent vegetation. Defensible space practices include:

- Increasing the moisture content of vegetation (irrigation practices)
- Decreasing the amount of flammable vegetation
- Shortening plant height
- Altering the arrangement of plants
- Planting the right tree, in the right place

This is accomplished through the "Three R's of Defensible Space"

REMOVAL	Remove hazardous brush, weeds, and highly flammable vegetation for a minimum distance of 100 feet around a structure. Example: remove any tree that is dead or dying or any portion that extends within 10 feet of a chimney. Work with PG&E to remove trees growing near power lines and contact them at 1-800-743-5000
REDUCTION	The removal of plant parts, such as branches or leaves, constitute reduction. Examples of reduction are pruning dead wood from a shrub, removing low branches, and mowing dead, tall grass. Reduce the potential for trees to contact power lines by working with utility companies to remove trees under high voltage lines that will grow taller than 25 feet in height.
REPLACEMENT	Substitution of hazardous vegetation with less flammable plants. For example, removal of dense brush and replacing with an irrigated, maintained landscape. Replace trees under power lines with plants that do not exceed 25 feet in height. Visit www.safetree.net for a list of trees.

Methods of Treatment

Work by hand:

Advantages:

Low cost if landowner performs the work
Can be done throughout the year
Minimal soil disturbance
Works well on steeper slopes
Free chipping programs available in many areas
Chipped material leaves a mulch and limits re-sprouting
Easy to create a mosaic of vegetation

Disadvantages:

Difficult to clear thick or tall brush
Can be expensive if you hire outside labor
Can be labor intensive to gather and move materials to a chipper or haul to a green waste site
Takes longer to treat than mechanization
Can be dangerous if landowner is inexperienced with chain saw

Hand Cutting, Pruning and Thinning

Start by evaluating your property. Which areas need to be treated? What method of treatment will work best for you? Hand cutting will require a good set of loppers, chain saw, safety goggles, gloves, hardhat and chaps. Hand removal of brush works great for small acreage, usually less than ten acres. Loppers work great for small diameter vegetation such as smaller shrubs and tree branches. A chainsaw will be needed for larger diameter vegetation when pruning and thinning. Chainsaws can be dangerous. Visit your local saw shop for safety tips and demonstration classes.

Once the vegetation has been cut, trimmed and thinned, you will need to decide whether to pile and burn the material, move it to an area accessible to a chipper or haul it away to a green waste facility. Hauling it away is the least desirable unless you have a wood center or biomass plant near you. To burn the material, you will need to make piles away from the standing trees and other vegetation.

You must ALWAYS CALL THE BURN HOTLINE BEFORE YOU BURN. It must be a permissible burn day per the local Air Quality District and permits will be required during certain times of the year. Contact your local fire department or CDF for more information. Chipping small diameter material creates a mulch layer on the ground and may limit the re-sprouting vegetation. By chipping, you will not be reducing the fuel load on your property, but rather re-orienting the material; yet this method is very effective.



Sharp equipment is more effective and safer.



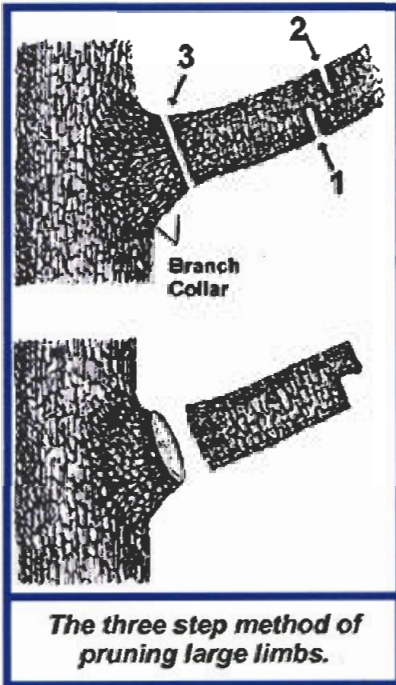
Leave some of your brush piles for wildlife

Work by hand:

Pruning

Pruning can involve both dead and live limbs. If the ground and ladder fuels have been removed, prune limbs up to 10 feet above the ground. If you are pruning for future timber quality for commercial harvesting purposes, pruning can occur up to 18 feet above the ground. Most pruning is done with a pruning saw, with or without a long handle, or a gas powered pruning saw. For smaller trees, loppers can be used for smaller branches.

When pruning, trim branches as close to the trunk or bole as possible without cutting into the branch collar. This is necessary to keep the tree healthy and minimize the chance of infection through the limb wound. For pine trees, only prune in late fall or winter to minimize the chance of bark beetle infestation.



Thinning

Timber stands in this area are dominated by overstocked, dense stands of small trees (primarily incense cedar, white fir and ponderosa pine). These dense young stands need to be thinned to remove ladder fuels from under the crowns of older trees and to reduce competition for nutrients and moisture. This will improve tree vigor and longevity of the larger, remaining trees.

The purpose of thinning for fuels reduction is to increase the distance between tree crowns in order to reduce the chance that fire will spread between them, and/or to remove ladder fuels to reduce the possibility that a ground fire will transition to a crown fire. Thinning can be done by hand or using a wide variety of equipment.

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

Piling

Material removed by hand can be piled away from structures on your property for wildlife brush piles. These can provide great habitat for small animals and birds. The piles will decompose naturally. Although hand removal can be labor intensive, it is usually less of an impact on the soil and ecosystem. The material can also be chipped or burned. If piling for burning, limit the size of your piles to approximately 8 x 8 feet.

Burning

Please use a safe method for burning piles. Contact your local fire department or California Department of Forestry for burn information. ALWAYS call first and make sure it is a burn day, and whether a burn permit is needed. Even if it is a permissible burn day, if the weather is windy in your area, you should wait for a better day to burn. Do not leave the pile unattended and make sure the fire is completely out before leaving it. Always add water to put the ashes dead out.

Do not burn poison oak!

Equipment necessary for burning a pile is a shovel and/or pitch fork, water supply or hoses and buckets and a telephone nearby. Also, wear non-flammable gloves and clothing, if possible.

Mechanical Methods

Advantages:

Treats brush or dense vegetation well
Can achieve results in a short time on large areas
Adds a “mulch type” layer on the ground (mastication)
Mulch layer slows the re-growth of brush

Disadvantages:

Can be expensive
Limited number of contractors with masticators
Steep slopes can be a limiting factor

Mechanical Methods include all methods of modifying the fuels profile except for fire use applications, work by hand, chemical treatments and livestock grazing. Mechanical treatments include: biomass removal, biomass thinning, rearrangement, chipping, tractor piling, and mastication. Biomass is defined as organic materials, such as small trees, woody plants and agricultural wastes that can be burned to produce energy or converted into a gas and used for fuel.

Tractor Pile and Burn

Tractor piling and the eventual burning of the piles is much faster and more efficient than hand cutting and piling. Tractor piling usually results in a longer lasting fuel reduction treatment because most of the roots are removed with the clearing operation. When a tractor is used, a brush rake attachment should generally be used to pile brush and debris while reducing the amount of dirt in the piles and minimizing soil disturbance. An experienced and careful tractor operator can pile brush with minimal dirt getting into the brush pile. Excessive dirt will reduce the ability of the brush to burn completely. Excessive slopes can be a limitation to tractor clearing.

Burning of these large piles can only be done on “permissive burn days” as regulated by the Northern Sierra Air Quality District and the California Department of Forestry and Fire Protection.

Remember to discuss soil erosion prevention issues with your contractor beforehand and have an agreement to install erosion control methods where needed as a result of the tractor work.

Mastication

This treatment is a relatively new technology and is done with a very specialized piece of heavy equipment that essentially grinds vegetative material down close to or into the dirt. This is a one-step operation that effectively reduces vegetative fuels on a wide variety of topography in a rapid manner. Like chipping, mastication provides the added benefit of returning the vegetative material back to the ground where it can act as a soil amendment or provide an erosion control mulch-like layer over the surface of the soil. Mastication can be done most times of the year without permits. Due to move-in/move-out cost of equipment, this method can be expensive for small landowners (10 acres or less). This can be overcome by increasing the project size by the addition of several adjacent property owners. Mastication is generally used on dense areas of small, live fuels such as brush and small diameter trees. Mastication is the breaking of fuels into small pieces and (usually) leaving them on the forest floor. It is a very effective tool for thinning trees and brush in plantations. This equipment is an excellent tool for maintenance of fuelbreaks.



Small masticator used on smaller acreage. Equipment on tracks for minimal soil disturbance. Note the drum head attachment for “chewing up the vegetation.”

Mechanical Methods

Mastication mimics understory burning to one extent, and thus can be an effective replacement for prescribed burning in areas where fire is not safe to use anymore. Once limited to slopes less than 30 percent for safety reasons, some modern mastication machines have capabilities of operating safely on steeper slopes. Since mastication does not kill the root systems of target sprouting shrubs and hardwood trees, these plants typically sprout rapidly following mastication treatment. This method of treatment has severe limitations on rocky sites.



Large masticator works on slopes up to 40% and reduces unwanted vegetation from 20 feet high down to ground level mulch. Here a rotary head “chews up” the vegetation.



Recycling



Chipping (on site)

Chipping of vegetation may be a good option for smaller properties or smaller project areas that are close to roads. This treatment has the added benefits of returning the organic matter back to the ground where it can act as a soil amendment and/or provide soil erosion control over the surface of the soil. The major disadvantage of using a chipper is that it is a large piece of equipment and limited to roads or very flat surfaces adjacent to roads, therefore the material needs to be brought to where the chipper is located. The best use of chippers is where fuel load reduction work takes place along roadsides or adjacent properties. Other advantages are that chippers can be used throughout all seasons with minimal risk of fire, does not need permits and it does not produce smoke. Chipping allows you to reduce your tree trimmings and provides mulch to be recycled for landscaping on your property.

Do not leave chip piles against or under trees as they can attract insects, and could lead to beetle infestation and death of some trees.

Contact your local Fire Safe Council for information on *free chipping* services. Many times they have programs for the disadvantaged, disabled and seniors.



Livestock Grazing Methods

Advantages:

Natural, holistic method
Can be low cost
Can graze steep slopes
Generally socially acceptable
Can significantly reduce vegetation/ invasive weeds over time
Excellent for yearly maintenance
Excellent as follow up method after other types of initial treatment on vegetation

Disadvantages:

Animals must be fenced
Animals need water source
Takes longer to reduce vegetation
Need predator control
Could compact soil in small areas
May need supplemental feed year-round

The grazing method involves the use of animals to control the composition and rate of growth of brush and grasses. Livestock will graze grasses and legumes, invasive weeds and brush species. You can achieve different results depending on the type of animal you choose.

Several factors need to be considered when choosing a grazing method:

- * Size of your parcel
- * Number of grazing animals
- * Type of vegetation
- * Terrain and topography
- * Availability of water
- * Type of fencing and predator control
- * Zoning restrictions and ordinances
- * Time of year

Using animals to reduce vegetative fuels can be a long term commitment or you can rent goats. The local goat contractor can provide all or part of the management, including transportation, temporary fencing and predator control.

For assistance with livestock grazing management, contact your local UC Extension Farm Advisor or your local Resource Conservation District.



Goats eat a variety of grass and brush species and are the best “brushers”. They are good tree climbers, consequently desirable trees may need protection.

Let Animals Be Your Groundskeepers

Livestock Grazing Methods

Rotational Grazing



Whichever type of animal you choose to aid in reducing unwanted brush and weeds, there are some grazing management tools you should consider. When grazing grasses, do not over-graze below 4 inches of grass height. This will allow for re-growth of pastures and protect the soil from erosion and reduce water and manure run off. If you are raising animals year round, consider rotating animals from area to area to allow them to graze the re-growth, especially when trying to reduce re-sprouting vegetation and invasive weeds. Attempt to graze areas before weeds go to seed.



Goats are the best all around “groundskeepers.” They love a multitude of grasses, clovers, weeds and especially the brush species such as manzanita, berry bushes and poison oak.

They will even eat star thistle! Goats are also good tree climbers and will prune the lower branches of vegetation. If goats have grazed down the vegetation and are left in an area too long, over-grazing will occur. When this happens, they will usually eat the bark off of trees, called girdling, and the trees will die. You can protect your trees from girdling by loosely wrapping chicken wire around the tree trunk, rotating the animals to a different area or fencing off areas with trees.

Goats can be combined with other species of livestock. They do not require expensive handling equipment but do require good fences and predator control. Angora and cashmere goats need to be sheared annually.

If you plan on renting goats for reducing the unwanted brush on your property or using them for annual maintenance, it might require spring and fall grazing for a few years to drastically reduce the unwanted species.

Cattle require larger acreage and require sturdy fences and loading equipment. Cattle will graze grasses and browse brush species, especially when plants are young. Cattle, sheep or goats can be grazed together.



Sheep are good brushers and also enjoy grazing on grass pastures. They graze close to the ground so it is important to rotate grazing areas to avoid over-grazing and development of weeds. Most sheep do need to be sheared annually.



Horses are much more selective grazers than the other livestock and prefer grasses and clovers. Horses tend to eat young grasses low to the ground and leave more mature, unpalatable grasses standing. It is a good practice to follow up with other livestock to eat vegetation that horses leave behind. Horses can develop a disorder called founder if they graze pastures that are rich and lush or have a high concentration of legumes, such as clover. Many weeds and plants are poisonous to horses so knowing your pasture plants is important. Horses are not usually good for “brushing.”



As with all species of livestock, rotational grazing is required to protect the land and allow for re-growth of grasses and legumes, such as clovers. Temporary electric fencing with a portable solar charger can be used with all species of livestock. The larger the animal, the higher the fence needs to be or more strands of wire or electric tape. Predator control is vitally important and all animals need a clean water source. Animals can be enjoyable and fun while helping maintain your property.

Chemical Methods

Advantages:

- Does well as annual maintenance tool
- Can target specific plants
- Can be cost effective
- Effective on sprouting vegetation
- Many herbicides are available “over the counter”
- County Agriculture Commissioner available for information and education
- Licensed applicators can assist with application

Disadvantages:

- Less effective on dust covered plants
- Must follow label exactly
- Requires a buffer near water sources
- Can damage desired plants
- Can not be applied when rainy or windy
- Applications must be timed to plant life cycle stage
- Should not kill vegetation while wildlife nesting



Pesticides can be used to reduce hazardous vegetative fuels. Pesticide treatment can have a high degree of selectivity (undesirable plants are controlled, others are suppressed, and desirable plants are released) and be very cost-

effective especially when treating large areas. Some pesticides are designed to target only select groups of plants; some are designed to kill all or most vegetation. For example, a specific herbicide will kill only yellow star thistle and other closely related plants. After the star thistle is killed, the area should be replanted with desired seed to out-compete and keep the star thistle from returning.

There are several different ways to apply pesticides. Pesticides can be applied by hand, with large spray machines, or even by using aerial systems. Low-impact application methods include: spot spraying individual, undesirable plants; tree injection, cut-stump sprays or wipes; and directed foliar sprays. Herbicide treatments work well when used in conjunction with other vegetation management treatments. For example, once an area has been masticated to knock down the brush, a follow up treatment with a herbicide to kill the re-sprouting, unwanted vegetation can be very effective.

Care should be used in the selection of the product to use, how and when to apply it, and how it fits into the overall vegetation treatment. **Always** read all of the information on the product label before using any pesticide. Read the label for application restrictions.

Do not allow careless application, apply near or on water, allow spray to drift, and/or allow spills. Dispose of containers properly. Contact your County Agricultural Commissioner for more information.



Above: Sprouting vegetation has been effectively sprayed to reduce the fuel ladder and reduce the competition of plants for water and nutrients.
Below: a mosaic of manzanita remains for wildlife habitat.



Developing a Plan



Develop a plan for your property that includes your goals, the time you have available for maintenance, resource inventory of your property and note any sensitive areas or concerns. Resource inventory includes the type of soil, location of water courses, slope and topography and type of existing vegetation (including invasive weeds). Look over your property and see if any soil erosion or flooding has occurred. Make note of any wildlife and determine their habitat needs. Make biodiversity part of your goal.

Multiple plant species increases the biodiversity and habitat for different animals. Biodiversity or different habitat includes different plant structures and elements like pockets or mosaics of brush, large decaying logs, snags (dead trees), clumps of oaks or piles of stacked dead brush. These different elements increase the habitat available to different birds and wildlife. Different plant structure can be strategically placed so it does not reduce the effectiveness of your fuel reduction treatment. There are many websites available that have information on Threatened and Endangered plant and animal species in your area as well.

Annual Maintenance is an integral part of every plan. California's fire evolved ecosystem is not static. Every year vegetation growth (biomass) exceeds vegetation decomposition. If vegetation is not managed yearly and it continues to build up, it creates potential fuel loads on your property. Therefore, annual monitoring and maintenance is needed. Native shrubs either resprout or rapidly germinate from seed. For example, white-leaf manzanita produces seed that can stay viable for 300 years! The most effective method of keeping non-native and invasive weeds from taking over your property is early detection and treatment. Once you have initially treated your property, annual maintenance usually takes far less work and time to achieve the desired results.

Make living among wildlife part of your plan. Consider their habitat needs of food, shelter and nesting. Create mosaics of habitats, such as brush, so their needs can be met too.



Resource Conservation Districts and the USDA Natural Resource Conservation Service are available in almost every county to assist you with natural resource planning on your property. www.ncrcd.org, www.carc.org www.ca.nrcs.usda.gov

California Department of Forestry and Fire Protection (CDF) and your local Fire Safe Council can also assist you with your plans for removing and modifying vegetation. www.fire.ca.gov

Visit PG&E at www.pge.com or www.safetree.net for more information on tree and vegetation safety.

Visit California Department of Fish & Game web site for more wildlife and habitat information at www.dfg.ca.gov

Annual Maintenance is the Key



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