

FIRESCAPING

Jennifer de Graaf

PLA, LEED AP, BFQP & Rater, QWEL

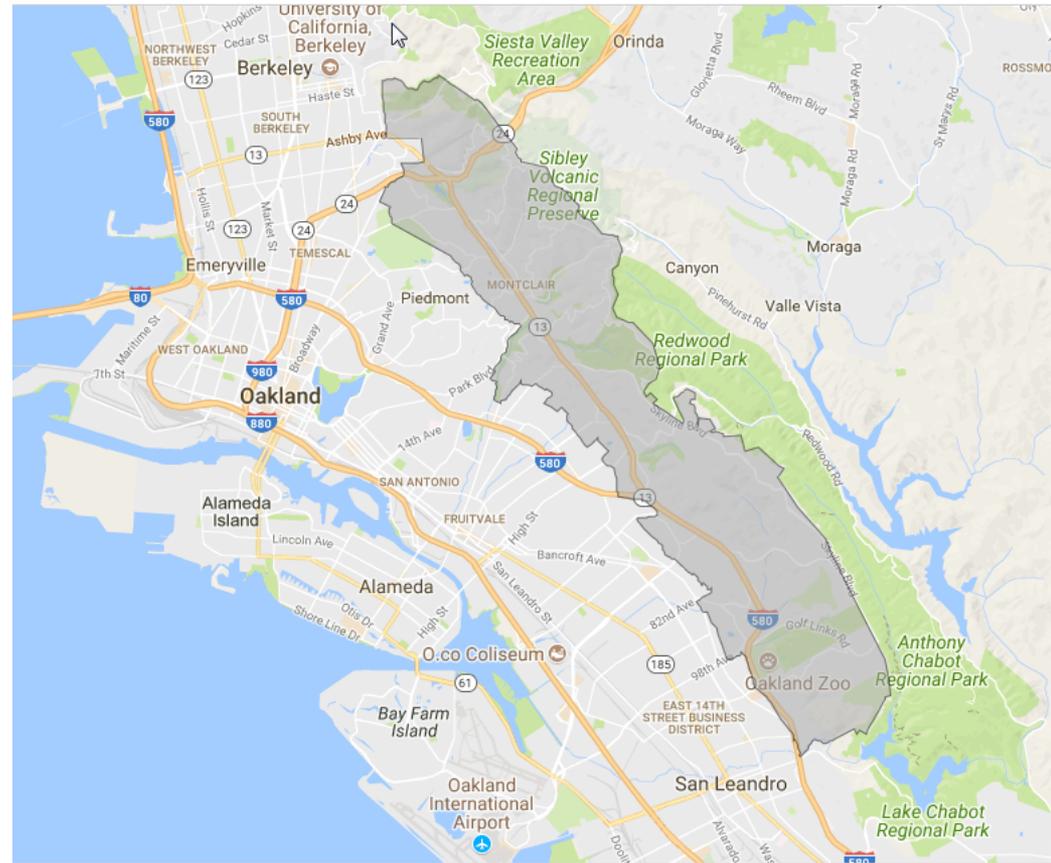
Jennifer@deGraafAssoc.com

2018



CA IS FLAMMABLE!

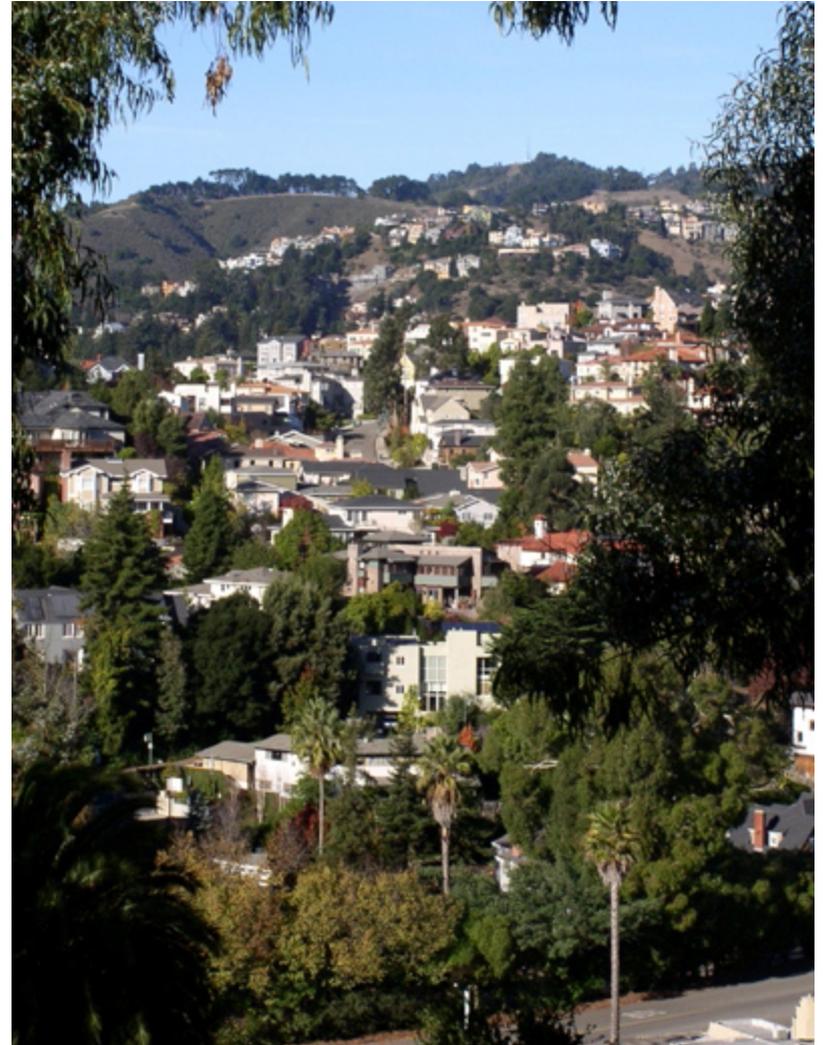
- 6-8 months w/o rain
- Long growing season and just enough rain = loads of fuel
- Climate warming and drought > intensifies fires
- “fire safe” is like “deer proof”



Oakland High Severity Zone

THE PEOPLE PROBLEM...

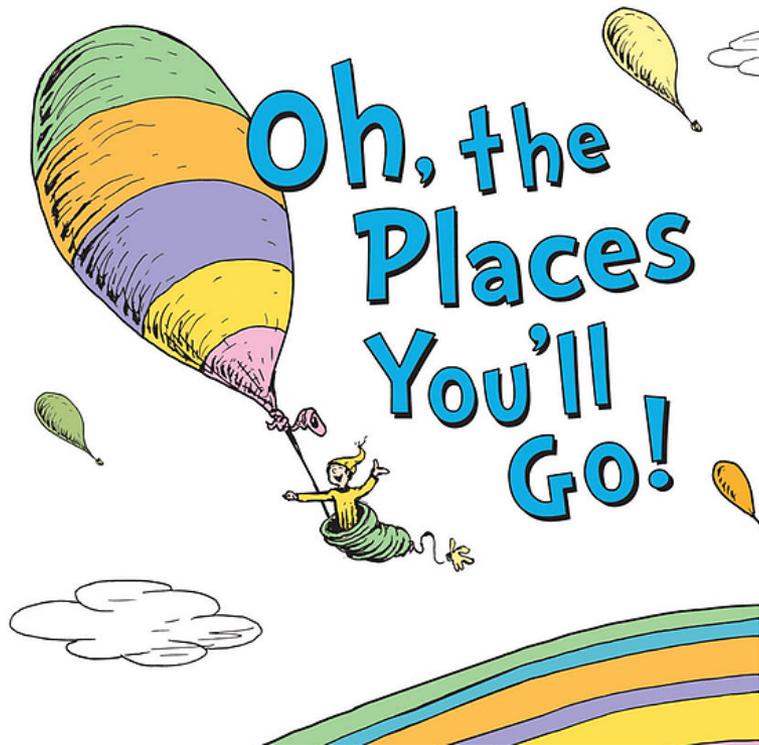
- More homes at wilderness interface
- Fire suppression instead of natural fire ecology
- Privacy
- Urban density
- Insular, non-collaborative, non-sharing attitudes



SECURITY?



FIRE!



Firebrands can go
a MILE



DESIGNING AGAINST FIRE

Ignition sources:

- BBQ / grills
- Workspaces
- Oily rags in garages
- Firebrands from other fires (embers can travel a mile!)
- Fuse boxes
- Cigarettes
- Powerline transformers...

2 lawnmower fires in Sacramento
2015 burned 3 ac



...and lawnmowers!

FIRE DANGER RATINGS

- **Low:** fuels do not ignite easily from small embers, but a more intense heat source, such as lightning, may start fires in duff or dry rotten wood. Fires in open, dry grasslands may burn easily a few hours after a rain, but most wood fires will spread slowly, creeping or smoldering. **Control of fires is generally easy.**



<https://www.fs.usda.gov/detail/inyo/home/?cid=stelprdb5173311>

FIRE DANGER RATINGS

- **Extreme:** Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or conifer stands may be unmanageable while the extreme burning conditions last.



Under these circumstances the only effective and safe control actions are on the flanks until the weather changes or the fuel loading decreases.

BURNING

- Flame:
 - Smoldering, slow burns
 - Fast, spreading flames
- Embers / firebrands
- Raidant heat



FIRE' S PASSIONS

- Run uphill
- Run with the wind
- Climb things
- Grow big and tall
- Eat, eat, eat
- Go fast, out of control
- Do damage

(Sound familiar?)



WON'T THEY SAVE ME?!

- Narrow roads
- Roads without room to turn around a fire truck
- Driveways
 - Long +/- narrow
 - Dense or shrubby foliage along sides
 - Overhanging trees

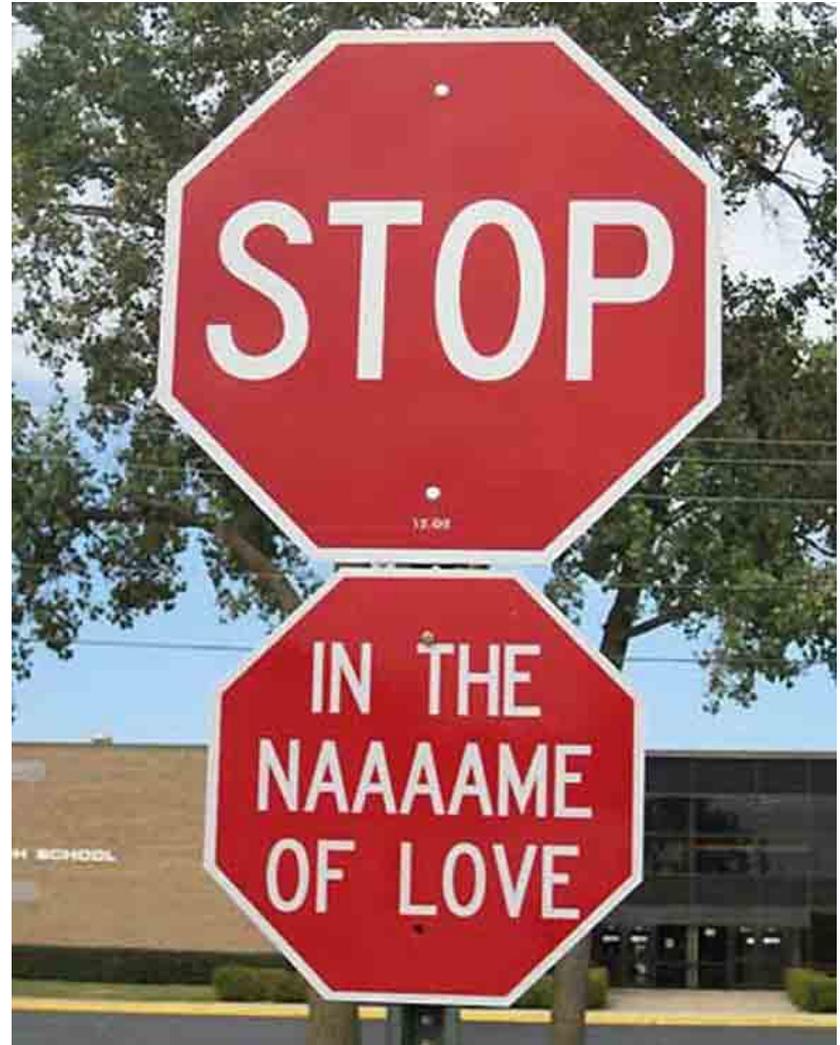
Firefighters will defend what they can most *safely* and most likely save.



FIRST CHECK

Local ordinances & Codes

- Fire
- Planning
- Building
- They rule over any model, list, or article



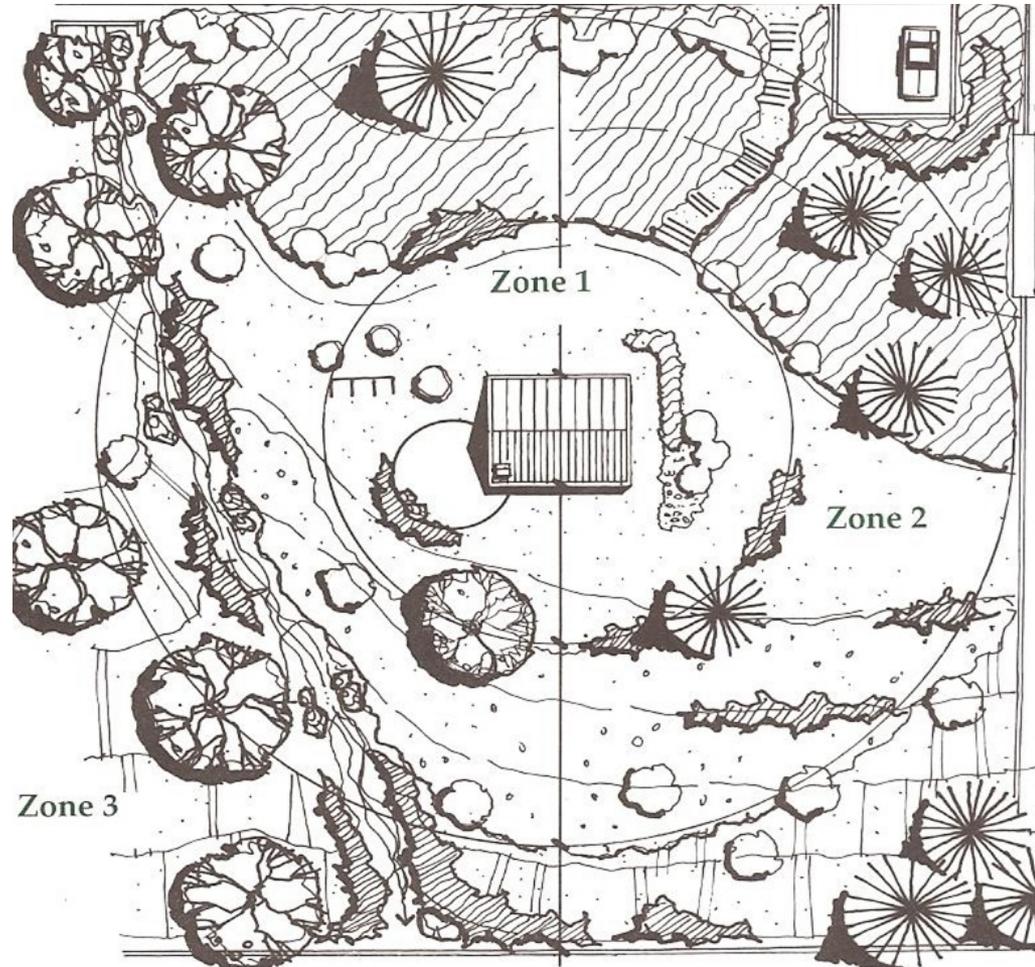
DEFENSIBLE SPACE 3R'S

- Removal:
 - Dead stuff (fuel)
 - Flammable materials (fuel)
- Reduction
 - Pruning (fuel)
 - Mowing (fuel)
- Replacement
 - Fire magnets (fuel again)
 - Stressed / dead plants (fuel)
 - Irrigation (preventing fuel)



ZONES

- Zone dimensions vary between agencies, but are very similar
- Zones are a *working theory / model* developed for home protection in the 50's and 60's.
- These are from both: Firescaping book and IBHS.



NEW ZONE I: TBHS MODEL

- 0-5'
- 5-30'
- 30-100'



- Non-combustible hardscaping
- Low combustibility plants such as non-woody, non-resinous, perennials.
- Take special care with planting near vents, windows, interior corners.

ZONE I - GARDEN

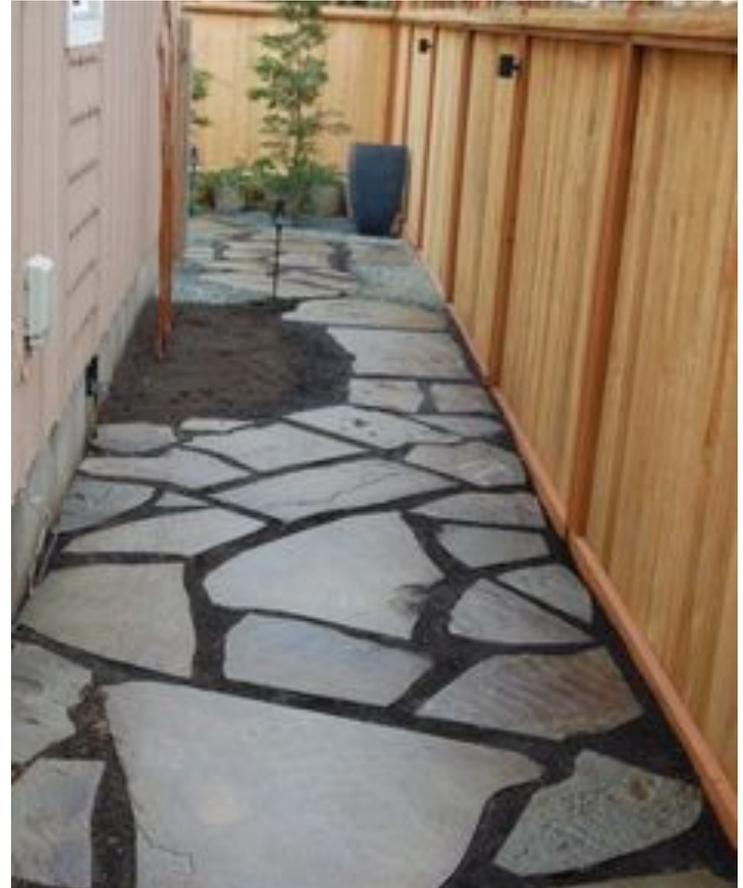
- To 30' away from the structure
- Primary goal: people can get out, fire fighters can get in



ZONE I - GARDEN

Practices:

- Slow, Shorten, Cool
- Select low flammability plants
- Use building materials resistant to high temps
- Work w/ neighbors
- Practice good hygiene



narrow - thoughts?

ZONE 2 – FIRE BREAK

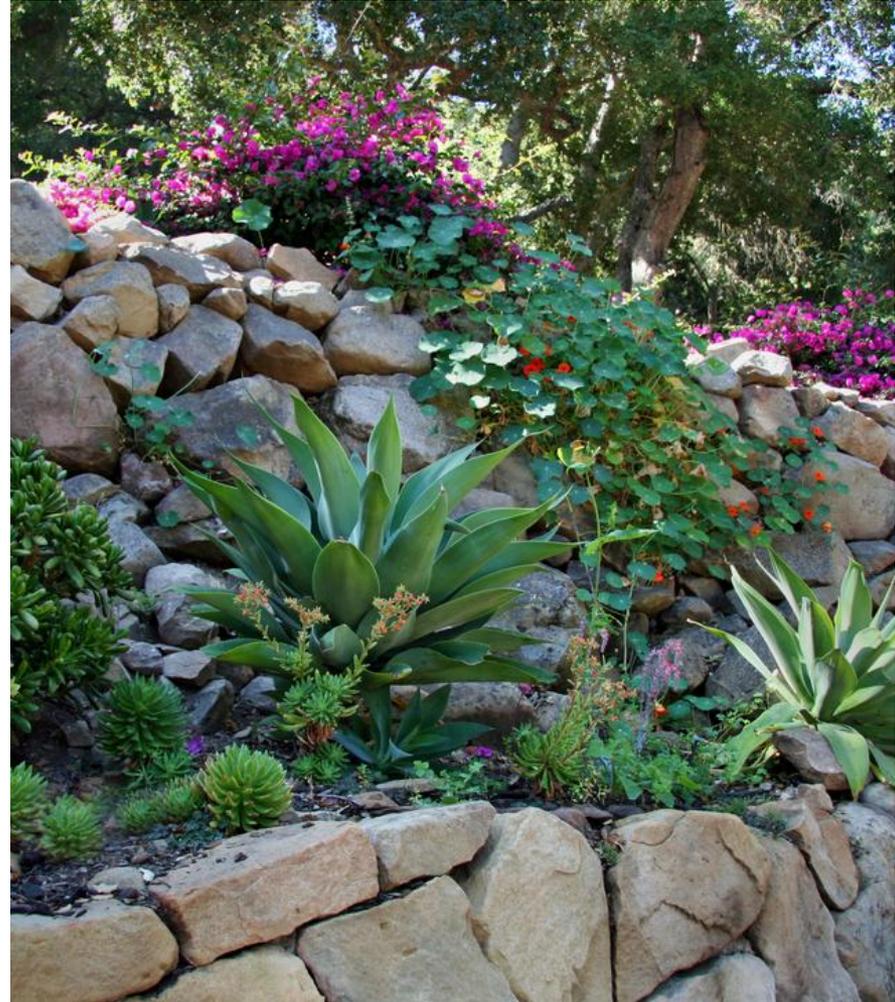
- Approx 31-70' from a protected structure...
- Primary goal is to stop a ground fire.



ZONE 2 – FIRE BREAK

Practices:

- Add 10' for every 10% increase in slope (ie: 120' for a property at 50% slope)
- Select less flammable plants and materials
- Remove/reduce fuel load



ZONE 3 – TRANSITION

- From 71' (or farther) to an additional 50' outward.
- Primary goal is to dramatically slow a fire



ZONE 3 – TRANSITION

Practices:

- Use slower growing, slower burning vegetation.
- Clear excess dead stuff



<https://www.feis-crs.org/feis/>

look up fire regimes!

ZONE 4 – NATURAL

- Everything beyond zone 3
- Goal: reduce the severity



ZONE 4 – NATURAL

Practices

- Leave native spaces as natural as feasible.
- Thin as needed, remove dead stuff, but keep “brush”
- Protect soils from erosion by protecting ecosystem



MULCH & COMPOST

Flammable?

- Rubber Mulch (shredded)
- Pine needles
- Compost
- Shredded wood
- Bark chips
- Rocks, DG

(The studies weren't consistent, each noted add'l contradicting info they also found)



Studies by Universities of Arizona
& Nevada

MULCH & COMPOST

Flammable?

- Rubber Mulch: burned hot, tall, caught easily, went long!
Keep away from targets!
- Pine needles: very flammable, second only to rubber, keep out of zone 1
- Compost: could smolder a long time, otherwise good
- Shredded wood: similar to pine needles
- Bark chips: slower burners, keep outside zone 1
- Rocks, DG: not flammable, but avoid letting debris collect
- Flame Retardant additives only bought 10 min!

MULCH & COMPOST

Q: so, should we even use compost and mulch?



MULCH & COMPOST

Q: so, should we even use compost and mulch?

A: YES! They're for the health of the plant and the soil - healthy, unstressed plants are more fire-resistant! Keep leaf litter too, esp under Oaks, but avoid excessive build-up.



CONSIDERING WATER

- Water budgets and water use classifications, the push to use Low(er) water use plants.
- Plants that are dry because they're being deficit irrigated
- Amount of heat needed to ignite a plant is related to moisture content in plant.



CONSIDERING WATER

- Insufficient irrigation
- Overwatering
- Dry, dusty plants
- Low plant available water
- Poor water retention in the soil
- Lack of mulch
- Plants that can't deal



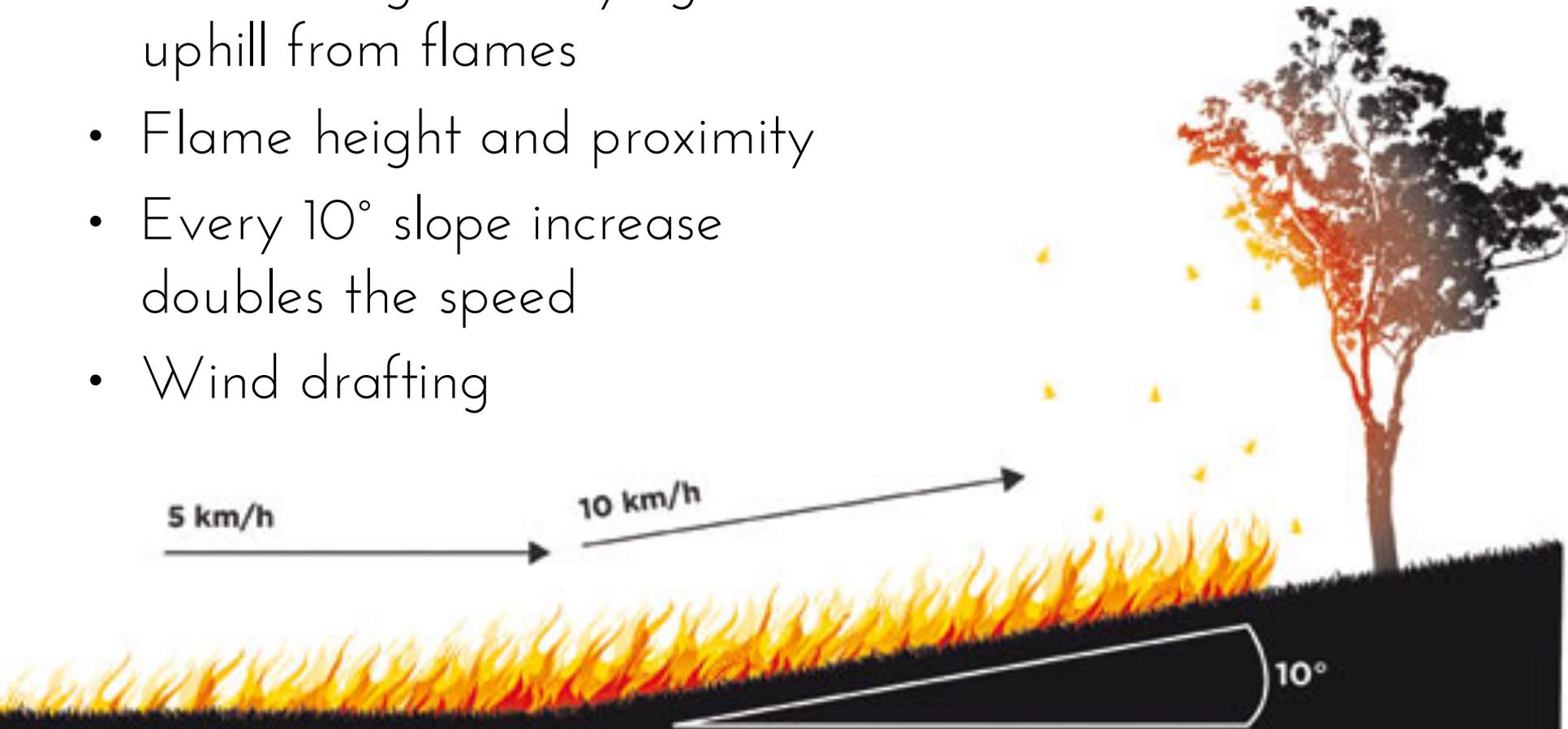
3X



SLOPES

Why? Heat rises

- Pre-heating and drying out uphill from flames
- Flame height and proximity
- Every 10° slope increase doubles the speed
- Wind drafting



From edge of one shrub to the edge of the next

Flat to mild slope
(0% to 20% slope)

Two times (2x) the height of the shrub
(Two shrubs 2' high should be spaced 4' apart)



Mild to moderate slope
(20% to 40% slope)

Four times (4x) the height of the shrub
(Two shrubs 2' high should be spaced 8' apart)



Moderate to steep slope
(greater than 40% slope)

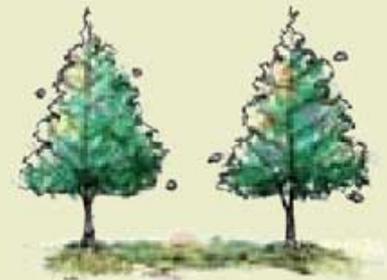
Six times (6x) the height of the shrub
(Two shrubs 2' high should be spaced 12' apart)



From edge of one tree canopy to the edge of the next

Flat to mild slope
(0% to 20% slope)

10 feet



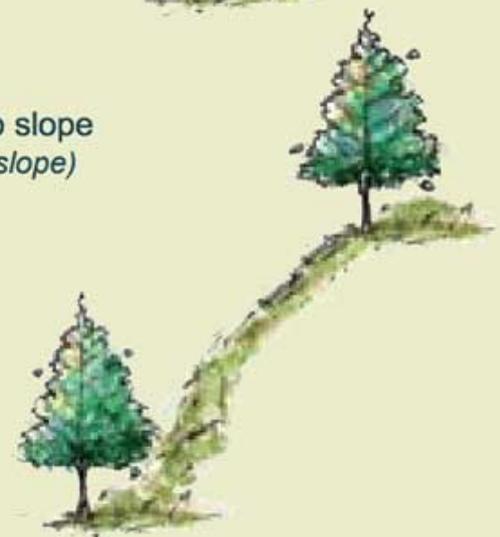
Mild to moderate slope
(20% to 40% slope)

20 feet



Moderate to steep slope
(greater than 40% slope)

30 feet



SLOPES

- Keep taller vegetation farther away if downhill of target
- Highest risk = top of slope, inaccessible mid-slope areas, wind tunnels.
- Fire ladders



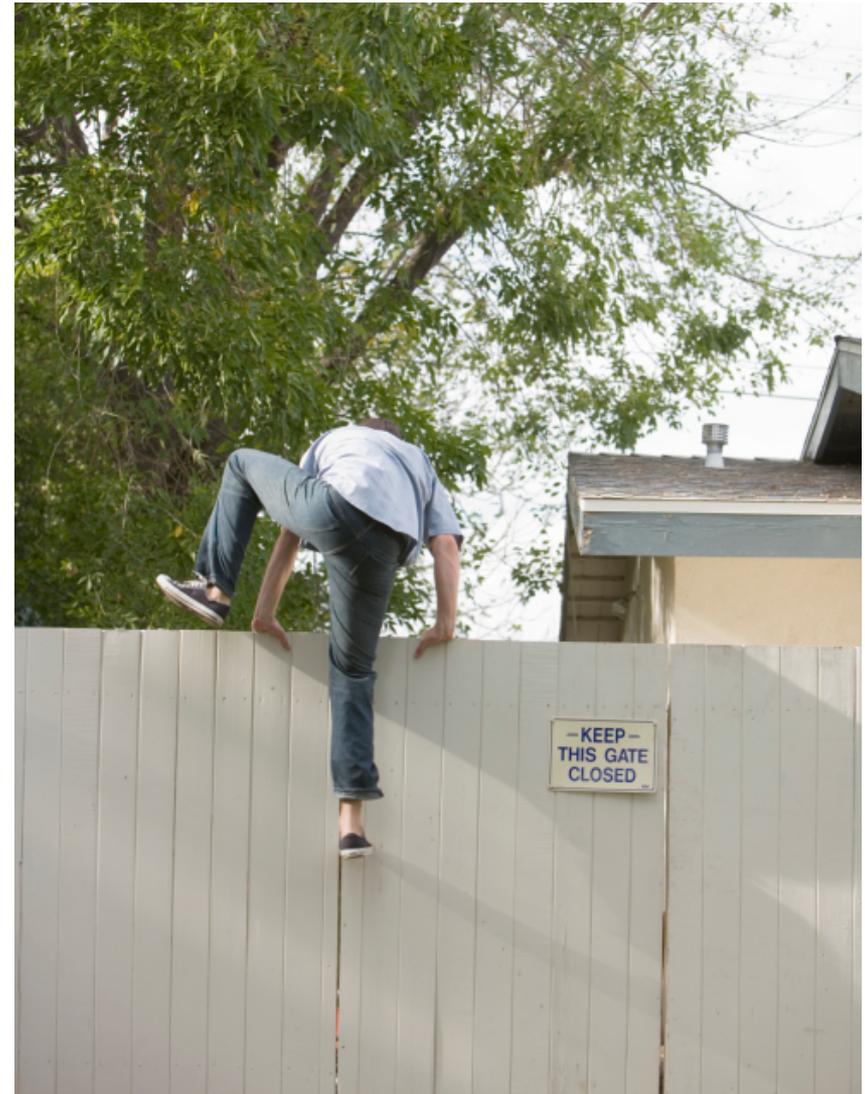
FIRE LADDERS



DESIGNING AGAINST FIRE

Basic Safety

- Highly visible address: mailbox, curb paint, etc
- Don't block firefighter access
- Reconsider solid fencing
- Multiple ways in/out
- Keep it clean
- Store firewood away



DESIGNING AGAINST FIRE

Materiality

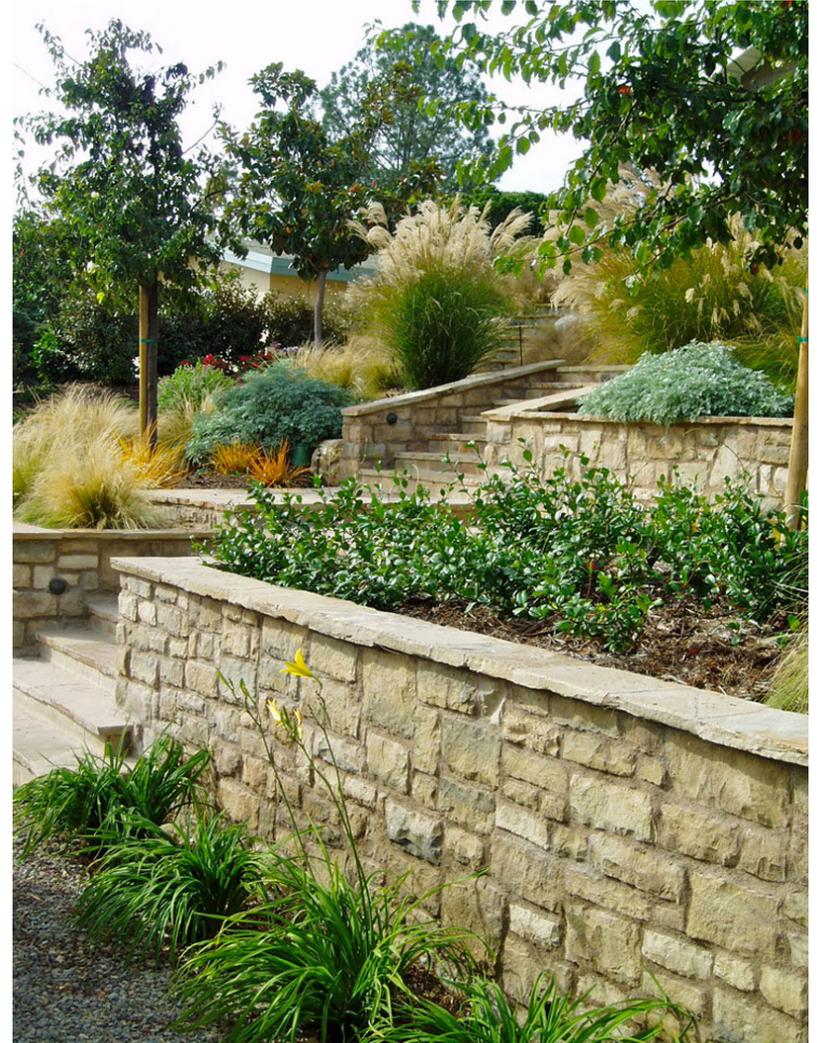
- Architecture
- Planters
- Furniture
- Arbors
- Trellises
- Sheds
- Railings
- Planting



DESIGN AGAINST FIRE

Fire Breaks

- Terracing
- Paving
- Pools
- Lush lawns
- Non-flammable structures
- Even a few rocks to hold



DESIGNING AGAINST FIRE

Architecture

- Avoid flammable overhangs (decks up-slope, deep eaves on roofs incl. sheds)
- Avoid ignition sources near flammable surfaces (bbq under the eaves, on wood deck)
- Use less flammable materials like Class A roofing



DESIGNING AGAINST FIRE

Sheds!

- So overlooked!
- Non-flammable roofs
- Defensible area
- Distance from home
- Clutter, fuels inside?



DESIGNING AGAINST FIRE

Fences

- Non-combustible materials or less of it
- Add a gate between neighbors
- Give critters a way to escape (depending on circumstance!)
- Thicker posts

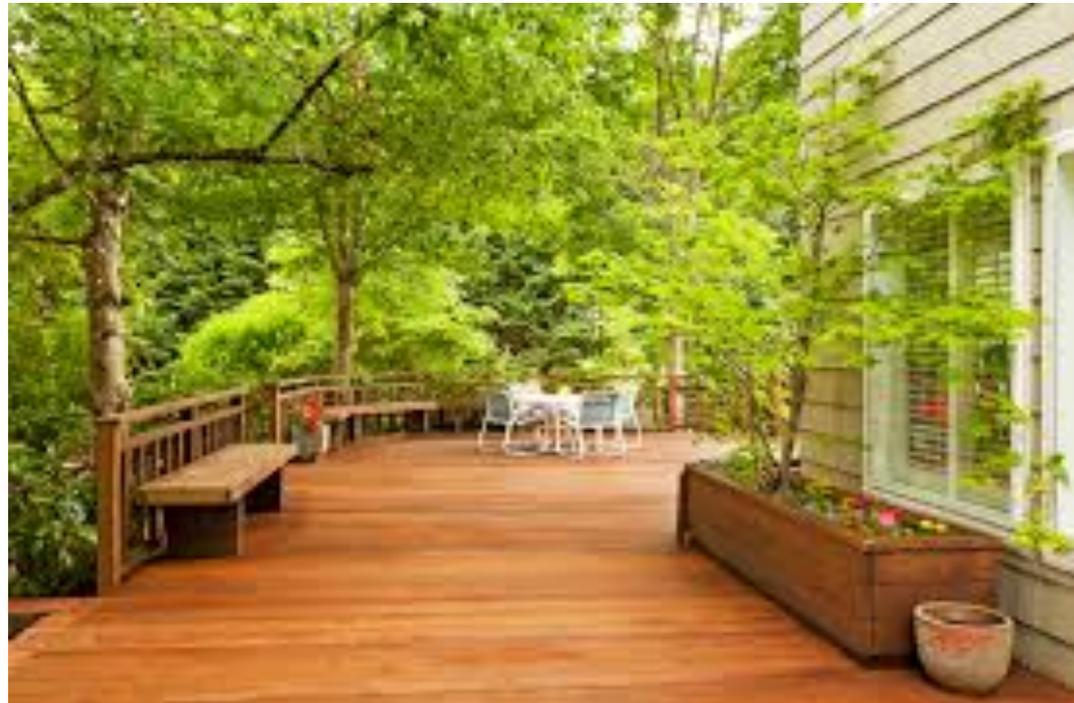


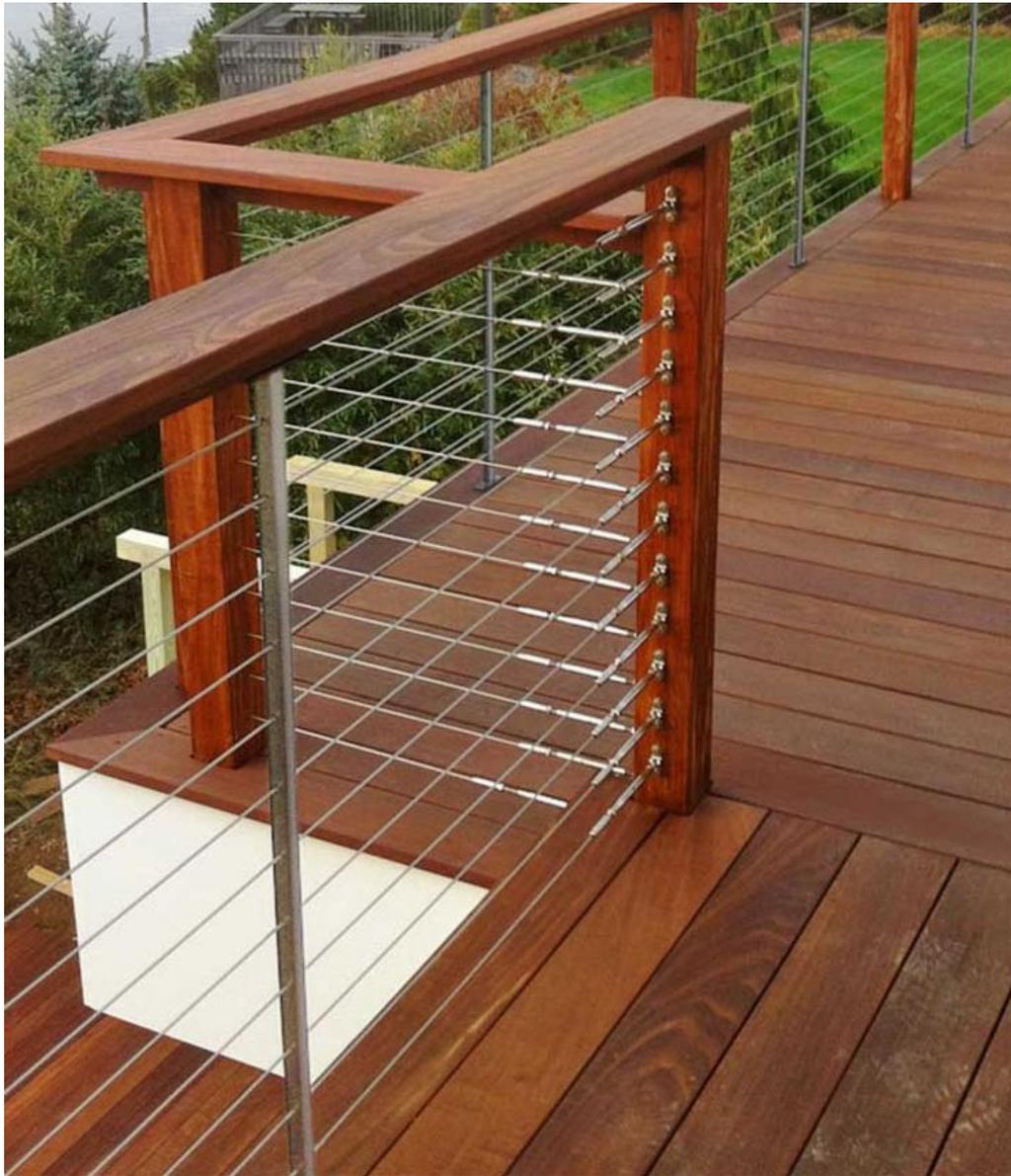


DESIGNING AGAINST FIRE

Decks

- Skirt or screen (1/4" wire mesh min) with non-flammable materials
- Avoid overhangs on hillsides
- Flame-resistant undersides (tile, stucco, etc)
- Non-wood or non-flammable decking











PLANTS BURN, PERIOD

- All plants will burn: diff is heat, ignition, stay lit
- General size and shape of plants affects intensity of a fire
 - Grasses: typ. short flames, fast moving, not as hot
 - Trees & shrubs: typ. Hotter, slower, taller flames
 - Generalizing not perfect



GENERALIZATIONS

- Non-resinous
 - Deciduous < evergreens
 - Broadleaf < needles
- Moist, easily bent < stiff or leathery
- Thick leaves < fine
- Slower growing
- Fewer branches, leaves
- Less leaf litter



Bamboo

GENERALIZATIONS

Less flammable cont.:

- Open branching habit
- Watery sap < gummy thick sap
- Fragrance-free foliage
- Hairless, non-fuzzy
- Silver foliage except native sages



Stachys byzantina

EUCALYPTUS FO' EXAMPLE ...



GENERALIZATIONS

- Natives less flammable?
 - Fines more flammable?
 - Well watered?
 - Drought tolerant?
-
- GET SPECIFIC



Stipa gigantea

RESISTANT CANADIAN NATIVES

- Las Pilitas totally geeky leaf burn times study:
http://www.laspilitas.com/classes/fire_burn_times.html
- Burn times measured up to 60 seconds...

ONE MINUTE



RESISTANT AU NATIVES

CSIRO study: most under 1 min to burn @752°F (same as Las Pilitas)

- *Lomandra longifolia*
- *Anogoanthos*
- *Casuarina glauca*
- *Acmena smithii* (myrtle family)
- *Tristaniopsis laurina*



RESISTANT OTHERS

- Agapanthus (favored in AU as a firebreak)
- Liriope
- Raphiolepis
- Dianella
- Gazania
- Persimmon



LANDSCAPE MAINTENANCE

BF Principles & practices
kept coming up!

- Soil health
- Avoid compacting soil
- No till
- Avoid erosion
- Proper watering
- Avoiding herbicide
- Compost



LANDSCAPE MAINTENANCE

Don't Shear

- Stressful
 - Deadwood, twiggy
 - Fine texture
 - Too dense
-
- Use proper PRUNING instead to support good structure and health!



LANDSCAPE MAINTENANCE

Stay hydrated

- Keep trees alive in drought
- Avoid deficit watering, especially when the risks are enhanced
- Keep lawns watered or convert
- Rinse foliage on occasion
- Use compost and mulch!



LANDSCAPE MAINTENANCE

Pruning & cleaning

- NO shearing
- Prune properly and in the appropriate season
- Keep palms “clean and trimmed”
- Remove dry blades from ornamental grasses
- Keep any turf short



LANDSCAPE MAINTENANCE

Pruning for health:

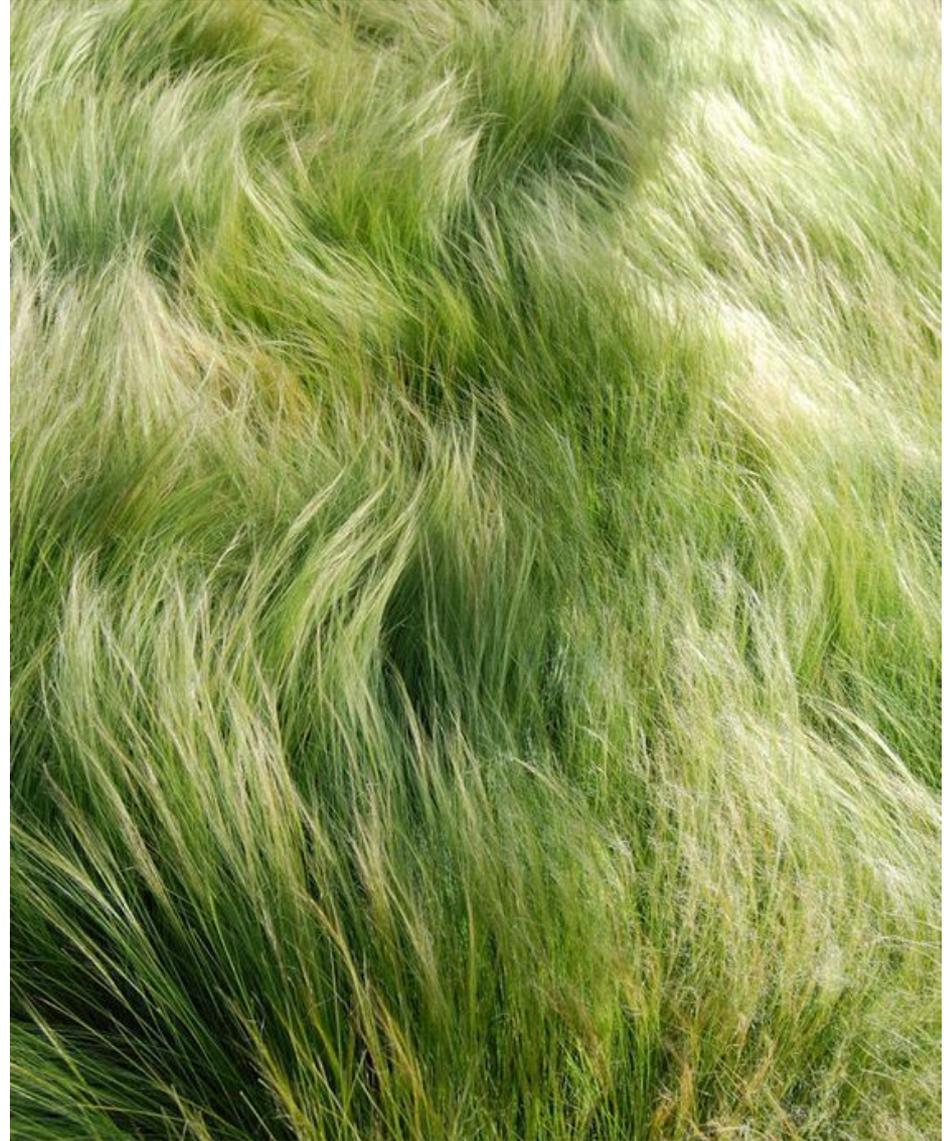
- Remove co-dominant leaders
- Excessively long or horizontal branches
- Signs of decay
- Cracks at branch unions
- Arborist evaluated safety



LANDSCAPE MAINTENANCE

Fine fuels

- Keep piles of cuttings from ‘stockpiling’
- Don’t keep piles of mulch
- Remove dry, dead material from building up even on succulents.
- Avoid invasives
- Eliminate weeds



LANDSCAPE MAINTENANCE

Conflict avoidance

- Keep trees from overhanging building
- Be aware of ignition sources
- Keep BBQs away from flammable materials
- Keep side paths clear for fire fighters' access



LANDSCAPE MAINTENANCE

Mowers, trimmers, etc:

- Use ones w/ motors before 10am (not in the heat of the day or when it is windy!)
 - Use trimmer on dry vegetation, not mower!
 - Remove rocks hidden in grass or weeds
 - Keep equip well maintained and clean. Don't top tanks.
 - Clearance, permits, extinguishers
- Put it in maintenance manual for Client / Owner
 - Do it at your house and explain it to your neighbors!



DOOM 'N' GLOOM?



ENVIRONMENTAL SERVICES

- Cleaning
- Providing Habitat
- Killing disease and pests
- Next Generation

Cooper and Friends



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IN A NUTSHELL

- Design can help slow a fire, but everything burns in the right conditions. Our best approach is limiting the damage and buying time.

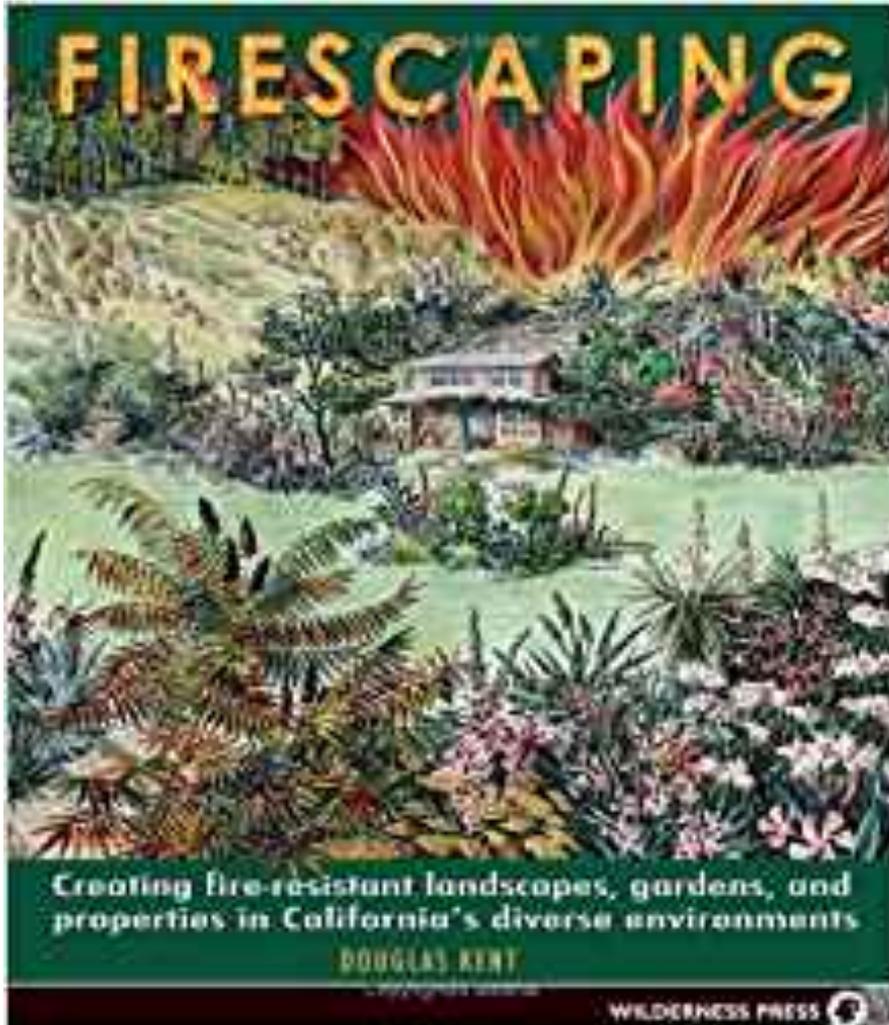


IN A NUTSHELL



- Firescaping isn't a style, it is
 - Informed decisions
 - Good garden hygiene
 - Proper pruning
 - Healthy plants

RESOURCES



- FIRESCAPING by Douglas Kent
- UC ANR pubs
- CalFire.CA.gov
- Diablo Fire Safe Council
- IBHS
- ReScapeCA.org

A FIRESCAPED GARDEN IS NEVER CREATED ONCE, BUT MAINTAINED OVER A LIFETIME

-Douglas Kent



Photo credit: University of Wisconsin
Ecosystem and Landscape Ecology Lab