Boopsie! What happened? Your line went dead!

I'm sorry, Sid. The house was filling up with smoke.

What? Malibu's on fire again?

Well, our neighbor's backyard is, and it looks like ours is next.

Of course, it's not really "ours," is it? The chaparral belongs to nature, and it needs the fire to renew itself. It's all part of God's plan!

What fools we've been...

Hey, didn't I tell you to pave it over? Didn't I?
No, but we can do better than…
Overview

- What’s the problem?
- What are the solutions?
- Firewise landscaping
  - plants with firewise characteristics
  - appropriate placement
  - management, maintenance
- Firewise plant examples
WUI – Wildland/UUrban Interface

- Between core rural and urban areas
- Popular for housing and recreation
- Increasing pressure throughout the West
- Problems with wildlife, water quality, and fire
Popularity = Problems

- Attractive natural (and introduced) vegetation
- Fire often a natural part of landscape
- Access and infrastructure problems
- Minor fires become major concerns
Oakland/Berkeley Hills before; 1991
Oakland/Berkeley Hills after; 25 killed, 3,354 homes lost, $1B damage
Cerro Grande Fire, Los Alamos, 2000; 220 homes burned, up to $800M losses
Cedar/Old/etc. Fires, California, 2003; 3,640 homes burned; at least 15 fatalities
Witch/Grass Valley/etc. Fires, California, 2007; 2,180 homes burned
Solutions

- Community, Development, Individual
Community

- Planning & zoning*
- Infrastructure requirements
- Demonstration homes, landscapes*
- Ordinances*

*Affect/affected by plants & landscaping
Development

- Development location, layout*
- Access
- Fuel breaks*
- Water supplies
- Buried utilities
- Street, home signs
- Covenants*
- Education, awareness*

*Landscape related
Individual

- Property selection*
- Building design, construction
- Water supply*
- Landscaping, maintenance*
- Readiness*

*Landscape related*
Property selection and construction

- Lot position – avoid ridge tops, canyons, steep slopes
- Ensure water availability
- Need vehicle access
- Small lots = more dependence on neighbors
- NO WOOD ROOFS!
Fires burn fast and hot up hills and canyons.
Stucco siding

Fire resistant roof; minimal overhang

Concrete wall to deflect heat; house set back from top of slope

Fuel reduced; some plants for stability

Trees pruned and widely spaced
Firewise landscaping

- Designing, installing, and maintaining landscapes to...
  - minimize fire hazard to structures, residents, and neighbors
  - maintain components of native ecosystems
  - achieve owner’s goals

- Focus on the *Home Ignition Zone*
Fire advances by direct flame contact and by airborne firebrands or embers.
Firebrands
Home Ignition Zone (HIZ)*

- 100-200 foot radius area around a home that affects wildfire’s ability to burn the home.
- Includes home, fences, decks, and landscape – all are fuel.
- Research shows that large flames must be within 30 feet to ignite a home.
- Fire moves into and through this zone by direct flame contact and firebrands.

*As conceived by Jack Cohen, U.S. Forest Service
Home Ignition Zone, Defensible Space

Zone 1 must include 3’ to 5’ non-combustible area

Zone 1: Low fuel, clean and green; few trees, pruned, spaced 30’ apart; few, spaced out shrubs or other vegetation clumps; irrigate if possible; no firewood or propane; ensure firefighter access

Zones 1 and 2: Create fuel breaks of pavement (patio, sidewalk, driveway), mowed lawn, or grazed pasture; prune trees up 8’ to 15’; remove dead vegetation

Zone 2: Same as in Zone 1 but more fuel allowed and less intensive maintenance; clumps of 2-3 trees 30’ apart; xeriscape

Zone 3: Prune and thin trees and shrubs

All zones: Vegetation amounts step down from maximum in wildland to none next to house
Firewise landscape design

- Zone 1 – Home, attached structures, and landscape out to 30’.
  - Home placement, design, construction, maintenance.
  - Non-combustible area 3’ from home.
  - Beyond 3’ use firewise plants; lean and green.
  - Space out groups of plants; prune trees.
  - Sidewalks, patios, grazed pasture
  - Intensive maintenance, irrigation.
  - Access for fire suppression equipment.
  - Also called defensible space; condition may effect firefighters’ willingness or ability to defend
Firewise landscape design

- Zone 2 – Low fuel landscape 30’ to 100’ out.
  - Same ideas as Zone 1, but less intensive modification and maintenance of landscape
  - Good place for xeriscape if water availability is a concern
  - Extend up to 200’ on steep slopes.
Firewise landscape design

- Zone 3 – Surrounding wildland.
  - Focus on thinning & pruning where feasible.
  - Don’t dump fuel here; remove.
Firewise landscape design

- Often parts of zone 2 and all of zone 3 are not yours – will need to work with neighbors.
Neighbors need to work together

100 foot radius around WUI homes
High quality firewise landscaping isn’t easy

- Must know plant needs and habits so you can use and manage them appropriately.
- Good looking firewise landscapes aren’t easy to design or maintain; takes considerable expertise.
Firewise landscape maintenance

- Irrigate appropriately to keep plants green & moist.
- Mow & water grass regularly according to its needs.
- Rake up and remove dead needles, leaf litter and other plants debris.
- Clean roof, gutters, home perimeter
- Remove tops of herbaceous plants that have gone to seed or become dry.
- Keep shrubs small by pruning back annually.
- Prune low tree branches to a height of 8’ to 15’.
- Don’t pile debris in zones 2 or 3; remove it.
Firewise Landscape Maintenance

POORLY MAINTAINED LANDSCAPE
- Tree overhanging roof and chimney
- Shrubs growing under tree branches
- Continuous masses of shrubs

WELL MAINTAINED LANDSCAPE
- Solitary tree pruned up and away from house
- Shrubs next to house removed
- Adequate space between shrubs and tree
- Shrubs in distinct groups
- Low ground cover or gravel beds
Firewise plants and landscaping don’t guarantee fire safety

But, firewise plants, good design, and maintenance help establish a defensible space and reduce fire intensity near structure
Firewise plant terminology

- Firewise
  - less likely to burn
  - or will burn less hot or for less time
  - may imply low maintenance, slow growth

- Don’t use terms fire-safe or fireproof – all plants will burn under extreme conditions

- Fire resistant is OK
What makes a plant firewise?

- Firewise plants have one or more traits:
  - Tissues contain more moisture, especially during fire season.
  - Tissues contain low amounts of volatile oils and other readily flammable chemicals.
  - Provide less fuel, by producing less litter or by staying small.
  - Compact or low to the ground; can be used in landscape to interrupt fire pathways.

- Interrupt at least one leg of the fire triangle.
What makes a plant firewise?

- Firewise plants generally low to ground, compact, and stay green and healthy with low maintenance and minimal water.
Firewise plant characteristics and management

- Trees provide large amounts of fuel; carefully place and maintain.
- Broadleaved trees generally are less flammable than conifers (pines, firs, spruces, junipers).
- Most do well in sunny areas typical of some fire-prone sites.
- Some need minimal or no irrigation; over-irrigation can harm or cause fast growth. Some require irrigation.
- Some can be weedy in certain circumstances.
- Consider plant availability and cold-hardiness.
Firewise plants – Grasses

- Most low growing
- Some need to be mowed or grazed
- Warm season/cool season
Crested Wheatgrass (Agropyron cristatum)

- Resists fire spread due to growth form

Photo: www.greatplains.org

Photo: clearwaterlandscapes.com
Western Wheatgrass (*Agropyron smithii*)

- Low fuel loads; regrows quickly after fire

Photo: www.rwrp.umt.edu
Buffalograss (*Buchloe dactyloides*)

- Low growing w/out mowing; moist through summer with minimal irrigation
Orchardgrass (*Dactylis glomerata*)

- Mow or graze

Photo: aggie-turf.tamu.edu

Photo: forages.orst.edu
Blue Fescue (*Festuca cinerea* and others)

- Most low growing; may need to mow; stays moist w/ irrigation
Rye Grass (*Lolium* species)

- Green w/ less irrigation than some; mow or graze

Photo: [www.agronomy.psu.edu/Extension/Turf](http://www.agronomy.psu.edu/Extension/Turf)
Kentucky Bluegrass (*Poa pratensis*)

- Low growing; mow; moist with irrigation

Photo: www.oznet.ksu.edu/hfrr
Sandberg Bluegrass (*Poa secunda* or *sandbergii*)

- Low growing w/out mowing; low fuel loads
Firewise plants – Herbaceous perennials

- Grow back from underground parts every year
- Not woody
Yarrow (*Achillea clavennae, A. filipendulina, etc.*)

- Good for dry sites; varying sizes; not all good

![A. clavennae](Photo: www2.arnes.si/~popsd1s/ilbi/botanika.html)

![A. filipendulina 'Parkers Variety'](Photo: www.stauder.net/BILDEARKIVET.htm)
Columbine (*Aquilegia* species, hybrids)

- Likes moisture & some shade
Sea Pink, Sea Thrift (*Armeria maritima*)

- Low growing; dry infertile sites only; salt tolerant
Beach Wormwood, Dusty Miller
(*Artemisia stelleriana*)

- Very well-drained soil; moist in summer

Photo: www.stauder.net/BILDEARKIVET.htm
Bergenia (*Bergenia* species, hybrids)

- Moisture loving; medium sized; semi-evergreen

Photo: www.stauder.net/BILDEARKIVET.htm
Red Valerian, Jupiter’s Beard
(\textit{Centranthus ruber})

- Gets fairly large; moist in summer
Snow-in-summer (*Cerastium tomentosum*)

- Low growing; moist in summer

Photo: www.ujf-grenoble.fr/JAL/visi/apennins/corps.htm
Coreopsis (perennial *Coreopsis* species)

- *C. auriculata* var. ‘Nana’ low growing, needs water; others larger, drought tolerant
Hardy Ice Plant (*Delosperma nubigenum*; also other hardy species)

- Very drought tolerant; low growing; some not cold hardy

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Photo: bot-garden.uibk.ac.at

Photo: www.stauder.net/BILDEARKIVET.htm
Pinks (*Dianthus* species)

- Use perennials; need moisture; moist in summer

Photo: www.stauder.net/BILDEARKIVET.htm
Fleabane (*Erigeron* species, hybrids)

- Moist in summer

Photo: www.csdl.tamu.edu/FLORA

‘Rosa Triumph’

Photo: www.stauder.net/BILDEARKIVET.htm
Blanket Flower (*Gaillardia x grandiflora*)

- Drought, heat tolerant; moist in summer; large

Photo: www.csu.org
Geranium (Geranium species)

- Most low-growing; need shade where hot; moist in summer; use perennials

Photo: www.stauder.net/BILDEARKIVET.htm
Photo: www.ext.nodak.edu/county/cass/horticulture.htm
Daylily (*Hemerocallis* species)

- Green and moist in summer

‘Stella d’Oro’

Photo: biology.smsu.edu/Herbarium

‘Sammy Russell’

Photo: www.stauder.net/BILDEARKIVET.htm
Coral Bells, Alum Root (*Heuchera sanguinea*)

- Also other species, hybrids; low growing foliage
Evergreen Candytuft (*Iberis sempervirens*)

- Fairly low growing; evergreen

Photo: www.ingibjorg.is
Photo: home.onego.ru/~otsoppe
Iris (*Iris* species, hybrids)

- Green and moist in summer
Red-hot Poker (Kniphofia species, hybrids)

- Large plants; moist in summer
Lavender (Lavandula species)

- Moist in summer; compact; cut to ground regularly

Photo: www.icangarden.com/NewEden/pukehou.htm
Shasta Daisy (*Leucanthemum x superbum*)

- Green and moist in summer
Sea Lavender, Statice (*Limonium latifolium*)

- Low growing leaves;
- Salt resistant;
- Dry soils

Photos: www.csu.org
Flax (*Linum* species)

- Good for tough sites & soils

Photos: www.terra.hu/novkomy/ htm/linuaust.htm
Lily-turf (*Liriope spicata*)

- Fairly low growing;
  moist or dry sites;
  evergreen
Lupine (Lupinus species, hybrids)

- Some are annuals; poisonous to livestock; good for poor soils

L. nootkatensis

Photo: www.stauder.net/BILDEARKIVET.htm
Alfalfa (Medicago sativus)

- Green & moist in summer; low growing

Photo: www.snre.umich.edu/nassauer/rules.html
Primrose (*Oenothera* species)

- Fairly low growing; best on poor soils

Photo: [www.stauder.net/BILDEARKIVET.htm](http://www.stauder.net/BILDEARKIVET.htm)
Poppy (*Papaver species*)

- Easy to grow; cut back regularly
Penstemon (Penstemon species, hybrids)

- Use on well-drained soils

Photo: www.stauder.net/BILDEARKIVET.htm
Russian Sage, Azure Sage
(*Perovskia atriplicifolia*)

- Moist in summer; cut back yearly

Photo: www.csu.org

Photo: www.ext.nodak.edu/county/cass/horticulture.htm
Cinquefoil, Potentilla (*Potentilla* species, hybrids)

- Use low-growing, non-shrubby spp.; full-sun

*P. nepalensis* ‘Roxana’

Photo: www.stauder.net/BILDEARKIVET.htm
Salvia, Sage (Salvia species, hybrids)

- Some are annuals; only use low-growing, small plants; Mediterranean sage is weedy

Photo: www.stauder.net/BILDEARKIVET.htm
Stonecrop, Sedum (*Sedum* species)

- Very low growing; fleshy, moist leaves; drought tolerant

Photo: www.stauder.net/BILDEARKIVET.htm
Hen and Chicks (Sempervivum tectorum and other species)

- Very low-growing; succulent; good on droughty, poor soils

Photo: www.stauder.net/BILDEARKIVET.htm
Lamb’s Ear (Stachys byzantina)

- Moist in summer;
  good on poor soils

Photos: www.stauder.net/BILDEARKIVET.htm
Yucca (Yucca filamentosa)

- Evergreen; very drought tolerant

Photo: members.aol.com/hardycacti
Firewise plants – Shrubs, vines

- Woody; grows out from above-ground stems
- Many low growing; slow growing
Bearberry, Kinnikinnick, Manzanita
(*Arctostaphylos uva-ursi*)

- V. low, spreading; evergreen; poor soils; needs little pruning; salt tolerant

Photos: www.funet.fi/pub/sci/bio/life
Saltbush (*Atriplex* species)

- Very drought tolerant; low maintenance

Photos: helios.bto.ed.ac.uk/bto/desertecology

A. *canescens*  
A. *polycarpa*
New Jersey Tea (Ceanothus americanus)

- Low, dense form; evergreen; fairly trouble-free; drought tolerant
Ceanothus (Ceanothus ovatus and others)

- Fairly low growing;
- Evergreen;
- Low maintenance

Photo: wiscinfo.doit.wisc.edu/herbarium
Rock-rose (*Cistus* species)

- Not all are cold hardy; evergreen; dry sites; size varies
Cotoneaster (Cotoneaster horizontalis, C. dammeri, & others)

- Use low-growing, compact forms; some are evergreen; dry sites; low maintenance; tough

Photos: www.orst.edu/dept/idplants; Dept. Hort., Oregon State Univ.
English Ivy (Hedera helix)

- Evergreen vine;
  low growing, spreading, climbing; prune to control spread; sun or shade
Immigrant Forage Kochia (*Kochia prostrata*)

- Stays green most of year; no volatiles; grows in clumps that break up fuel continuity; don’t confuse w/ weedy annual kochia (*K. scoparia*)

Photo: Mike Pellant
Honeysuckle (*Lonicera* species, hybrids)

- Shrubs or vines; use low-growing species/cvs.

Photo: muextension.missouri.edu/xplor/agguides/hort/g06840.htm
Creeping Oregon-grape (*Mahonia repens*)

- Very low growing, spreading shrub; evergreen; needs some shade

Photo: www.csdl.tamu.edu/FLORA/imaxxber.htm
Virginia Creeper (*Parthenocissus quinquefolia*)

- Vine; tough and very adaptable; prune to control spread

Photo: www.orst.edu/dept/ldplants; Dept. Hort., Oregon State Univ.
Sand Cherry (*Prunus besseyi*)

- Small, spreading shrub for dry, tough sites

*P. besseyi* ‘Pawnee Buttes’

Photo: www.ext.colostate.edu/p.sel
Bitterbrush, Antelope Bitterbrush
(*Purshia tridentata*)

- Low maintenance; good for dry, tough sites

Photos: www.cnr.vt.edu/dendro/wwwmain.html; Virginia Tech Dendrology
Firethorn, Pyracantha (Pyracantha species)

- Evergreen shrub; use low-growing selections; prune regularly

Photo: www.orst.edu/dept/idplants; Dept. Hort., Oregon State Univ.
Buckthorn (*Rhamnus* species)

- Tough shrub; low maintenance

Photo: [www.hort.uconn.edu/plants](http://www.hort.uconn.edu/plants)
Skunkbush Sumac and other Sumacs (*Rhus trilobata* and others)

- Skunkbush small, easy to grow, low maintenance; some get large; thin & prune; drought tolerant

Photo: [www.biosurvey.ou.edu](http://www.biosurvey.ou.edu)

Photo: [www.csdil.tamu.edu/FLORA/BigBend/BB0294.jpg](http://www.csdil.tamu.edu/FLORA/BigBend/BB0294.jpg)
Currant, Gooseberry (*Ribes* species)

- Use low-growing dwarf forms; fairly tough; adaptable

Photo: www.gf.vu.lt/depts/garden/photogallery.htm

Photo: www.orst.edu/dept/idplants; Dept. Hort., Oregon State Univ.
Shrub Roses (*Rosa rugosa* and other species)

- Medium shrub; tough; fairly drought and salt tolerant

Photo: [www.wsu.edu/~lohr/wcl](http://www.wsu.edu/~lohr/wcl)
Photo: [www.wellesley.edu/Biology/Courses/217/Rosaceae.html](http://www.wellesley.edu/Biology/Courses/217/Rosaceae.html)
Russet Buffaloberry (*Shepherdia canadensis*)

- Does well on very poor soils; drought tolerant; fixes nitrogen; salt tolerant
Lilac (*Syringa vulgaris*)

- Small to large shrubs; green in summer with irrigation; thin & prune regularly

Photo: www.oznet.ksu.edu/hfrr

Photo: www.orst.edu/dept/IDplants; Dept. Hort., Oregon State Univ.
Large Periwinkle (*Vinca major*)

- Low growing, prostrate ground cover; sun or shade; evergreen

Photos: [www.csltl.tamu.edu/FLORA/imaxxapo.htm](http://www.csltl.tamu.edu/FLORA/imaxxapo.htm)
Dwarf Periwinkle, Common Periwinkle (*Vinca minor*)

- Similar to large periwinkle, but very low to the ground

Photos: [www.hort.uconn.edu/plants](http://www.hort.uconn.edu/plants)
Firewise plants – Trees

- Many will need supplemental moisture
- Large woody plants; lots of fuel
- Use moist, broadleaved trees; not conifers
- Pruning branches up from ground important
- Break up large, continuous wooded areas near area to be protected
Firewise Plants – Trees

- Maple (*Acer*)
Firewise Plants – Trees

- Birch (*Betula*)
Firewise Plants – Trees

- Redbud (Cercis)
Firewise Plants – Trees

- Aspen, Cottonwood, Poplar (*Populus*)
- Willows (*Salix*)
Firewise landscaping resources

- USU Extension or at http://forestry.usu.edu/htm/forest-fire/fire-safetywildland-urban-interface
- Firewise website at www.firewise.org
- Oakland Hills fire history – https://www.youtube.com/watch?v=IrZsQW1uaDA
Firewise landscaping resources

- Mike Kuhns, Extension Forester
  5230 Old Main Hill, USU
  Logan, UT 84322-5230
  mike.kuhns@usu.edu