

2024

A Guide to

DEFENSIBLE SPACE & HOME HARDENING



An interpretation of the
Fuel Mitigation
Ordinance No. 24-01
Version 1, Spring 2024



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Prepare Your Home and Property for Wildfire

Hardening your home and addressing ornamental vegetation adjacent to your structure are critical elements in structure survivability.

Defensible space requirements are outlined in the Fire Code, International Wildland Urban Interface Code and WFPD Fuel Mitigation Ordinance



SCOPE. This standard and guideline provide the minimum requirements necessary for the maintenance of a property's defensible space and home hardening. Defensible space shall be in accordance with Woodside Fire Protection District Ordinance No. 24-01 and home hardening shall be in accordance with the 2022 California Fire Code, Building Code, and Residential Code.

PURPOSE. We have built many homes in the Wildland Urban Interface (WUI), where homes are now often surrounded by forested areas. This guideline is to provide mitigation measures, strategies, and tactics in order to reduce structure ignitability through defensible space and home hardening. One of the primary objectives of landscape maintenance in wildfire-prone regions is fuel reduction. Regular maintenance, including clearing away flammable debris and creating defensible space, helps break the continuous fuel supply, limiting the potential for a small fire to escalate into a large and destructive wildfire. In addition, recognizing that home-hardening through improved architectural design, ember and ignition resistant material selection, and retrofitting existing buildings are the most important factors in improving home survival during wildfires.

Home destruction largely results from direct firebrand ignitions, or lofted burning embers, and fires spreading on the ground within the community. When homeowners take action to lessen the ignitability of the home ignition zone, they dramatically increase the survivability of their home (Cohen, Quarles 2011).

Property owners can start to take action by creating defensible space. Defensible space is the area between a house and an oncoming wildfire that acts as a buffer that slows the fire and provides an opportunity for firefighters to defend the home. Defensible space is created and maintained through the proper management and modification of vegetation in the area immediately surrounding your home.

Next property owners can harden their homes. Fire-resistant building materials and designs are extremely effective at reducing structural ignitions. These include a wide variety of materials combined with engineering and design choices for nearly every aspect of home construction. Ranging from relatively expensive materials such as tempered glass and upgraded roofing, to simple, inexpensive but effective features such as fine wire mesh covering attic and basement vents. Many of these features can be retrofitted or applied to new construction. While new construction and substantial remodels within the Fire District are required to use ignition, resistant materials meeting the standards of Chapter 7A of the CBC (California Building Code), owners of existing homes are

strongly encouraged to make simple but effective upgrades. By applying new knowledge and approaches based on research and observations that have changed the understanding of home ignition during wildfires and can be more effective to reduce the loss of structures during wildfires. The focus is to reduce overall community risk by reducing home ignition potential during a wildfire.

An effective home ignition zone (HIZ) assessment makes it clear that while no one can guarantee a house will survive an extreme wildfire, effectively treating the HIZ can dramatically increase the chances of structure survival and the collective benefits of property owners' actions increase structure survival by increasing an entire community's ignition resistance.

Your home may be the most valuable investment you ever make. If you live in a high-risk fire hazard area, protect against the chance of losing that investment by creating defensible space and [hardening your home with fire-resistant construction materials and design](#).

Inspection Process

Free residential home assessments are available year-round to assist residents by providing specific requirements and recommendations to reduce their home ignition potential. Please schedule your inspection to have an opportunity to meet one-on-one with a defensible space inspector to assess your property for potential hazards and mitigation measures in accordance with applicable fire codes and local ordinances.

- 1) 2,000 parcels will be inspected every year. To view your community's schedule, please visit (<https://www.woodsidefire.org/our-district/vegetation-management-defensible-space/home-assessments>). A video is also available that will help outline how an inspection is conducted. (<https://youtu.be/fjJATG9Hugc>)
 - a. In order to make this program run efficiently and successfully, we ask that all residents call to schedule an inspection.
 - b. Upon arrival, an inspector will knock on your door for you to accompany them on a walk around your property.
 - c. If you are not home, the inspector will leave a door hanger informing they had been by. Please call to schedule an inspection for your home.
- 2) Homeowners have the option to schedule a home assessment inspection at any time during the year if they are in the zones of inspection by calling Administration Office at 650-851-1594 or email info@woodsidefire.org.
- 3) Should an owner like to have a jump start on getting work done, they can go to our website and use the self-assessment tool to conduct their (pre-inspection). This will assist the property owner in understanding what will be expected during their inspection year.

Incentive Programs

- [Los Trancos and Vista Verde Defensible Space Program - Click here for more Information](#)
\$5,000.00 is available each calendar year per household on a first come, first served basis until budgeted yearly funding has been depleted. Each property owner may receive **50% reimbursement on approved items and/or work completed.**

Mission of the Program

The Home Hardening and Defensible Space program should collectively protect the entire community of the Los Trancos County Maintenance District (LTCMD) while developing a fair program that allows every resident to participate.

- [Town of Woodside Defensible Space & Home Hardening Matching Fund Program - Click here for more Information](#)

For approved projects, the Town will reimburse you 50% of the cost of creating defensible space and/or home hardening, up to a maximum of **\$3,000.**

Mission of the Program

The Town of Woodside is committed to reducing the threat of wildfire in their community. In support of this effort, the Town Council has established the **Defensible Space and Home Hardening Matching Fund Program.**

Enforcement Process

The Fire District understands that this Ordinance will require much time, energy, and resources, especially on large properties and that owners will not be cited for non-compliance with the ordinance so long as they can show evidence of substantial progress toward compliance within the past 12 months.

- Re-inspections of the same violation shall incur an hourly re-inspection fee reflected in the Fire District's fee schedule at the time of re-inspection for every hour of re-inspection after the third inspection of the same violation, at the same location, within a one-year period.
- The Fire District makes every effort to work with property owners in developing a plan to comply. Should recommendations and requirements be ignored, the fire district may conduct abatements and handle accounting, assessment, and collection of abatement costs, including recordation of liens as may be established by Fire District Ordinances.
- The Fire Code Official may, at his or her discretion, issue an administrative citation for violations of this Ordinance, in lieu of abating a parcel.

Phased Compliance due to Qualified Circumstances

- A person who is financially unable to comply with this Ordinance or make substantial progress to compliance within one year may file a Modification request for Phased Compliance.
- A Person who has any ownership or possessory interest or easement obligation interest in or control of any Parcel may also file for a modification request for phased compliance, if there are practical difficulties in complying or making substantial progress to compliance. For example:
 - The need to establish new Fire Resistive Vegetation to prevent erosion prior to removing existing Hazardous Vegetation.
- Request shall not exceed a period of 3 years.

Submittal Process for a Modification Request

- A written letter sent to WFPD making the request and why you are unable to make substantial progress to compliance within one year (via email info@woodsidefire.org) or USPS.
- Supporting documents or materials may be requested that demonstrate either financial inability or other practical difficulties.
- Once received, documents will be reviewed. The Fire District shall issue a written determination listing the reasons for the determination to issue or not issue the modification request for phased compliance.

REMEMBER

The goal of defensible space is to:

- eliminate pathways for a wildfire to burn directly to the home
- reduce radiant heat exposures
- reduce the potential for embers to ignite vegetation and other combustible materials adjacent to the home
- provide a safe place for fire personnel to defend the home and allow safe routes for evacuation

Defensible space is also important to:

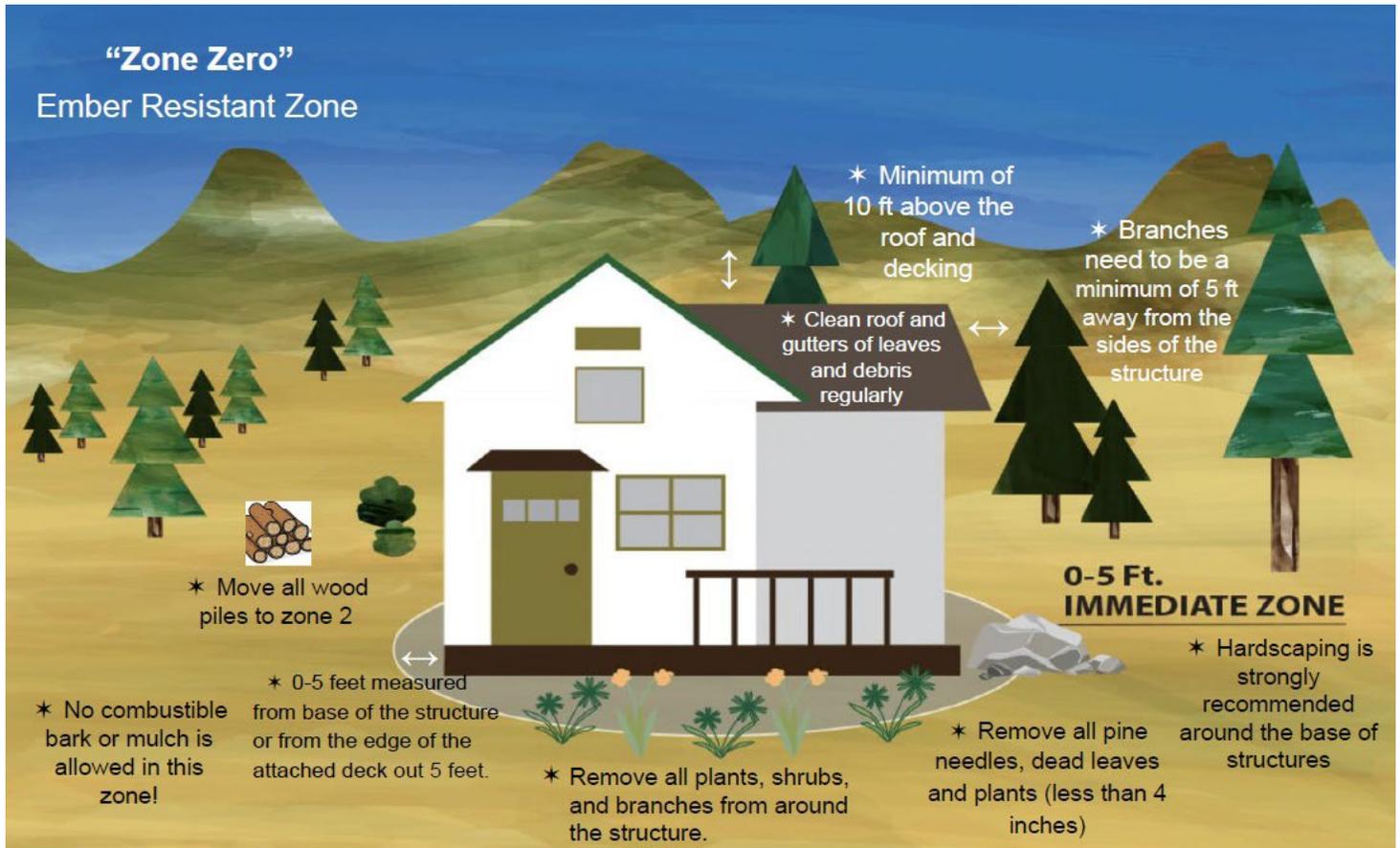
- Help protect firefighters when they are defending your home.
- Creating defensible space does not mean you need a ring of bare dirt around your home! Through proper planning, you can have both a beautiful landscape and a fire safe home.

“First Responders can’t be in parity with protecting the environment if homeowners don’t engage in reducing the ignitability of their home.” Jack Cohen

DEFENSIBLE SPACE

ZONE 0 EMBER RESISTANT or IMMEDIATE ZONE: (0 – 5 FEET) - REQUIREMENTS **FURTHER ZONE 0 DETAILS & RECOMMENDATIONS CAN BE FOUND IN APPENDIX A**

[What is Defensible Space? Get to Know your Zero Zone – Click here for video](#)



- **VEGETATION:**

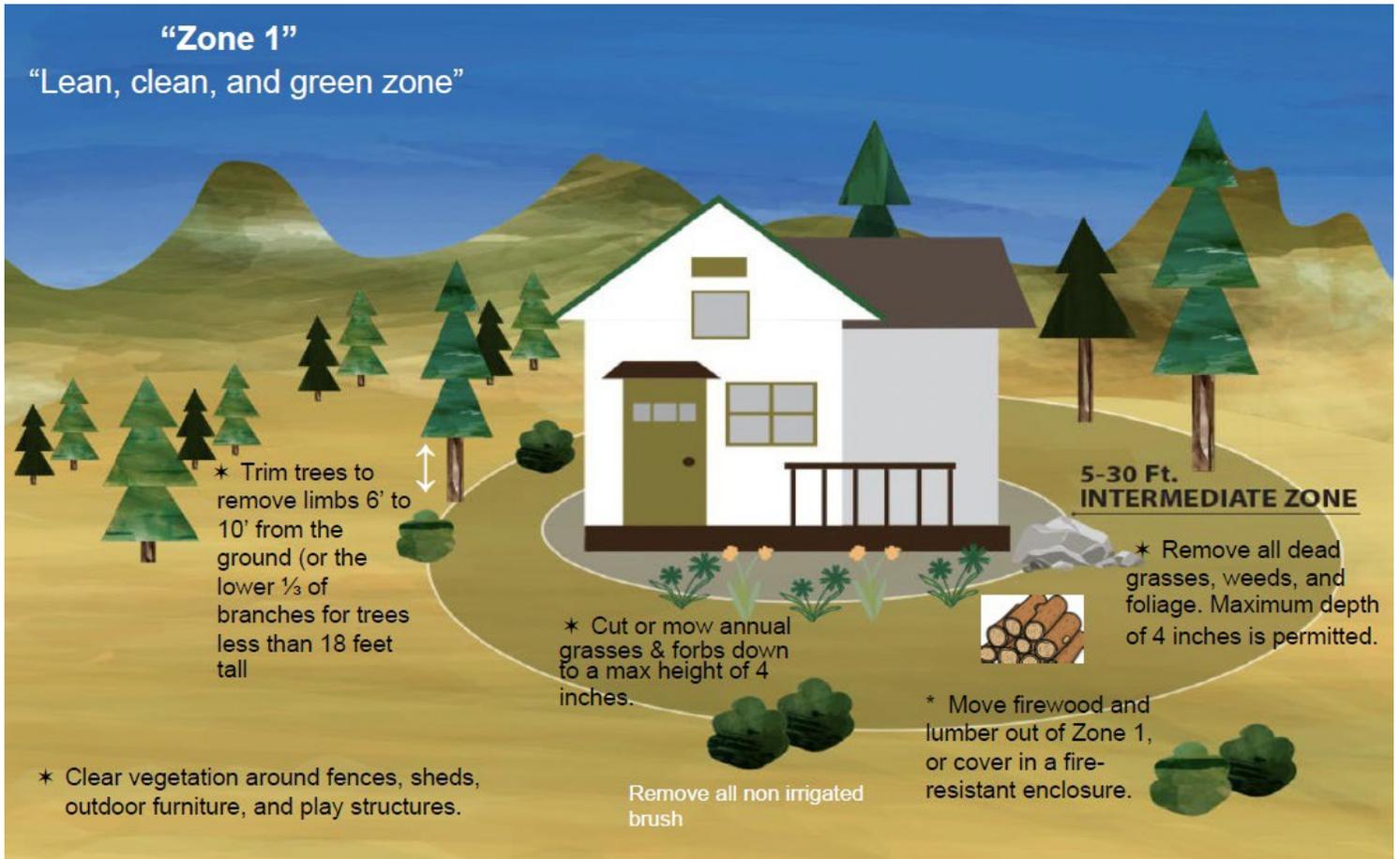
- No hazardous vegetation within 5 feet of any structure; hardscaping is recommended.
- Remove all combustible ground cover, such as wood mulch, chips, bark, and gorilla hair.
- Remove all **dead** and **dying** weeds, grass and forbs, plants, shrubs, trees, and vegetation debris (leaves, needles, cones, bark, etc.)
- Remove tree limbs that extend into this zone and 10 feet above the roof and decking.
- Trim trees to create 10 feet of clearance from the chimney outlets that burn solid fuels.
- Relocate exposed wood piles to zone 2.
- Grasses and forbs must be either removed or irrigated and cut to less than 4 inches.
- Removal of fire-hazardous plants such as juniper, cypress, pine, acacia, eucalyptus, and bamboo.

- **FURNISHINGS:**

- Remove combustible outdoor furniture. Replace with metal or non-combustible varieties.
- Replace jute or natural fiber doormats with heavy rubber or metal grates.
- Remove or relocate all combustible materials, lumber, storage, and patio accessories.

ZONE 1 LEAN, CLEAN & GREEN, or INTERMEDIATE: (5 – 30 FEET)
FURTHER ZONE 1 DETAILS & RECOMMENDATIONS CAN BE FOUND IN APPENDIX A

[Wildfire Watch “How to Make a Landscape fire-safe” - Click here for video](#)



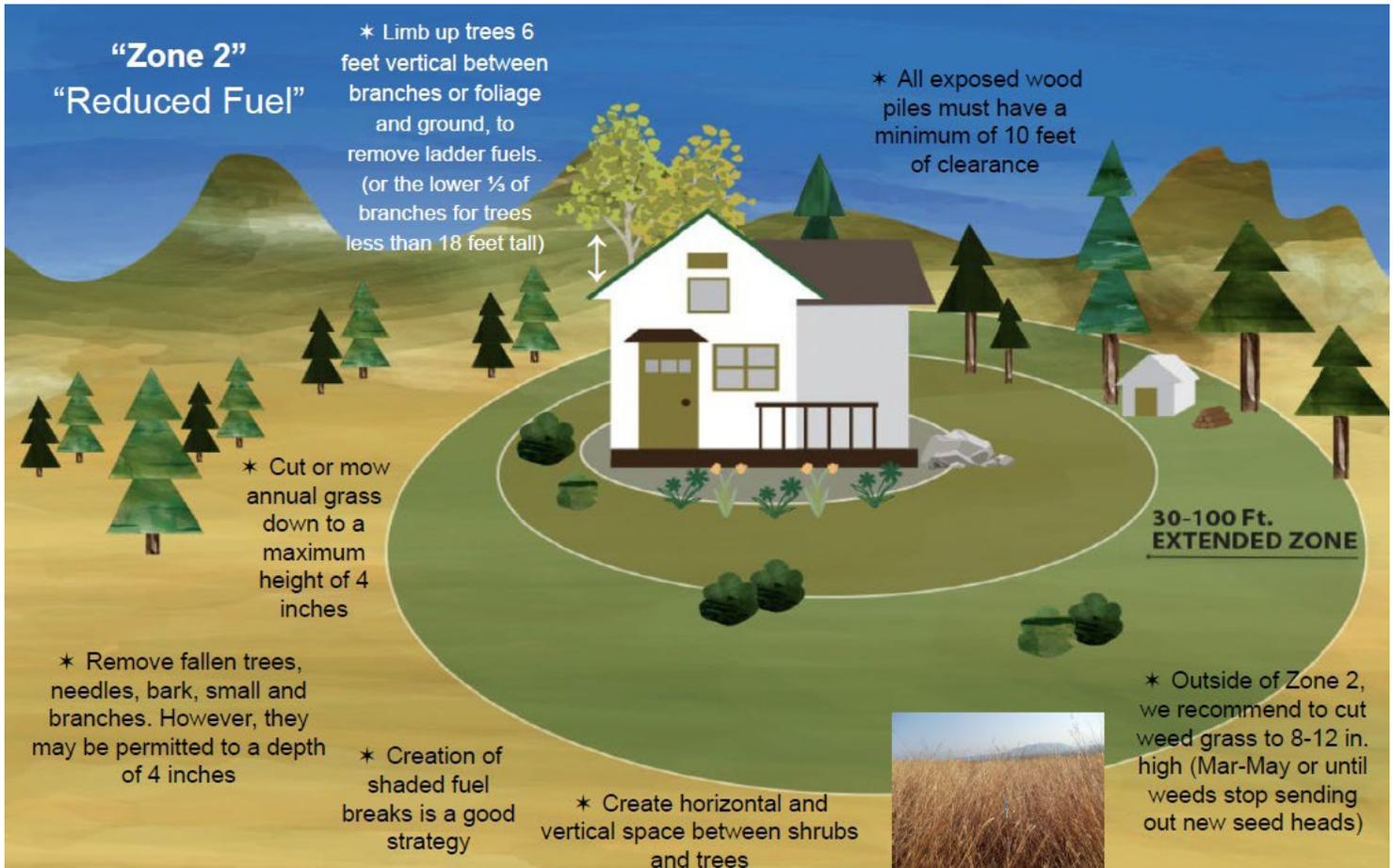
- Remove all fallen leaves, twigs, bark, cones, and small branches; shall be permitted to a maximum depth of 4 inches.
- Trim trees to remove limbs 6' to 10' from the ground. (or the lower 1/3 of branches for trees <18 ft.
- Remove branches that overhang your roof or within 10' of chimneys that burn solid fuel.
- Cut annual grasses and forbs to a maximum height of 4 inches.
- Move exposed firewood, lumber and other combustible material to Zone 2 (> 30 feet from house) or cover in a fire-resistant enclosure or secured certified material (see Appendix A for details)
- Maintain regularly, focusing on the areas closest to structures.

“Fuel is the only thing we have control over.”

Revisions for clarity, consistency & readability are ongoing. Thank you for your patience.

ZONE 2 FUEL REDUCTION or EXTENDED: (30 – 100 FEET)
FURTHER ZONE 2 DETAILS CAN BE FOUND IN APPENDIX A

[Zone 2 – Fuel Reduction Zone - Fire Safe Marin - Click here for Video](#)



- Cut or mow annual grasses and forbs (wildflowers) down to a maximum height of 4 inches. Wildflowers shall be cut after blooming, usually after June 15th.
- Create horizontal space between shrubs and trees.
- Limb up trees 6 ft vertical or the lower 1/3 of branches for trees less than 18 ft tall. Create vertical space between grass, shrubs and trees by removing ladder fuels.
- Creation of shaded fuel breaks is a good strategy.
- Remove fallen leaves, needles, twigs, bark, cones, and small branches. However, they may be permitted to a depth of 4 inches.
- All exposed wood piles must have a minimum of 10 feet of clearance, down to bare mineral soil, in all directions. Or can use hardscape like gravel, flagstone, concrete or other non-combustible materials. Exposed wood piles are to be 30 feet away from any structure (including neighbors).

“Home survival is a function of things you do on your property, at your home and vegetation and combustibles on your property; walk out your doors, put your back against the wall, look down, and then straight out – you do NOT want to be looking at combustibles. Your home needs to resist embers that will come to your home.”

Steve Quarles

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ACROSS ALL ZONES: (0 – 100 FEET)

• **ACCESS ROADS: 0-10 ft Horizontally & 13 ft 6 in Vertically**

Extends from 0ft to at least 10ft horizontally from the edge of roads and 13ft 6in overhead. Property owners are responsible for vegetation adjacent to roads. Private access roads are critical for evacuation and first responder access. Maintenance is required year-round.

- Trim / Thin / Prune / Cut Back vegetation 13ft 6in unobstructed overhead (vertical) clearance and 10' from sides of roads (horizontally) in the same manner as Defensible Space Zone 1.
- Remove dead or dying vegetation, encroaching on roadway, located within 10 horizontal feet of the roadway.
- Consider removal of hazardous vegetation, (flammable five) such as juniper, cypress, pine, acacia, eucalyptus, and bamboo that are within 10 feet of the roadway.
- Plantings shall be fire smart and must not extend into the roadway.
- Address numbers must be clearly visible from the road, with at least 4" numbers on a contrasting background. Reflective or lighted numbers are best for existing structures only.
- Create vertical spacing between shrubs, and lower tree limbs.
- Cut all grasses.



• **DRIVEWAYS: 0-5 ft Horizontally & 14 ft Vertically**

Extends from 3ft to at least 5ft horizontally from the edge of roads and 13ft 6in overhead. Property owners are responsible for vegetation adjacent to driveways. Driveways are critical for evacuation and first responder access. Maintenance is required year-round.

- Trim / Thin / Prune / Cut Back vegetation 13ft 6in unobstructed overhead (vertical) clearance and 5' from sides of roads (horizontal) in the same manner as Defensible Space Zone 1.
- Address numbers must be clearly visible from the road, with at least 4" numbers on a contrasting background. Reflective or lighted numbers are best for existing structures only.

- Remove dead or dying vegetation, encroaching on roadway, located within 5 horizontal feet of the roadway.
- Consider removal of all plants such as (flammable five) juniper, cypress, pine, acacia, eucalyptus, and bamboo that are within 5 feet of the driveway.
- Create vertical spacing between shrubs, and lower tree limbs.
- Cut all grasses.

Vegetation to be removed along critical evacuation route.



Clear combustible debris from driveway so that you can evacuate, and first responders can reach your home.

- **CLIMBING VINES: Remove all climbing vines from structures within 100 feet of structures.**
 - Unless, climbing vines greater than ½ inch in diameter that are irrigated, cleared of dead material, do not constitute a ladder fuel, located and maintained so that they do not cause damage to any part of the structure.
 - A well-maintained, healthy vine on a free-standing support, **not structure** is permitted in Zones 1 & 2 meeting the above criteria.
 - This does not apply to new construction, nor to the planting of new climbing vines on existing Structures. It is not permitted at all.
- **OUTBUILDINGS & LIQUID PROPANE GAS (LPG) STORAGE TANKS:**
(Outbuildings are non habitable structures with roof & no walls, <120 sq ft.)
 - Maintain 10 feet of bare mineral soil around Liquid Propane Gas (LPG) storage tanks and Outbuildings.
 - Remove all dead or dying vegetation for an additional 10 feet

- **FENCES:**

Fences are **one of the most common ways** that wildfires spread to homes. [Did You Know...Fences? - Click here to watch video.](#)

- No screen, fence, or other structure made of bark, mulch, or wood chips is allowed within 100 feet of a Structure or within 10 feet of the paved edge of the road.
- Any new combustible fence shall have a separation distance of at least 6 feet from any structure unless the last 6 feet of fence connecting to the structure is constructed of non-combustible materials.
- Fence recommendations: <https://firesafemarin.org/articles/fencing-out-fire-fire-resistant-fences-and-gates/>

- **GROUND-MOUNTED PHOTOVOLTAIC SYSTEMS, EQUIPMENT, & ENERGY STORAGE SYSTEMS**

- For cluster of panels <1,500 sq ft: Initial 5 feet shall meet the Zone 0 standards. The subsequent 5 feet shall meet the Zone 1 standards. Total of 10 feet of clearance.
- For cluster or panels great than 1,500 sq ft: Initial 5 feet shall meet the Zone 0 standards. The remainder shall meet the Zone 1 standards.

RECOMMENDATIONS BEYOND ZONE 2 INFORMATION ONLY

- **Addressing Tree Hazards**

A home which has been properly prepared to resist the embers generated by wildfires has a high chance of survival. It is the embers generated by large amounts of combustible material that ignites homes during wildfires. These embers land in combustible materials immediately adjacent to the home, enter the home through improperly screened vents, ignite leaves on roofs and gutters and can enter a home through small openings in the exterior. A home can be surrounded by burning trees and still survive. When thinking about tree hazards, consider the placement, species, and maintenance.

If it helps to ease your nerves, know that the mere presence of trees (even some fire-hazardous species like eucalyptus, pines, and firs, etc.) does not necessarily indicate that an “extreme” fire hazard exists. Single specimens of most tree varieties can usually be maintained in a way that minimizes the hazard. Remember, trees don’t magically burst into flames, even during a wildfire. Some types of fuel, usually on the ground, carry the fire into the tree. Eliminating these “ladder fuels” is often more important than the tree species itself.

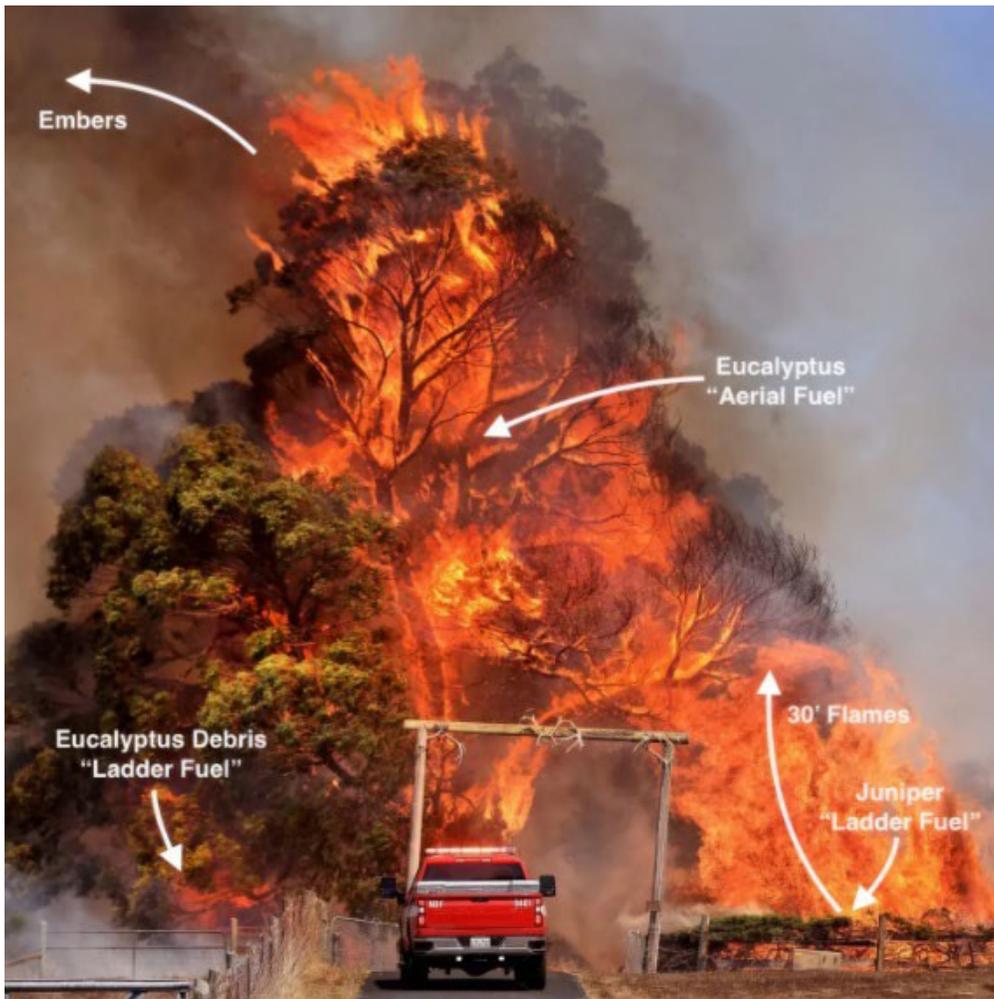
It is rare that WFPD will ever recommend the removal of a healthy living tree. Usually, proper maintenance is all that is required to keep the tree fire safe. We recommend that you contact a licensed arborist to examine any trees on your own property that cause you concern; they will make recommendations on ways to improve their health and resistance to fire.

- **Tree Trunks with diameters of 12 inches or more:** Single specimens of standing dead trees in zone 2 or beyond with only major limbs remaining that are of likely benefit to wildlife will be allowed at the discretion of the Fire Code Official.
- **Tree trunks greater than 8 inches in diameter** can be left in place on the ground to decay over time if the entire trunk surface is in contact with the ground and cut into smaller logs.
 - **For trunks in zone 1 & 2,** either relocate or chip and spread around your property.
- **Maintaining Oak Woodland:** Healthy oak canopies should be maintained. Healthy oaks are slow to ignite, are fire resistant, and can suppress growth of invasive plants that are often highly flammable. California bay trees can overtop oaks, are a greater fire risk, and can spread Sudden Oak Death to some oaks and other trees. Reducing the number of California bay trees (*Umbellularia californica*) may help maintain a healthy oak canopy.

- **Removal of eucalyptus trees, highly recommended, but not required by ordinance. At the least, here are recommendations to make eucalyptus tree more resistant to ignitions during a wildfire:**

- Remove vegetation around the base of the trees.
- Remove the bark which peels back annually.
- Remove small diameter lower limbs up to at least one-third of the tree’s height.
- Remove the leaves that fall onto rooftops.
- **Contact your local fire department or a licensed arborist for an evaluation of the trees in question.**

Revisions for clarity, consistency & readability are ongoing. Thank you for your patience.



Eucalyptus must be properly maintained for safety. Ladder fuels interspersed with lower limbs of the tree is the biggest threat. Leaf and bark litter shall be removed. Or consider removal of the tree if you cannot maintain it.

- **Removal of Junipers is highly recommended, but not required by ordinance. Junipers: Juniper does not belong in the landscaped environment or defensible space zones of structures in California:**

Junipers are coniferous plants in the genus *Juniperus* of the cypress family Cupressaceae. Junipers (*Juniperus* spp.) are one of the hardiest, most versatile, and drought-tolerant shrubs. They are also one of the most fire prone species and are sometimes referred to as a “gasoline bush” by firefighters. They are conifers with prickly young foliage that becomes flatter and softer with age. All junipers are recommended to be removed within 100’ of structures or 10’ of roads and driveways.

- **Trees, Shrubs, Hedges**
 - Select appropriate plants for hedges.
 - Plant hardwood trees, like maple, poplar, and cherry that are less combustible than conifers like pine and fir.
 - Maintain your trees carefully, being sure to limb up and remove “ladder fuels” and shrubs beneath trees.
 - Choose shrubs that are low growing, with minimal dead material and supple leaves.



- **Your Part in the Community:** Can include 100-200 feet depending on the layout of the houses. Many homes do not have 100' of space between structures and parcel lines. Property owners are required to maintain defensible space to their property line. California and local laws do not require you to create defensible space on property you don't own. Work with your neighbor to gain permission to clear defensible space on their property if it will help protect your home! In most cases, the most effective solution is a cooperative approach between neighbors.
 - Grazing is a good option for maintaining defensible space on open land near homes.

HOME HARDENING

THIS SECTION WILL BE COMPLETED AND ADDED AT A LATER TIME

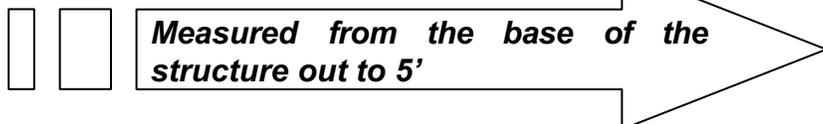
- Identify their home's vulnerabilities to wildfires and embers;
- Introduce ignition and ember resistant design and materials;
- Provide home-hardening and retrofitting resources;
- Encourage building modifications to reduce the likelihood of structural ignitions during wildfires;

WHAT DO THE PHRASES "FIRE HARDENED" AND "HARDENING HOMES" MEAN?

"Fire hardened" describes a building or structure that is prepared for wildfire and an ember storm. It does not mean fireproof. Home hardening addresses the most vulnerable components of your house with building materials and installation techniques that increase resistance to heat, flames, and embers that accompany wildfires.

APPENDIX A – ZONE 0, ZONE 1, ZONE 2

Zone 0 Why should you care about “Zone Zero”? It’s the area closest to your house, from 0 to 5 feet. This includes the surfaces of the structure itself, plants, decks, outdoor furniture, and the outside walls and coverings. This area is the most vulnerable and should be aggressively maintained to keep fire or embers from igniting materials that can spread the fire to your home. When wildfire embers land in this area, they ignite any combustible material which in turn can ignite your home. Gravel mulch and hardscaping are very effective in this area.



❖ **Other things you can do to protect your home from wildfire:**

❖ **Smart Spending for Zone Zero:**

<https://firesafemarin.org/articles/smart-spending-for-zone-zero/>

- Remove all dead and dying weeds, grass and forbs (or cut to less than 4 inches), plants, shrubs, trees, and vegetation debris (leaves, needles, cones, bark, etc.).
 - Check your roofs, gutters, decks, porches, and stairways.
- No vegetation is recommended within 5 feet of any structure.
- Remove tree limbs that extend into this zone. (minimum of 5 feet away from the sides of the structure, minimum of 10 feet above the roof and decking).
- Ensure all branches are a minimum of ten feet (10 ft.) away from chimney and stovepipe outlets for appliances/fireplaces that burn solid fuels.
- Relocate combustibles from under decks or overhangs.
- Examples of hardscape: gravel, flagstone, permeable pavers or blocks, pervious or porous concrete, bare ground, or other noncombustible materials.
- Replace combustible fencing, gates, trellis, and arbors attached to the Structure(s) with noncombustible features. For existing fences, consider providing a separation distance of at least 6 feet from any structure unless the last 6 feet of fence connecting to the structure is constructed of non-combustible material.
- Relocate garbage and recycling containers outside of this zone unless in a secured, fire-resistant enclosure or covered with a secured, fire-resistant material.



Good use of gravel mulch and hardscape walkway in Zone 0



Firesafe vegetation setback 5 feet with gravel path

Embers (Firebrands) and Mulch. Embers, also known as firebrands, are the leading cause of building ignition during wildland–urban fires. This is attributed both to direct ignition of material on, in, or attached to the building, and indirect ignition where they ignite vegetation or other combustible material near the building, which results in a radiant heat and/or direct flame contact exposure that ignites the building. Indirect ignition of a building can occur when embers accumulate on and ignite nearby combustible fuel such as mulches, pine needles, wood and bark chips, and recycled rubber, resulting in radiant heat or flame constant exposure. **No combustible bark or mulch is allowed in this zone.** Mulch helps plants retain moisture, but it will burn too! Use in zone 1 or 2, but not more than 2” layers.

✓ Use inorganic, noncombustible mulch (rock, stone, or gravel mulch), or hardscape.

The safest and lowest maintenance Zone 0 is hardscape. As an exception to the rule of no plants in Zone 0, plants are permitted if they are: herbaceous (non-woody); hydrated and healthy; maintained free of dried or dead material; low-growing; and growing on non-combustible substrate (bare soil, gravel). Keep in mind that ground cover plants that spread by runners or trailing stems can form a net that traps dead material such as fallen leaves.

Examples of ground covers to consider are:

- ✓ *Armeria maritima* (Common Thrift)
- ✓ *Asarum caudatum* (Wild Ginger)
- ✓ *Clinopodium douglasii* (Yerba Buena)
- ✓ *Fragaria vesca* (Woodland Strawberry)
- ✓ *Oxalis oregana* (Redwood Sorrel)
- ✓ *Phyla nodiflora* (Common Lippia)
- ✓ *Sisyrinchium bellum* (Blue-eyed Grass)

Note:

- ✓ All plants can burn regardless of how they are marketed.
- ✓ Fire safe landscaping requires maintenance (pruning, irrigation, clean-up)
- ✓ Select low growing, open structured, less resinous, higher moisture content plants.
- ✓ Native and drought tolerant can be options, if maintained well.
- ✓ Avoid planting near windows.





0-5 ft “noncombustible zone” to reduce chance of flame contact exposure

Effective defensible space must be present on all sides of the home



Where the lawn begins, that’s where you can consider placing your planters’ boxes.

[Why is Zone Zero so important to maintain following these guidelines above – Click here for video](#)

Zone 1: 5-30ft. – Lean, Clean and Green

In this zone, 5-30 ft. from the home, remove dead vegetation and debris and maintain spacing between shrubs and trees. Remove “ladder fuels” (i.e. trees or shrubs that are growing under other trees) because they can increase the probability of fire moving into the tree canopy. Keep vegetation in this zone irrigated. Hardscape and plant islands or beds can help maintain horizontal separation to reduce the spread of fire.

- Recommend the use of only fire-smart plants and keep them healthy and well-irrigated.
- Recommend removal of “Gorilla Hair” or shredded bark mulch.
- [Use only compost or heavy bark mulch to maintain soil moisture, or for erosion control.](#)
- Choose only [fire-smart plants](#), and keep them healthy and well irrigated.
- Removal of [fire-hazardous plants](#) is highly recommended.
- Not a requirement but, consider the removal of fire-hazardous plants (The Flammable Five) such as juniper, cypress, pine, acacia, and eucalyptus. And bamboo. These species are not permitted in new construction or for existing structures, the planting of.
- Consider spacing between shrubs, at least 2 times the height of the mature plant. Add space on steeper slopes.

- Move firewood & lumber to *Zone 2* or cover with material that is certified as fire-retardant according to the NFPA 701 Method 2 Standard. The covering must be secured to the ground and completely enclose the wood pile. Or an enclosure that will not allow embers to penetrate.
 - **Maintain 10 feet of clearance around the covered wood pile**, down to hardscape, bare mineral soil, or a non-combustible ground cover.
- Remove combustibles around and under decks and awnings.
- Landscape in islands with built in hardscape around to create pathways around, in and out of your property.



Rock wall firebreak for island beds
By April Owens



Home hardened courtyard patio with cement
stone pavers, colorful rock mulch
By April Owens



Zone 2: 30-100ft. – Fuel Reduction

Zone 2 extends from 30ft to at least 100ft. Fuels need to be reduced in this zone. Dead grass, weeds, plants, and shrubs should be removed. Shaded fuel breaks that favor the growth of large native species by removing the understory, ladder fuels, and invasive species can favorably modify wildfire behavior while providing the foundation for a healthy and resilient forest.



Fire safety protection, trees limbed up with no shrubbery as shaded fuel break creates a park like setting.



Grass and dead material removed and trees limbed up.



Rock lined cut flower garden bed, island planting, wide mulched paths, and discontinuous vegetation. Note well maintained exit row. - Design by April Owens

APPENDIX B – PLANT & TREE SPACING GUIDELINES

Plant and Tree Spacing Guidelines for Zones 1 and 2

Ordinance 24-01 imposes certain vertical and horizontal spacing requirements, with the Fire Code Official being authorized to determine appropriate minimum clearance distances. In order to assist in meeting these requirements, Ordinance 24-01 provides plant spacing guidelines for general reference. Creating space between plants in the yard, both vertically and horizontally, **slows or stops the spread of fire**. Horizontal spacing can be achieved by planting in clusters called plant islands or beds. Hardscape materials like stone, gravel, and boulders help create this space and can be used as attractive pathways throughout the garden. Vertical space is created by limbing up trees and reducing the height of plants near or under the trees. This eliminates a feature called ladder fuels which can spread fire from grass to brush to the trees themselves. Remember that [on hillsides more space is needed](#) between trees and shrubs to reduce fire spread. Space around plants creates a fuel break to slow the spread of fire to a house. Design your yard with these principles in mind:

1. **Use mulch or low-growing ground cover beneath trees to prevent fire from traveling from ground to the canopy.**
2. **Group plants in “islands” separated by hardscaping to interrupt the pathway of fire.**
3. **Use a variety of hardscape and mulch textures to add interest to your firescaping.**
4. **Functional features, like walkways, paths, and planting boxes can be strategically used as fire breaks in aesthetically pleasing ways. (This principle addresses the two photos below).**
5. **Replace large lawns with sections of grasses, flowers, pathways and beds to minimize the need for continuous watering.**



Dense vegetation in contact with tree limbs leads to rapid fire spread, particularly on slopes. The goal is to create a fuel break between the vegetation and the structure (your home), so that the vegetation cannot carry the fire to the structure and ignite it.

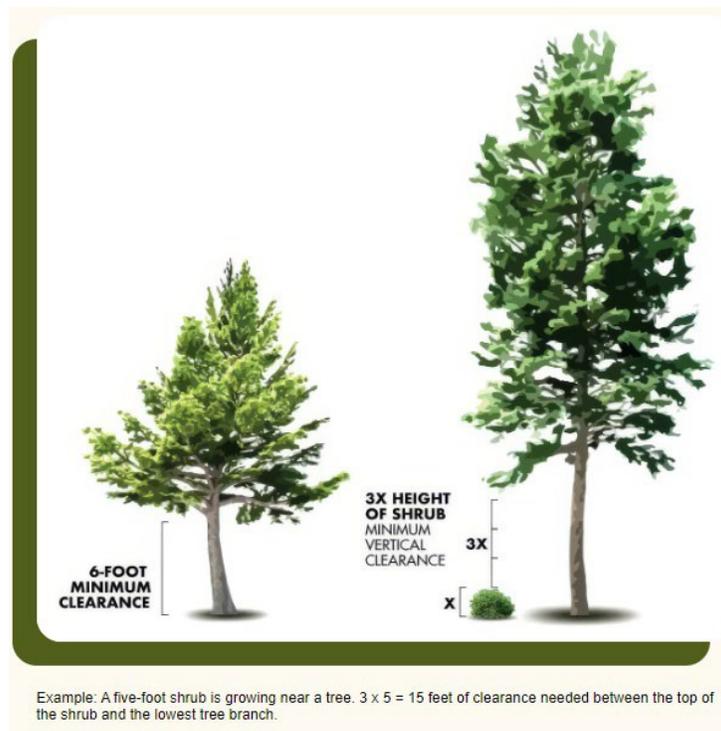


Vertical Spacing

The spacing between grass, shrubs, and trees is crucial to reduce the spread of wildfires. The amount of spacing needed is determined by the type and size of brush and trees, as well as the slope of the land. For example, a property on a steep slope with larger vegetation requires greater spacing between trees and shrubs than a level property that has small, sparse vegetation.

- Remove all tree branches at least 6 feet from the ground or the lower 1/3 of branches from trees less than 18 feet tall.
- Allow extra vertical space between shrubs and trees. Lack of vertical space can allow a fire to move from the ground to the brush to the tree tops like a ladder.

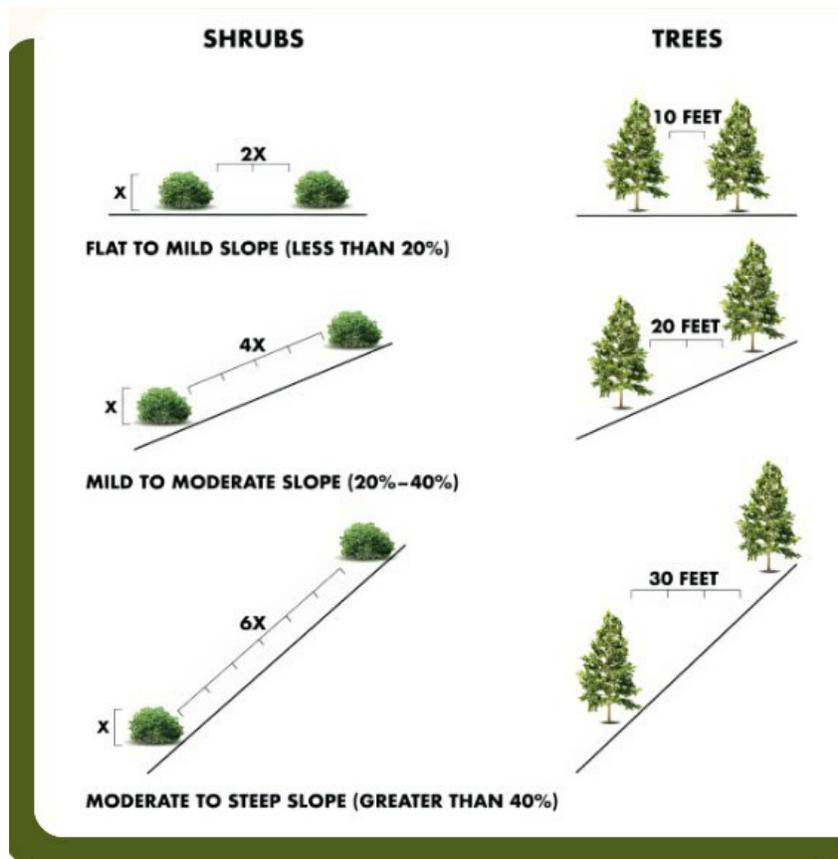
To determine the proper vertical spacing between shrubs and the lowest branches of trees, use the formula below.



Horizontal Spacing

The goal is to create a fuel break from the vegetation to the structure (your home), so the vegetation does not ignite the structure, or the structure ignites the vegetation.

Horizontal spacing depends on the slope of the land and the height of the shrubs or trees. Check the chart below to determine spacing distance recommendations.



PRIVACY SCREENS – Permitted outside of Zone 0

As homeowners seek to enhance their privacy and create aesthetically pleasing landscapes, the use of plant privacy screens has become increasingly popular. These screens, composed of densely planted vegetation, serve as natural barriers to shield properties from prying eyes. However, in wildfire-prone regions, these seemingly harmless landscaping choices may pose unforeseen risks.

- **The Fire Risk:** While lush, green plant privacy screens may be visually appealing, the vegetation within them can become fuel for wildfires. Many of the plants commonly used in privacy screens, such as evergreen shrubs like Italian cypress and tall grasses like bamboo, are highly flammable. In the event of a wildfire, these plants can contribute to the rapid spread of flames, putting both property and lives at risk. [Privacy Screens - click to watch video](#)
- **Firebreaks and Defensible Space:** In wildfire-prone regions, creating defensible space around a property is crucial for minimizing fire risk. Plant privacy screens can inadvertently hinder the establishment of effective defensible space by providing continuous fuel for fires. Homeowners should carefully consider the spacing and composition of their privacy screens to ensure they do



not impede the creation of firebreaks, which act as barriers

Dense bamboo privacy screen. Bamboo is very flammable and difficult to maintain. Note the leaf litter at the bottom of the plants. Better Homes and Gardens.

to slow or stop the advance of wildfires.



Hedge privacy screens are flammable because the inside of the plant is dry material.

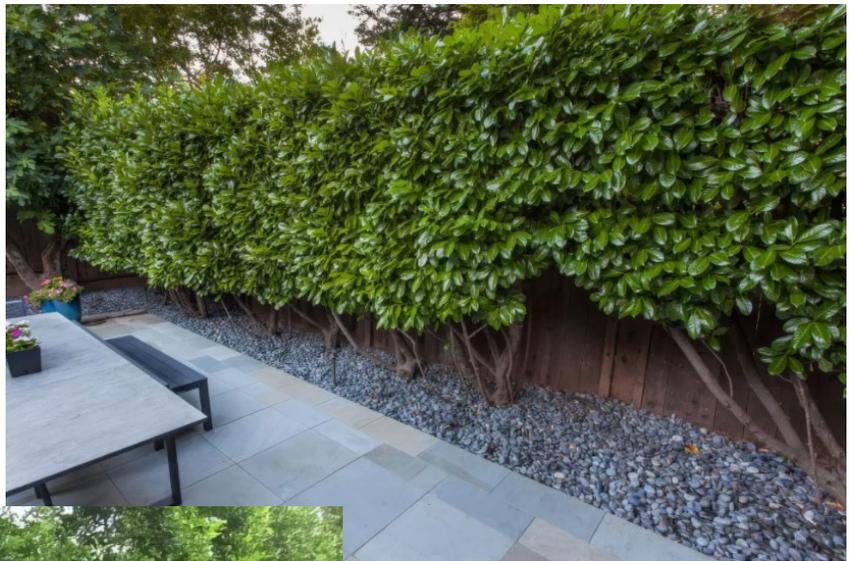
- **Plant Selection and Maintenance:** Homeowners can mitigate the risks associated with plant privacy screens by carefully choosing plant species and implementing regular maintenance practices. Opting for plants with high moisture content, low flammability, and a slower rate of growth can help reduce the risk of the vegetation becoming a fire hazard. Additionally, routine pruning and removal of dead or dry plant material can limit the potential for wildfires to spread through the screen.

Privacy Screening → Not a wall of plants



A Few Well-Placed Plants to INTERRUPT SIGHTLINE

Well pruned English Laurel evergreen privacy hedge with rock mulch.
(Firewise Garden, San Anselmo, CA)



Use of trees for privacy.

(Don Pedro Décor & Design)

- **Alternative Solutions:** For homeowners who prioritize privacy but are concerned about the fire risk associated with plant privacy screens, there are alternative solutions to consider. Hardscaping options, such as fences and walls made from fire-resistant materials, can provide effective privacy barriers without introducing combustible elements into the landscape.

While plant privacy screens can offer a sense of seclusion and natural beauty, their use in wildfire-prone areas requires careful consideration of the associated risks. Homeowners must strike a balance between privacy and safety by selecting fire-resistant plant species, maintaining their vegetation, and being mindful of local regulations. By taking these precautions, homeowners can enjoy the benefits of privacy screens without compromising the safety of their property and surrounding communities in the face of wildfire threats.



Consider use of well maintained trees, limbed up, gravel mulch underneath, for privacy.

- If your privacy screen is outside of Zone 0, add fuel breaks. Horizontal breaks of minimum 5 feet.
 - Groups of vegetation growing together less than 10 feet in total foliage width may be treated as a single plant.
- **Tips**
 - Visit your local nursery to assist with drought-tolerant and fire smart plant
 - Examples: Pineapple Guava, Cherry tree, Podocarpus gracilior, Rhamnus

Always be sure to select the [right tree for the right place.](#)

The information contained on this page is derived from several print and online sources:

- University of California Publication 8228. Home Landscaping for Fire. 2007. University of California, Davis. <https://anrcatalog.ucanr.edu/pdf/8228.pdf>
- <http://www.readyforwildfire.org/> Wildfire is Coming: Are You Ready. CAL FIRE. 2012.
- [Urban Forestry Associates.](#) Ray Moritz, Urban Forester and Fire Ecologist.

Other Landscaping Examples:

The photo shows the use of planters, various mulches, hardscape, and plant separation. These plants are well separated, and several different methods are used to create horizontal spacing including stone steps, mulch, lawn and planter boxes.



Plant “islands” or beds are a good placement strategy. In the photo, several different mulches are used including gravel, wood chips, and decomposed granite to help create space between plants. Plants are grouped together, and boulders are both aesthetically pleasing and aid in plant separation. There should be no plants immediately adjacent to the home.



In the photo, plants are grouped and separated with hardscape and mulch. Flagstones create space and pathways. Different rock materials are attractive. Stone walls can help stop fire from spreading.



APPENDIX C – APPROVED VEGETATION

The following sources contain examples of types of vegetation that can be considered as smart plants:

- 1) Fire Safe Marin – Fire Smart Plants, Garden, Spacing, Pruning and much more.
<https://firesafemarin.org/?s=fire+smart+plant>
- 2) Portola Valley Conservation Committee has a guide to [Understory Habitat and Defensible Space](#) which advises where, when, and how we can sustain local plant communities and wildlife habitat as we manage vegetation for fire safety.
- 3) Portola Valley Conservation Committee's list of Low Fire Hazard California Native Plants
<https://www.portolavalley.net/home/showpublisheddocument/14083/637425259236670000>
- 4) Town of Portola Valley Conservation Committee's list of [Landscape Plants](#) is coded for multiple traits, including fire risk:



"High fire hazard" plants have characteristics that can make them highly flammable, such as very small leaves, dense twiggy growth, and aromatic oils.



"Low fire hazard" plants have characteristics that make them less likely or slower to catch fire.

- 5) Firescaping with Native Plants, San Mateo County, California
<https://www.woodsidefire.org/our-district/vegetation-management-defensible-space/fire-smart-plants>
- 6) Examples of ground covers to consider are:
 - ✓ *Armeria maritima* (Common Thrift)
 - ✓ *Asarum caudatum* (Wild Ginger)
 - ✓ *Clinopodium douglasii* (Yerba Buena)
 - ✓ *Fragaria vesca* (Woodland Strawberry)
 - ✓ *Oxalis oregana* (Redwood Sorrel)
 - ✓ *Phyla nodiflora* (Common Lippia)
 - ✓ *Sisyrinchium bellum* (Blue-eyed Grass)

REPLACEMENT CONSIDERATIONS

- After removing highly flammable plants, such as junipers, cypress, and bamboo. Consider these four concepts when choosing replacements:
 - 1) Size at maturity
 - 2) Drought tolerant
 - 3) Easy to maintain.
 - 4) Considering Ecology as a Whole (plants that bring birds and bees)
- Once you have chosen your plants remember:
 - 1) Plant in islands
 - 2) Nothing that burns next to the house.
- Fire Smart Landscape Basics - <https://firesafemarin.org/create-a-fire-smart-yard/firescaping/>
Firescaping uses fire-resistant designs and materials, in conjunction with careful selection of plants, to strategically resist the spread of fire to your home.

APPENDIX D – DEFINITIONS

AERIAL FUELS. Standing and supported live and dead combustible materials not in direct contact with the ground and consisting mainly of foliage, twigs, branches, stems, cones, bark, and vines.

APPROVED VEGETATION. Plants, shrubs, trees, groundcovers, and other vegetation approved by WFPD which exhibit properties, such as high moisture content, little accumulation of dead vegetation, and low sap or resin content, that make them less likely to ignited, contribute heat, or spread flame in a fire. Typically, vegetation must be irrigated to be fire resistant. (See appendix A)

BUILT FUELS. Combustible structures, including buildings and infrastructure.

CROWN FIRE. A fire that advances from top to top of trees or shrubs more or less independent of a surface fire.

DEFENSIBLE SPACE. The selection, location, grouping, and maintenance of vegetation on the property in such a manner that the opportunity for fire to burn directly to a structure is minimized and so that property can be defended.

EMBERS. *see firebrand.*

EXPOSURE. The contact or vulnerability of an entity, asset, resource, system, or geographic area with a potential hazard.

FIRE-ADAPTED COMMUNITY. A human community consisting of informed and prepared citizens collaboratively planning and taking action to coexist with wildland fire.

FIREBRAND. Any source of heat, natural or human made, capable of igniting wildland fuels, flaming or glowing fuel particles (embers) that can be carried naturally by wind, convection currents, or by gravity into unburned fuels.

FIRE INTENSITY. Commonly referred to as *fire line intensity*, this is the amount of heat energy that is generated by burning materials.

FIRE-SMART VEGETATION. Fire-resistant plants that do not easily ignite, and their foliage and stems do not contribute to fire intensity. Supple leaves that are moist or have high water-content. Characteristics include:

1. Watery sap with little odor
 2. Plants with an **open-growth structure** (space between branches)
 3. No dead wood
 4. Thick bark that does not peel away from the trunk.
- You can ensure your plants will be more resistant to wildfire by regularly watering, fertilizing them with compost, and clearing away dry debris.
 - Using drip irrigation can help both conserve water and deliver enough water to your plants.
 - Pruning or thinning shrubs and **trees** to have a more open structure will help ensure they do not accumulate dead material within themselves. Some plants have even adapted to survive the devastating

effects of wildfire. Incorporating these hearty, fire-resistant plants into your own garden can help reduce wildfire risk on your property. These plants can also slow the spread of fire if it threatens your house.

- Even fire resistant plants can be damaged or killed by fire, especially if they are not maintained and kept healthy. There is no consistent standardized measure of plant flammability, so do not rely on plants with a 'firesafe' label to naturally resist fire without any attention or cultivation. Instead, ensure proper irrigation of plant beds and prune plants to keep them resistant to fire.
- Plants native to your area can flourish more easily and have their own strategies to protect themselves from wildfire. For example, with some plants, the roots remain intact and can help prevent erosion as the plant recovers from fire damage.

FIRE WEATHER. Weather conditions which influence fire ignition, behavior, and suppression.

FIREWISE USA: A voluntary program administered by the National Fire Protection Association that teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action to prevent losses. Some communities have applied the term "firewise" more broadly to refer to wildfire mitigation activities.

FUELS. All combustible materials in the wildland-urban interface, including but not limited to vegetation and structures.

FUEL TREATMENT. Manipulation or removal of fuels to reduce the likelihood of ignition or to lessen potential damage and resistance to control (e.g., lopping, chipping, crushing, piling, and burning).

GROUND COVER. Consisting of irrigated, approved vegetation. Irrigated green grass, succulents or similar plants may be used as ground cover, no taller than 4 inches.

GROUND FUEL. All combustible materials below the surface litter, including duff, tree or shrub roots, punky wood, peat, and sawdust, that normally support a glowing combustion without flame.

Fuel is...anything that will burn.

- **Dry or dead vegetation**
- **Wood siding, roofing, fencing, decking**
- **Woody shrubs or perennials**
- **Landscape mulch, wood chips**

HAZARD. Any real or potential condition that can cause damage, loss, or harm to people, infrastructure, equipment, natural resources, or property.

HAZARDOUS VEGETATION (HAZARDOUS PLANTS). Fire-Hazardous Plants. All plants can burn, but the ease of ignition, rate of consumption, and generation of heat may be vastly different between species of vegetation.

Fire-hazardous plants include species that ignite readily and burn intensely, and typically share certain characteristics:

[How to Address Tree Hazards - Fire Safe Marin](#)

[Defensible Space/Vegetation Management | Portola Valley, CA](#) (The Flammable Five)

- They are usually blade-leaf or needle-leaf evergreens.
- They have stiff, woody, small or finer lacey leaves.
- Their leaves and wood usually contain volatile waxes, fats, terpenes or oils (easily identified, since crushed leaves have strong odors).
- Their sap is usually gummy, resinous, and has a strong odor.
- They usually contain plentiful fine, twiggy, dry, or dead materials.
- They may have pubescent (hair covered) leaves.
- They may have loose or papery bark.
- These plants flame (not smolder) when preheated and ignited with a match.

- The condition of a plant is as important as its species when considering fire. Even some fire-hazardous specimens can be fire-resistant if properly maintained.
- Depending on its growth form and access to water, the same species may be fire resistant in one environment and fire-prone in another. Water-stressed plants that are in poor condition are more fire-prone.
- Many fire-prone species become explosively flammable when poorly maintained. South-facing slopes, windy areas, sites with poor soils, and urban landscapes are more stressful for plants, and enhance any plant's ability to burn.

HOME IGNITION ZONE (HIZ). Also see *structure ignition zone*. The area where the factors that principally determine home ignition potential during extreme wildfire behavior (high fire intensities and burning embers) are present. The characteristics of a home and its immediate surroundings within 100 feet comprise the HIZ.

HYDROPHOBIC SOILS. Resistance to wetting exhibited by some soils, also called water repellency.

INITIAL ATTACK (IA): A preplanned response to a wildfire given the wildfire's potential. Initial attack may include sizing up, patrolling, monitoring, holding action, or suppression.

LADDER FUELS. Fuels that provide vertical continuity from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crown fires.

MITIGATION. The act of modifying the environment or human behavior to reduce potential adverse impacts from a natural hazard. Mitigation actions are implemented to reduce or eliminate risks to persons, property, or natural resources, and can include mechanical and physical tasks, specific fire applications, and limited suppression actions.

NATURAL HAZARD. Source of harm or difficulty created by a meteorological, environmental, or geological event; also affected by topography.

PREPAREDNESS. Activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives through appropriate planning and coordination.

PRESCRIBED FIRE. Any fire intentionally ignited by management actions in accordance with applicable laws, policies, and regulations to reduce fuel load and fire hazard.

PREVENTION. Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards (fuels management); actions to avoid an incident, to intervene for the purpose of stopping an incident from occurring, or to mitigate an incident's effect to protect life and property.

RESILIENCY. The ability to prepare and plan for, absorb, respond, recover from, and more successfully adapt to adverse events.

RISK. A measure of the probability and consequence of uncertain future events.

RISK ASSESSMENT. Product or process that collects information and assigns values to risks for the purpose of informing priorities, developing, or comparing courses of action, and informing decision making.

STRUCTURE FIRE. Fire originating in and burning any part or all of any building, shelter, or other structure.

STRUCTURE IGNITION ZONE (SIZ): Also see *home ignition zone*. The area around a specific structure and associated accessory structures, including all vegetation that contains potential ignition sources and fuels.

SUPPRESSION. A wildfire response strategy to “put the fire out” as efficiently and effectively as possible while providing for firefighter and public safety.

SURFACE FIRE. A fire that burns loose debris (e.g., dead branches, leaves), and low vegetation on the surface of the ground.

SURFACE FUEL. Fuels lying on or near the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low-stature living plants.

URBAN CONFLAGARATION. A large, destructive fire that spreads unimpeded by fire suppression efforts or barriers, destroying large areas of structures and infrastructure.

VALUES. Identified by a community as having measurable or intrinsic worth that could be negatively resources, community infrastructure, and economic, environmental, and social values.

WILDLAND. An area in which development is essentially nonexistent, except for roads, railroads, power Structures, if any, are widely scattered.

WILDLAND FUELS. All vegetation (natural and cultivated).

WILDFIRE. An unplanned wildland fire, including unauthorized human-caused fires and escaped prescribed Fire management objectives may vary based on site-specific circumstances and conditions.

WILDLAND FIRE. Any non-structure fire that occurs in vegetation or natural fuels.

WILDLAND URBAN INTERFACE (WUI): Any developed area where conditions affecting the combustibility of natural and cultivated vegetation (“wildland fuels”) and structures or infrastructure (“built fuels”) allow for the ignition and spread of fire through these combined fuels.

WILDFIRE HAZARD. The combination of the likelihood of a fire occurring and the intensity of the fire. Also refers to the wildland or built fuels present in a given area, or the combustibility of a given fuel type or fuel complex in general; exacerbated by weather and topography

WILDFIRE RISK. The wildfire hazard with the addition of the factors that contribute to susceptibility, or the impact of a wildfire on highly valued resources and assets.

ZONES. Zone 0 (0-5 feet) Ember resistant or Immediate zone: non-combustible landscape. Zone 1 (5-30 feet) Lean, Clean, and Green or Intermediate zone: Reduce fuels continuity. Zone 2 (30-100 feet) Fuel Reduction or Extended Zone: Wide spacing and high pruning.

RESOURCES

- 1) Use this [low-cost retrofit list](#) developed by Cal-fire as a best practices guide to ensure your home is more ignition-resistant from wildfires.
- 2) [“How to create Fire-Smart Landscaping with UC Marin Master Gardens” Click here for Video](#)
- 3) <https://firesafemarin.org/zone-2-fuel-reduction-zone/#gsc.tab=0>