



RESILIENT
LANDSCAPING:
Gardening in the
Defensible Space
Zone

*Garden as if life
depends on it!*

For the Mark West Watershed
Community

Sponsored By:
Sonoma Resource
Conservation District

Presented By:
Resilient Landscapes Coalition

Funded By: County of Sonoma

April 26, 2022

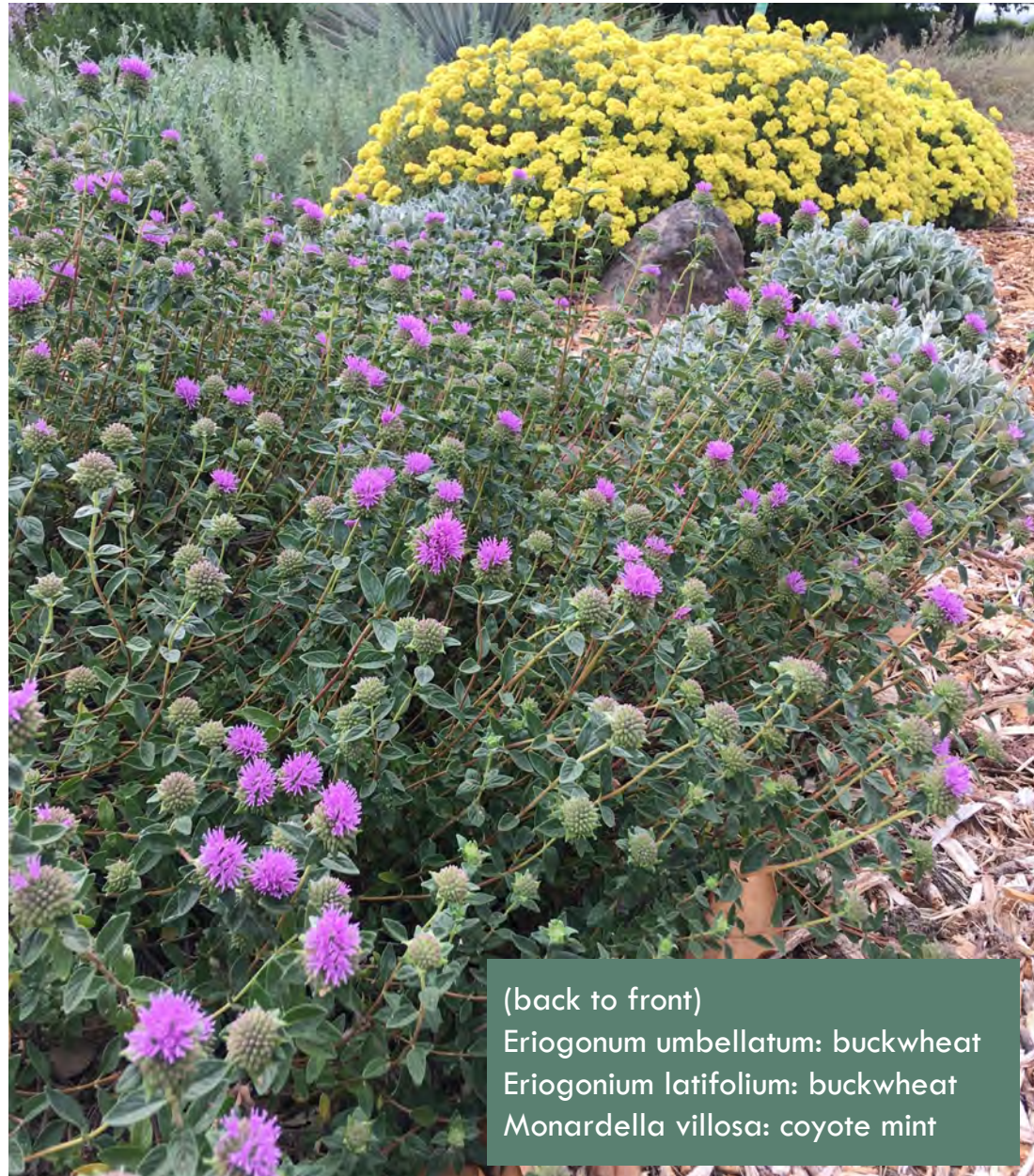
Resilient

- a. capable of withstanding shock without permanent damage or rupture*
- b. tending to recover from or adjust easily to misfortune or change*

THIS IS A WEBINAR:
YOU DO NOT HAVE AUDIO
OR VIDEO ACTIVATED

THIS WEBINAR IS BEING
RECORDED

QUESTIONS: WILL BE
TAKEN FROM THE Q&A
BOX ONLY



(back to front)
Eriogonum umbellatum: buckwheat
Eriogonum latifolium: buckwheat
Monardella villosa: coyote mint

Resilient Landscapes Coalition

Our Team:

- Fire Safe Sonoma *firesafesonoma.org*
 - **Roberta MacIntyre**
 - **Marika Ramsden**
- Habitat Corridor Project *habitatcorridorproject.org*
 - **April Owens**
- Sonoma Ecology Center *sonomaecologycenter.org*
 - **Ellie Insley**
 - **Jon Kanagy**
- UC Master Gardener Program, Sonoma County
sonomamg.ucanr.edu
 - **Mimi Enright**
 - **Jennifer Roberts**

In Partnership with:

- County of Sonoma Fire Prevention Division
- CAL FIRE & Local Fire Departments

More info at: **SonomaResilientLandscapes.com**

Outline

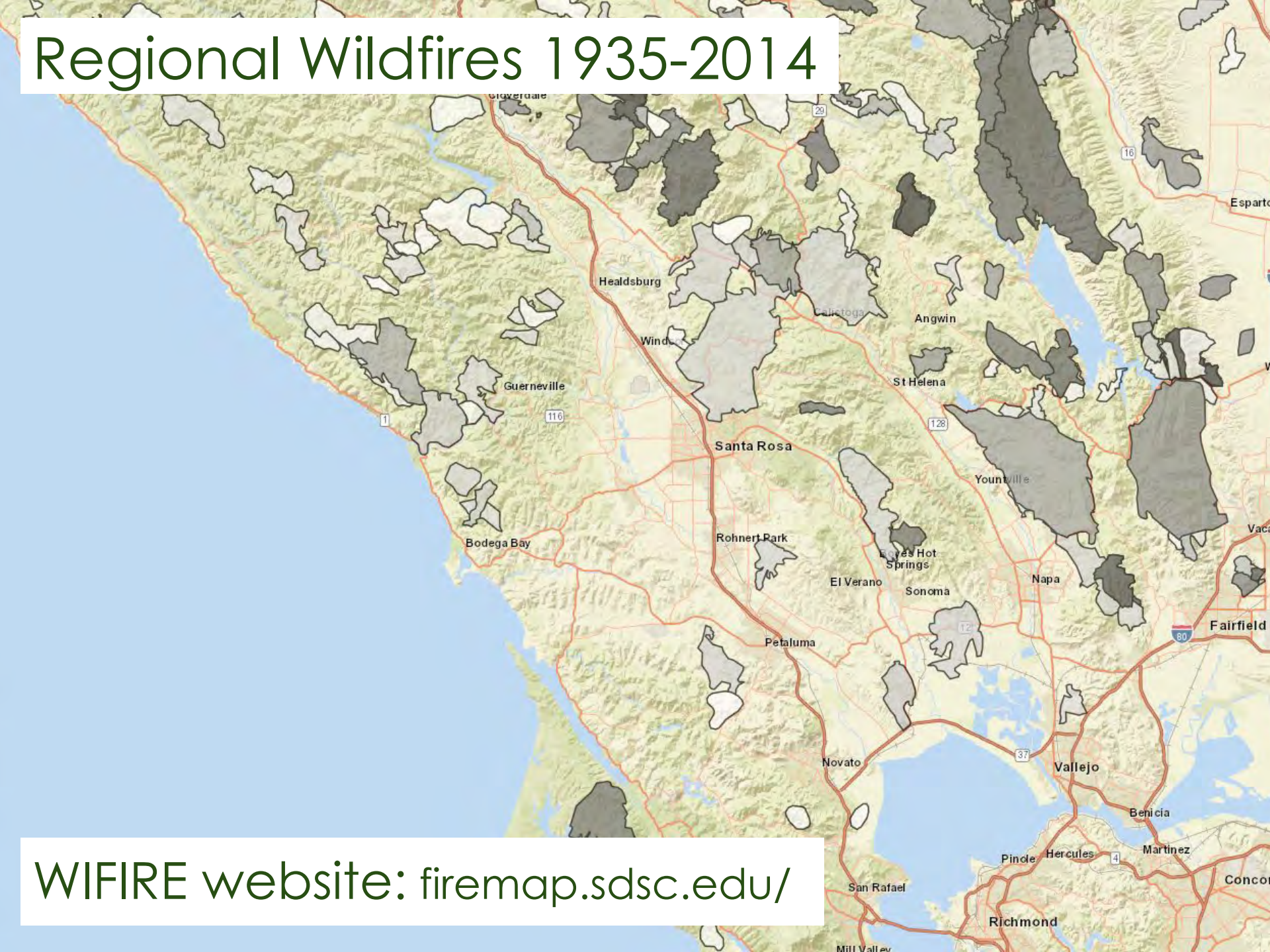
- **Fire Context; Ecology & Sustainability**
Jon Kanagy (25 minutes)
- **Design and Maintenance Principles**
Mimi Enright (25 minutes)
- **Landscape Design and Planting Examples**
April Owens (25 minutes)
- **Structural Hardening in the WUI**
Jeff Lemelin (15 minutes)
- ? **Questions & Conversation** (30 minutes)



**Defensible Space that is Beautiful, Sustainable,
and Biodiverse**
“The myth of the moonscape”

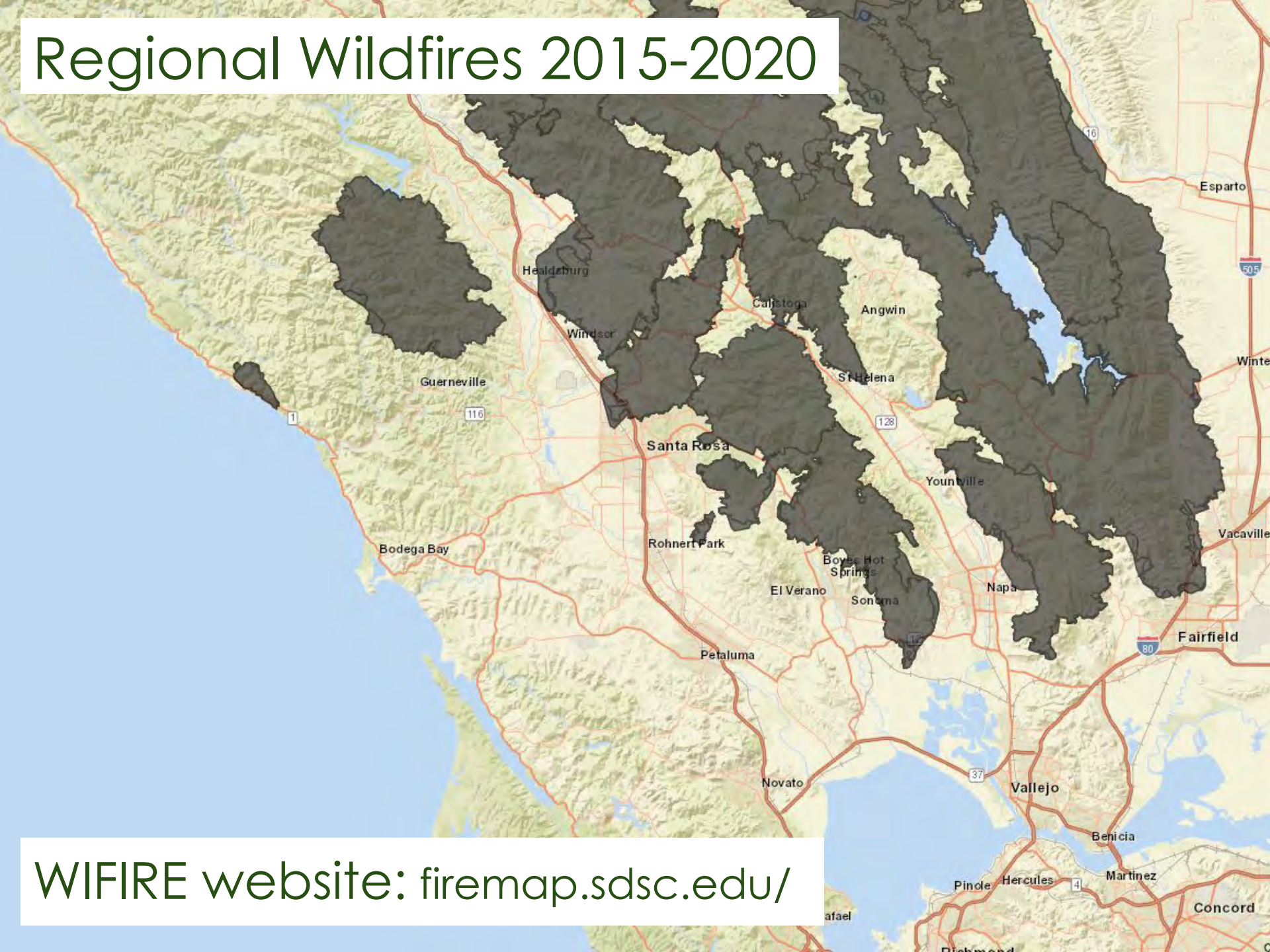


Regional Wildfires 1935-2014



WIFIRE website: firemap.sdsc.edu/

Regional Wildfires 2015-2020

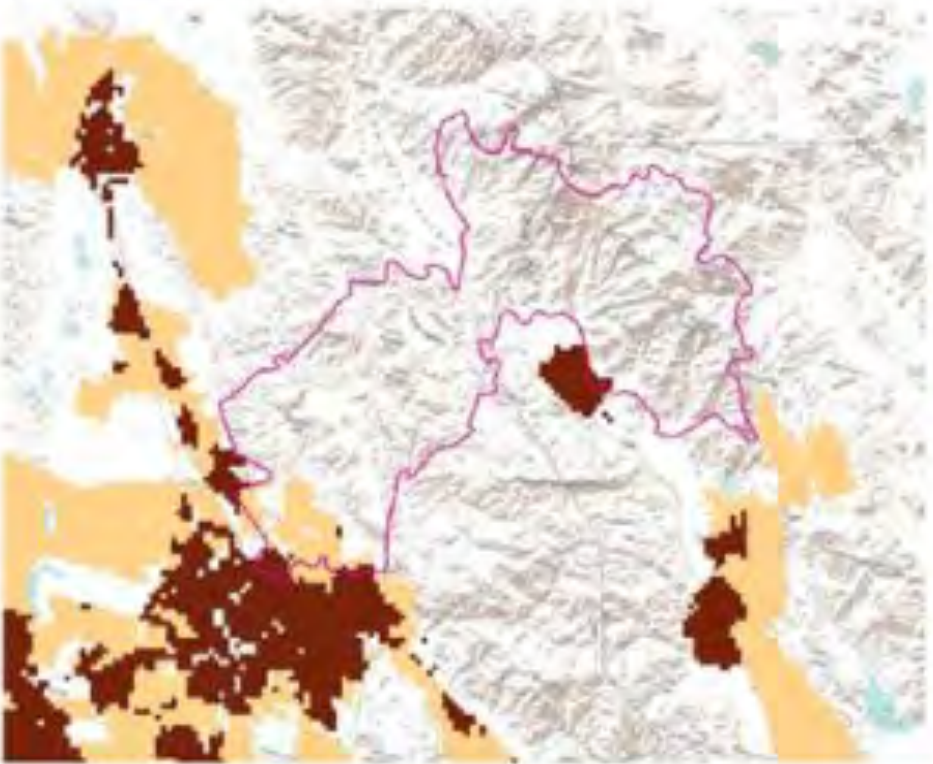


WIFIRE website: firemap.sdsc.edu/

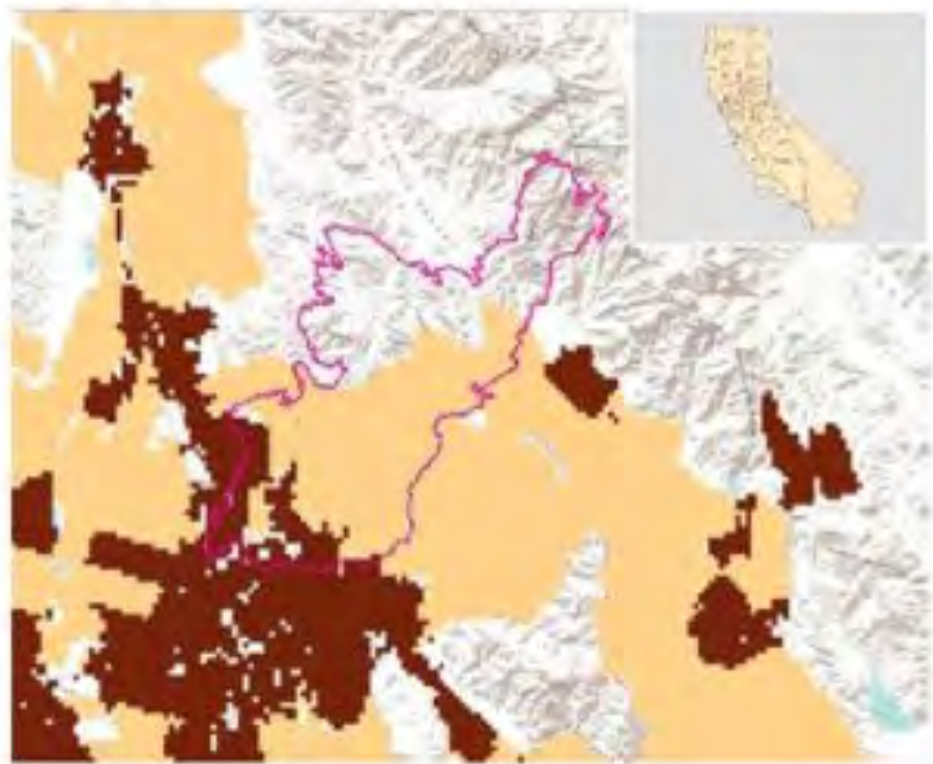
Wildland Urban Interface



a 1964 Hanly Fire



b 2017 Tubbs Fire



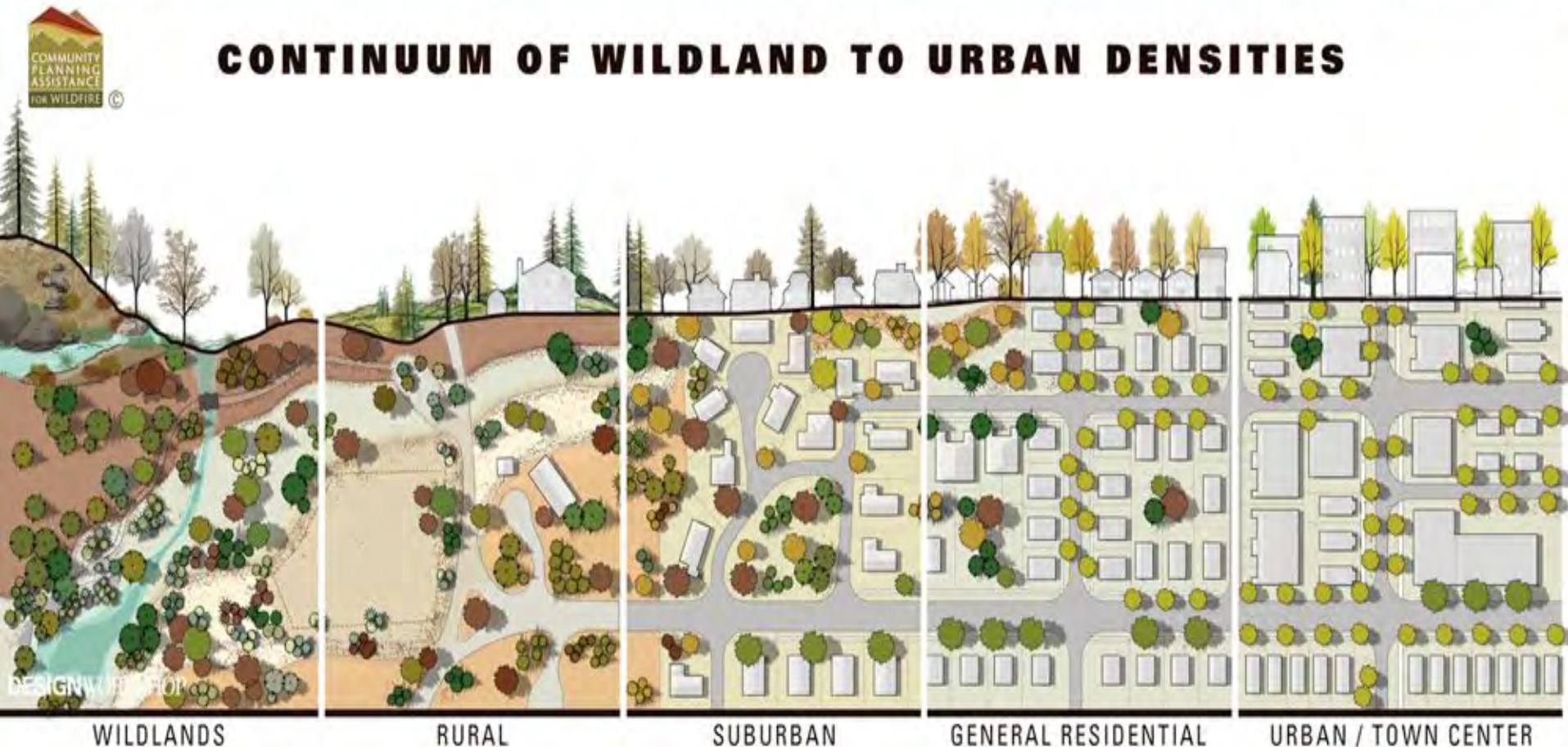
Low-density housing development
High-density housing development

Jon E. Keeley and Alexandra D. Syphard

Wildland Urban Interface

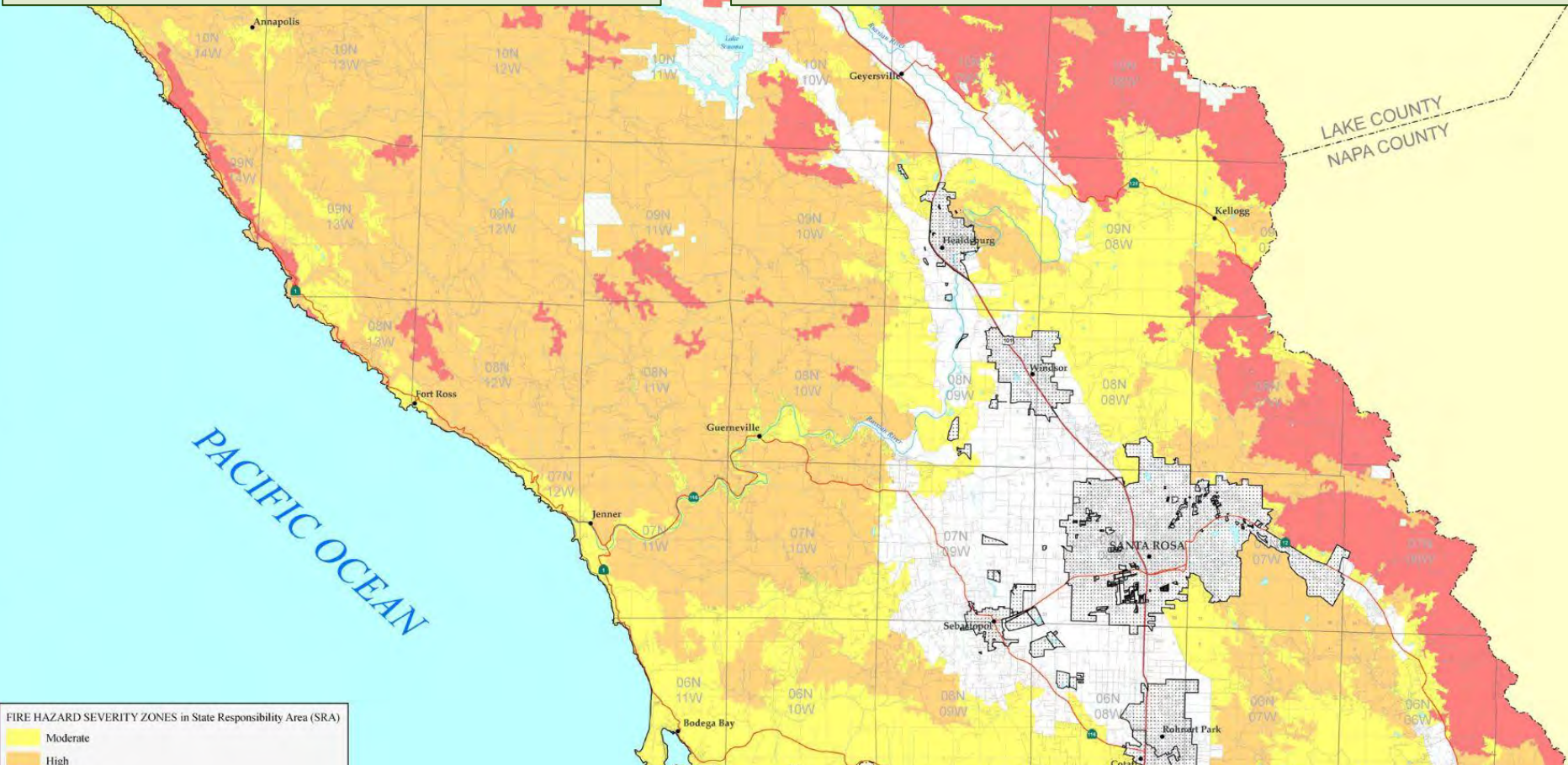
- WUI: an area where homes and associated structures are built adjacent to or among forests, shrubs, or grasslands.
- Climate change + fire suppression + increased development in wildland = increased fire risk
- = increased potential for catastrophic fire
 - loss of homes & lives; air/water pollution, disposal, increased use of resources to rebuild

CONTINUUM OF WILDLAND TO URBAN DENSITIES



Know your Hazard Zone LRA or SRA

Sonoma County Fire Hazard Severity Zones adopted by CAL FIRE 2007



FIRE HAZARD SEVERITY ZONES in State Responsibility Area (SRA)

- Moderate
- High
- Very High

FIRE PROTECTION RESPONSIBILITY

- Federal Responsibility Area (FRA)
- Local Responsibility Area (LRA) - Unincorporated
- Local Responsibility Area (LRA) - Incorporated

Defensible Space Regulations:

- State Public Resources Code 4291 (SRA)
- Local Ordinances: Sonoma County Ordinance Chapter 13A; City of Santa Rosa (LRA)
- Additional requirements in **High and Very High Fire Hazard Severity Zones**

Public Resources Code 4291-4294 direct the California Department of Forestry and Fire Protection (CAL FIRE) to map the hazard within State Responsibility Areas (SRA) based on relevant factors such as fuels, terrain, and weather. These statutes were passed after significant wildland-urban interface fires, consequently these hazards are described according to their potential for causing ignitions to buildings. These zones referred to as Fire Hazard Severity Zones (FHSZ), provide the basis for application of various mitigation strategies to reduce risks to buildings associated with wildland fires. The zones also relate to the requirements for building codes developed to reduce the ignition potential to buildings in the wildland-urban interface zones.

These maps have been created by CAL FIRE's Fire and Resource Assessment Program (FRAP) using data and models describing development patterns, estimated fire behavior characteristics based on potential fuels over a 30-50 year time horizon, and reported burn probabilities to quantify the treatment and nature of vegetation the exposure to near construction. Details on the project and specific modeling methodology can be found at <http://map.cdf.ca.gov/projects/hazardmethods.htm>.

The version of the map shown here represents the official "Maps of Fire Hazard Severity Zones in the State Responsibility Area of California" as required by Public Resources Code 4291-4294 and entitled in the California Code of Regulation, Title 14, Section 1280 Fire Hazard Severity Zones, and as adopted by CAL FIRE on November 7, 2007.

An interactive system for viewing map data is hosted by the UC Center for Fire at <http://firecenter.berkeley.edu/hsz/>.

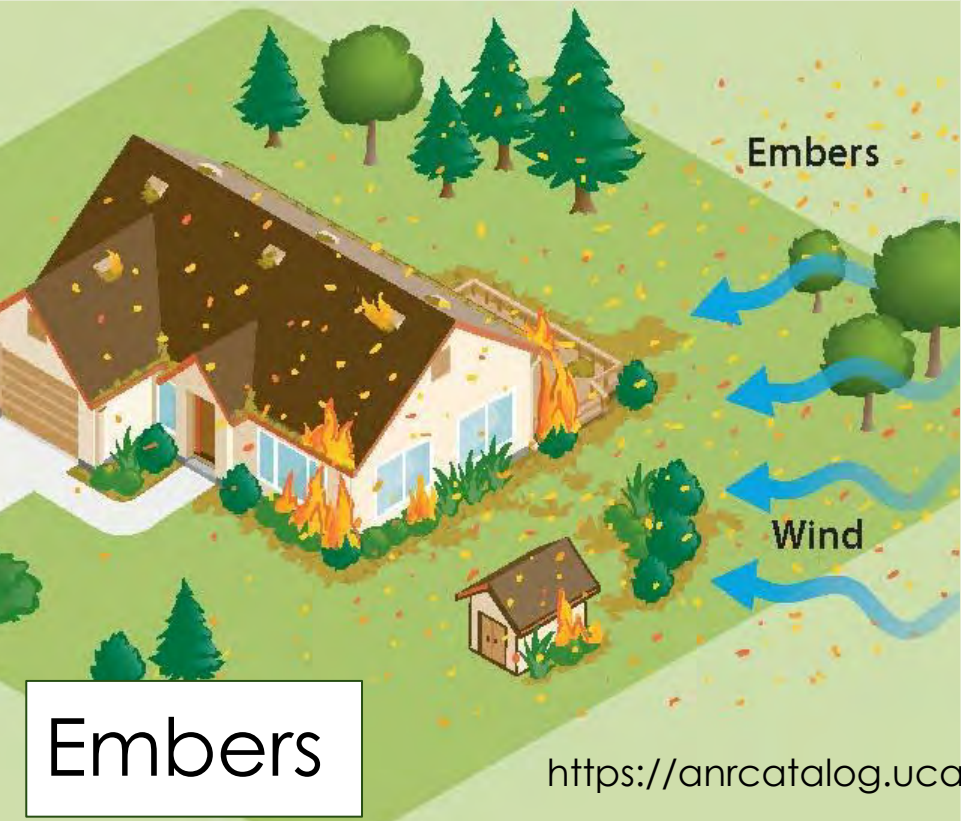
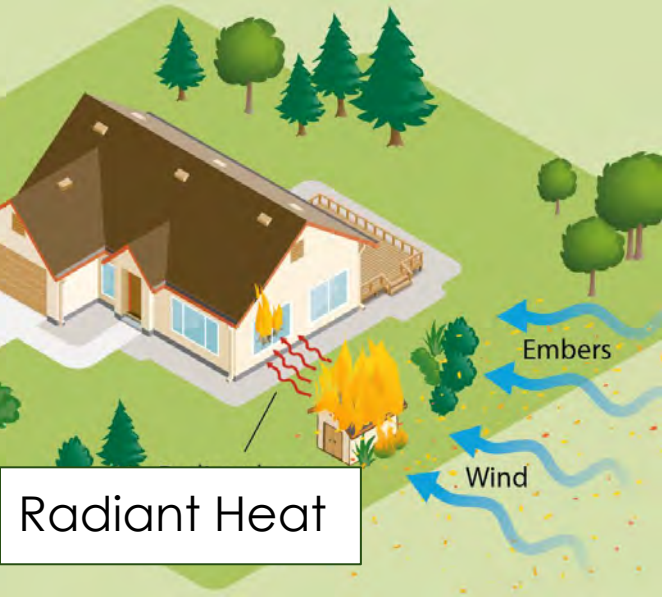
Questions can be directed to David Sappis, at 916.445.5369, davis.sappis@fire.ca.gov.

Assessment of Risk

Ask yourself:

- What are the vegetation patterns in the broader landscape around my community, and how do they contribute to potential fuels?
 - What are the resources and conditions in my neighborhood?
 - What are the conditions on my own property, including the topography? Has the house been assessed? Have home hardening practices been completed? If so, what steps should be taken working out into the landscape?
 - What is my own personal perspective on risk? How will I balance risk and other factors such as sustainability, aesthetics, and home improvement costs?
-
- Public Resources Code (PRC) 4291
 - “The amount of fuel modification necessary shall consider the flammability of the structure as affected by building material, building standards, location, and type of vegetation.”
-
- Each individual must assess their own personal risk and tolerance, but:
 - Your risk decisions intersect with those of your neighbors!

Three types of Fire Exposure



<https://anrcatalog.ucanr.edu/pdf/8695.pdf>



Embers

The greatest cause of structure ignition

Your house may be the greatest fire threat to your neighbors!

Ecology and Sustainability in the Defensible Space Zone: Taking Care of All our Neighbors



- We have an important role in protecting **homes, habitat, ...**
- “For the first time in history...gardeners have become important players in the management of our nation’s wildlife.” - Douglas Tallamy



Defensible Space: Ecosystem Services

- Shade (air conditioning)
- Aesthetics
- Enrich soil and hold it in place
- Clean & manage stormwater (slow it, spread it, sink it, store it)
- Sequester carbon
- Support birds and other pollinators (biodiversity)





Defensible Space: Supporting Biodiversity



Biodiversity: the web of life above and below ground, is declining alarmingly.



Defensible Space:

Supporting Biodiversity: Biodiversity
= Redundancy

- Choose native species, at least 70%-80% - native pollinators prefer them
- Plant islands for bird and butterfly food and shelter
- Use integrated pest management
- Provide a water source





Defensible Space: Supporting Biodiversity

- Keep all plants healthy (appropriate **mulch** and irrigation)
- A healthy plant is also more fire resistant.
- Oak trees have highest food productivity (acorns, caterpillars)
- Leaf litter supports insects, birds, microorganisms and roots





Defensible Space: Supporting Biodiversity

- Timing of vegetation management is important
- Birds nest March-August
- Trim and prune Sept-February (when most plants are dormant)





Defensible Space:

Supporting Sustainability

- Enrich soil and hold it in place
- Carbon sequestration
- Encourage water to infiltrate
- Protect water quality



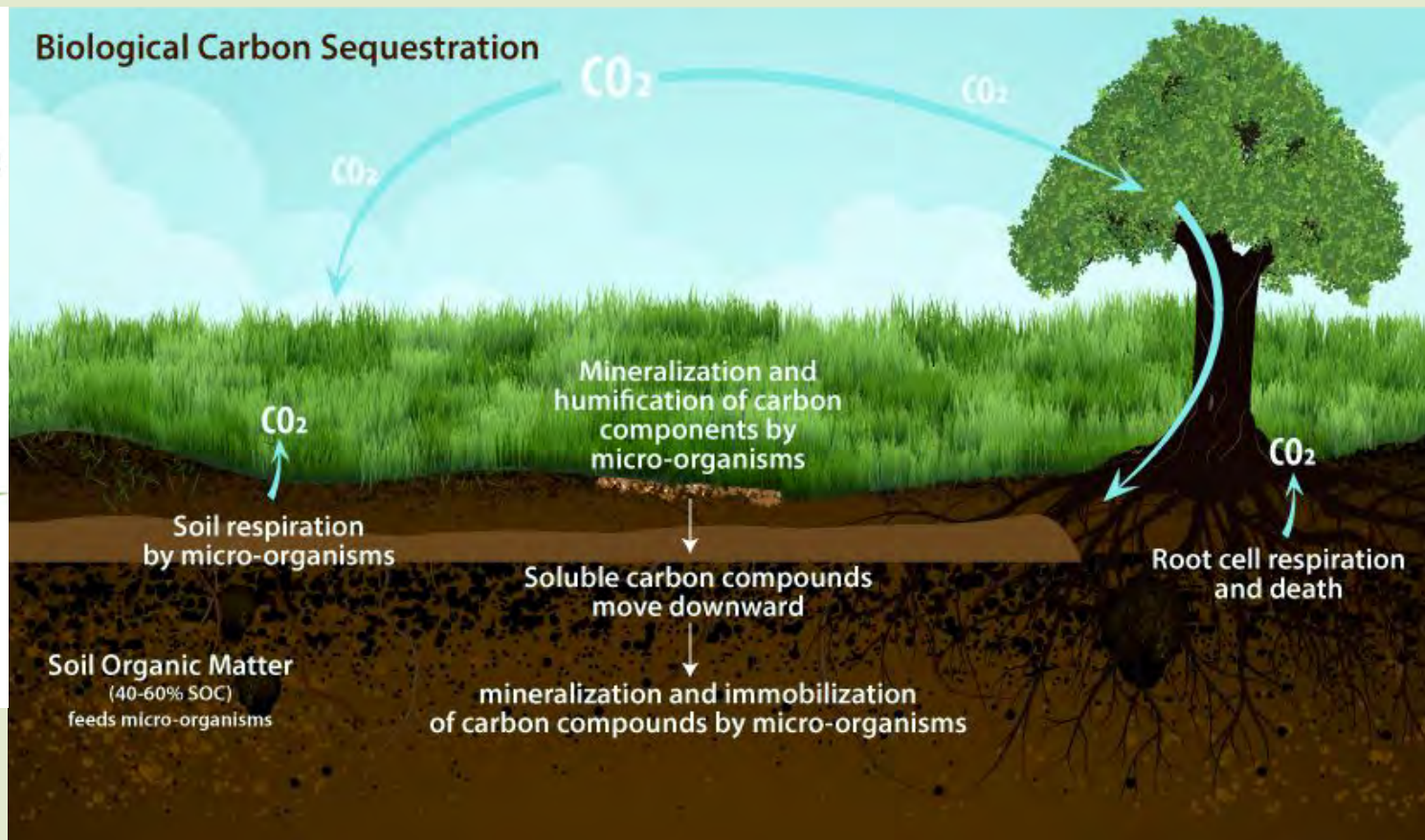
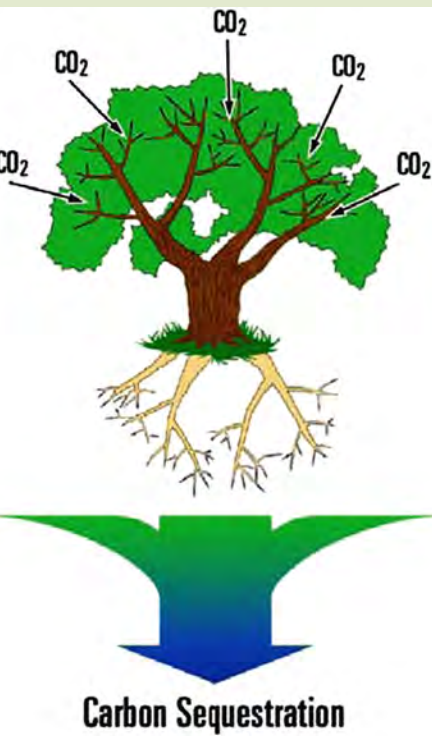
Defensible Space: Supporting Sustainability

- Avoid over-clearing to protect soil, streams, and fish, and reduce flammable invasive plants



Defensible Space: Sequestering Carbon

- Healthy soil sequesters more carbon, retains moisture and supports a healthier, more fire resistant landscape



Defensible Space: Nurturing soil



Soil is a complex network that includes plant roots, insects, fungi, and organic matter supplied by fallen leaves and organic mulch.

- Retain and incorporate organic matter
- avoid synthetic fertilizers
- keep soil covered with plants, mulch, and leaf litter where appropriate



Defensible Space: Clean and manage water

Keep water on your property: slow it, spread it, sink it, store it!



Credit: April Owens Design



Find resources at:
dailyacts.org/savewater

We encourage you to become more intimate with your garden and your wildlife neighbors, while reducing fire risk and enhancing biodiversity.

It is worth the time & effort!





RESILIENT LANDSCAPES



University of California
Agriculture and Natural Resources

UCCE Master Gardener Program
Sonoma County

Creating a Firewise & Sustainable Landscape

- Basic Principles
- Recommendations by Defensible Space Zone
- Maintenance & Mulch
- Recap

Homeowner action is key.

- There is no such thing as a fireproof home, especially in extreme conditions, but you can reduce your risk.
- Increasingly, there is more fire than there are firefighters.



YOUR WORK will be the most effective defense for your home.

Fire and Fuels

Fuel + Oxygen + Heat = Fire

Fuel + Weather + Topography = Fire Behavior

Fuel is... anything that will burn

- Vegetation (trees, woody shrubs, perennials)
- Landscape mulch
- Fencing, roofing, decks
- Lawn furniture
- Arbors, trellises, planter boxes

Our Basic Principles for Creating a Firewise & Sustainable Landscape



All plants in your landscape should be selected & placed carefully and should be regularly maintained & hydrated



Design for ease of maintenance!



Each home and landscape is unique and must be considered individually



Do what is required by law



Use science to inform your decisions – most of this information is science based but research is ongoing

Fire-wise Landscape Design & Maintenance Basics

Remove ALL dead or dying plants and branches and remove ladder fuels

Create islands of plantings with non-combustible paths between to interrupt the path of fire

Avoid planting or mulching close to structures

Prune tree limbs up at least 6' (or 1/3 of tree height) from ground

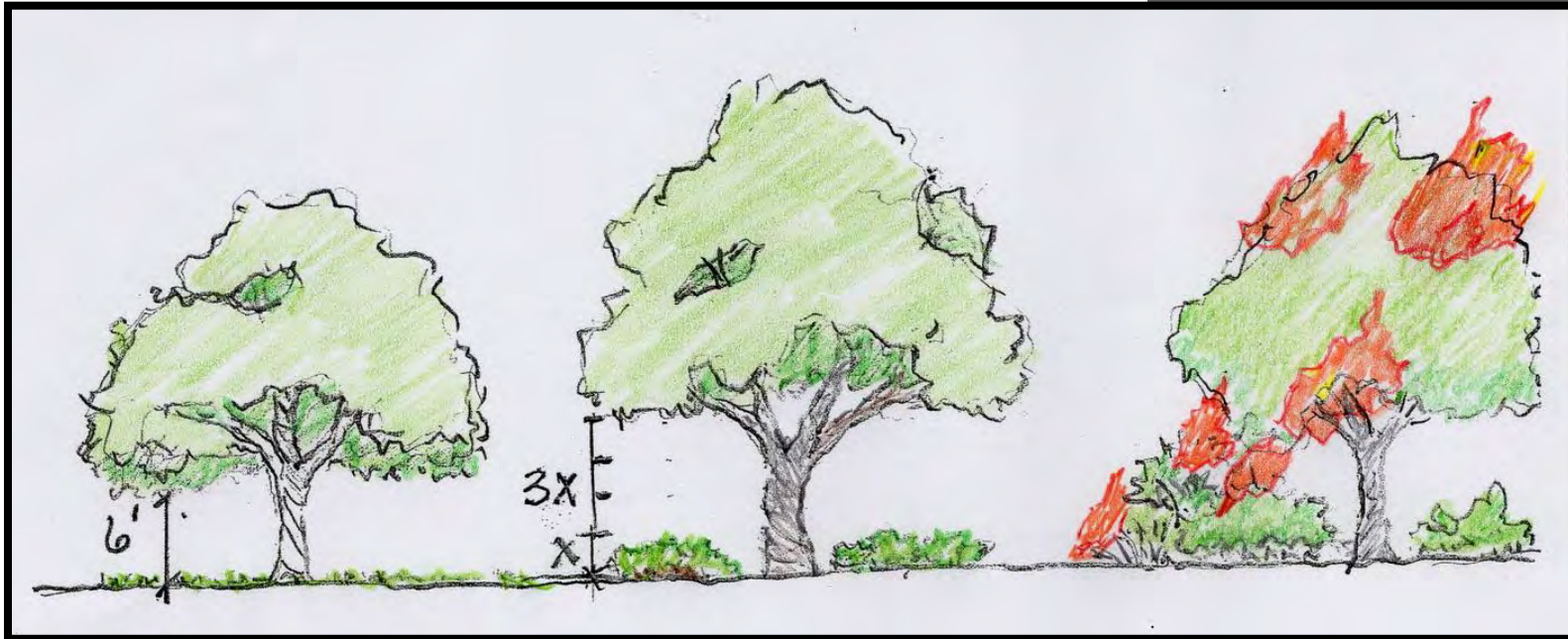
Gates & Fencing

- Consider alternatives to wood fences such as concrete or rock walls or metal fences
- Wire mesh fencing can reduce fuel mass while preserving views
- Gates made from organic material should not attach to the house



Eliminate Ladder Fuels

- Allow 3 times the height of the shrub to the lowest tree limb
- Keep fire from moving from ground into trees
- Limb up all trees at least 6' or $\frac{1}{3}$ height of tree



drawing courtesy of Ellie Insley

Firewise Plant Selection Considerations

- **How large** will this plant grow? (affects placement, fuel load & maintenance, PG&E lines)
- **Will it thrive** where it will be planted? (affects health & vigor and flammability)
- Will it require more **maintenance** than can be provided now or in the future? (affects fuel load)
- Is it **invasive**? (affects fuel load over wide areas)
- Consider how a plant changes over its **lifespan** (affects fuel load)

Firewise Plant Selection Considerations





← Ladder Fuels: Before




Ladder Fuels: After →



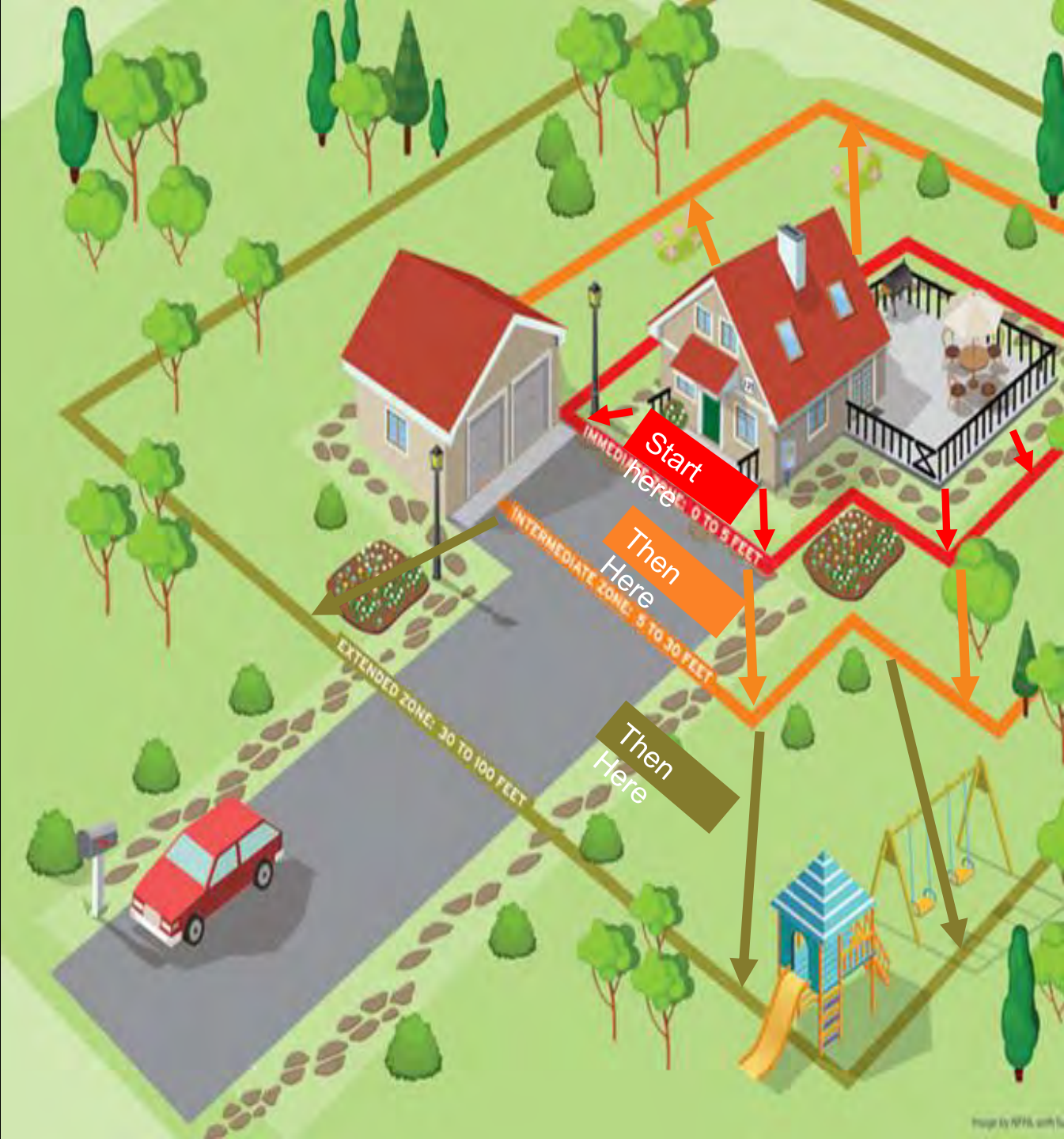
Photos courtesy of Ellis Insley

A large orange circle with a white border, partially overlapping the left edge of the slide.

Where to not to plant

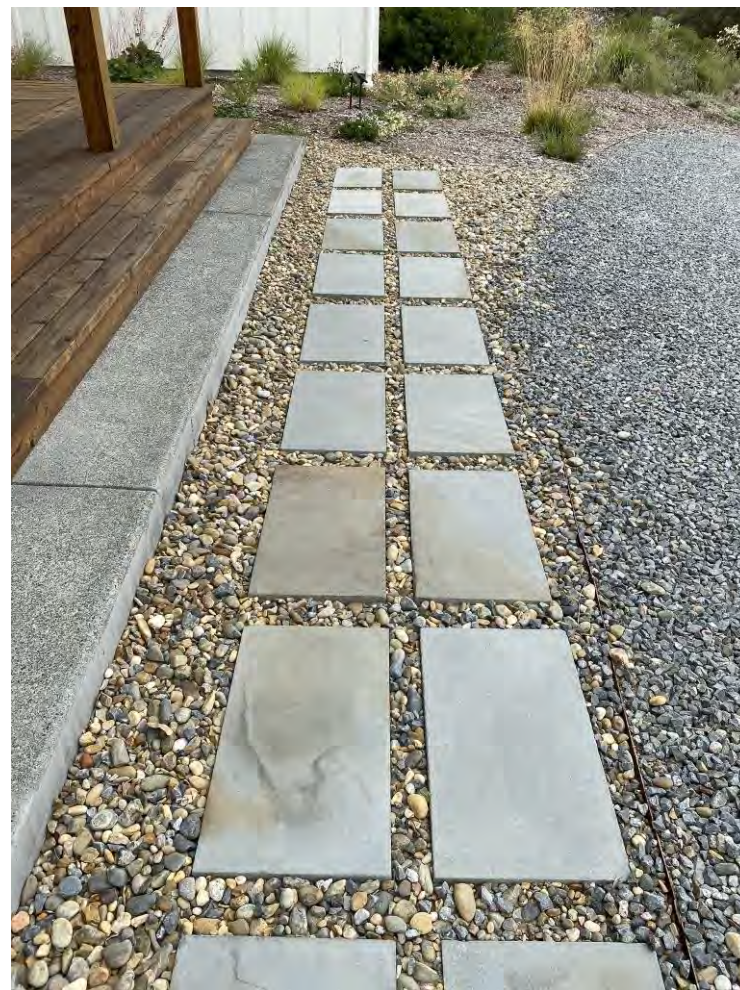
- 0-5' out from the house
 - Under vents and eaves
 - In front of windows or combustible siding
 - Under or near decks
 - Inside corners
- 
- A yellow curved graphic element consisting of two parallel curved lines, one above the other, located in the bottom right corner of the slide.

Start at the house and work out!



Zone Zero: 0-5' Ember Defense Zone

- Optimally **no** combustible materials in this zone!
- Minimize/remove planting here especially:
 - Under vents and eaves
 - In front of windows or combustible siding
 - Under or near decks



Photos & garden design: April Owens

Zone 0: 0-5' Ember defense zone



- Regularly remove dead/dry plant material
- Remove any dead branches & limb up existing tree limbs to 6' from ground or $\frac{1}{3}$ tree height

Zone 0: 0-5' Ember Defense Zone

- Roof litter maintenance is critical!
 - Maintain tree limbs 6' above roof if you won't be doing regular litter removal
- **County Code mandates cutting tree limbs 10' from stove pipe or chimney outlet**
 - **MAINTAIN YEAR ROUND!**



Zone 1: 5-30' Home Defense Zone

- Plant in “islands” separated by non-combustible pathways
- Use smaller shrubs and groundcovers (to 3') & herbaceous perennials
- Trees are OK if they're green & free of dead plant material



Photo & garden design April Owens

Zone 1: 5'-30' Home Defense Zone

Low growing,
mostly perennial

Low fuel = Well
Maintained

Great place for
hardscape close to
house

Make sure you can
access all plants for
maintenance



Photo courtesy of Clio Tarazi

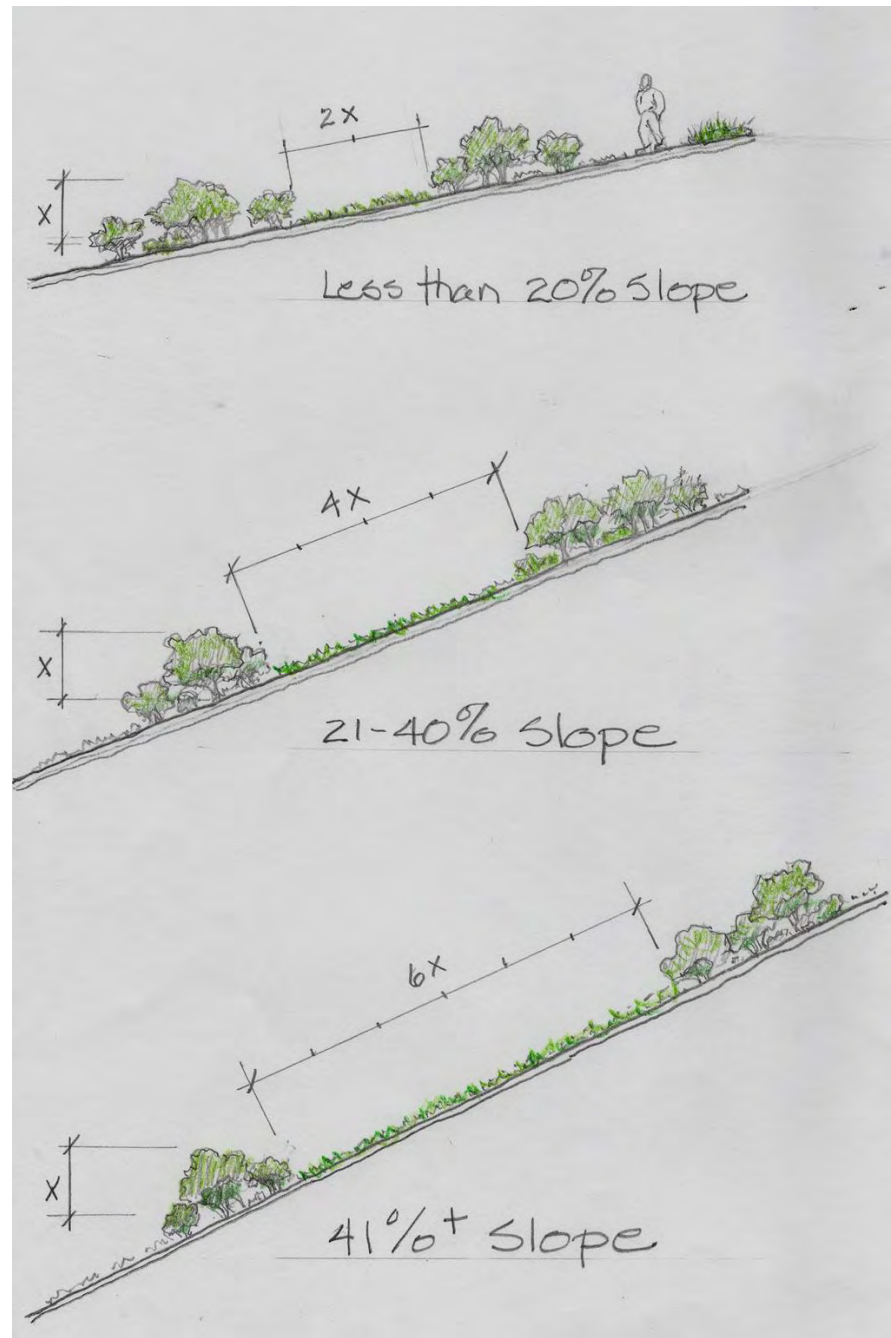
Zone 2: 30'–100' Reduced Fuel Zone

- Regularly remove dead plant material
- Keep annual grasses mowed to 4"
- 4-5' wide walkways can help separate planting areas & act as fire breaks



Suggested Spacing Guidelines (within 100' of buildings)

Graphic courtesy of
Ellie Insley



Ideal Spacing Guidelines (within 100' of buildings)

0% to 20% slope

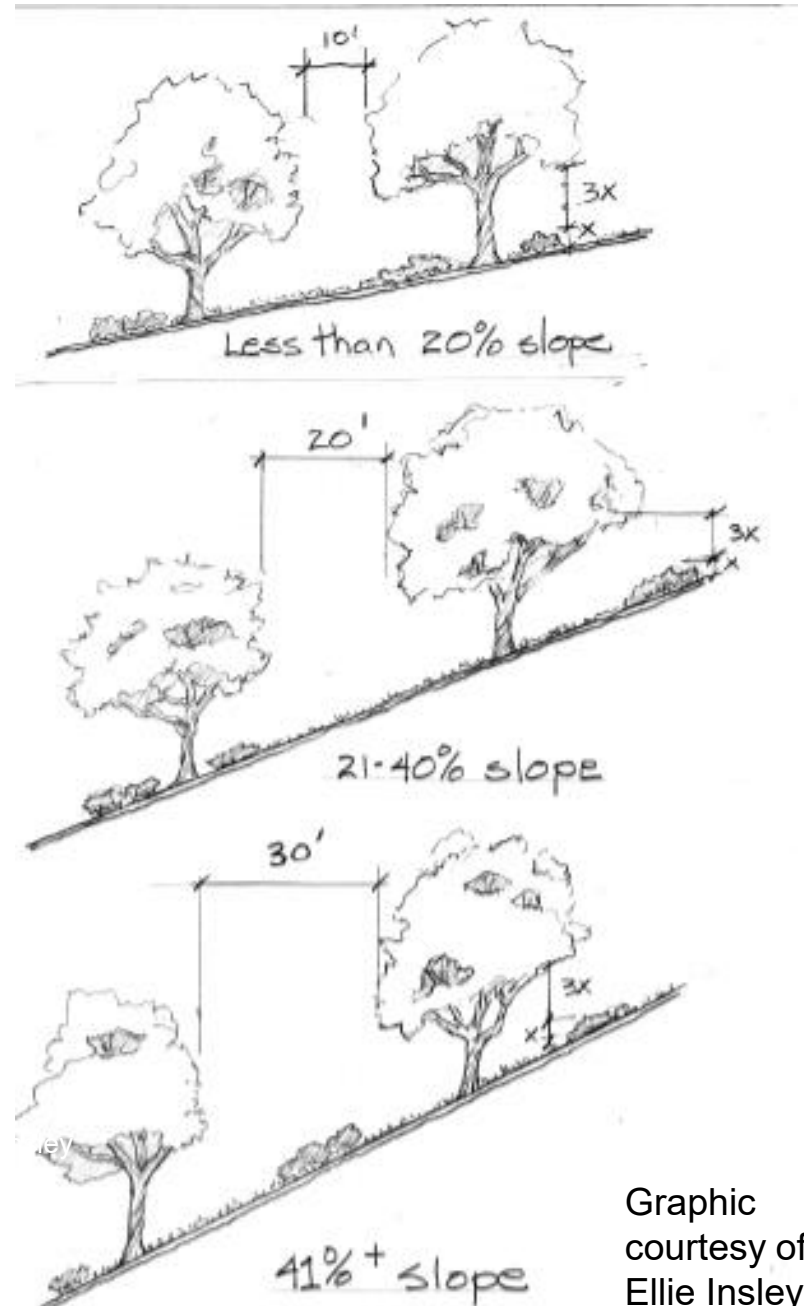
Trees spaced 10' apart
Shrub separated by a space 2 times the height

21% to 40% slope

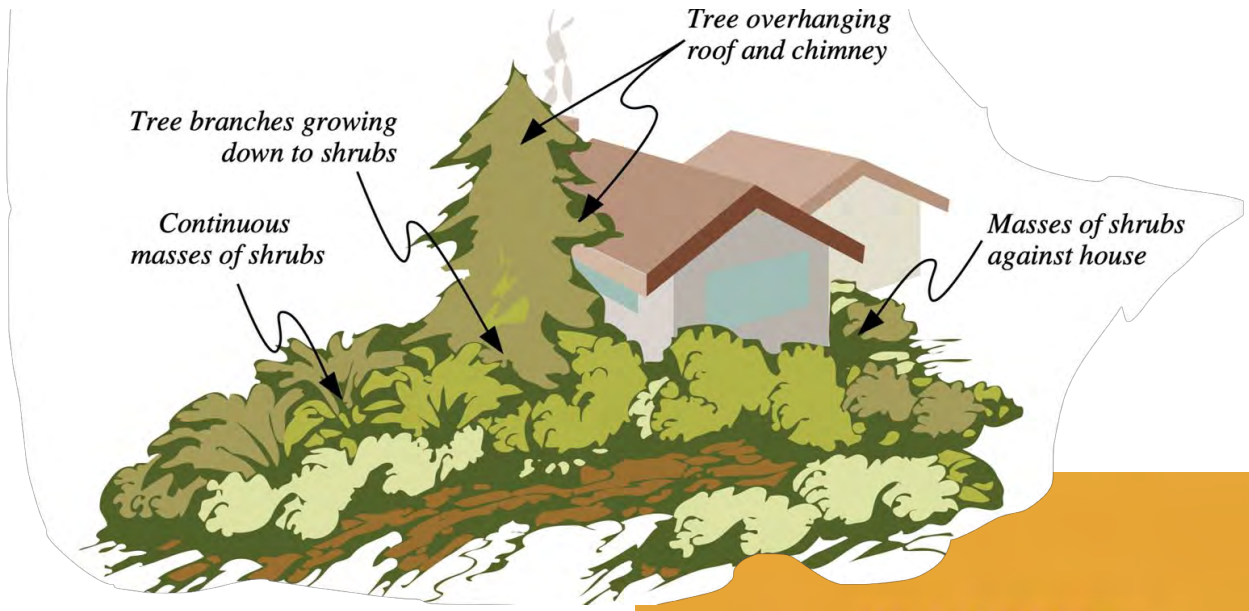
Trees spaced 20' apart
Shrubs separated by a space 4 times the height

41% slope or more

Trees spaced 30' apart
Shrubs separated by a space 6 times the height



Graphic
courtesy of
Ellie Insley



Before



After

5/9/2020

Access Zone

- Maintain vegetation on both sides of roads & driveway – 10' from road edge and 15' vertically
- Maintain 12' of unobstructed pavement for passage of vehicles

Neighborhood Considerations

- Start with your house & defensible space zones. Then talk with your neighbors! Work together to develop a fuel reduction plan for the entire neighborhood.
- Watch for maintenance needed -
- debris accumulating on a neighbor's roof, uncovered woodpiles, unmown tall weeds.
- What is total volume of vegetation in area? Any ladder fuels?

Work with your neighbors!



Photo: Mimi Enright

Shaded fuel break

- Control fire behavior by reducing ladder fuels
- Open the canopy
- Maintain ground fuels
- Facilitates fire suppression (ground and air attack)



Ongoing Maintenance

- Remove dead plants & dead branches from trees and shrubs
- Remove vines from trees & shrubs



Annually before fire season:

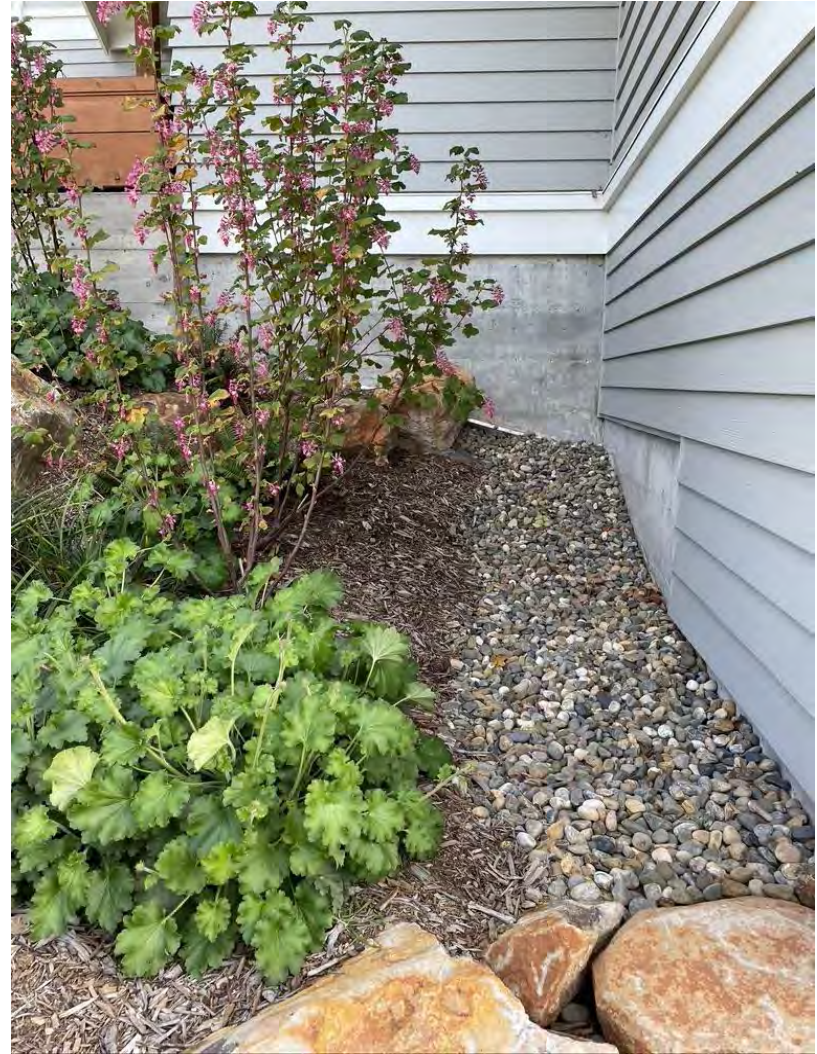
- Mow annual grasses & weeds to 4" tall or less
- Cut back woody perennials & shrubs as needed
- Thin overgrown vegetation
- Consider timing of plant removals/cutbacks based on wildlife cycles
- Move woodpiles to 30+ feet from buildings, or cover with fire resistant tarps and clear surrounding vegetation

Every few
years as
needed:

- Thin & reduce tree canopies to remove twiggy growth, maintain separation between trees & reduce overall fuel load
- Keep lowest branches of trees pruned up at least 6' from ground
- Cut back groundcovers & vines to remove build up of dry stems & dead leaves
- Cut back shrubs to renew

Mulch

No organic mulch in the 0-5' zone



Mulch

Separate mulched areas (2-3" deep) with non-combustible materials where possible, especially in 5-30'



Photo: Mimi Enright



Photo: Clio Tarazi

Mulch

Large sized composted arbor mulch are the best options in 30-100' zone (NO "gorilla hair")



Image courtesy of Fire Safe Marin

Defensible Space Zone Design Recap

- 0-5' zone from house: No organic materials if possible. Use inorganic materials such as gravel or stepping stones.
- 5-30' zone from house: Plant in "islands" with materials such as low herbaceous perennials, grasses or succulents, and specimen (or individual) shrub or tree are optimal.
- 30-100' zone from house: Same basic principles as the 5-30' zone, but you can include shrub and tree groupings in widely spaced groups separated by areas that break up the spread of wildfire.

Resilient Landscaping

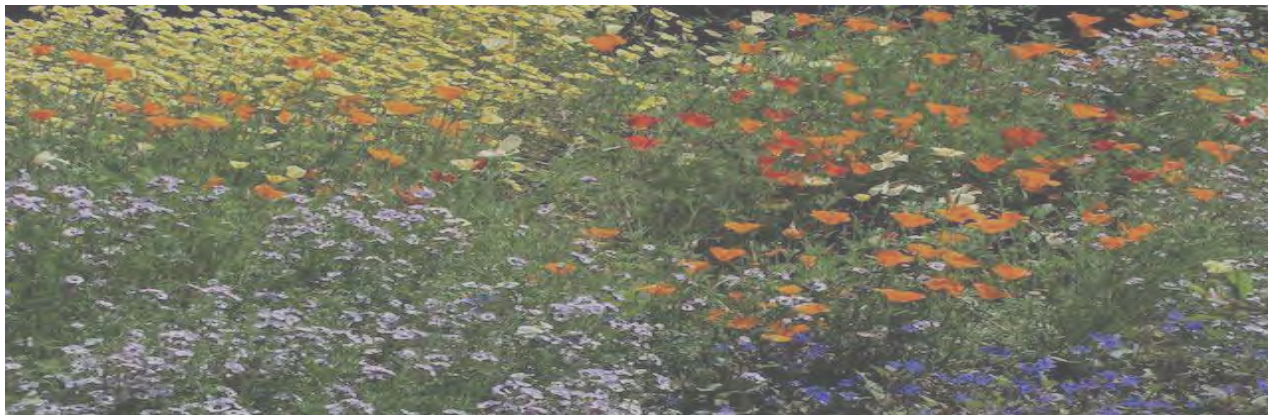
Ongoing maintenance is essential!

- Remove dead or dying branches from trees and shrubs regularly
- Prune out any dead material from the interior of shrubs if possible
- Remove any ladder fuels – prioritize removing any shrubs planted directly under trees

More Resources

For more resources go to the UC Master Gardener Program of Sonoma County web page: <http://sonomamg.ucanr.edu/>

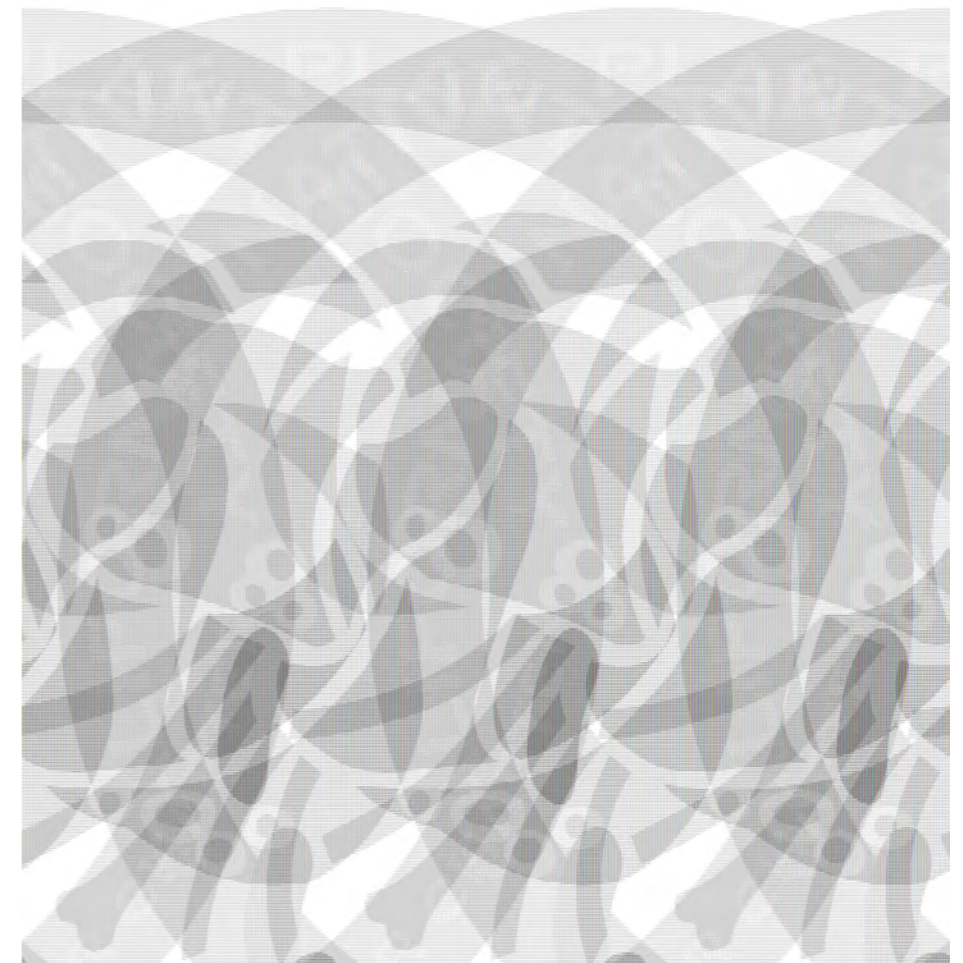
Or send an email to our Information desk at mgsonoma@ucanr.edu





Biodiverse, Drought Resistant,
Fire-wise and Beautiful

California Resilient Landscapes - Upper Mark West Springs



Mission

To conserve California native plants and their natural habitats, and increase understanding, appreciation, and horticultural use of native plants.

<https://milobaker.cnps.org/>

habitat corridor project

Mission

To create and promote California native plant restoration gardens in the urban environment.

HabitatCorridorProject.org

Resilient Landscapes

TIP: Take a Hike! - look at how Mother Nature designs. What plants have the most life on them.

Systems
Thinking

Resilient
landscapes
consider drought,
fire, and
biodiversity as
they are
designed.

Biodiversity = Redundancy!

so...

“If one species struggles or fails, its function within the ecosystem - for example to provide certain food nutrients, a specific type of shelter, or an essential chemical interaction it may be performed by one or more other species.” - Douglas Tallamy





Driveways and Auto Courts

TIP: Take a field trip to a materials yard and see what you like - so many options!

Decorative Rock
and Boulders

Permeable
Hardscape



Design 0'-5'



A little bit: Well Hydrated Plants

Bentgrass Turf - Delta Blue Grass



Dymondia Groundcover -
not native, but well behaved.

Tip: Use native turf options just be sure they are cut back in Summer



Swales and Rain Gardens.
Drain Away from Home.

Swale path

Design 0'-5' EXISTING TREES

Energy Savings

Coast Live Oak

Deciduous Trees

Vigilant Maintenance All year round now...

HOME SURVIVED KINCADE FIRE
HERE





Design 5'-30'

- Low growing
- Low fuel - Seasonal Maintenance
- Rock mulch between plantings or hardscape between plantings
- Well hydrated - easier with California native plants

Paths and Swales as Separation of Islands



Swale: a low or hollow place especially a marshy depression between ridges.



Rain Garden With Native Plants



Design 30'-100'

More Habitat - Larger Islands with
Shrubs - Plenty of Space Between





This Year

Eriogonum fasciculatum (California Buckwheat)



Last Year



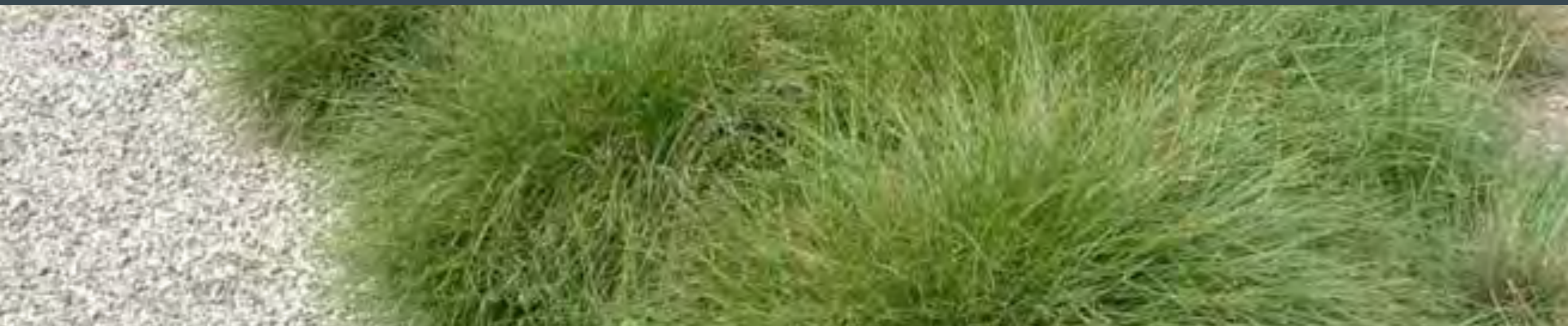
**Mimulus and Salvia
Deergrass in Background**

What to use between the masses of plants?



Gravel

Arbor Mulch



Mowed California Native Bunch Grasses or Well Maintained Groundcover





Why use California Native Plants?

Add your why in chat. What are your favorites? Are there insects and fauna you especially love?

- Biodiversity and the Food Web
- Sustainable
- Resilient
- Adapted
- Beautiful

Biodiversity Fact

There are over 1000 native bees in California that provide critical pollination to our native plants. 26 of them are the delightful bumblebees and the rest are solitary bees.

Frangula californica
'Mound San Bruno'
(Coffeeberry)



Tips for Successful Habitat Planting

Many Types of Flowers

Large Groupings - Pollinator Targets

Flowering at Different Times

Plants that Provide Both Nectar and
Pollen Sources

WOOLY SUNFLOWER
(*ERIOPHYLLUM*
LANATUM)



Big Habitat Value!

Groundcover to Large Shrub - Cultivars vs. Species



Buckwheat (*Eriogonum* spp.) and California Fuchsia (*Epilobium* spp.)

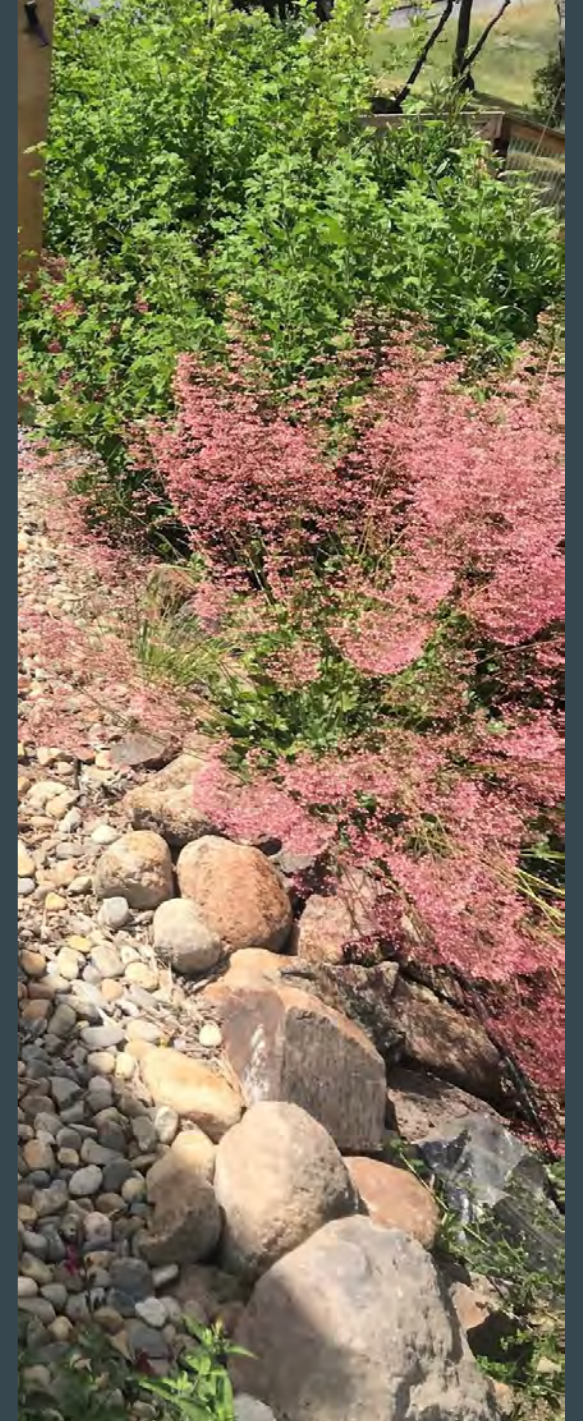
California Native Shrubs- Toyon (Heteromeles arbutifolia)



California Native Shrubs- *Ribes sanguineum* (California Currant)



In the Shade



Hummingbird sage (*Salvia spathacea*), Spicebush (*Calycanthus occidentalis*), Yerba Buena (*Satureja douglasii*) and Alum Root (*Heuchera micrantha*)

Biodiversity Islands: Mix Shrubs with low growing - well maintained plants - provide space between groupings

Sun to part -shade

- Coffeeberry (Frangula 'Mound San Bruno') or Toyon (Heteromeles arbutifolia)
- Sage (Salvia clevelandii and Salvia spathacea)
- California Fuchsia (Epilobium 'Wayne's Silver', 'Calistoga' or 'Everett's Choice')
- Manzanita (Arctostaphylos 'Howard McMinn' or local species)
- Monkeyflower (Mimulus aurantiacus)
- Add a grass (Deer Grass, California fescue, Hairgrass, etc...)



Drought, Fire, Native Plants and Irrigation

And soil health



Or Grid of Drip





Why? For our future.

THANK YOU



WE WILL SEND OUT :

AN EMAIL WITH THE VIDEO
RECORDING AND
POWERPOINT SLIDES

A POST WORKSHOP
SURVEY

PLEASE PARTICIPATE TO
HELP IMPROVE OUR
PROGRAM




RESILIENT LANDSCAPES COALITION

- Fire Safe Sonoma
- Habitat Corridor Project
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- UCCE Master Gardener Program of Sonoma County



*Epilobium
canum*

 <https://www.sonomaresilientlandscapes.com>