A guide for homeowners

Revised 2010

Defensible Space is
Sensible Space
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If you would like to support any future funding for these materials or any other Fire Safe activity, please contact:

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Felton, CA 95018

USEFUL LINKS

COUNTY STATE AND FEDERAL
Fire Wise Communities........................................www.firewise.org
Fire Safe San Mateo County ................................www.smcfiresafe.org
The Fire Safe Council........................................www.firesafecouncil.org
CAL FIRE......................................................www.fire.ca.gov
U.S. Fish and Wildlife Service - Fire Management  www.fws.gov/fire/
USGS Western Ecological Research Center - Fire Ecology Research, California Shrublands www.werc.usgs.gov/fire/shrubland.html
National Interagency Fire Center - Protecting Your Home from a Wildland Fire www.nifc.gov/preved/protecthome.htm
California Fire Alliance ......................................www.cafirealliance.org
CAL FIRE - Wildland Hazard/Building Codes ......www.fire.ca.gov/fire_prevention/fire_prevention_wildland.php
San Mateo County Parks and Recreation ........www.co.smateo.ca.us/portal/site/parks
Golden Gate National Recreation Area ..............www.nps.gov
California Department of Fish and Game ..........www.dfg.ca.gov/
San Francisco Water Department .....................www.sfwater.org
San Mateo Resource Conservation District ..........www.smcfiresafe.org/

OTHER
Stanford University Jasper Ridge Biological Preserve http://jrbo.stanford.edu/
Sudden Oak Death ........................................www.suddenakdeath.org
Community Wildfire Protection Plans (CWPPs) ....www.cafirealliance.org/cwpp/
Midpeninsula Regional Open Space District Wildland Fire Management www.opensapce.org/plans_projects/wildlandfire.asp
CWPP - Updates and information regarding CWPP development in San Mateo/Santa Cruz Counties http://wildfireplan.blogspot.com/

VISIT OUR WEBSITE:
www.smcfiresafe.org
LOCAL ORGANIZATIONS
WORKING TO PROTECT YOU AND YOUR PROPERTY:

IN AN EMERGENCY CALL 9-1-1

Local Fire Protection Agencies and Districts:
CAL FIRE (San Mateo - Santa Cruz Unit): .....................(831) 335-5355 www.fire.ca.gov
Belmont-San Carlos Fire Department: .........................(650) 802-4255 www.bscfd.org
Central County Fire Dept. ( Burlingame, Hillsborough): (650) 558-7600 www.burlingame.org/
Foster City Fire Department: ......................................(650) 286-3350 www.fostercity.org/services/safety/fire/
La Honda Fire Brigade: ........................................... (650) 747-0381 www.lahondafire.org
Millbrae Fire Department: ........................................ (650) 259-2400 www.ci.millbrae.ca.us/
North County Fire Authority
(Brisbane, Daly City, Pacifica): ...............................(650) 991-8138 www.northcountyfire.org
Redwood City Fire Department: ................................(650) 780-7400 www.redwoodcity.org/fire
San Bruno Fire Department: ......................................(650) 616-7096 http://sanbruno.ca.gov/fire_main.html
San Mateo Fire Department: .....................................(650) 552-7900 http://www.ci.sanmateo.ca.us/
San Mateo County Fire: ..........................................(650) 573-3845 www.cfsfire.org
South San Francisco Fire Department: .......................(650) 829-3950 www.cissf.ca.us/

Law Enforcement Agencies:
San Mateo County Sheriff’s Office: ...........................(650) 363-4911 www.co.sanmateo.ca.us/sheriffs/
California Highway Patrol: .................................(415) 557-1094 www.chp.ca.gov/

Local Public Resource Agencies/Organizations:
Animal Control Services
(Peninsula Humane Society): .....................................(650) 340-7022 www.peninsulahumanesociety.org/
American Redcross Bay Area................................(415) 427-8000 www.redcross.org
Bay Area Air Quality Management District: ............(415) 771-6000 www.baaqmd.gov/
CAL Water: ...........................................................(650) 558-7800 www.calwater.com
California Native Plant Society: .............................. www.cnps.org/
California Oak Mortality Task Force: .....................(650) 363-4700 www.suddenoakdeath.org
Highlands Recreation District: .................................(650) 341-4251 www.highlandsrec.ca.gov/
Jasper Ridge Biological Preserve
Stanford University: ..............................................(650) 851-6813 http://jrbp.stanford.edu/
Office of Emergency Services: .............................(650) 363-4790 www.co.sanmateo.ca.us/oes
PG&E: .................................................................(800) 743-5000 www.pge.com
Midpeninsula Regional Open Space District: ..........(650) 691-1200 www.openspace.org
San Francisco Water Department (SFPUC): ............(650) 872-5900 www.sfwater.org
San Mateo County Department of Parks: .................(650) 363-4020 www.co.sanmateo.ca.us/
SMC Sheriff’s Emergency Services Detail: ...............(650) 363-4012 www.sanmateosar.org/
Fire is a natural part of the environment. Forests, shrublands and grasslands were burning long before there existed an urban interface.

People are now living in the fire prone environments, and many homes are built and maintained without regard to wildfires.

With more people inhabiting the wildlands, more fires are likely to occur.

Wildfires burn intensely and can be difficult to control.

- Greater loss of life.
- Increased property losses.
- Damage to natural resources.
- More money spent on firefighting.

Many people assume that when a wildfire starts, it will be quickly controlled and extinguished. This is an accurate assumption 97% of the time. Firefighters have the ability, equipment, and technology for effective fire suppression, yet 3% of the time wildfires burn so intensely that there is little firefighters can do.
LONG BEFORE A FIRE THREATENS

Prepare an Evacuation Checklist and Get Organized:

- Critical medications
- Important personal papers, photos and digital files
- Essential valuables
- Pet and Livestock transport and equipment
  - Pet carriers, food, water, medications, halters, leashes, blankets, plastic bags, paper towels, first aid kit, toys, treats, etc.
- Change of comfortable clothing and toiletries
- Cell phone with charger
- An evacuation route map with at least 2 routes and a family meeting place
- Drive your planned route of escape before an actual emergency
- Sign up for San Mateo County’s Community Alert System at www.smcalert.info

WHEN WILDFIRE APPROACHES AND EVACUATION IS IMMINENT

- Locate your evacuation checklist and place items in your vehicle
- Park your vehicle facing outward and with your keys in the ignition
- Locate your pets and keep them nearby
- Prepare farm animals for transport (if capable)
- Close windows and doors, chimney dampers to the house – air conditioning off.
- Close garage doors and all inside doors including pet doors
- Take down drapes and curtains to prevent combustion from radiant heat
- Turn on all lights so your house is visible in heavy smoke
- Charge pre-positioned garden hose lines for firefighters use in combating fire
- If the roof is combustible, clean off debris and wet roof down -- place ladder leading to roof
- Move propane BBQ appliances away from structures
- Remove any combustible patio furniture or other items such as door mats, play structures, and firewood from structures
- Keep the radio tuned to local stations for timely reports on the fire status and for evacuation instructions
- Cover up. Wear long pants, long sleeve shirt, heavy shoes or boots, cap, bandana for face cover, goggles or glasses
- If told to evacuate, leave the area as directed. All evacuation instructions provided by officials should be followed immediately for your safety
- If the fire cannot be stopped and passes over your home before you and your family evacuate, the safest place for your protection is inside the house with all the doors closed

COMPLY WITH ALL EVACUATION ORDERS
THE FIRE ENVIRONMENT

The “fire environment” is defined as the “surrounding conditions, influences and modifying forces that determine wildfire behavior.” Firefighters recognize three components of the fire environment: weather, topography and fuel. Together, these three components affect the likelihood of a fire start, speed and direction at which a wildfire will travel, intensity at which a wildfire burns, and the ability to control and extinguish a wildfire. Although weather and topography cannot be changed, the fuels (or vegetation) can be modified.

WEATHER: Dry, hot and windy weather increases the likelihood of a major wildfire. These conditions make ignition easier, allow fuels to burn more rapidly, and increase fire intensity. High wind speeds, in particular, can transform a small, easily controllable fire into a catastrophic event in a matter of minutes.

TOPOGRAPHY: Of all the topographic features, the steepness of slope is among the most influential on fire behavior. As the steepness of the slope increases, a fire will spread faster. Other important topographic features include aspect, south and southwest slopes usually have more fires, and chimneys (steep, narrow drainages) can significantly increase the rate of fire spread.

FUEL: Fuel is required for any fire to burn. With regards to wildfires, fuels almost always consist of living vegetation (trees, shrubs, grass and wildflowers) and dead plant material (dead trees, dried grass, fallen branches, pine needles, etc.). Houses, when involved in a wildfire, become a source of fuel. The amount, size, moisture content, arrangement and other fuel characteristics influence ease of ignition, rate of fire spread, length of flames produced and other fire behaviors.

HUMAN ENVIRONMENT: When people are living in high fire hazard environments, the human built environment becomes an important factor in predicting the loss of life and property. Untreated wood shake and shingle roofs, narrow roads, limited access, lack of fire-wise landscaping, inadequate water supplies and poorly planned subdivisions are examples of increased risk to people living with the threat of wildfire.
THE LIMITATIONS OF WILDLAND FIREFIGHTING

<table>
<thead>
<tr>
<th>FLAME LENGTH</th>
<th>EFFECTIVE FIREFIGHTING TACTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 4 ft</td>
<td>Firelines constructed with hand tools, such as shovels and axes, can be effective at the front of the fire.</td>
</tr>
<tr>
<td>4 to 8 ft</td>
<td>Bulldozers and other heavy equipment will be needed to construct an effective fireline. Where bulldozers are not available, fire engines with hoses and water will be required to “knock down” the flames before the fire crews with hand tools can be effective, or fire crews must construct a fireline at a considerable distance from the fire.</td>
</tr>
<tr>
<td>8 to 11 ft</td>
<td>Airtankers with fire suppressing retardant or helicopters with water are required to reduce the fire’s rate of spread before fireline construction by crews or bulldozers can be effective.</td>
</tr>
<tr>
<td>More than 11 ft</td>
<td>Direct fire suppression efforts will be ineffective. Firefighters retreat to existing roads, streams and other barriers and attempt to burn out fuels between the fireline and the advancing fire front.</td>
</tr>
</tbody>
</table>

IMPROVE THE ODDS: CREATE A...

Creating defensible space means modifying and reducing vegetation 30 to 100 feet around the structure to provide an opportunity for firefighters to effectively defend the home or structure in the event that a wildfire should approach.
Frequently Asked Questions

ABOUT DEFENSIBLE SPACE

WHAT IS THE RELATIONSHIP BETWEEN VEGETATION AND WILDFIRE THREAT?

All vegetation, including naturally occurring native plants and ornamental plants in the residential landscape, is potential wildfire fuel. If vegetation is properly modified and maintained, a wildfire can be slowed, the length of flames shortened, and the amount of heat reduced, all of which assist firefighters to defend a home against an oncoming wildfire.

DOES DEFENSIBLE SPACE REQUIRE A LOT OF BARE GROUND IN MY LANDSCAPE?

No. Unfortunately that is a common misconception. While bare ground may be effective in reducing the wildfire threat, it lacks in appearance and may cause soil erosion. Landscaping can be designed to create an attractive well-vegetated property that also provides effective defensible space for homes.

WHAT DOES THE LAW SAY?

The Government Code 51182 and the Public Resources Code 4291 requires that any person that owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining any land covered with flammable material shall at all times maintain 100 feet of defensible space.

DOES DEFENSIBLE SPACE REQUIRE ANY SPECIAL SKILLS OR EQUIPMENT?

No. For the most part, creating a defensible space employs routine gardening and landscape maintenance practices; such as, pruning, mowing, weeding, plant removal, appropriate plant selection and irrigation. The necessary equipment consists of common tools, like a chain saw, pruning saw, pruning shears, loppers, weed-eater, shovel and a rake. A chipper, compost bin or a large rented trash dumpster may be useful in disposing of unwanted plant material. * Do not use power equipment on red-flag days.

WHAT DOES DEFENSIBLE SPACE MAKE A DIFFERENCE?

Yes. Post fire investigations of homes threatened by wildfire indicate that houses with an effective defensible space were much more likely to survive a wildfire. Furthermore, homes with both an effective defensible space and a nonflammable roof (composition shingles, tile, metal, etc.) are many times more likely to survive a wildfire than those without. These conditions give firefighters the opportunity to effectively and safely defend a home.

THE FIRE DEPARTMENT IS SUPPOSED TO PROTECT MY HOUSE, SO WHY BOTHER WITH DEFENSIBLE SPACE?

During a major wildfire, it is unlikely there will be enough firefighting resources available to defend every home. In these instances, firefighters will most likely select homes they can safely and effectively protect. Even with adequate resources, some wildfires may be so intense that there may be little firefighters can do to prevent a house from burning. The key is to reduce fire intensity as wildfire nears the house. This can be accomplished by reducing the amount of flammable vegetation surrounding a home. The action taken by the owner before the wildfire occurs (such as proper landscaping) is critical and is also required by the Government Code and the Public Resources Code.
**THE THREE R’s OF DEFENSIBLE SPACE**

<table>
<thead>
<tr>
<th><strong>Removal</strong></th>
<th>This technique involves the elimination of entire plants, particularly trees and shrubs, from the site. Examples of removal would be the cutting down of a dead tree or the cutting out of a flammable shrub.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reduction</strong></td>
<td>The removal of plant parts, such as branches or leaves, constitute reduction. Examples of reduction are pruning dead wood from a shrub, removing low tree branches, and mowing dried grass.</td>
</tr>
<tr>
<td><strong>Replacement</strong></td>
<td>Replacement is the substitution of less flammable plants for more hazardous vegetation. For example, removal of a dense stand of flammable shrubs and planting an irrigated, well maintained flower bed would be a type of replacement.</td>
</tr>
</tbody>
</table>
CREATING A DEFENSIBLE SPACE

A Step-by-Step Guide

Are you worried about the wildfire threat to your home, but are not sure how to get started in making your home defensible? Follow these steps to create an effective defensible space.

**STEP 1)** Remove all dead and dry vegetation.

**STEP 2)** Break up continuous vegetation.

**STEP 3)** Reduce height of vegetation in 30-foot zone.

**STEP 4)** Remove ladder fuels such as low tree limbs 6 to 8 feet off the ground.

**STEP 5)** Create a 30-foot wide “lean, clean and green” area and a 70-foot wide area with reduced fuel.

**STEP 6)** Maintain the vegetation within the defensible space.
**STEP ONE: IS THERE ANY DEAD VEGETATION WITHIN THE RECOMMENDED DEFENSIBLE SPACE AREA?**

The most important vegetation treatment to reduce the severity of a fire that burns into your defensible space is removal of the dead vegetation on the surface of the ground (also called fine dead fuels.) Dead vegetation includes dead trees and shrubs, dead branches lying on the ground or still attached to living plants, dried grass, flowers and weeds, dropped leaves and needles, and firewood stacks. A description of the types of dead vegetation you’re likely to encounter and the recommended actions are listed below.

<table>
<thead>
<tr>
<th>TYPES OF DEAD VEGETATION AND RECOMMENDED PRACTICE</th>
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<tbody>
<tr>
<td><strong>DEAD FUEL TYPE</strong></td>
</tr>
<tr>
<td>STANDING DEAD TREE</td>
</tr>
<tr>
<td>FALLEN DEAD TREE</td>
</tr>
<tr>
<td>DEAD SHRUBS</td>
</tr>
<tr>
<td>DRIED GRASSES AND WILDFLOWERS</td>
</tr>
<tr>
<td>DEAD NEEDLES, LEAVES, BRANCHES AND CONES (ON THE GROUND)</td>
</tr>
<tr>
<td>DEAD NEEDLES, LEAVES, BRANCHES AND TWIGS (OTHER THAN ON THE GROUND)</td>
</tr>
<tr>
<td>FIREWOOD AND OTHER COMBUSTIBLE DEBRIS</td>
</tr>
</tbody>
</table>

**BRUSH PRUNING**

*When doing thinning and pruning use the following guidelines:*

1. Remove dead or dying material, trim back lower large branches, and thin crowded plants so that 50 percent of material in the retained plants is removed.

2. Plants which are not to be saved, should be cut off at ground level.

3. Minimize walking and maintenance activities on steep slopes since this promotes erosion and causes soil to become compacted and increases the amount of runoff.
**STEP TWO**: IS THERE A CONTINUOUS DENSE COVER OF SHRUBS OR TREES PRESENT WITHIN THE RECOMMENDED DEFENSIBLE SPACE AREA?

Sometimes wildland plants can occur as an uninterrupted layer of vegetation as opposed to being patchy or widely spaced individual plants. The more continuous and dense the vegetation, the greater the wildfire threat. If this situation is present within your recommended defensible space area, you should “break-it-up” by providing separation between plants or small groups of plants like the picture below.

For areas with continuous tree canopy within the defensible space zone, large trees do not have to be cut and removed as long as all the plants beneath them are removed. Dead fuel in the understory should be removed and lower limbs of trees pruned. This will eliminate a vertical "fire ladder."

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**Recommended Separation Distances Between Tree Canopies**

**TREES**

- From edge of one tree canopy to the edge of the next
  - Flat to mild slope (0% to 20% slope)
    - 10 feet
  - Mild to moderate slope (20% to 40% slope)
    - 20 feet
  - Moderate to steep slope (greater than 40% slope)
    - 30 feet

Disturbance to a minimum. Also, it may be necessary to replace flammable vegetation with other plant materials to prevent excessive soil erosion.

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**Recommended Separation Distances for Shrubs**

**SHRUBS**

- From edge of one shrub to the edge of the next
  - Flat to mild slope (0% to 20% slope)
    - (Two shrubs 2' high should be spaced 4' apart)
  - Mild to moderate slope (20% to 40% slope)
    - Four times (4x) the height of the shrub
    - (Two shrubs 2' high should be spaced 8' apart)
  - Moderate to steep slope (greater than 40% slope)
    - Six times (6x) the height of the shrub
    - (Two shrubs 2' high should be spaced 12' apart)

For example, if a home is situated on a 30% slope, the separation of tree canopies within the defensible space should be 20 feet. Creating separation between tree canopies can be accomplished through tree removal.

Not only are steep slopes often considered high wildfire areas, they are also highly erodible. When removing shrubs and trees from steep slopes, keep soil

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The recommended separation distance can be accomplished by removing plants or through pruning that reduces the diameter or height (shorter height means less separation) of shrubs.
**STEP THREE:**
**HEIGHT OF VEGETATION IN 30 FOOT ZONE**

Vegetation is often present at varying heights. Flame lengths can be expected to increase based on the height of the fuel. For example, a 5 foot bush can produce 15 foot flame lengths. By reducing the height of bushes and shrubs in the 30 foot zone around the structure, flame lengths and radiant heat will also be reduced. Also, by lower height of vegetation the possibility of flame spreading into tree canopies and upper portions of structures is reduced.

**STEP FOUR:**
**ARE THERE LADDER FUELS PRESENT WITHIN THE RECOMMENDED DEFENSIBLE SPACE AREA?**

When fire "climbs" from lower vegetation it is referred to as "ladder fuels". The ladder fuel problem can be corrected by providing a separation between the vegetation layers. This can be accomplished by removing the lower tree branches 6-8 feet off ground level.

**HABITAT PROTECTION TIPS:**

*Note: A grouping of vegetation may be treated as a single plant if the foliage of the grouping will not exceed 10 feet in width. For example, three individual manzanita plants growing in a cluster with a total foliage width of 8 feet can be "grouped as an island" and considered as one plant.*

**ADDITIONAL DEFENSIBLE SPACE CONSIDERATIONS**

- **SENSITIVE HABITATS** - Some areas in San Mateo County require special attention due to their sensitive habitat value. For example, riparian corridors, wetlands, red-legged frog and San Francisco Garter Snake habitats. Contact your local planning department for specific information on fuel mitigation in sensitive habitat areas.

- **TREE REMOVAL** - Sometimes in our heavily forested communities trees may need to be removed in order to achieve defensible space or because they are at risk of falling onto a residence or access road. Please contact your local planning department for information regarding the removal of trees. For tree removals outside the city limits, contact CAL FIRE San Mateo-Santa Cruz Unit Resource Management staff at (831) 335-6740.
STEP FIVE:
IS THERE A LEAN, CLEAN, GREEN ZONE OF 30 FEET SURROUNDING YOUR HOME AND A FUEL REDUCTION ZONE IN THE NEXT 70 FEET (or to the property line)?

The area immediately adjacent to a house is particularly important in terms of an effective defensible space. It is also the area that is usually landscaped. Vegetation in areas extending at least 30 feet from any structure, should be:

- **Lean**—small amounts of low flammable vegetation.
- **Clean**—no accumulation of dead vegetation or other flammable debris. (Don't forget to clean roof and gutters.)
- **Green**—plants that are healthy and green during the fire season.

The “Lean, Clean and Green Zone Checklist” will help you evaluate the area immediately adjacent to your home. Remove dead fuels. Provide separation of trees and shrubs consistent with the recommendation in step three. Reduce height and remove ladder fuels between shrubs and trees to provide vertical clearance.

STEP SIX:
MAINTAIN DEFENSIBLE SPACE ON A REGULAR BASIS

Keeping your defensible space effective is a continual process. At least annually, review these defensible space steps and take action accordingly. An effective defensible space can be quickly diminished through neglect.

### LEAN, CLEAN & GREEN CHECKLIST

- Emphasize the use of low growing herbaceous (non-woody) plants that are kept green during the fire season through irrigation as needed. Herbaceous plants include lawn, clover, a variety of groundcovers, bedding plants, bulbs, perennial flowers and native, perennial grasses.
- Emphasize use of mulches, rock and non-combustible hard surfaces (concrete sidewalks, brick patios and asphalt driveways).
- Deciduous ornamental trees and shrubs are acceptable if they are kept green, free of dead plant material, ladder fuels are removed, and individual plants or groups of plants are arranged in a manner which cannot convey a fire to structures. Shorter deciduous shrubs are preferred.
- Minimize the use of ornamental coniferous shrubs and trees and tall exotic grasses (such as pampas grass).
- Retain native shrubs and trees. Thin native plants to form small groups of shrubs. Thin denser stands of native trees to remove the thinner saplings, retaining older trees. Remove dead limbs from trees and most that are within 4 to 6 feet of the ground surface to prevent fires from spreading from lower vegetation to the tree crowns.
- Tree limbs within 10 feet of a chimney, encroaching on powerlines, or touching a structure should be removed.
If a wildfire comes through your neighborhood, could your house survive on its own?” A dramatic question, but one we need to consider when living in an environment where wildfire is a common occurrence. Firescaping is landscape design that may reduce house and property vulnerability to wildfire. The goal is to develop a landscape design and choice of plants that offers the best possible fire protection. The ideal is to surround the house with plants that are less likely to burn. It is imperative that when building homes in wildfire-prone areas that fire safety be a major factor in landscape design. Appropriate manipulation of the landscape can make a significant contribution towards wildfire survival.

Firescape integrates traditional landscape functions and needs into a design that reduces the threat from wildfire. It need not look much different from a traditional design. In addition to meeting a homeowner’s aesthetic desires and functional needs such as entertaining, playing, storage, erosion control, firescape also includes vegetation modification techniques, planting for fire safety, defensible space principles and use of fire safety zones.

There are three things which determine wildfire intensity: topography, weather and vegetation. We can only affect vegetation. Through proper plant selection, placement and maintenance, we can diminish the possibility of ignition, lower fire intensity, and reduce how quickly a fire spreads to increase a home’s survivability.

In firescaping, plant selection is primarily determined by a plant’s ability to reduce the wildfire threat. Other considerations may be important such as appearance, ability to hold the soil in place, and wildlife habitat value. The traditional foundation planting of junipers is not a viable solution in a firescape design. Minimize use of evergreen shrubs and trees within 30 feet of a structure, because junipers, other conifers and broadleaf evergreens contain oils, resins and waxes that make these plants burn with great intensity. Use ornamental grasses and berries sparingly because they also can be highly flammable. Choose “fire smart” plants—plants with a high moisture content. They are low growing. Their stems and leaves are not resinous, oily or waxy. Deciduous trees are generally more fire resistant than evergreens because they have a higher moisture content when in leaf, but a lower fuel volume when dormant.

Placement and maintenance of trees and shrubs is as important as actual plant selection. When planning tree placement in the landscape, remember their size at maturity. Keep tree limbs at least 10 feet from chimneys, power lines and structures. Specimen trees can be used near a structure if pruned properly and well irrigated.

Firescape design uses driveways, lawns, walkways, patios, parking areas, areas with inorganic mulches, and fences constructed of nonflammable materials such as rock, brick, or cement to reduce fuel loads and create fuel breaks. Fuel breaks are a vital component in every firescape design. Water features, pools, ponds or streams can also be fuel breaks but need to be treated with bacterial products sold to prevent mosquito breeding which could increase the spread of bird flu. Areas where wildland or planted vegetation has been thinned are the traditional fuelbreak. Remember, while bare ground is effective from the wildfire viewpoint, it is not promoted as a firescape element due to aesthetic, soil erosion, and other concerns.

A home located on a brushy site above a south or west facing slope will require more extensive wildfire safety landscape planning than a house situated on a flat lot with little vegetation around it. Boulders and rocks become fire retardant elements in a design. Whether or not a site can be irrigated will greatly influence location of hardscape (concrete, asphalt, wood decks, etc.), plant selection and placement. Prevailing winds, seasonal weather, local fire history, and characteristics of native vegetation surrounding the site are additional important considerations.

The area closest to a structure out to 30 feet will be the highest water use area in the fire safe landscape. Highly flammable fuels should be kept to a minimum and plants kept green throughout the fire season. Use low growing or non-woody deciduous plants. Lawn is soothing visually, and is also practical as a wildfire safety feature but lawns are high maintenance requiring regular watering, weeding, mowing and fertilizing. Rock mulches are good choices. Patios, masonry or rock planters are excellent fuel breaks and increase wildfire safety. Be creative with boulders, riprap, dry streambeds and sculptural inorganic elements.

When designing a fire-safe landscape remember less is better. Simplify visual lines and groupings. A firesafe landscape lets plants and garden elements reveal their innate beauty by leaving space between plants and groups of plants. In firescaping, open spaces are more important than the plants.

Lawn can be an effective firescape feature. But extensive areas of turfgrass may not be right for everyone. Some good alternatives include clover, groundcovers, and native, and perennial grasses but some regularly sold groundcovers such as baby tears, English ivy, ice plant, and periwinkles are aggressive weeds that need to be avoided.
Firescaping is the use of proper plant selection, placement, and maintenance around homes to reduce the threat of wildfire. This list of suggested species is intended to guide homeowners in selecting some of the more commonly available native plants adapted to the San Mateo County climate. Drought-resistant native plants require less water to stay alive and well-hydrated. No plant is completely fire-resistant, but by using appropriate plant choices and by attentively managing the landscape around the property a homeowner can significantly reduce the risk of fire. Detailed guidance given elsewhere in this brochure is a must-read. Here is a summary of some of the more important considerations in planting and managing a firescape:

- Prune shrubs annually to remove dead wood, low branches, fine twigs.
- Thin shrubs and woody plants to create spaces between them - break up continuous vegetation.
- Use low-growing plants or mulch to prevent erosion and reduce fuel.
- Plants with broad leaves are generally a better choice than plants with thin, needle-like leaves.
- Weed out invasive annuals; dense patches of these dry weeds are highly flammable.
- Keep trees and tall shrubs away from structures; avoid creating “fire ladders”
- If native plants are already present around the house, don’t necessarily clear them all but selectively thin, prune, and manage them.

Plants on this list can be found at most commercial nurseries specializing in native plants. Some plants will do well along the coast, others in the warmer inland areas. A native plant nursery will recommend plants suited to your specific habitat conditions.

### NATIVE SHRUBS

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
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<tbody>
<tr>
<td>Coffeeberry (prostrate forms)</td>
<td>Rhamnus californica</td>
</tr>
<tr>
<td>Spiny redberry</td>
<td>Rhamnus crocea</td>
</tr>
<tr>
<td>California lilac (many varieties and forms)</td>
<td>Ceanothus spp.</td>
</tr>
<tr>
<td>Golden-yarrow</td>
<td>Eriophyllum confertiflorum</td>
</tr>
<tr>
<td>California rose</td>
<td>Rosa californica</td>
</tr>
<tr>
<td>Snowberry</td>
<td>Symphoricarpus albus</td>
</tr>
<tr>
<td>Creeping snowberry</td>
<td>Symphoricarpus mollis</td>
</tr>
<tr>
<td>Silk tassel bush</td>
<td>Garrya elliptica</td>
</tr>
<tr>
<td>Toyon</td>
<td>Heteromeles arbutifolia</td>
</tr>
<tr>
<td>Western redbud</td>
<td>Cercis occidentalis</td>
</tr>
<tr>
<td>Bearberry</td>
<td>Arctostaphylos uva-ursi</td>
</tr>
<tr>
<td>Manzanitas (many varieties and forms)</td>
<td>Arctostaphylos spp.</td>
</tr>
<tr>
<td>Bush poppy</td>
<td>Dendromeon rigida</td>
</tr>
<tr>
<td>Coyote brush - prostrate form</td>
<td>Baccharis pilaris</td>
</tr>
<tr>
<td>Currant (many species)</td>
<td>Ribes spp.</td>
</tr>
<tr>
<td>Holly-leaved cherry</td>
<td>Prunus ilicifolia</td>
</tr>
<tr>
<td>Mountain mahogany</td>
<td>Cercocarpus betuloides</td>
</tr>
</tbody>
</table>

### NATIVE TREES

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coast live oak</td>
<td>Quercus agrifolia</td>
</tr>
<tr>
<td>Black oak</td>
<td>Quercus kelloggii</td>
</tr>
<tr>
<td>Canyon live oak</td>
<td>Quercus chrysolepis</td>
</tr>
<tr>
<td>California buckeye</td>
<td>Aesculus californica</td>
</tr>
<tr>
<td>Madrone</td>
<td>Arbutus menziesii</td>
</tr>
<tr>
<td>Catalina ironwood</td>
<td>Lyonothamnus floribundus</td>
</tr>
</tbody>
</table>

### NATIVE TREES (RIPARIAN OR IRRIGATED AREAS)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coast redwood</td>
<td>Sequoia sempervirens</td>
</tr>
<tr>
<td>Western sycamore</td>
<td>Platanus racemosa</td>
</tr>
<tr>
<td>Valley oak</td>
<td>Quercus lobata</td>
</tr>
<tr>
<td>Willows</td>
<td>Salix spp.</td>
</tr>
<tr>
<td>Big-leaf maple</td>
<td>Acer macrophyllum</td>
</tr>
</tbody>
</table>

# Firescaping with Native Plants

## San Mateo County, California

### Native Shrubs (Riparian or Irrigated Areas)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mock orange</td>
<td>Philadelphus lewisii</td>
</tr>
<tr>
<td>California barberry</td>
<td>Berberis pinnata</td>
</tr>
<tr>
<td>Blue elderberry</td>
<td>Sambucus mexicana</td>
</tr>
<tr>
<td>Thimbleberry</td>
<td>Ribes parviflorus</td>
</tr>
<tr>
<td>Creek dogwood</td>
<td>Cornus sericea ssp. occidentalis</td>
</tr>
<tr>
<td>Flowering currant</td>
<td>Ribes sanguineum var. glutinosum</td>
</tr>
<tr>
<td>Bush anemone</td>
<td>Carpenteria californica</td>
</tr>
</tbody>
</table>

### Native Perennials

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yarrow</td>
<td>Achillea millefolium</td>
</tr>
<tr>
<td>California poppy</td>
<td>Eschscholtzia californica</td>
</tr>
<tr>
<td>Chaparral penstemon</td>
<td>Penstemon heterophyllus</td>
</tr>
<tr>
<td>Firecracker penstemon</td>
<td>Penstemon centranthifolius</td>
</tr>
<tr>
<td>California buttercup</td>
<td>Ranunculus californica</td>
</tr>
<tr>
<td>Hummingbird sage</td>
<td>Salvia spathacea</td>
</tr>
<tr>
<td>Western columbine</td>
<td>Aquilegia formosa</td>
</tr>
<tr>
<td>Sticky monkeyflower</td>
<td>Mimulus aurantiacus</td>
</tr>
<tr>
<td>California fuchsia</td>
<td>Epilobium canum</td>
</tr>
<tr>
<td>California goldenrod</td>
<td>Solidago californica</td>
</tr>
<tr>
<td>Creeping sage</td>
<td>Salvia sonomensis</td>
</tr>
<tr>
<td>Coyote mint</td>
<td>Monardella villosa</td>
</tr>
</tbody>
</table>

### Native Groundcovers, Bunchgrasses

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue-eyed grass</td>
<td>Sisyrinchium bellum</td>
</tr>
<tr>
<td>Douglas’ iris</td>
<td>Iris douglasiana</td>
</tr>
<tr>
<td>Yerba buena</td>
<td>Satureja douglasii</td>
</tr>
<tr>
<td>Strawberry</td>
<td>Fragaria vesca</td>
</tr>
<tr>
<td>Dudley</td>
<td>Dudleya cymosa</td>
</tr>
<tr>
<td>Pacific stonecrop</td>
<td>Sedum spathulifolium</td>
</tr>
<tr>
<td>Spreading rush</td>
<td>Juncus patens</td>
</tr>
<tr>
<td>Foothill sedge</td>
<td>Carex tenuiflora</td>
</tr>
<tr>
<td>Purple needlegrass</td>
<td>Nassella pulchra</td>
</tr>
<tr>
<td>Deer grass</td>
<td>Muhlenbergia rigens</td>
</tr>
<tr>
<td>California fescue</td>
<td>Festuca californica</td>
</tr>
</tbody>
</table>

### Invasive and/or High Fire Hazard Plants—Not Recommended for Firescaping

- Acacia; pampas grass; gorse; juniper; eucalyptus; all conifers, including pines, cypress, Douglas fir, spruce, cedar, hemlock; pepper tree; bamboo; palms; periwinkle (Vinca); Algerian, English, or German ivy; French, Spanish, or Scotch broom.

*Photos courtesy of the California Native Plant Society, Jasper Ridge Biological Preserve.*
Plant the “Right Tree in the Right Place”

Tree Planting Safety
Your safety is PG&E’s top priority. Planting trees under power lines can pose electrical shock hazards and fire safety risks. To stay safe, keep the lights on and get the long-term benefit, beauty and satisfaction from the trees you plant, refer to to the planting zone guidelines below.

When landscaping be sure to consider overhead power lines and underground utilities in addition to fire hazard, sun exposure and soil conditions when selecting shrubs and trees.

The best way to protect yourself and your home is by planting the “right tree in the right place.” Though some large trees grow under power lines naturally, many are planted without the realization of how large they would eventually become. So, select a tree with the proper height at maturity for its location.

Plant the "Right Tree in the Right Place" for personal and fire safety. Use the "Small, Medium and Tall Zone" guidelines near distribution lines and the "Wire Zone, Border Zone, Outer Zone" guidelines near transmission lines. If you're not sure whether a line is distribution or transmission call us at 1-800-743-5000.

For more information about trees and power lines:
• Visit www.pge.com/trees
• Request a "Guide to Planting Small Trees Near Distribution Lines" by calling 1-800-743-5000 or email: RightTreeRightPlace@pge.com.
Specify: Northern California, Central California or the Bay Area/Inland area.

<table>
<thead>
<tr>
<th>Tree Zones</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tall Zone</strong></td>
<td>Trees taller than 40 feet at maturity</td>
</tr>
<tr>
<td><strong>Medium Zone</strong></td>
<td>Trees no taller than 40 feet at maturity</td>
</tr>
<tr>
<td><strong>Small Zone</strong></td>
<td>Trees no taller than 25 feet at maturity</td>
</tr>
<tr>
<td><strong>Wire Zone</strong></td>
<td>No trees</td>
</tr>
<tr>
<td><strong>Border Zone</strong></td>
<td>Only small trees or shrubs.</td>
</tr>
<tr>
<td><strong>Outer Zone</strong></td>
<td>Trees no taller than the distance to the wire at maturity.</td>
</tr>
</tbody>
</table>

Planting distances from distribution lines:
- Wire Zone: 50 ft.
- Border Zone: 15 ft.
- Outer Zone: 0 ft.

Incompatible vegetation is subject to removal.
San Mateo County Fire agencies adopted the 2007 California Fire Code in 2008. Many codes relate to new construction or remodels and are listed here for reference. Some Fire agencies have adopted stricter codes and it is always wise to check with your local jurisdiction before planning a remodel or new construction project. These newer codes are intended to establish minimum standards for the protection of life and property by increasing the ability of a building to withstand the effect of a wildfire and will therefore contribute to a systematic reduction in conflagration losses.

**DEFENSIBLE SPACE**
- **Defensible Space for Structures:** By utilizing ignition resistant building materials and standards, structures have an increased ability to resist intrusion of flame or burning embers projected by a vegetation fire. Certain jurisdictions may have requirements regarding installation of roofs, eave and roof vents, exterior wall materials, exterior windows and doors as well as decks.
- **Roadside Vegetation Clearance:** Shall be cleared of flammable vegetation with a vertical clearance of 13 feet 6 inches. (IFC 503.2.1) Any person that owns, leases, controls, operates or maintains a building or structure shall maintain a 30 feet firebreak and up to 100 feet provide a reduced fuel zone. (Government Code 51182)
- **Roofs:** Each jurisdiction may have more stringent codes, please refer to your local agency. It is recommended that all new construction have Class A Fire Resistive construction roofing.
- **Smoke Alarms:** are required in all habitable sleeping areas. Single and multiple station smoke alarms shall be installed as per State Building Code. Rooms containing fuel fires appliances such as heating/air condition units and water heaters should have a carbon monoxide alarm.
- **Spark Arrestors:** Are required on all chimneys and outdoor fireplaces. Spark arrestor shall be constructed with heavy wire mesh with openings not to exceed 1/4 inch to prohibit the release of fire brands and embers.

**ACCESS AND ROADS**
- **Property and Street identification:** Addresses must be plainly legible and visible from the street. Numbers must be at least 4 inches high on contrasting background. Streets and roads must be identified with approved signs. (2006 IFC Chapter 5 sec 505.1 & 505.2)
- **Width and vertical clearance:** Fire apparatus access shall have an unobstructed road width of at least 20 feet and vertical clearance of 13 feet 6 inches. (IFC 505.2.1) Fire apparatus access shall not be obstructed in any manner including vehicle parking or vegetation intrusion. (CFC 503.4)
- **Gates:** The installation of a security gate shall be approved by the fire department. Gates shall have an approved means of emergency operation. (IFC 503.6)
- **Bridges:** Must be constructed and maintained to carry the load of fire apparatus. Load limits shall be posted at both entrances to the bridge. (IFC 503.2.6)

**WATER SUPPLY**
- **Storage:** Minimum water supply for new dwellings (that do not exceed 3,600 square feet) shall be capable of supplying a flow of 100 gallons of water per minute for duration of 2 hours (10,000 gallons). (Appendix B-105.1)
- **Sprinklers:** Automatic sprinkler systems may be required for new construction or remodeled structures. Please contact your local fire agency for specific jurisdictional requirements.
- **Hydrants:** The fire hydrant shall be accessible at all times and shall have a perimeter clearance of 3 feet.
THE WOOD SHAKE AND SHINGLE ROOF HAZARD

A house can be threatened by a wildfire in three ways: direct exposure from flames, radiated heat, and airborne firebrands. Of these, firebrands account for the majority of homes burned by wildfire. The most vulnerable part of a house to firebrands is the roof.

Because of its angle, the roof can catch and trap firebrands. If the roof is constructed of combustible materials such as untreated wood shakes and shingles, the house is in jeopardy of igniting and burning.

Not only are combustible roofing materials a hazard to the structure on which they are installed, but also to other houses in the vicinity. Burning wood shakes, for example, can become firebrands, be lifted from the burning roof, carried blocks away, and land in receptive fuel beds such as other combustible roofs.

Unfortunately for homeowners with existing combustible roofs, there are no long-term reliable measures available to reduce roof vulnerability to wildfire other than re-roofing with fire resistant materials.

FIREBRANDS

Firebrands are burning embers produced by wildfire which are lifted high into the air and carried beyond the fire front. Firebrands are one of the major causes of homes burned due to wildfire.

Typical firebrand materials include pine cones, bark, and if houses are involved, wood shakes and shingles. Depending on wind speed and size of materials, firebrands can be carried more than 1/2 mile ahead of the fire front.

A shower of thousands of firebrands can be produced during a major wildfire event. If these firebrands land in areas with easily ignited fuels, numerous spot fires can start. Homes located blocks away from the main fire front can be threatened.

When wildfire flame lengths exceed 11 feet, direct firefighting efforts are ineffective. Under these conditions firefighters use roads, streams, and other barriers to control the wildfire.
Residential Fire Hazard Evaluation Score Sheet

*Estimate Hazard Score For Each Item and Total to Determine Hazard Rating*

<table>
<thead>
<tr>
<th>SLOPE</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5%</td>
<td>1</td>
</tr>
<tr>
<td>6-20%</td>
<td>2</td>
</tr>
<tr>
<td>21-40%</td>
<td>3</td>
</tr>
<tr>
<td>41%</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ROOF</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A (Non Wood)</td>
<td>1</td>
</tr>
<tr>
<td>Class B</td>
<td>2</td>
</tr>
<tr>
<td>Class C</td>
<td>3</td>
</tr>
<tr>
<td>Wood Shake</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIDING</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Hour</td>
<td>1</td>
</tr>
<tr>
<td>Stucco n/r</td>
<td>2</td>
</tr>
<tr>
<td>Metal</td>
<td>3</td>
</tr>
<tr>
<td>Heavy Wood/Combustible</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EAVES</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>1</td>
</tr>
<tr>
<td>Boxed</td>
<td>2</td>
</tr>
<tr>
<td>Open</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DECKS/BALCONIES/PATIOS</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protected 1-Hour</td>
<td>1</td>
</tr>
<tr>
<td>Heavy Timber</td>
<td>2</td>
</tr>
<tr>
<td>Light Wood</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VEGETATION</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water/Bare Rock, Irrigated Lawn</td>
<td></td>
</tr>
<tr>
<td>Grass, Shrub, Less than 2' tall</td>
<td></td>
</tr>
<tr>
<td>No Trees</td>
<td>1</td>
</tr>
<tr>
<td>Grass Shrub, Less than 4', Widely Dispersed Trees, Or Dense Young Shrubs, No Dead Woods or Trees</td>
<td>2</td>
</tr>
<tr>
<td>Many Trees, Touching, Some Grass and Brush or Dense Shrubs with Some Trees, Thick, Tall Grass</td>
<td>3</td>
</tr>
<tr>
<td>Dense Evergreen Trees with Grass and Shrubs, Dense Mature Shrubs with Dead Branches</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLOPE</td>
<td>------</td>
</tr>
<tr>
<td>ROOF</td>
<td>------</td>
</tr>
<tr>
<td>SIDING</td>
<td>------</td>
</tr>
<tr>
<td>EAVES</td>
<td>------</td>
</tr>
<tr>
<td>DECKS</td>
<td>------</td>
</tr>
<tr>
<td>VEGETATION</td>
<td>------</td>
</tr>
<tr>
<td>TOTAL</td>
<td>------</td>
</tr>
</tbody>
</table>

Total Score | Hazard Rating
-------------|------------------
6            | Low
7-12         | Medium
13-18        | High
19-22        | Extreme
Homeowner Checklist
How to Make Your Home Fire Safe in the Wildland area

OUTSIDE

Design/Construction
☐ Contact your local Fire Marshal’s office for current fire code requirements for new construction.
☐ Local building requirements address: ignition resistant construction; eave, balcony and deck enclosures; fire sprinklers; water storage; access road/driveway design and vehicle turn around design.
☐ All new construction in San Mateo County requires installation of fire sprinklers.
☐ New construction requires 10,000 gallons of water storage for fire suppression.

Access
☐ Make sure that your street name sign is visibly posted at each street intersection.
☐ Post your house address so it is easily visible from the street especially at night.
☐ Address numbers must be at least 4 inches tall and on a contrasting background.
☐ Identify at least two exit routes from your neighborhood.
☐ Clear flammable vegetation at least 10 feet from roads and driveways.
☐ Cut back overhanging tree branches above access at least 13’ 6” above access roads.
☐ Make sure dead end roads and long driveways have turn-around areas wide enough for emergency vehicles.
☐ Design bridges to carry heavy emergency vehicles.
☐ Post clear road signs to show traffic restrictions such as dead-end roads and weight and height limitations.

Roof
☐ Install fire resistant roofing when replacing your roof.
☐ Remove dead leaves and needles from your roof and gutters.
☐ Remove branches overhanging your roof and keep branches 10 feet from your chimney.
☐ Cover your chimney outlet and stovepipe with a nonflammable screen of ½ inch or smaller mesh.

Landscape
☐ Create a Defensible Space of 100 feet around your home. It is required by law.
☐ Create a “LEAN, CLEAN AND GREEN ZONE” by removing all flammable vegetation within 30 feet immediately surrounding your home.
☐ Then create a “REDUCED FUEL ZONE” in the remaining 70 feet or to your property line.
You have two options in this area:
A. Create horizontal and vertical spacing between plants. The amount of space will depend on how steep your property is and the size of your plants.
B. Large continuous tree canopies do not have to be removed as long as all the understory plants are removed.
☐ Remove lower tree branches at least 6 feet from the ground.
☐ Landscape with fire resistant plants.
☐ Maintain all plants with regular water and keep dead branches, leaves and needles removed.
☐ When clearing vegetation, use care when operating equipment such as lawnmowers. One small spark may start a fire; a string trimmer is much safer.

Yard
☐ Stack woodpiles at least 30 feet from all structures and remove vegetation within 10 feet of woodpiles.
☐ Locate LPG tanks (butane and propane) at least 30 feet from any structure and maintain 10 feet of clearance.
☐ Remove all stacks of construction materials, pine needles, leaves and other debris from your yard.

Emergency Water Supply
☐ Maintain an emergency water supply that meets fire department standards through one of the following:
  ○ A community water/hydrant system.
  ○ A cooperative emergency storage tank with neighbors.
  ○ 10,000 gallons of water storage for new construction.
☐ Clearly mark all emergency water sources.
☐ Create easy firefighter access to your closest emergency water source.
☐ If your water comes from a well, consider an emergency generator to operate the pump during a power failure.
Fire Safe San Mateo County has established this partnership as a resource for work on fuel reduction projects with the County. Trained in the use of wood chippers, chain saws and weed eaters a multitude of important projects have been successfully completed all over the County. These crews are not only available to perform a multitude of work on public lands, they are also Type I hand crews. These crews remain on call 24 hrs a day and trained for initial attack of any vegetation fire.

REMEMBER...
DEFENSIBLE SPACE IS SENSIBLE SPACE