

North Coastal California Fire-Smart Landscaping

Most of us create landscapes around our homes that are aesthetically pleasing or to attract desirable fauna such as birds and butterflies. If you live in or near a forest or rangeland, there are other factors worth considering such as plant flammability, and whether they can stand up to wildlife such as deer. The following are some general characteristics to consider when designing and/or maintaining your fire-safe landscape.

Design Tips/Considerations

- When designing a fire-smart garden, consider: the local area's fire history, site location, overall terrain, prevailing winds, seasonal weather, property contours, and boundaries.
- The area closest to your home should be a well-irrigated area encircling the home for at least 30' on all sides, providing space for fire suppression equipment in the event of an emergency. Plantings here should be limited to carefully spaced low flammability species.
- 30' away from your home use low flammability plants that are low-growing, and irrigate this area as well.
- Moving still further away from your home continue to use low flammability plants that are low-growing as well as well-spaced trees. Keep the volume of fuel low.
- The area furthest away from your home should be a natural area. Selectively prune and thin all plants here and remove highly flammable vegetation.
- Consider positioning of a plant in terms of what's around it, isolate and surround a poor fire-risk plant with more resistant species to create a specimen/focal point.
- Consider a plant's water retention ability and its irrigation needs. Use plants that retain water and don't need much irrigation such as fleshy-leafed plants.
- Plants that are not properly irrigated or pruned or that are planted in an inappropriate climate zone will have increased fire risk.
- Group plants of similar height and water requirements to create a "landscape mosaic" that can slow the spread of fire and use water most efficiently.
- Consider a plant's characteristics in terms of fire, such as fuel, texture of leaves for ignition, aromatic oils: Fuel volume should be low, so stick to plant's that are low growing, have limited spread and little dead material. Leaves with high water content or fleshy leaves don't ignite as readily. Plants containing resins and volatile oils can increase fire intensity.
- Consider a plant's size, you don't want to plant things that have a large mass or volume.
- Plant a wide swath of native groundcover adjacent to the lawn or garden leading to fire-resistant shrubs nearer the forest in order to create a buffer between your home and the forest.
- Keep trees furthest from your house.
- Fire barriers of fire-resistant plants should be planted so that they cross the likely paths of possible fires i.e., downhill slopes from buildings.
- Planting fire-resistant plants in groups, rows, and wind breaks around buildings can: decrease wind speed and turbulence, catch sparks and embers, decrease fire intensity, and absorb radiant heat energy that cause other plants and structures to burn.
- Avoid planting flammable plants in large quantities or near your home.
- Shrubs in the defensible space should be planted in (or thinned into) clumps, or islands, with open space between them (open space or cleared areas include: walkways, driveways, patios, lawns, paved areas, vegetable patches, orchards, etc.).
- Within the defensible space area, vertical separation between fuel layers should be at least three times the height of the lower fuel layer. For example, a 4' shrub growing next to an incense cedar should be separated by 12 vertical feet (4' x 3').
- Space trees at least 10 feet apart, and keep branches trimmed at least 10 feet from your roof. For trees taller than 18 feet, prune lower branches within 10-15 feet of the ground.
- The following chart represents the minimum spacing recommended between tree crowns as well as brush and shrub clumps based on slope. Thin trees and large shrubs so there is at least 10 feet between crowns. Crown separation is measured from the furthest branch of one tree to the nearest branch on the next tree. On nearly level ground, minimum spacing recommendations between clumps of brush and/or shrubs is 2 1/2 times the height of the vegetation. Maximum diameter of clumps should be 2 times the height of the vegetation. As with tree crown spacing, all measurements are made from the edges of vegetation crowns.

% Slope	Tree Crown Spacing	Brush and Shrub Clump Spacing
0 – 10%	10'	2 ½ x shrub height
11 – 20%	15'	3 x shrub height
21 – 40%	20'	4 x shrub height
>40%	30'	6 x shrub height

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Creating Wildfire-Defensible Zones no. 6.302

- Shrubs and trees with high levels of resins or volatile oils should not be planted on slopes down from and near buildings in fire prone areas.
- Use native vegetation that has evolved to thrive in local conditions.

Maintenance Tips

- Anything over three feet needs to be pruned up from the ground and have the branch structure thinned in order to reduce the risk of fire spread. Prune all trees so the lowest limbs are 10-15 feet above the ground. This will reduce the “fuel ladder” which allows fire to climb from the ground into the shrubs and trees.
- Remove leaf clutter and dead and overhanging branches.
- Mow the lawn regularly.
- Always remove dead branches/material on the ground or on plants near your home.
- Remove or chip cuttings and debris promptly, according to local regulations.
- Thin weak, dead or overcrowded trees.
- Trim branches that extend over the eaves of the home or within 15 feet of the chimney.
- Clean pine needles and debris from roofs and gutters.
- Relocate woodpiles and other flammable objects at least 30 feet from buildings.
- Maintain an irrigated greenbelt immediately around your home.
- Reduce the density of the forest surrounding the defensible space.
- Clear vegetation around fire hydrants, cisterns, and propane tanks.
- Clear all dry grass, brush and dead leaves at least 30 feet from your home, and at least 150 feet if you're on a hill.

While no plant is immune from fire, certain plants do exhibit traits that can slow or reduce the spread of fire. Fire resistant plants do not readily ignite from a flame or other ignition source. They generally look green (not brown), healthy, and vibrant. In addition, fire resistant plants have:

- leaves that are moist and supple,
- little dead wood and tend not to accumulate dry, dead material within the plant
- sap that is water-like and does not have a strong odor.

Most deciduous trees and shrubs are fire resistant.

The following chart is a list of fire-smart plants that will grow on the North Coast of California, and some of their characteristics.

Common Name	Botanical Name	Plant Type	CA Native	Deer Proof	Fire Resistant
Plants Less Than 10” Tall:					
Aloe	<i>Aloe spp.</i>	Succulent		Some	√
Beach strawberry, Sand strawberry	<i>Fragaria chiloensis</i>	Perennial	√	√	√
Big blue lily turf	<i>Liriope muscari</i>	Perennial			
Blue-eyed grass	<i>Sisyrinchium bellum</i>	Perennial	√	√	√
Blue fescue	<i>Festuca glauca</i>	Perennial		√	
California poppy	<i>Eschscholzia californica</i>	Annual	√	√	√
Cape weed	<i>Arctotheca calendula</i>	Perennial			√
Carpet bugle	<i>Ajuga reptans</i>	Perennial		√	√
Common thrift	<i>Armeria maritima</i>	Perennial	√		√
Creeping boobialla	<i>Myoporum parvi-folium</i>	Evergreen		√	√
Creeping red fescue	<i>Festuca rubra</i>	Perennial	√		√
Creeping thyme, Mother-of-Thyme	<i>Thymus serpyllum, T. praecox arcticus</i>	Perennial		√	√
Dwarf periwinkle	<i>Vinca minor</i>	Perennial		√	√

Common Name	Botanical Name	Plant Type	CA Native	Deer Proof	Fire Resistant
Emerald carpet, Crinkle-leaf creeper	<i>Rubus calycinoides</i>	Evergreen		√	√
Emerald carpet manzanita, Kinnikinnick	<i>Arctostaphylos uva-ursi x nummularia</i>	Evergreen	√	√	√
Green santolina	<i>Santolina virens</i>	Evergreen		√	
Gum plant, Coastal wild gum	<i>Grindelia stricta</i>	Perennial	√	√	√
Hens and chicks	<i>Echevaria spp</i>	Succulent			√
Iceplant	Yellow (<i>Delosperma nubigenum</i>) or Purple/pink (<i>D. cooperi</i>)	Succulent		√	√
Indian mock strawberry	<i>Duchesnea indica</i>	Perennial			√
Island alum root, Coral bells	<i>Heuchera maxima</i>	Perennial	√		√
Japanese spurge	<i>Pachysandra terminalis</i>	Evergreen			√
Lithodora	<i>Lithodora diffusa</i>	Perennial		√	√
Moss pink	<i>Phlox subulata</i>	Perennial		√	√
Roman chamomile	<i>Anthemis nobilis</i>	Perennial		√	
Silver thyme	<i>Thymus vulgaris</i> var. 'Argenteus'	Perennial		√	√
Snow-in-summer	<i>Cerastium tomentosum</i>	Perennial		√	√
Stonecrop	<i>Sedum spp</i>	Succulent	√		√
Sweet woodruff	<i>Galium odoratum</i>	Perennial			
Trailing ice plant	<i>Lampranthus spectabilis</i>	Succulent			√
Wild buckwheat	<i>Eriogonum spp</i>	Perennial	√	√	√
Wild ginger	<i>Asarum caudatum</i>	Perennial	√	√	√
Yellow-eyed grass	<i>Sisyrinchium californicum</i>	Perennial	√	√	√

Plants 12-24" tall:

Australian fuchsia	<i>Correa spp</i>	Evergreen		√	
Basket-of-Gold	<i>Aurinia saxatilis</i>	Perennial		√	√
Beard tongue	<i>Penstemon spp</i>	Perennial	Some		√
Black-eyed Susan	<i>Rudbeckia fulgida</i>	Perennial			
Brewer saltbush	<i>Atriplex lentiformis breweri</i>	Evergreen	√		√
Bush anemone	<i>Carpenteria californica</i>	Evergreen	√	√	
California fuchsia, Hummingbird flower	<i>Zauschneria californica</i>	Perennial	√	√	√
Cape honeysuckle	<i>Tecomaria capensis</i>	Evergreen			

Common Name	Botanical Name	Plant Type	CA Native	Deer Proof	Fire Resistant
Chilean guava	<i>Ugni molinae</i>	Evergreen		√	√
Chives	<i>Allium schoenoprasum</i>	Perennial		√	√
Cleveland sage	<i>Salvia clevelandii</i>	Perennial	√	√	√
Coastal wild gum	<i>Grindelia stricta venulosa</i>	Perennial	√	√	√
Common snowberry	<i>Symphoricarpos albus</i>	Deciduous	√	√	√
Common thyme	<i>Thymus vulgaris</i>	Perennial		√	√
Common yarrow, Milfoil	<i>Achillea millefolium white</i>	Perennial	√	√	√
Coreopsis	<i>Coreopsis spp</i>	Perennial	Some	√	√
Cranesbill	<i>Geranium spp</i>	Perennial	Some	√	√
Creeping mahonia (may pop when hot)	<i>Mahonia repens</i>	Evergreen	√	√	√
Currant, Gooseberry	<i>Ribes spp</i>	Deciduous	Some	√	√
Daylily	<i>Hemerocallis hybrids</i>	Perennial			√
Dwarf lily-of-the-Nile	<i>Agapanthus var 'Peter Pan'</i>	Perennial			
Evergreen currant, Catalina perfume	<i>Ribes viburnifolium</i>	Evergreen	√		√
Fireweed	<i>Epilobium angustifolium</i>	Perennial	√		√
Fortnight lily	<i>Dietes spp</i>	Perennial			
French lavender, Toothed lavender	<i>Lavandula dentata</i>	Evergreen		√	√
Germander	<i>Teucrium chamaedrys, T. cossonii majoricum</i>	Perennial		√	
Germander sage	<i>Salvia chameadryoides</i>	Perennial	√		√
Golden yarrow	<i>Eriophyllum confertiflorum</i>	Perennial	√		√
Heartleaf bergenia	<i>Bergenia cordifolia</i>	Perennial		√	√
Island bush snapdragon	<i>Galvezia speciosa</i>	Evergreen	√		√
Iris	<i>Iris spp</i>	Perennial	√	√	√
Lamb's ears	<i>Stachys byzantina</i>	Perennial		√	√
Lantana, shrub verbena	<i>Lantana camara</i>	Evergreen		√	
Lavender cotton	<i>Santolina chamaecyparissus</i>	Evergreen	√	√	√
Lemonade berry	<i>Rhus integrifolia</i>	Evergreen	√	√	√
Lilac	<i>Syringa spp</i>	Deciduous			√
Lily-of-the-Nile	<i>Agapanthus africanus</i>	Evergreen		√	
Lupine	<i>Lupinus spp</i>	Ann/Per/ Evergreen	Some	√	√
Maritime Ceanothus	<i>Ceanothus maritimus</i>	Evergreen	√		

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Mock orange	<i>Philadelphus spp</i>	Dec/Ever	Some		√
Monkey flower	<i>Mimulus longiflorus</i> (<i>Diplacus longifolius</i>)	Perennial	√	√	√
Orchid rockrose	<i>Cistus purpureus</i>	Evergreen		√	
Oregon boxwood	<i>Pachystima myrsinites</i>	Evergreen			√
Ozark Sundrops	<i>Oenothera missouriensis</i>	Perennial			√
Pacific coast iris, Douglas iris	<i>Iris douglasiana</i>	Perennial	√	√	√
Perennial blue flax	<i>Linum perenne</i>	Perennial			√
Plantain lily	<i>Hosta spp</i>	Perennial			√
Privet	<i>Ligustrum texanum</i>	Evergreen		√	√
Purple coneflower	<i>Echinacea purpurea</i>	Perennial			√
Red-hot poker, torch-lily	<i>Kniphofia uvaria</i>	Perennial		√	√
Rose	<i>Rosa floribundas</i>	Dec/Ever			
Rosemary	<i>Rosmarinus officinalis</i> ' <i>Tuscan blue</i> '	Evergreen		√	
Sandhill sage	<i>Artemisia pycnocephala</i>	Evergreen	√		√
Santa Barbara daisy, Mexican daisy	<i>Erigeron karvinskianus</i>	Perennial		√	
Scented penstemon	<i>Penstemon palmeri</i>	Perennial		√	√
Sea lavender, seafoam statice	<i>Limonium perezii</i>	Perennial		√	
Sedge	<i>Carex spp</i>	Perennial	Some		√
Shasta daisy	<i>Chrysanthemum</i> <i>maximum</i>	Perennial		√	
Sonoma sage, Creeping sage	<i>Salvia sonomensis</i>	Perennial	√		√
Squaw carpet, Mahala mats	<i>Ceanothus prostratus</i>	Evergreen	√		√
Sumac	<i>Rhus spp</i>	Deciduous	Some	√	√
Sunrose	<i>Helianthemum</i> <i>nummularium</i>	Evergreen		√	√
Sword fern	<i>Polystichum munitum</i>	Evergreen	√	√	
Wood's rose	<i>Rosa woodsii</i>	Deciduous	√		√
Woolly blue curls	<i>Trichostema lanatum</i>	Evergreen	√		√
Yarrow	<i>Achillea spp</i>	Perennial	Some	√	√
Yucca	<i>Yucca spp</i>	Evergreen	Some	√	√
Plants over 3' tall:					
American sweet gum	<i>Liquidambar styraciflua</i>	Deciduous			√
Ash	<i>Fraxinus spp</i>	Deciduous	Some		√

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Aspen, Cottonwood, Poplar	<i>Populus spp.</i>	Deciduous	√		√
Beech	<i>Fagus spp</i>	Deciduous			√
Bigleaf maple	<i>Acer macrophyllum</i>	Deciduous	√		√
Birch	<i>Betula spp</i>	Deciduous	Some		√
Black locust	<i>Robinia pseudoacacia</i>	Deciduous			√
Blue blossom	<i>Ceanothus thrysiflorus</i>	Evergreen	√	√	√
Butterfly bush, Summer lilac	<i>Buddleja davidii</i>	Deciduous			√
California buckeye	<i>Aesculus californica</i>	Deciduous	√	√	√
California lilac	<i>Ceanothus 'concha'</i>	Evergreen	√	√	√
California sycamore	<i>Platanus racemosa</i>	Deciduous	√		√
Carol Mackie daphne	<i>Daphne x burkwoodii var 'Carol Mackie'</i>	Evergreen		√	√
Chokecherry	<i>Prunus virginiana</i>	Deciduous	√		√
Coast live oak	<i>Quercus agrifolia</i>	Evergreen	√		√
Coffeeberry	<i>Rhamnus californica</i>	Evergreen	√	√	√
Common flannel bush	<i>Fremontodendron californicum</i>	Evergreen	√	√	√
Common hackberry	<i>Celtis occidentalis</i>	Deciduous			√
Common horsechestnut	<i>Aesculus hippocastanum</i>	Deciduous			√
Eastern redbud	<i>Cercis canadensis</i>	Deciduous			√
European mountain ash	<i>Sorbus aucuparia</i>	Deciduous			√
Flowering crabapple	<i>Malus spp</i>	Deciduous	Some		√
Flowering dogwood, Eastern dogwood	<i>Cornus florida</i>	Deciduous			√
Fremontia, Flannel bush	<i>Fremotodendron spp</i>	Evergreen	√	√	√
Holly-leaved cherry	<i>Prunus ilicifolia</i>	Evergreen	√		√
Honey locust	<i>Gleditsia triacanthos</i>	Deciduous			√
Kentucky coffee tree	<i>Gymnocladus dioica</i>	Deciduous			√
Lodgepole pine, Beach pine	<i>Pinus contorta</i>	Evergreen	√		√
Longleaf Mahonia	<i>Mahonia nervosa</i>	Evergreen	√		√
Madrone, Madrona	<i>Arbutus menziesii</i>	Evergreen	√	√	√
Manzanita	<i>Arctostaphylos spp</i>	Evergreen	√	√	√
Mountain alder	<i>Alnus tenuifolia</i>	Deciduous			√
Norway maple	<i>Acer platanoides</i>	Deciduous			√
Ocean spray, Cream bush	<i>Holodiscus discolor</i>	Deciduous	√	√	√
Oregon grape	<i>Mahonia aquifolium</i>	Evergreen		√	√

Common Name	Botanical Name	Plant Type	CA Native	Deer Proof	Fire Resistant
Oregon white oak, Garry oak	<i>Quercus garryana</i>	Deciduous	√		√
Pacific wax myrtle	<i>Myrica californica</i>	Evergreen	√	√	√
Pin oak	<i>Quercus palustris</i>	Deciduous			√
Pink winter currant, red flowering currant	<i>Ribes sanguineum</i>	Deciduous	√	√	√
Point Reyes Ceanothus	<i>Ceanothus gloriosus</i>	Evergreen	√		√
Ponderosa pine, Western yellow pine	<i>Pinus ponderosa</i>	Evergreen	√		√
Potato vine	<i>Solanum jasminoides</i>	Evergreen		√	
Quaking aspen	<i>Populus tremuloides</i>	Deciduous	√		√
Red alder	<i>Alnus rubra</i>	Deciduous	√		√
Redberry	<i>Rhamnus crocea</i>	Evergreen	√		√
Red oak	<i>Quercus rubra</i>	Deciduous			√
Red-osier dogwood, Redtwig dogwood	<i>Cornus stolonifera</i>	Deciduous			√
Redwood, Coast redwood	<i>Sequoia sempervirens</i>	Evergreen	√		
Robinson crabapple	<i>Malus var. 'Robinson'</i>	Deciduous			
Rockrose	<i>Cistus spp</i>	Evergreen		Some	√
Rocky mountain maple	<i>Acer glabrum</i>	Deciduous	√		√
Salal	<i>Gaultheria shallon</i>	Evergreen	√	√	√
Serviceberry	<i>Amelanchier spp</i>	Deciduous	Some		√
Sugar pine	<i>Pinus lambertiana</i>	Evergreen	√		√
Sunset maple, Scarlet maple	<i>Acer rubrum</i>	Deciduous			√
Toyon, Christmas berry, California holly	<i>Heteromeles arbutifolia</i>	Evergreen	√	√	√
Vine maple	<i>Acer circinatum</i>	Deciduous	√		√
Walnut	<i>Juglans spp</i>	Deciduous	Some		√
Western azalea	<i>Rhododendron occidentale</i>	Deciduous	√	√	√
Western catalpa	<i>Catalpa speciosa</i>	Deciduous			√
Western larch, Tamarack	<i>Larix occidentalis</i>	Deciduous			√
Western redbud	<i>Cercis occidentalis</i>	Deciduous	√	√	√
Western spirea	<i>Spiraea douglasii</i>	Deciduous	√		√
White alder	<i>Alnus rhombifolia</i>	Deciduous	√		√
Wild lilac	<i>Ceanothus spp</i>	Evergreen	√	√	
Willow	<i>Salix spp</i>	Deciduous	Some		√
Winged Euonymus	<i>Euonymus alata</i>	Deciduous			√

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- Barton, LeeAnn, California-certified nursery professional, Dazey's Supply, Redway, CA.
- California Forest Stewardship Program (CFSP), Fire-Resistant Trees and Shrubs, <http://ceres.ca.gov/foreststeward/html/Moritz.html>, provides information regarding the design of a firewise landscape.
- California Forest Stewardship Program (CFSP), *Forestland Steward* Newsletter, Summer 1999, Breaking Up Fuel Continuity and Fuel Ladders, <http://ceres.ca.gov/foreststeward/html/fuelladder.html>, provides information regarding the arrangement of fuels.
- City of Oakland, Watershed Improvement Program, Fire Wise Native Plants, <http://oaklandpw.com/creeks/fireplants.htm>.
- Fire Ready Wildfire Prevention & Protection Services, Defensible Space Issues & Explanations, Your Best Defense, <http://www.fireready.net/noframes/defense.html#defense>, provides information on how to create a defensible space.
- Fire Safe Council, Fire Safe Landscaping, <http://www.firesafecouncil.org/education/landscaping/index.html>, provides information on defensible space, planning, spacing, watering, maintenance.
- Firewise, Firewise Landscaping Checklist, <http://firewise.org>, checklist to help you design and maintain a firewise landscape.
- Fitzgerald, Stephen and Amy Jo Waldo, Oregon State University Extension Service, Forest Resource Note No. 6, April 2002, Fire-Resistant Plants for Oregon Home Landscapes, <http://extension.oregonstate.edu/deschutes/forestry/documents/FireResPlantsPictorial.pdf>, suggests specific types of vegetation that may reduce your risk from wildfire.
- Hagen, Bruce W., California Forest Stewardship Program (CFSP), Firewise Landscaping, <http://ceres.ca.gov/foreststeward/html/landscaping.html>, provides information on how to create a defensible space including plant selection.
- Harris, F.C., Colorado State Forest Service, Creating Wildfire-Defensible Zones no. 6.302, www.ext.colostate.edu/pubs/natres/06302.pdf, great article regarding plant spacing.
- Jepson Manual – Higher Plants of California, edited by James C. Hickman, 1993, University of California Press: Berkeley and Los Angeles, California.
- Planting for Fire Protection, <http://environment.prsc.qld.gov.au/FireProtection.asp>, good information on plant and fire characteristics.
- Scripps Howard News Service, 20 March 2004, Consider fire-resistant plants, <http://web.redding.com/newsarchive/20040320handg017.shtml>, newspaper article discussing fire-resistant plants including a few examples of fire-retardant plants.
- Southern California Water Agencies, bewaterwise.com, Fire-resistant California Friendly plants, <http://bewaterwise.com/fire.html>, lists California native plants.
- Sunset Western Garden Book, 1995, Sunset Publishing Corporation: Menlo Park, California.
- Sunset Western Garden Book, 2001, Sunset Publishing Corporation: Menlo Park, California.
- UC Berkeley Forest Products Lab, Fire-Safe Demonstration Garden Plant List & Garden Layout, www.ucfpl.ucop.edu/HOPlantList.htm.

For Additional Information Regarding Fire-Safe Plants Go To:

- F.C. Dennis, Colorado State Forest Service, Creating Wildfire-Defensible Zones no. 6.302, www.ext.colostate.edu/pubs/natres/06302.pdf, great article regarding plant spacing.
- Fire-Safe Landscape Database, www.ucfpl.ucop.edu/491/Garden/searchALL.htm.
- Nevada County Fire Safe Council, Fire Safe Plants, www.firesafecouncilnevco.com/html/fire_safe_plants.html.
- UC Berkeley Forest Products Lab, Introduction to the I-Zone, Chapter XIV – Fire-Safe Vegetation, <http://www.ucfpl.ucop.edu/I-Zone/chapter14.pdf>, great article regarding vegetation in the fire zone and landscape design and maintenance.
- UC Berkeley Forest Products Lab, Defensible Space Landscaping in the Urban/Wildland Interface, Plants with a Favorable Fire Performance Rating, www.ucfpl.ucop.edu/I-Zone/XIV/vegetati.htm, lists plants that have a high or moderate fire resistance rating.