

Zone 0

Guidance,
interpretation, and
regulations for
enhanced defensible
space as directed by
AB 3074 (2020)



Photo: Institute for Business and Home Safety

Workgroup Efforts

- Introductory presentation to the full Board in 2021
- Workgroup formed, and developed a framework for Zone o considerations
- Several presentations to the Resource Protection Committee in 2022. The workgroup has presented draft elements for consideration of Zone o and alignment with Zone 1 and 2
- RPC asked Workgroup to schedule a workshop with the full board (today's efforts)

Presentation outline

- Workgroup members
- Problem statement
- Details and supporters of AB 3074 (2020)
- Brief background on defensible space evolution in California
- Workgroup draft recommendation for Zone 0 (purpose and details)
- Workgroup draft recommendation for alignments for Zone 1 and 2

Workgroup participants

Board of Forestry

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Insurance Institute for Business and Home Safety

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Foster McLean

Southern Marin Fire

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Wildfires are increasing in size and intensity

A photograph of a wildfire. The upper half of the image is dominated by intense orange and yellow flames engulfing a hillside. Below the fire, a layer of thick, dark smoke hangs over a residential area where several houses are visible. The overall scene conveys a sense of a major, active wildfire.

In the last 10 years in California.....

- 1 of every 8 acres has burned
- 173 lives have been lost
- Over 43,000 structures have been destroyed
- Embers contribute to building ignition



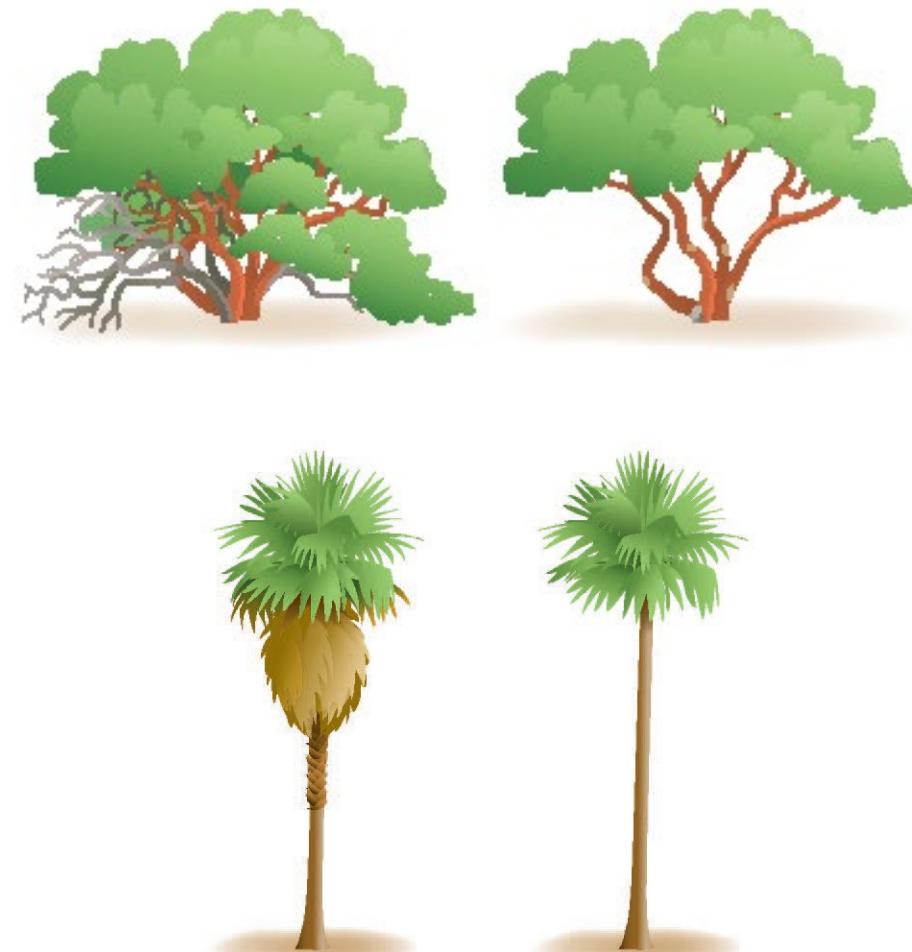
**A firefighter works to put out
spot fires from embers**

Source: LA Times

Plant placement is more important than plant type

- ✓ 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
- ✓ More info: Research Literature Review of Plant Flammability

Testing, Fire-Resistant Plant Lists and Relevance of a Plant Flammability Key for Ornamental Landscape Plants in the Western States ([Bethke, et al 2016 UCCE San Diego](#))



What does AB 3074 require?

- Create an **ember-resistant zone within 5 feet of the structure**, based on regulations promulgated by the State Board of Forestry and Fire Protection
- On or before **January 1, 2023**, the State Board of Forestry and Fire Protection, in consultation with the Department of Forestry and Fire Protection, shall update the **guidance document** to include suggestions for creating an ember-resistant zone within five feet of a structure based on regulations promulgated by the State Board of Forestry and Fire Protection, in consultation with the Department of Forestry and Fire Protection, to **consider the elimination of materials in the ember-resistant zone that would likely be ignited by embers.**
- For purposes of this section, **a structure for the purpose of an ember-resistant zone shall include any attached deck.** This section does not limit the authority of the State Board of Forestry and Fire Protection or the Department of Forestry and Fire Protection to require the removal of fuel or vegetation on top of or underneath a deck pursuant to this section.
- (2) (A) The requirement for an ember-resistant zone pursuant to Section 51182 **shall not take effect for new structures until the State Board of Forestry and Fire Protection updates the regulations**, pursuant to paragraph (1) of subdivision (a) of Section 51182, and the guidance document, pursuant to paragraph (2) of subdivision (c) of Section 51182.
- (B) The requirements for an ember-resistant zone pursuant to Section 51182 **shall take effect for existing structures one year after the effective date for the new structures.**

Zone Zero applies to SRA
and VHFHZ in LRA.



Bill Supporters

- ✓ American Planning Association, California Chapter
- ✓ American Property Casualty Insurance Association
- ✓ Building Owners and Managers Association California Apartment Association
- ✓ California Association of Realtors
- ✓ California Association of Resource Conservation Districts California Building Industry Association
- ✓ California Business Properties Association
- ✓ California Fire Chiefs Association
- ✓ California Fire Safe Council
- ✓ California Forestry Association
- ✓ California State Association of Counties
- ✓ California State Firefighters' Association
- ✓ City of Malibu
- ✓ Congress of California Seniors
- ✓ County of Del Norte, Board of Supervisors
- ✓ County of Humboldt, Board of Supervisors
- ✓ Defenders of Wildlife
- ✓ Fire Districts Association of California
- ✓ Fire Safe Council of San Diego County
- ✓ Midpeninsula Open Space District Orange County Fire Authority
- ✓ Pacific Forest Trust
- ✓ Pacific Gas and Electric Company
- ✓ Perimeter Solutions
- ✓ Personal Insurance Federation of California
- ✓ Resource Conservation District of Greater San Diego County Rural County Representatives of California
- ✓ San Diego Gas & Electric
- ✓ Sierra Club California
- ✓ Southern California Edison
- ✓ The Nature Conservancy
- ✓ Tree Care Industry Association
- ✓ Western Wood Preservers Institute

Defensible space evolution

OUTSIDE

1 Design/Construction

(See Wildland Urban Interface Construction of Structures)

- Use ignition-resistant construction (effective January 1, 2009) for roofed structures, patios, decks, exterior walls, exterior windows.
- Reduce the number of eaves, brackets and other ground debris with fire-resistant materials.
- Show your 100 foot Defensible Space on plot plan.
- Build your home away from ridge tops, canyons and areas between high points of a ridge.
- Consider installing residential sprinklers.
- Make sure that electric service lines, fuse boxes and circuit breaker panels are installed and maintained per code.
- Contact qualified individuals to perform electrical maintenance and repairs.

2 Access

- Make sure that your address name sign is clearly posted at each street intersection.
- Post your house address so it is easily visible from the street, especially at night.
- Address numbers should be at least 8 inches tall and on a contrasting background.
- Identify at least two exit routes from your neighborhood.
- Clear combustible vegetation at least 10 feet from roads and the base from driveways.
- Cut back overhanging tree branches above access roads.
- Construct roads that allow emergency traffic.
- Make sure dead end roads, and long dead ways have turns 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.

3 Roof

- Install a fire-resistant roof. Contact your local fire department for current roofing requirements.
- Remove dead leaves and needles from your roof and gutters.
- Remove dead branches overhanging roof and keep branches 10 feet from roof chimney.
- Cover your chimney outlet and overhang with a non-combustible screen of 1/2 inch or smaller mesh.

4 Landscape

- Create a Defensible Space of 100 feet around your home. It is required by law.
- Create a "LEAN, CLEAN and GREEN" by removing all flammable vegetation within 20 feet immediately surrounding your home.
- Then create a "REDUCED FIRE ZONE" in the remaining 70 feet of the 100 foot 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 close your property is and elevation of your plants.
 - B. Large trees do not have to be removed as long as all of the plants beneath them are removed.
- Remove brush piles at least six feet from the ground.
- Landscape with fire-resistant plants.
- Irrigate all plants with regular water, and keep dead branches, leaves and needles removed.
- When clearing vegetation, use tools when appropriate such as loppers if fuel load may start a fire, or using a chainsaw to knock undergrowth.

5 Yard

- Stack woodpiles at least 30 feet from all structures and between vegetation within 20 feet of woodpile.
- Above ground Liquid Propane Gas (LPG) propane tanks 200 or less cubic gallons shall be located a minimum of 20 feet with respect to buildings, pools, trees, and the lines of ejection property that can be built upon. (CFC 2094.2)
- Remove all stacks of construction materials, pine needles, leaves, and other debris from your yard.
- Contact your local fire department to use if debris burning is allowed in your area, obtain a burning permit and follow all local air quality restrictions.

6 Emergency Water Supply

- Maximize an emergency water supply that meets fire department standards through one of the following:
 - A community water system.
 - A community emergency storage tank with neighbors.
 - A minimum storage supply of 2,000 gallons on your property like a pond or pool.
- Clearly mark all emergency water sources.
- Create easy development 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.

California Department of Forestry and Fire Protection

www.fire.ca.gov

Homeowners Checklist

How To Make Your Home Fire Safe

For more information contact your local CAL FIRE office, fire department or Fire Safe Council for tips and assistance.
www.fire.ca.gov
Our Year Community Network
www.livewildfire.org or www.fire.ca.gov

March 2009



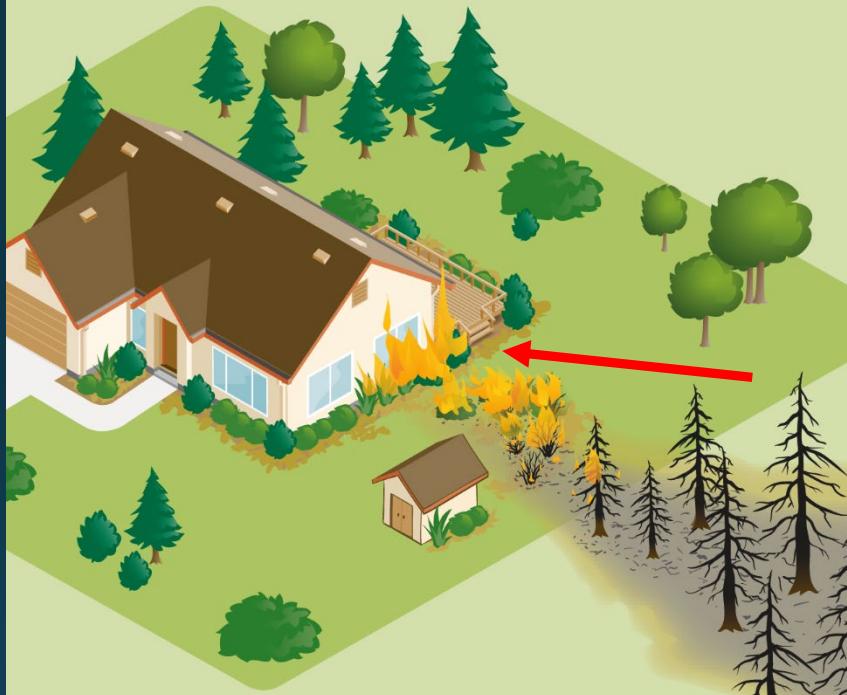
Strengths: Reduced fuel, no fuel ladders, safe place for a fire crew

Weaknesses: Vegetation next to house vulnerable to embers likely leading to spot fires touching the house

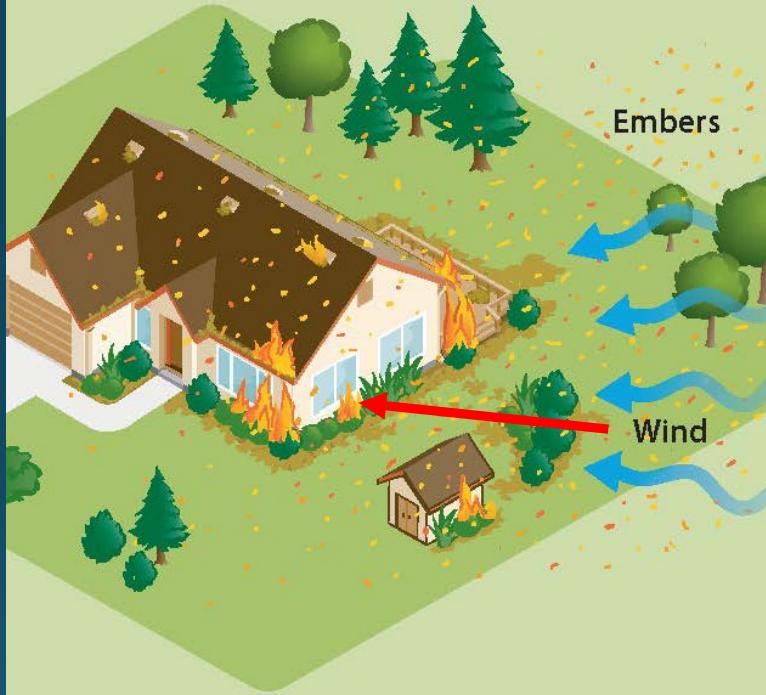
(photo: UC Master Gardeners)

Three types of fire exposures

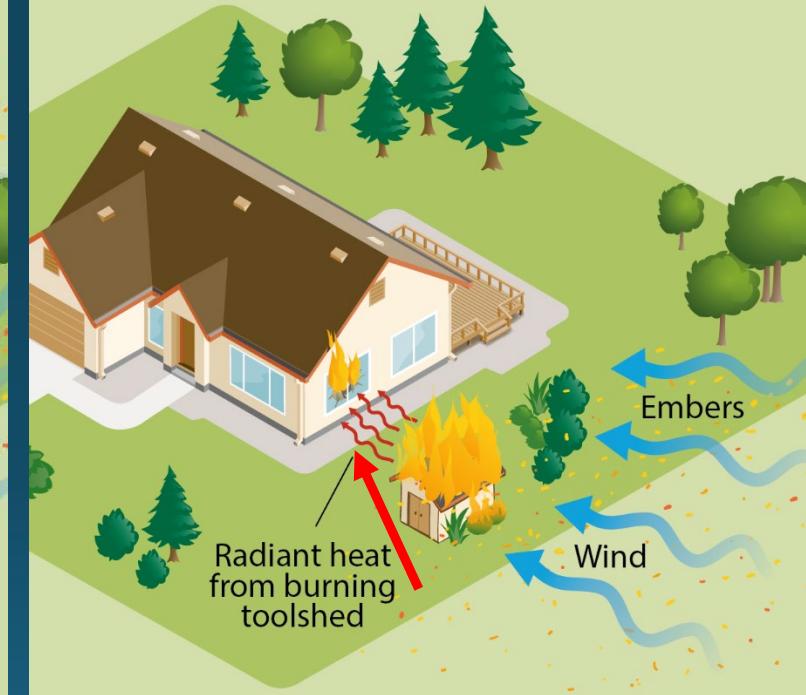
Direct flame contact



Embers



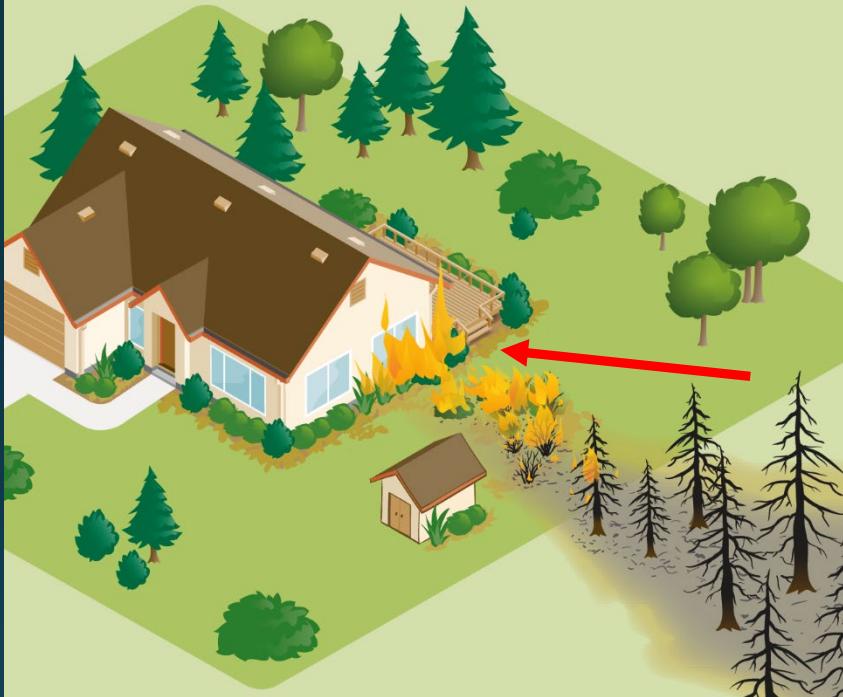
Radiant heat



- Defensible space strategies have focused on how to reduce direct flame contact.
- Preparing for embers and radiant heat exposures takes a different approach.

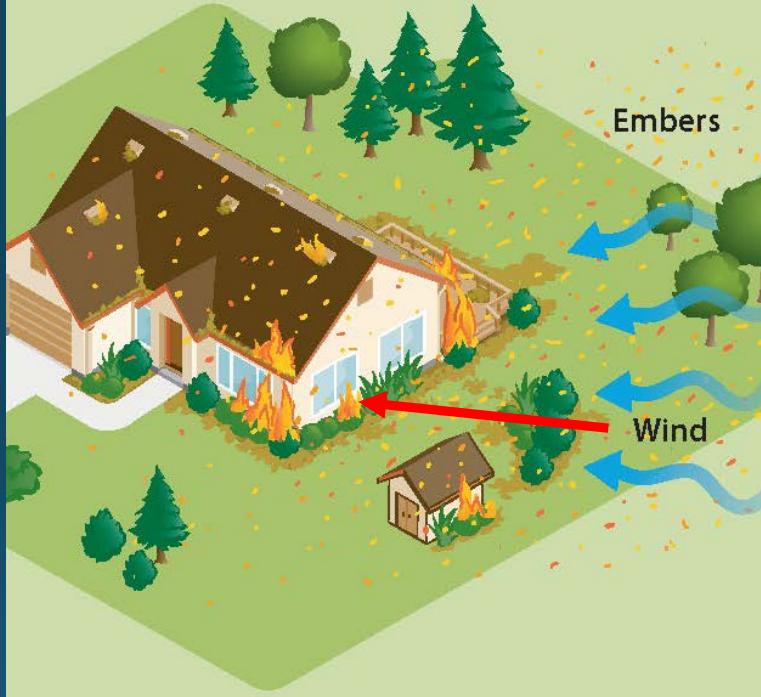
Techniques to reduce exposures

Direct flame contact



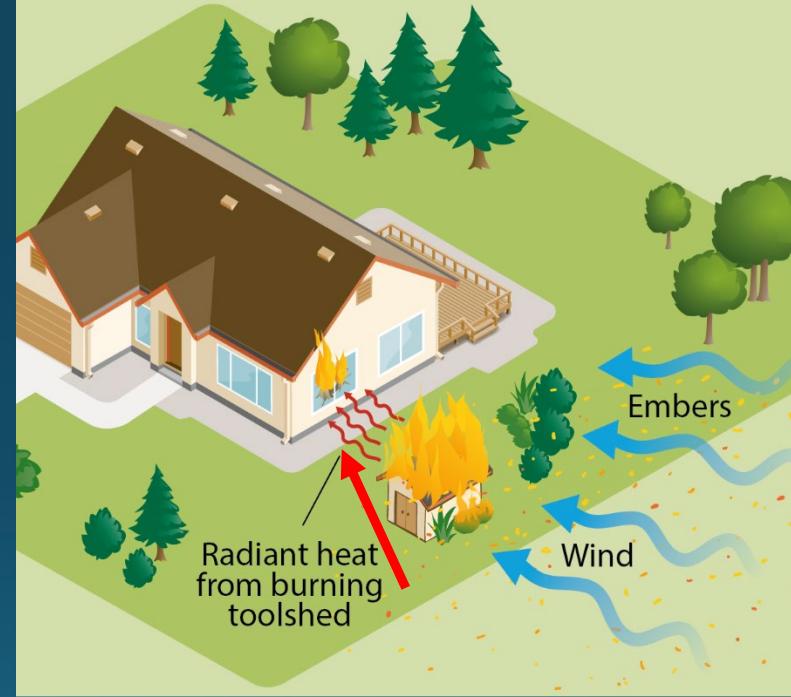
Defensible space implementation
interrupts fire pathways and reduces the
potential for direct flame contact

Embers



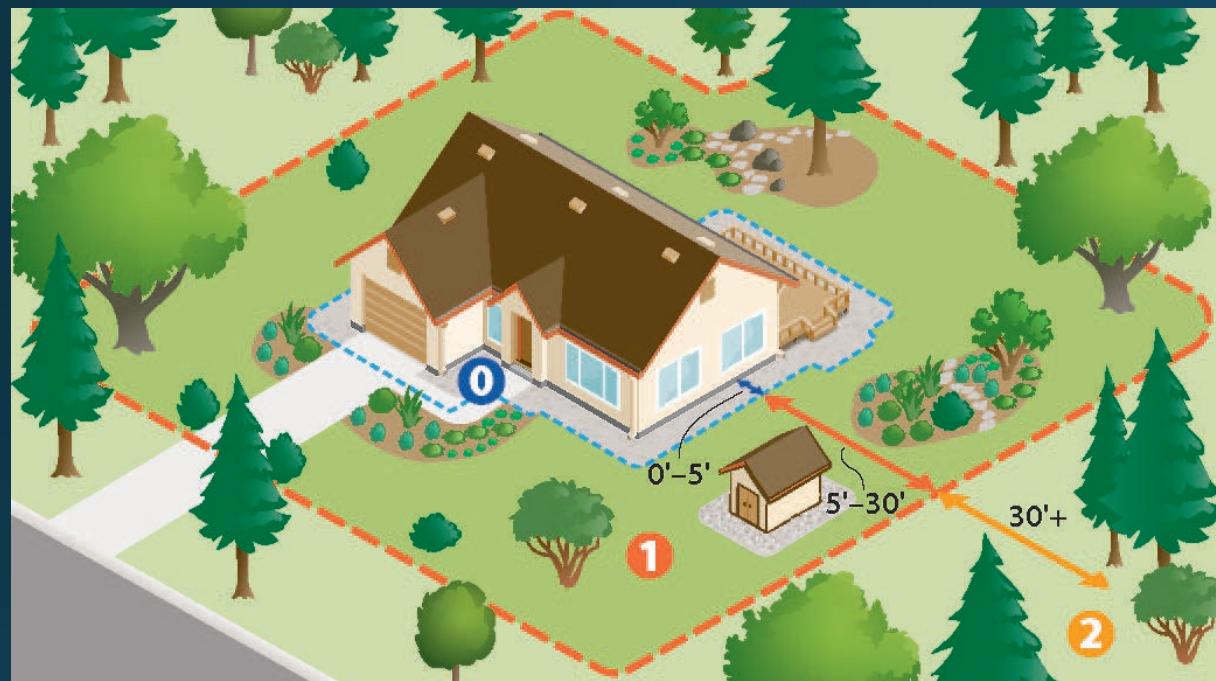
Home hardening with defensible
space can help mitigate ember
exposure

Radiant heat



Home hardening and fuel reduction
can address potential radiant heat
exposure

Purpose- Zone 0



Zone 0 is the 0-5' perimeter of the building and attached decks

Zone 0 reduces the likelihood of **structure ignition** by reducing the potential for **direct ignition of the structure from flame contact**, by **embers that accumulate at the base of a wall**, and/or **indirect ignitions when embers ignite vegetation, vegetative debris or other combustible materials located close to the structure that result in either a radiant heat and/or a direct flame contact exposure to the structure.**

Zone 0 is the **horizontal area within the first five feet around the structure and any outbuildings and attached decks, and stairs**. The zone also includes the **area under attached decks and stair landings**. To be most effective, the zone should incorporate a **6-inch vertical area** between the ground and the start of the building's exterior siding. (*Note: the appropriate vertical height would be dependent on whether combustibles are retained in Zone 0 and coupled with Chapter 7A requirements. The Office of the State Fire Marshal is the regulatory authority for this vertical zone since this zone would be part of the built environment.*)

Zone 0 is a critical component of structure defense and, when coupled with Zones 1 and Zone 2, is essential to defensible space.

Items commonly located in Zone O

- Rock, pavers, statuary, fountains, cement
- Mature tree
- Irrigated and mowed lawn
- Synthetic lawn
- Irrigated, non-woody plants
- Decorative structures
- Gate or fence that attaches to the building
- Parallel fence
- Covered storage facilities
- Landscape materials
- Potted plants
- Garbage, recycling receptacles
- Vehicles
- HVAC, heat pumps
- Outdoor kitchens
- Attached patio covers
- Portable BBQs
- Pet and animal structures

Workgroup recommendations

Not recommended

Covered storage facilities
(0/7)

Potted plants- combustible pot (0/7)

Gate or fence that attaches to the building (0/7)

Landscape materials (1/7)

Synthetic lawn (1/7)

Decorative structures (1/7)

Allowable

Rock, pavers, statuary, fountains, cement (7/7)

Mature tree (7/7)

Parallel fence (7/7)

Irrigated and mowed lawn (5/7)

Irrigated, non-woody plants(5/7)

Potted plants- noncombustible pot (5/7)

Educational Approach

Garbage, recycling receptacles

Vehicles

HVAC, heat pumps

Outdoor kitchens

Attached patio covers

Portable BBQs

Pet and animal structures

Highest standard

No combustibles (vegetation, mulch, wooden structures) and no trees

Allowances (7 of 7)

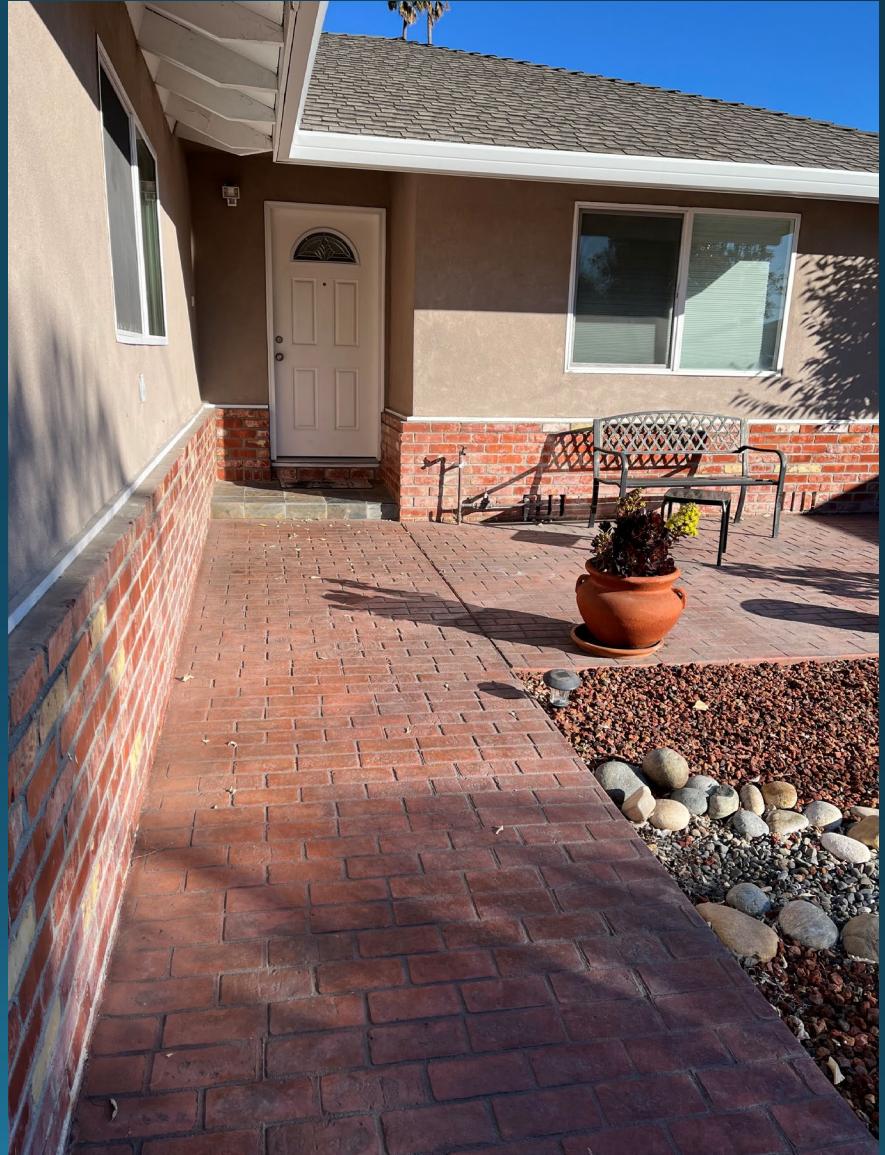
- Rock or other noncombustible mulch product (i.e., gravel, lava, decomposed granite)
- Statuary, fountain
- Attached decks and stairs
- Cement or stone pavers

Benefits

- Reduces the potential damage from ember deposition (and ignition) creating the potential for direct flame contact, and radiant heat exposure to the structure within the first 5 feet.

Considerations

- Reduces need for interpretation from the D-space inspector or Authority Having Jurisdiction (AHJ)
- Easiest to maintain
- Retrofitting (existing buildings) will be more costly than implementing for new construction.
- Easier to implement with new construction
- Implementation more difficult for buildings built on a slope.



Synthetic lawn- No

(1 of 7 supported this allowance)

Considerations

- Petroleum-based product.
- IBHS experiments suggest smoldering ignition. A NIST study suggested significant BTU production and flame heights.
- Combustible materials may accumulate on the surface.
Ignition would result in a flaming exposure.
- Hazard does not change seasonally
- SYNLawn has met ASTM E 108 Class A in a roofing application. How would an inspector know the product rating?
- The vertical noncombustible zone could be helpful for an allowance



Combustible decorative structure- No

Trellis, pergola, shade covering, planters, privacy wall, etc.

If these structures are a part of the deck, they would not be evaluated; however, the vegetation would be evaluated.

(1 of 7 supported this allowance)

Considerations

- Will help with public support
- Depending on the dimensions of the combustible materials and arrangement, these structures may compromise the fire protection benefits.
- These structures weather, vulnerability increases over time.
- Structures on decks are often unpermitted and added later.



Source: Pinterest



Source: Backyard Boss

Blue Ridge CABIN

Attached fence or gate-No

Combustible attachment

(0 of 7 supported this allowance)

Considerations

- A combustible fence can transmit fire to the home via an attached gate.
- The gate can be replaced using noncombustible materials.
- Perpendicular attachment is the concern.



Boulder, Marshall Fire 2021



Coffey Park, Tubbs Fire 2017

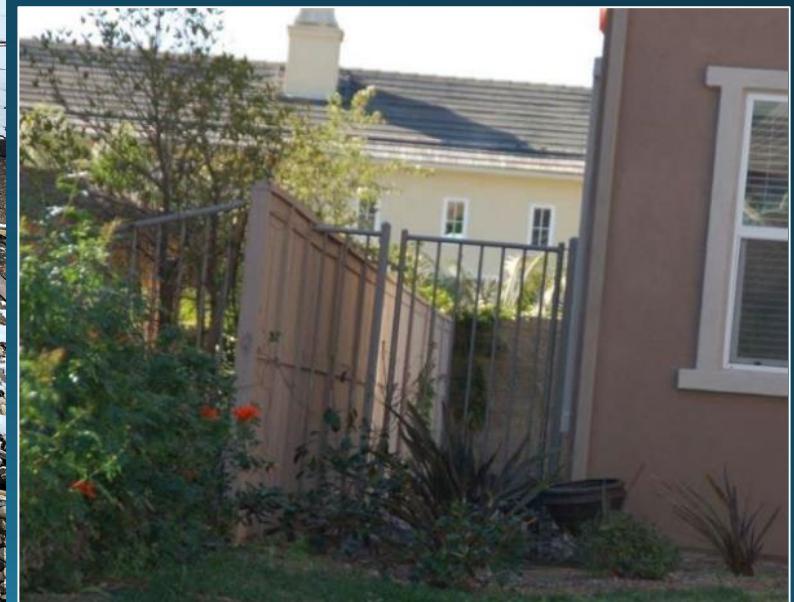


Photo from an experiment at IBHS where combustible mulch ignited a wood fence.

The metal gate and rock mulch in Zone Zero prevented the fire from spreading to the building.

Photo: Institute for Business and Home Safety



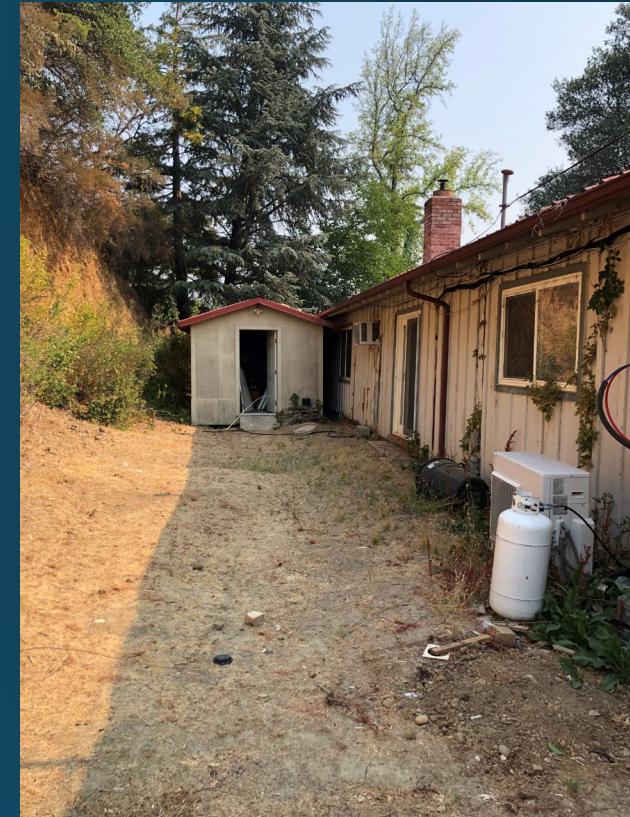
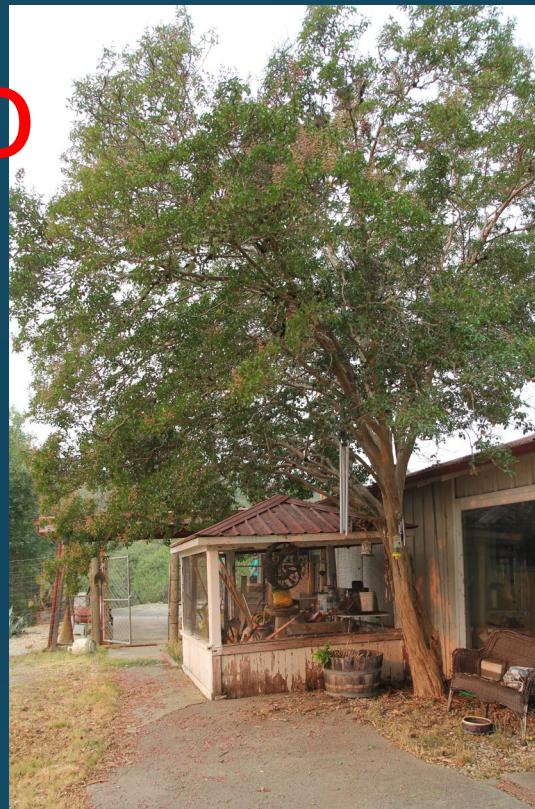
Storage structures-No

Not built to 7A standards

(0 of 7 supported this allowance)

Considerations

- Helps with public support
- Difficult to implement
- If made of ignition-resistant material or ignition-resistant construction, could these be allowable?



Source: Reddit



Source: DunnLumber

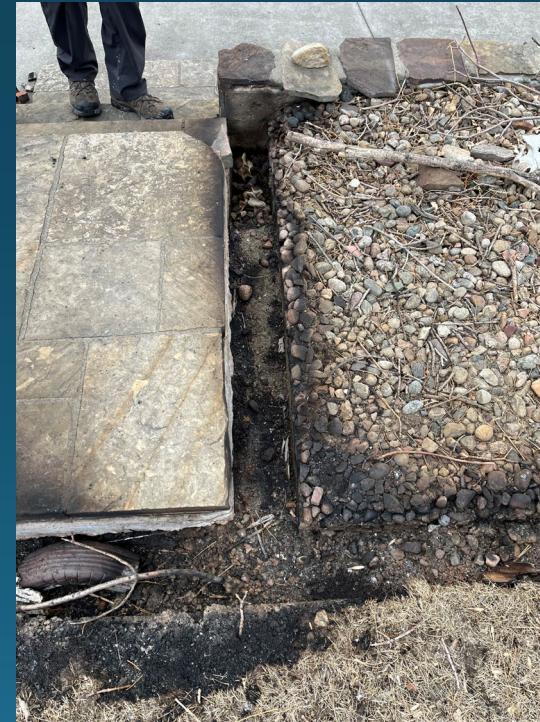
Landscape materials-No

Woody mulch, combustible boards

(0 of 7 supported
this allowance)

Considerations

- Wood mulch is highly flammable
- Wood or petroleum-based boards are the concern; some can be made of metal or cement.
- Used to separate garden beds and their placement can lead to the house or follow fence lines
- The concern is especially when in contact with the house in Zone 0



Source: Southwestern Garden Supplies



Fire burned under the stucco wall

Landscape materials-No

**Lumber or round logs,
railroad ties, creosote-
treated, pressure-treated**

(1 of 7 supported this allowance)

Considerations

- Always combustible
- Used as retaining walls
- Fences are often adjacent
- Logs can be used to make garden bed separation or create height
- Can be buried



Marshall Fire 2021

Potted plants, combustible pot-No

Wine barrel, wood pot, plastic

(0 of 7 supported this allowance)

Considerations

- What plant?
- Maintained?
- Irrigated?
- Near to window?



Workgroup recommendations

Not recommended

Covered storage facilities
(0/7)

Potted plants- combustible pot (0/7)

Gate or fence that attaches to the building (0/7)

Landscape materials (1/7)

Synthetic lawn (1/7)

Decorative structures (1/7)

Allowable

Rock, pavers, statuary, fountains, cement (7/7)

Mature tree (7/7)

Parallel fence (7/7)

Irrigated and mowed lawn (5/7)

Irrigated, non-woody plants(5/7)

Potted plants- noncombustible pot (5/7)

Educational Approach

Garbage, recycling receptacles

Vehicles

HVAC, heat pumps

Outdoor kitchens

Attached patio covers

Portable BBQs

Pet and animal structures

Mature tree- Yes, if

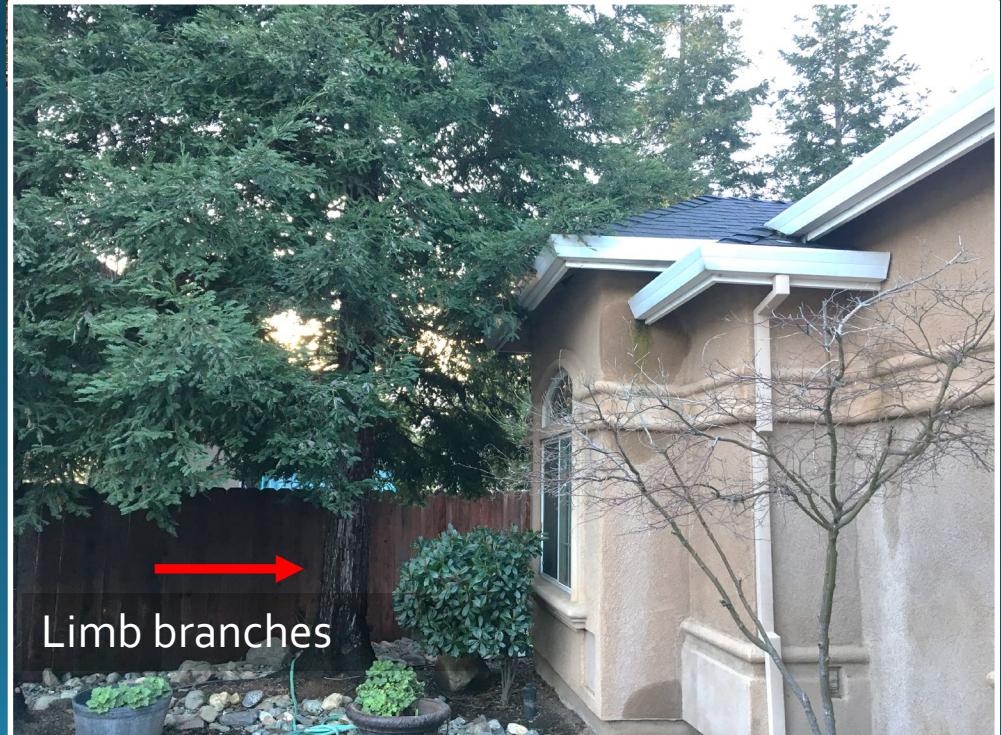
Bole within or touching the Zone 0

Branches 10' above the roof and from the chimney, not under the eaves, and no ladder fuels

(7 of 7 supported this allowance)

Considerations

- May help in gaining public support
- Trees provide **shade** (Green Energy Code consideration)
- Trees provide a regular source of **needles, leaves, branches**, and other items that will accumulate on or near the building.
- **Tree type** likely matters, with a greater tolerance for hardwoods over conifers. The bole of palm trees are very fibrous.
- Will inspectors be able to identify tree types or tree characteristics?
- Could have a recommendation to remove trees in Zone 0.





Irrigated/mowed grass

**Yes, if:
Max height 2-3 inches**

(5 of 7 supported this allowance)

Considerations

- May help in gaining public support.
- Thatch can burn under certain conditions.
- Homeowner practices vary, and this requires sufficient water to maintain grass during dry conditions (including drought).
- Grass is a one-hour fuel
- Without water, plant conditions change quickly.
- The vertical noncombustible zone could be helpful for the allowance of a mowed and dry lawn.



Irrigated, non-woody, herbaceous plantings, separated- Yes, if:

All ground cover (< 3" in height) and plants (< 16" in height) shall be minimally set back from structures, decks, and other plants 1.5 times the height of the plant or 12-inches, whichever is greater. Ground covers and plants shall have high water content. No combustible mulch.

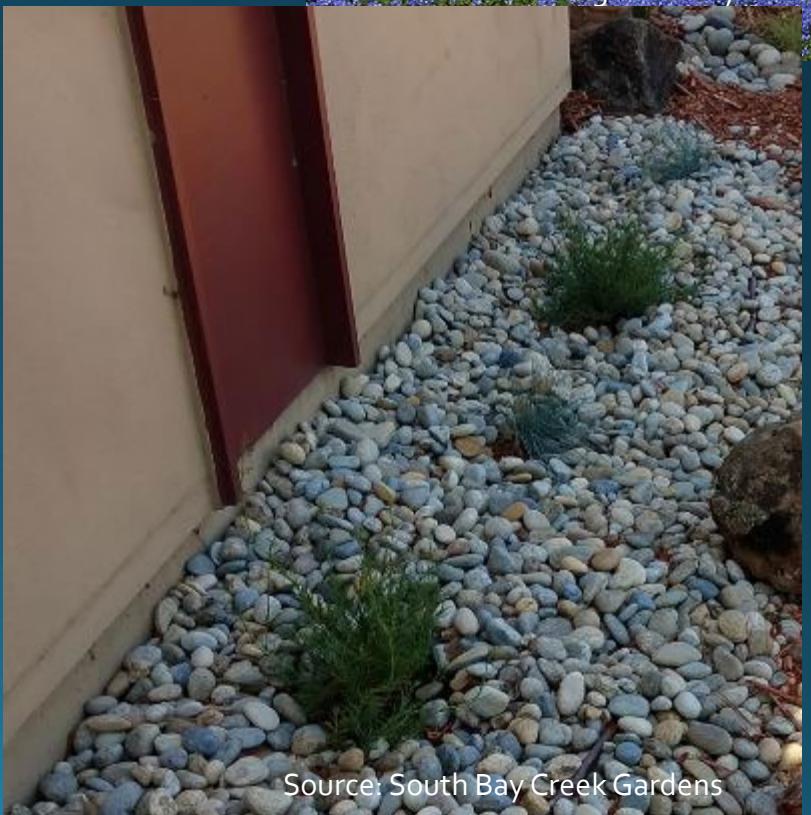
(5 of 7 supported this allowance)

Considerations

- Will help with public support
- The more vegetation allowed in Zone 0, the more likely the fire protection benefits will be compromised.
- Plants shed leaves and will require ongoing maintenance.
- Noncombustible mulch could be between plantings.
- This green vegetation can catch leaves, needles, and other debris, allowing for unanticipated accumulations of combustibles.
- Note that the vertical zone may need to increase in height if these combustibles are allowable.
- Succulents could be difficult to evaluate as many thatch and can be woody (e.g., ice plant is woody)



Source: High Country Gardens



Source: South Bay Creek Gardens

Potted plants, noncombustible pot

Yes, if:

- ✓ Ceramic, metal, cement
- ✓ Two ft max vegetation height

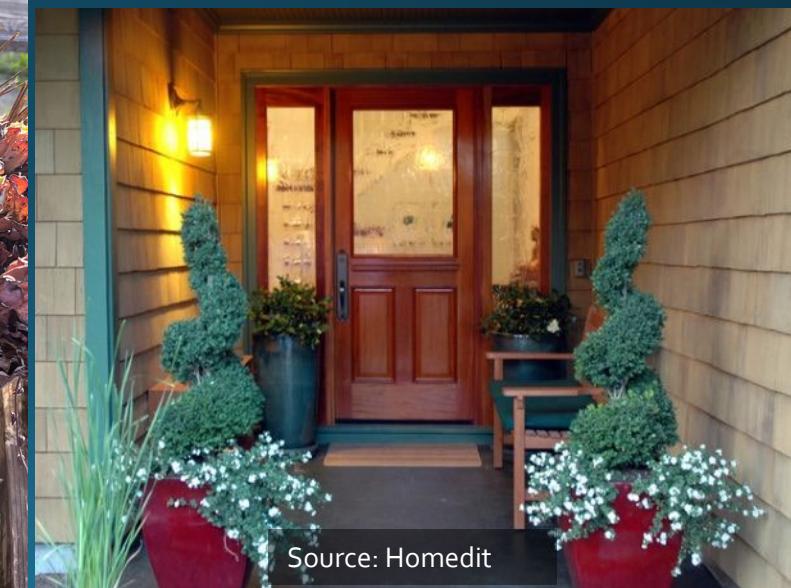
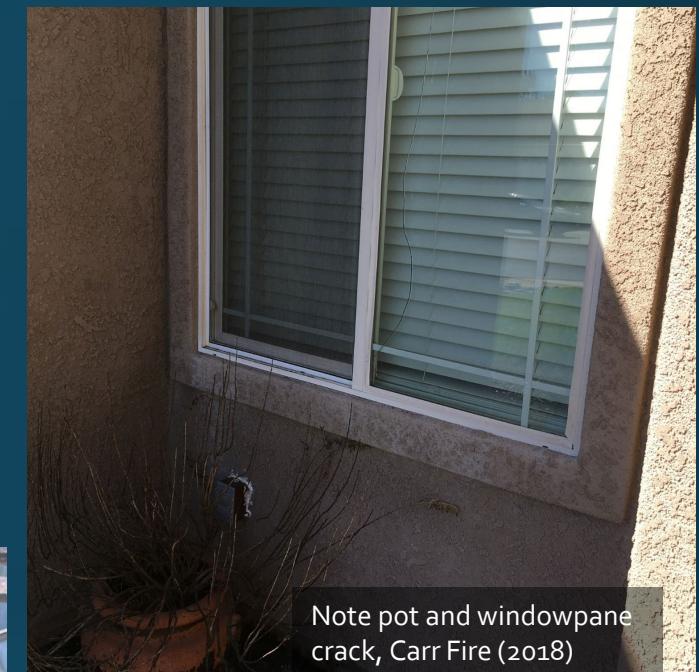
(5 of 7 supported this allowance)

Considerations

- What plant?
- Maintained? Irrigated?
- How many pots?
- Near to window?
- Near to combustible siding?



Source: American Meadow



Source: Homedit

Parallel fence- Yes

(7 of 7 supported this allowance).

Committee reluctantly accepts for existing construction.

Considerations

- Helps with public support
- More difficult to implement for existing construction
- Combustible fences directly ignite from embers on a privacy fence, less lightly on a good-neighbor fence.
- Embers ignite adjacent vegetation that can ignite the fence.
- Use of a steel fence along the property line, parallel to neighboring homes, would provide protection should one home ignite (Australia Bushfire CRC study)
- Could home hardening actions be used to mitigate the presence of the fence? Boxed in eaves? Tempered glass windows? Clad the fence in metal roofing?
Recommended or required mitigations?



Source: Dreamtime.com

Use an educational strategy for:

- ✓ Garbage, recycling receptacles
- ✓ Vehicles
- ✓ HVAC, heat pumps
- ✓ Outdoor kitchens
- ✓ Attached patio covers
- ✓ Portable BBQs
- ✓ Pet and animal structures



Workgroup recommendations

Not recommended

Covered storage facilities (0/7)
Potted plants- combustible pot (0/7)
Gate or fence that attaches to the building (0/7)
Landscape materials (1/7)
Synthetic lawn (1/7)
Decorative structures (1/7)

Allowable

Rock, pavers, statuary, fountains, cement (7/7)
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Parallel fence (7/7)
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Irrigated, non-woody plants(5/7)
Potted plants- noncombustible pot (5/7)

Educational Approach

Garbage, recycling receptacles
Vehicles
HVAC, heat pumps
Outdoor kitchens
Attached patio covers
Portable BBQs
Pet and animal structures

Purpose- Zone 1



Zone 1 is the 5-30' perimeter of the building and attached decks

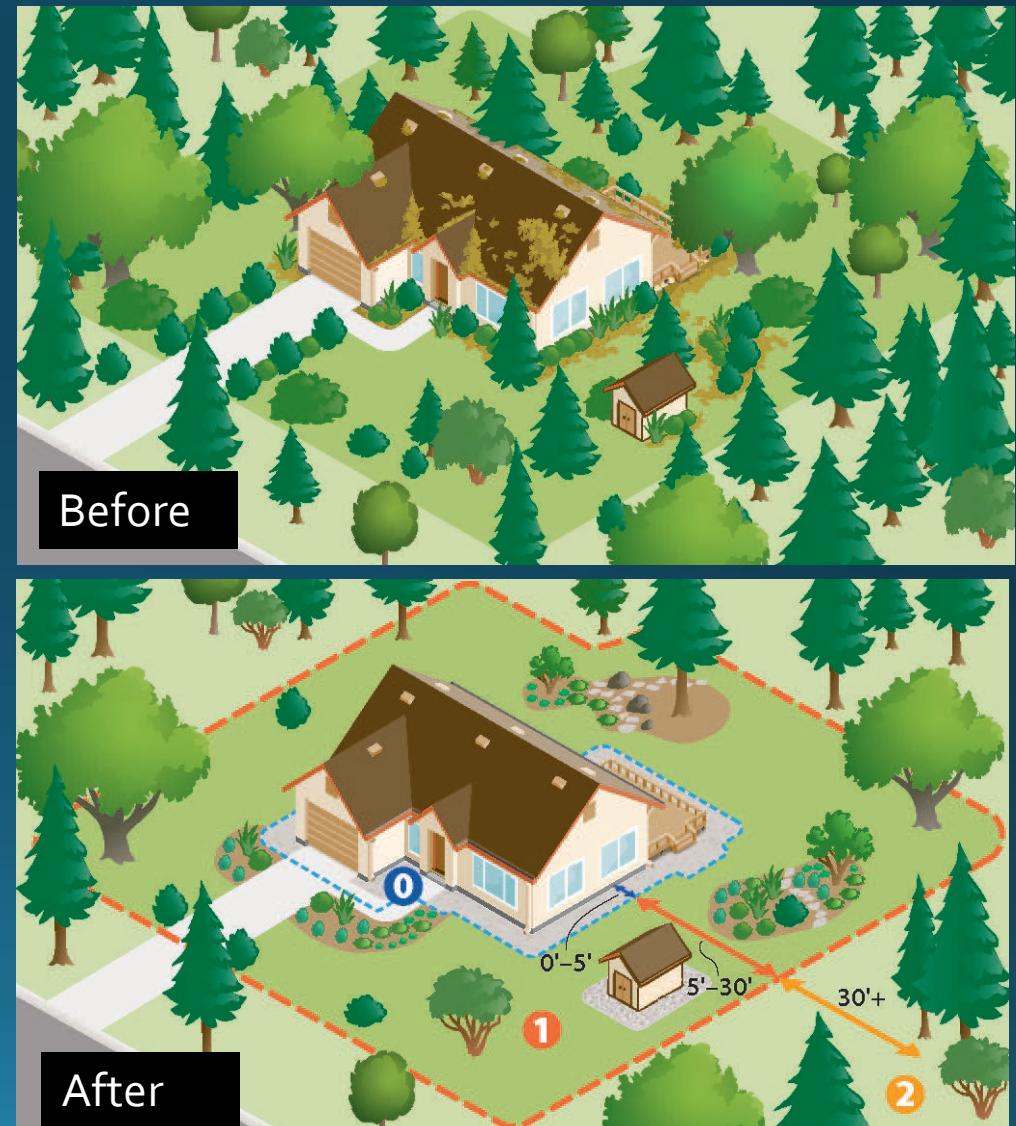
Zone 1 reduces the likelihood of fire burning directly to the structure.

This is accomplished by modifying fuels and creating a discontinuity between planting groups that limits the pathways for fire to burn to the structure and reduces the potential for near-to-building ember generation and radiant heat exposures.

An additional purpose of this zone is to provide a **defendable zone** for fire personnel to stage and take direct action

Zone 1- 5-30' Current Standard

- Remove all dead plants, grass and weeds
- Remove dead or dry leaves and pine needles from your yard, roof and rain gutters
- Remove branches that hang over your roof and keep dead branches 10 feet away from your chimney.
- Remove or prune flammable plants and shrubs near windows
- Trim trees regularly to keep branches a minimum of 10 feet from other trees.
- Relocate wood piles to Zone 2.
- Remove vegetation and items that could catch fire from around and under decks, balconies and stairs
- 10 feet of bare mineral soil around outbuildings plus 10 additional feet of no vegetation



Zone 1- 5-30' Recommendations

- Remove all dead plants, grass and weeds
- Remove dead or dry leaves and pine needles from your yard, ~~reef and rain gutters~~
- Remove branches that hang over your roof and keep dead branches 10 feet away from your chimney. *Remove branches 10 feet from roof or chimney.*
- ~~Remove or prune flammable plants and shrubs near windows~~
- Trim trees regularly to keep branches a minimum of 10 feet from other trees.
- Relocate wood piles to Zone 2.
- ~~Remove vegetation and items that could catch fire from around and under decks, balconies and stairs~~
- 10 feet of bare mineral soil around outbuildings plus 10 additional feet of no vegetation—*Use Zone 0 standards*



Orange: Move to Zone 0
Yellow: Improved language

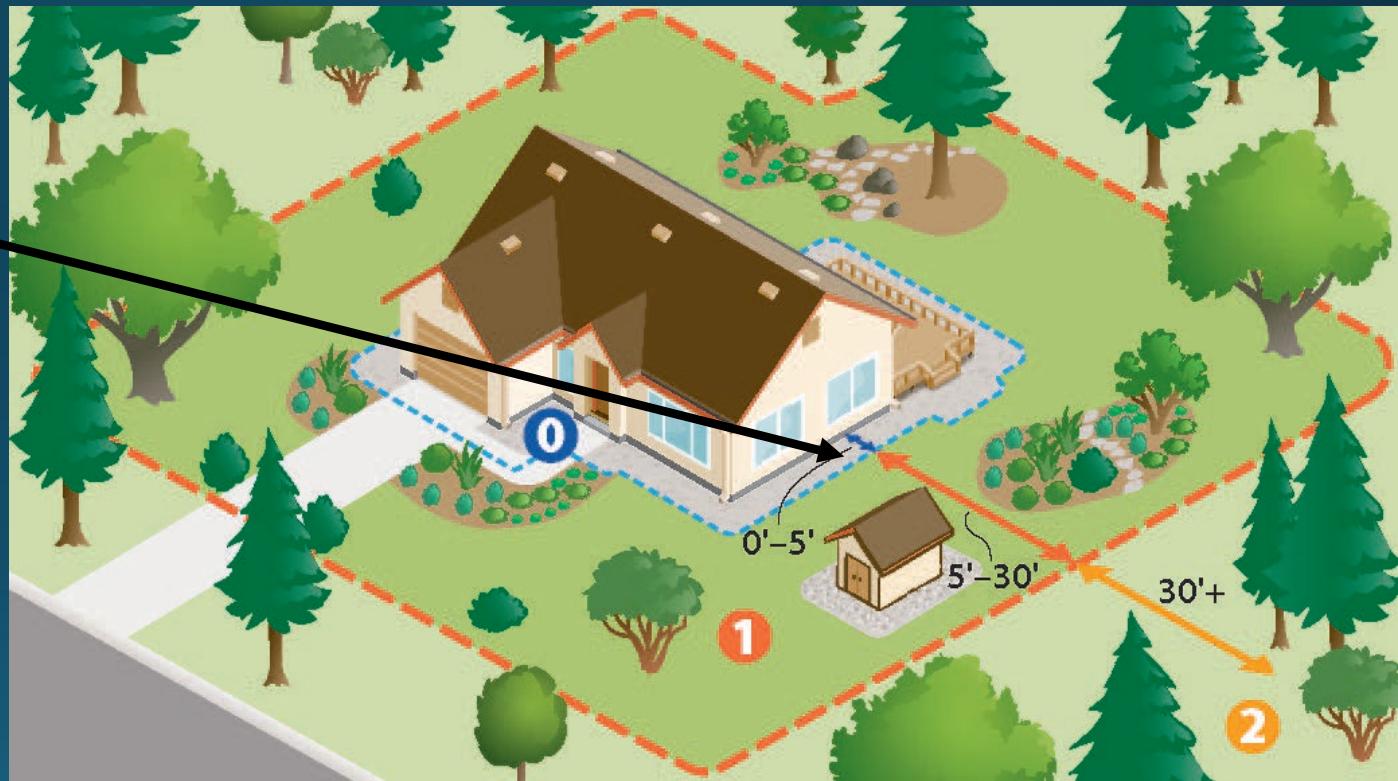
Zone 1- 5-30' Recommendations

Additional Considerations

- Wood mulch
- Transition from Zone 0- Zone 1
- Islanding or vegetation grouping
- Live lawn or annual grass height

Recommended approach

- **Wood mulch**- is allowable in Zone 1 if there is a transition from Zone 0- Zone 1 and vegetation is grouped
- Create discontinuity/separation between islands of vegetation, in adjacency to Zone 0, and in relation to wooden structures is needed.
- Use the **plant height separation** guidance developed for slopes as the standard.
- Minimize abrupt transitions between Zone 0 to 1, by limiting vegetation height to a max of two feet for an additional 5 feet
- Cut and maintain live grasses to 4" when not in a decorative island



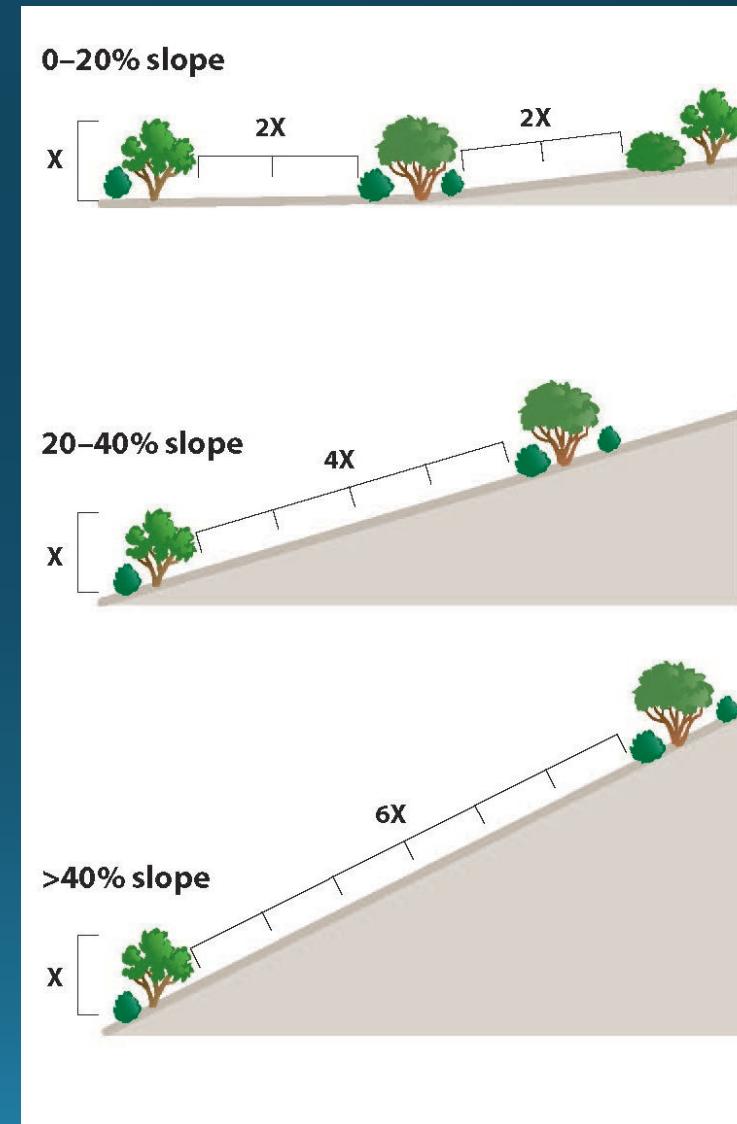
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Recommended approach

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- Create discontinuity/separation between islands of vegetation, in adjacency to Zone 0, and in relation to wooden structures is needed.
- Use the **plant height separation** guidance developed for slopes as the standard for separation of islands of vegetation.
- Minimize abrupt transitions between Zone 0 to 1, by limiting vegetation height to a max of two feet for an additional 5 feet
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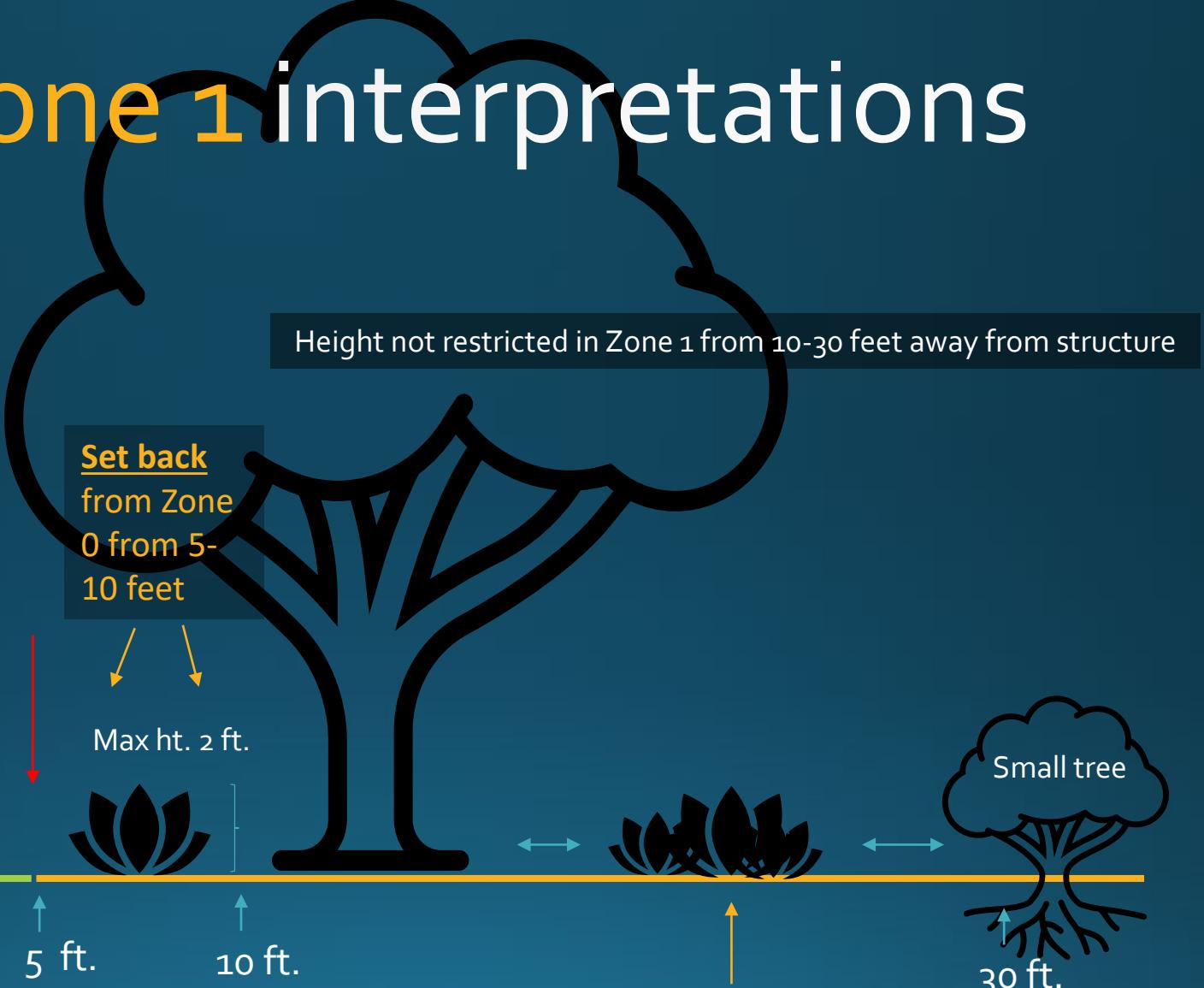


Zone 0 and Zone 1 interpretations



12"

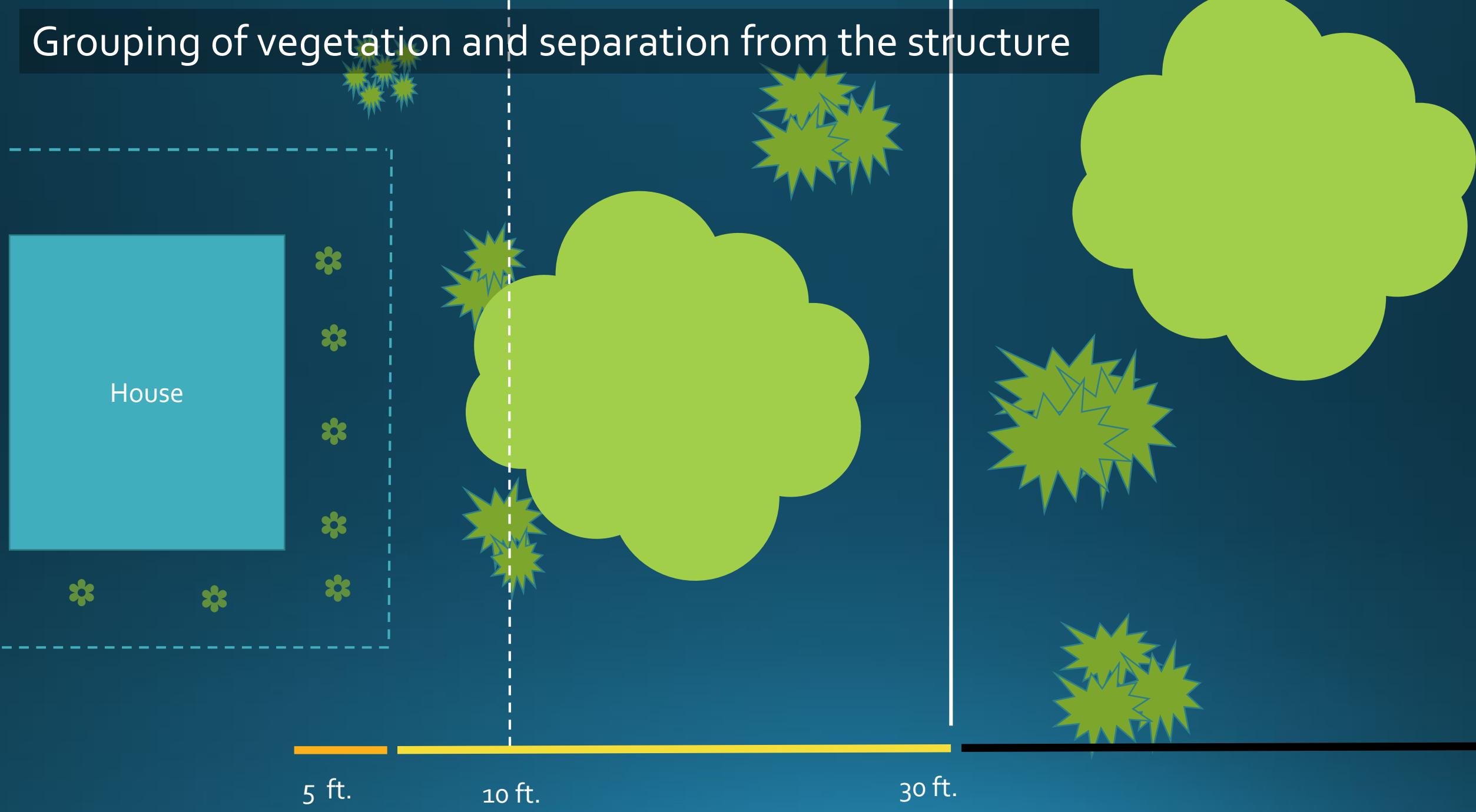
Zone 0 plants: All ground cover (< 3" in height) and plants (< 16" in height) shall be minimally set back from structures, decks, and other plants 1.5 times the height of the plant or 12-inches, whichever is greater.



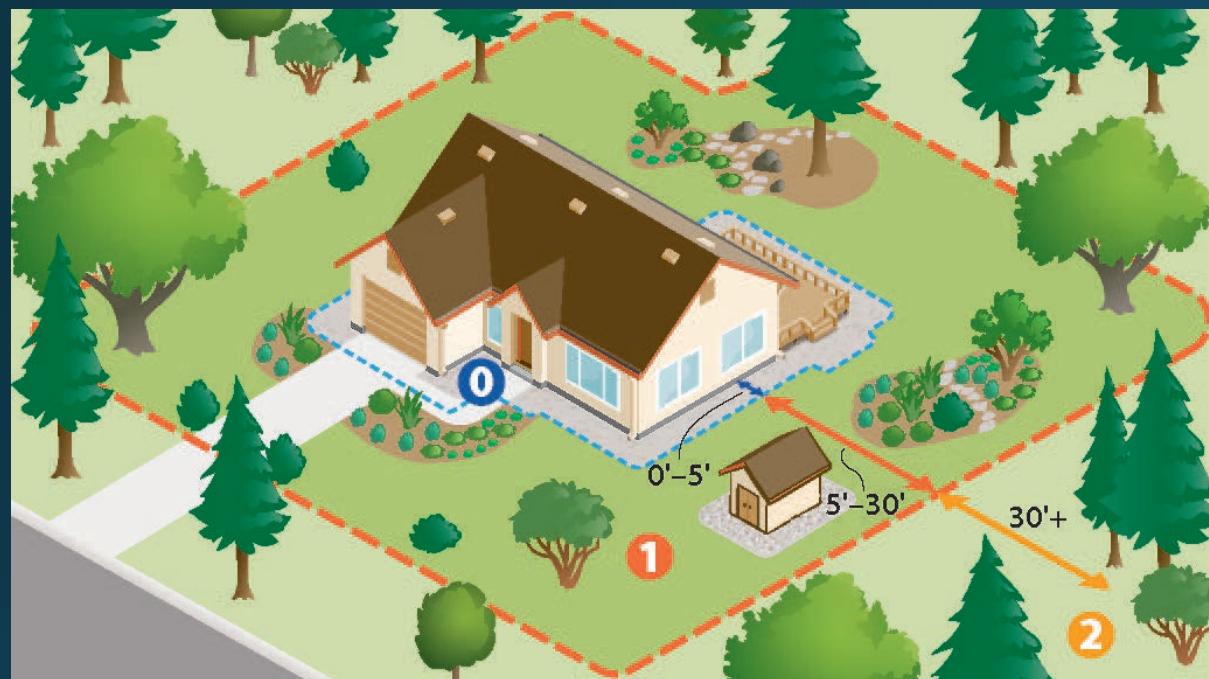
Wood mulch is allowed between islands of vegetation

Group vegetation. Use the slope separation guidance with plant height as the standard. Tree is not an island. Islands are similar height vegetation (at their maturity) are allowed up to a 75 ft sq

Grouping of vegetation and separation from the structure



Purpose- Zone 2



Zone 2 is the 30-100' perimeter of the building and attached decks, or to the edge of the property line

Zone 2 actions are designed to reduce the potential behavior of an oncoming fire in such a way as to drop an approaching fire from the crown to the ground.

Fuel modification includes removing dead vegetation and reducing living vegetation to **eliminate fuel ladders and create vegetation separation** between individual or islands of trees or shrubs.

These vegetation modification requirements are more significant for those properties with **steeper terrain, larger and denser fuels, highly volatile fuels, and areas subject to frequent fires**.

Additional **benefits** of the Zone 2 include facilitating direct defense actions, improving the function of Zones 0 and 1 by reducing the flame heights, and the potential for ember generation and radiant heat exposure to structures.

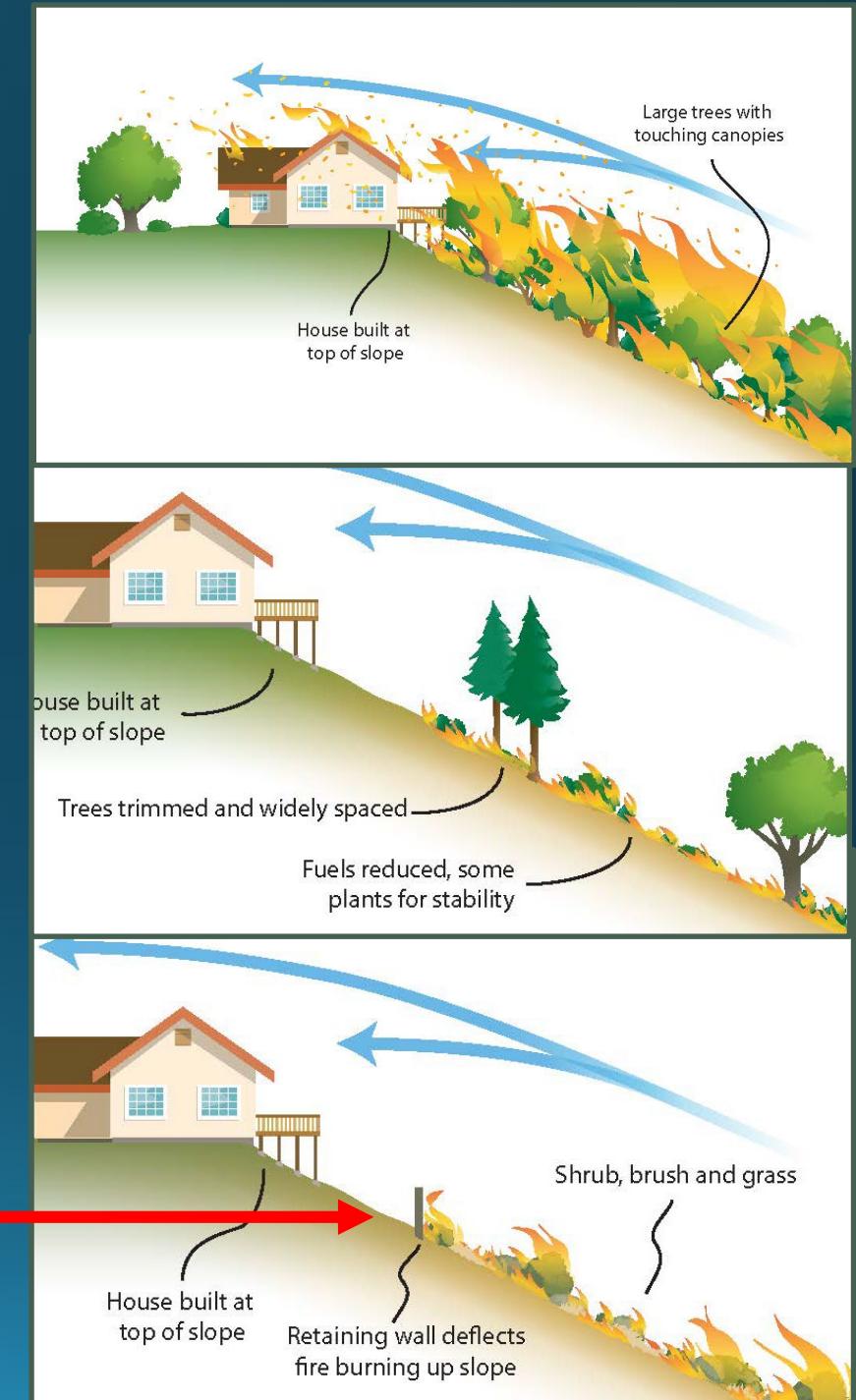
Zone 2- 30-100'

Current Standard

- Cut or mow annual grass down to a maximum height of 4 inches.
- Create horizontal space between shrubs and trees.
- Create vertical space between grass, shrubs, and trees.
- Remove fallen leaves, needles, twigs, bark, cones, and small branches. However, they may be permitted to a depth of 3 inches.
- All exposed wood piles must have a minimum of 10 feet of clearance, down to bare mineral soil, in all directions.

Recommendations:

In cases of construction on a **slope**, in a shrub or grass vegetation type, recommend the use of **noncombustible retaining wall** down-slope of building



Transition Examples



Images courtesy of the Insurance Institute for Business and Home Safety.



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