

Fire-smart Landscaping with Native Plants

Greg Rubin

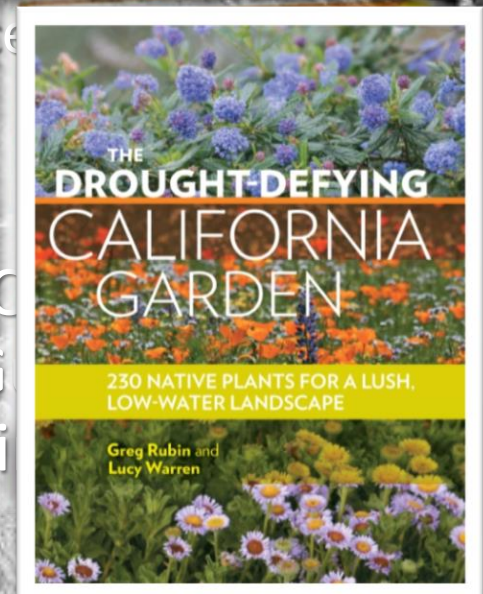
With Contributions from Richard Halsey

California's Own Native Landscape Design, Inc.

www.calown.com

Background

- Former aerospace engineer turned landscape contractor 24 years ago
- Design/installation of over 750 native landscapes in Southern California
- Several notable projects:
 - Infield of the Del Mar Thoroughbred Race
 - Lux Art Institute
 - Sanderling at Aviara
- Co-author (with Lucy Warren) of “The California Landscape: the Homeowner’s Design Guide Restoring its Beauty and Balance” on Ti



The Chaparral Ecosystem

Learning to live in a fire-prone environment



Chaparral

a unique plant community
characterized by...

drought-hardy shrubs,
a Mediterranean-type climate,
infrequent wildfire,
and increasing numbers of people living nearby.

**Chaparral
suffers an
identity
problem**



FORESTS



**GREAT BASIN
SAGEBRUSH/DI**



SHRUBLANDS



CALIFORNIA SAGE SCRUB

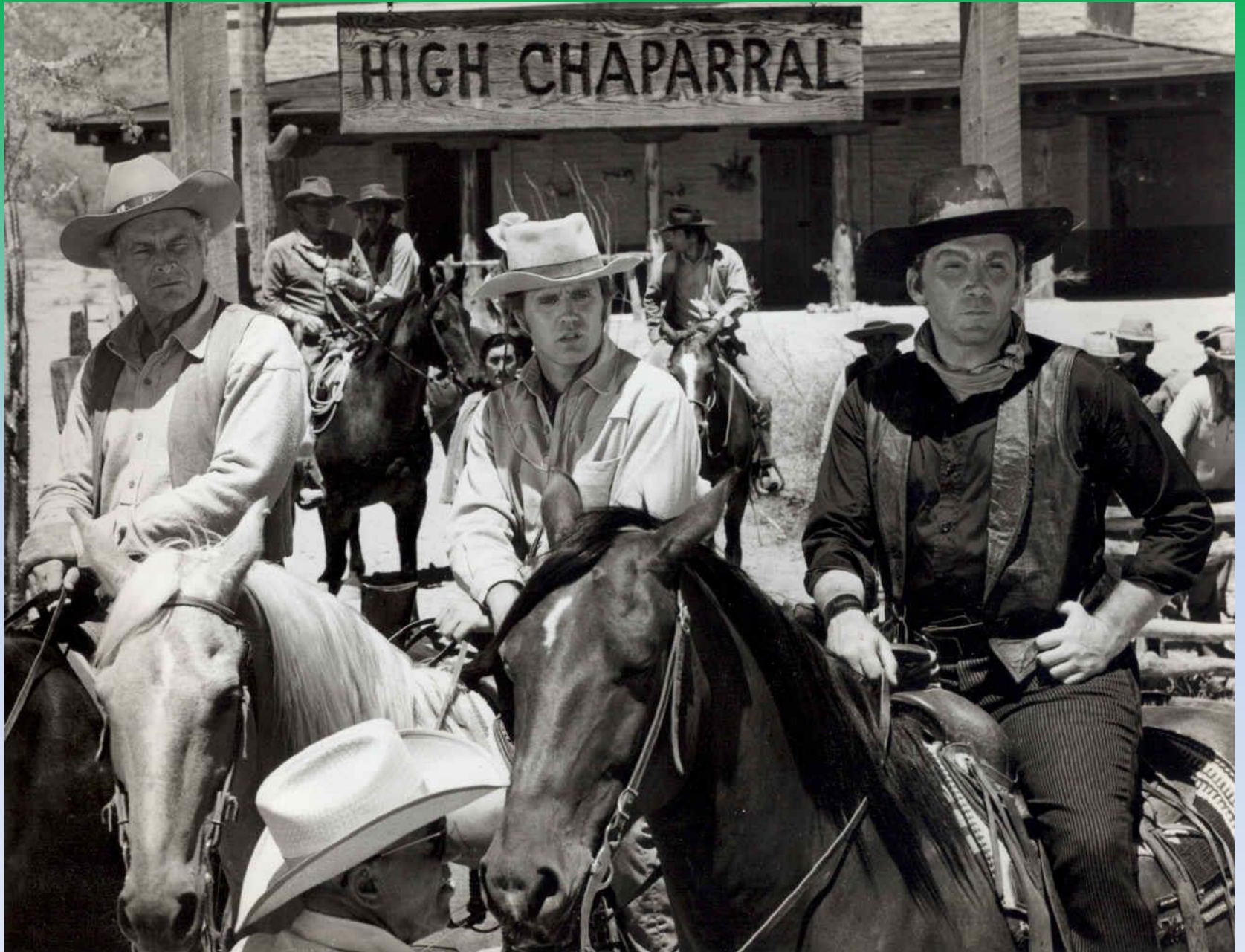


GRASSLANDS

**It's the ecosystem in
between**

What's in a name?





Firesmart L/S c. 2018 Cal Own

Protecting chaparral is critical to protecting biodiversity in California*

*it's not just "brush"



Los Osos, CA



Photo: Dianne Erskine-Hellrigel

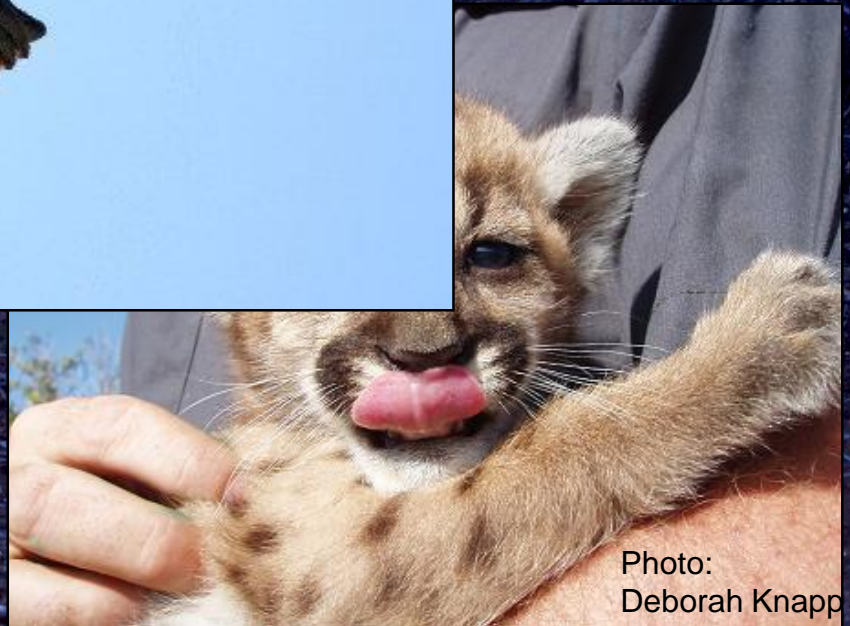


Photo: Deborah Knapp



The last grizzly in
Southern
California

Los Angeles Times
LATEST
Jan. 8, 1908.
WIPED OUT.
**LAST GRIZZLY
BEAR IS SHOT.**

*Steals Honey Near Santa
Ana; Pays the Penalty.*

*Hunters and Dogs Fight Her
in Final Struggle.*

*Battled Single-handed for
Twenty-five Years.*

Holy Jim Canyon



Fire

COLES LEEVE
ECOSYSTEM PRESERVE
Arco Western Energy
DIVISION OF OIL AND GAS
10000 S. 1000 E. 1000 N.
10000 S. 1000 E. 1000 N.

“Fuel” Reduction



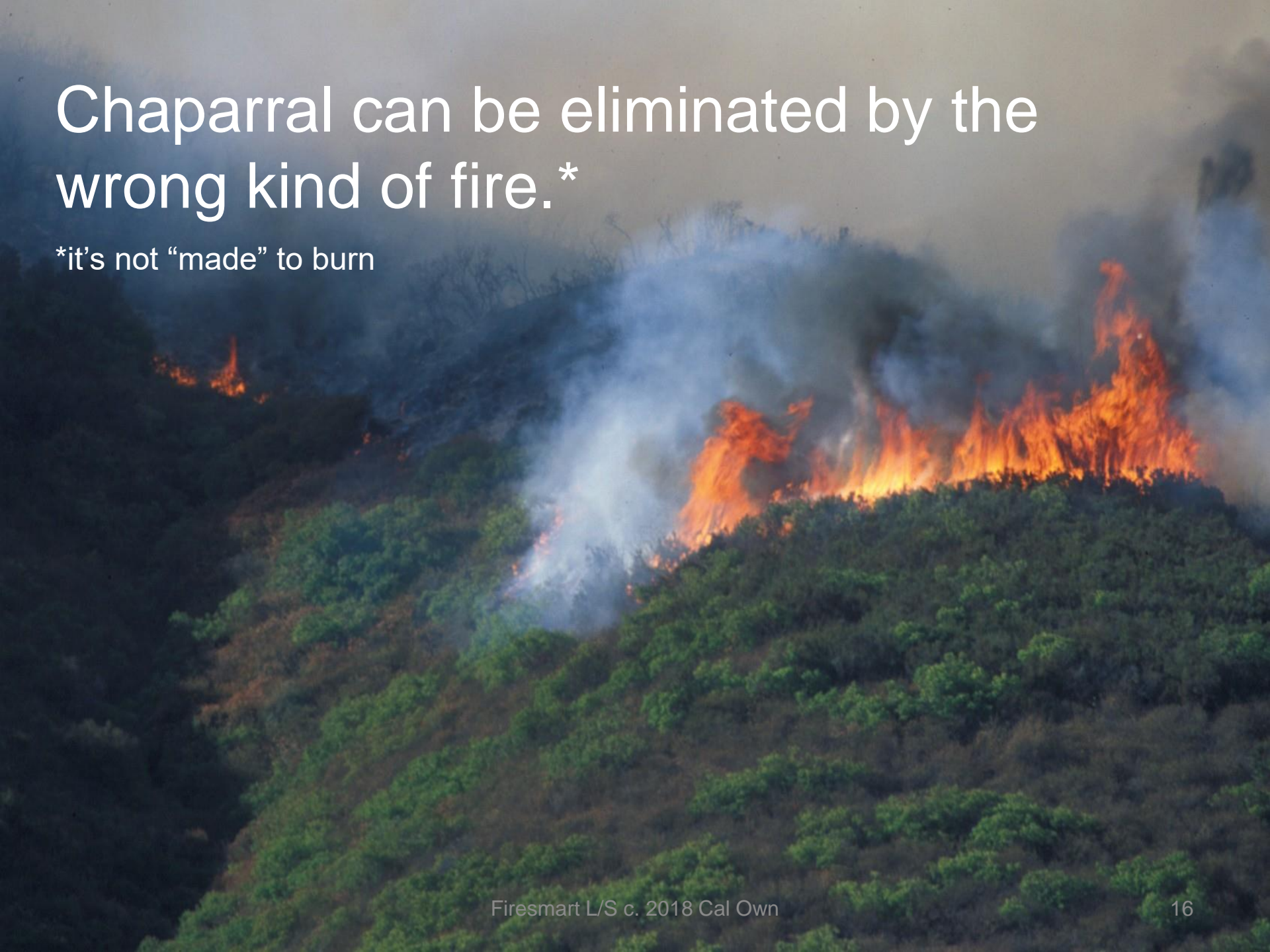
Chaparral is a diverse, rich ecosystem.*

*it's not all the same

1. Red shanks
2. Ceanothus
3. Chamise
4. Mixed
5. Manzanita
6. Scrub Oak
7. Montane

Chaparral can be eliminated by the wrong kind of fire.*

*it's not "made" to burn




Too many fires, no chaparral

1970

1970
2001

1970
2001
2003



Mixed chaparral near Temecula,
California

Alien grassland near Ramona,
California

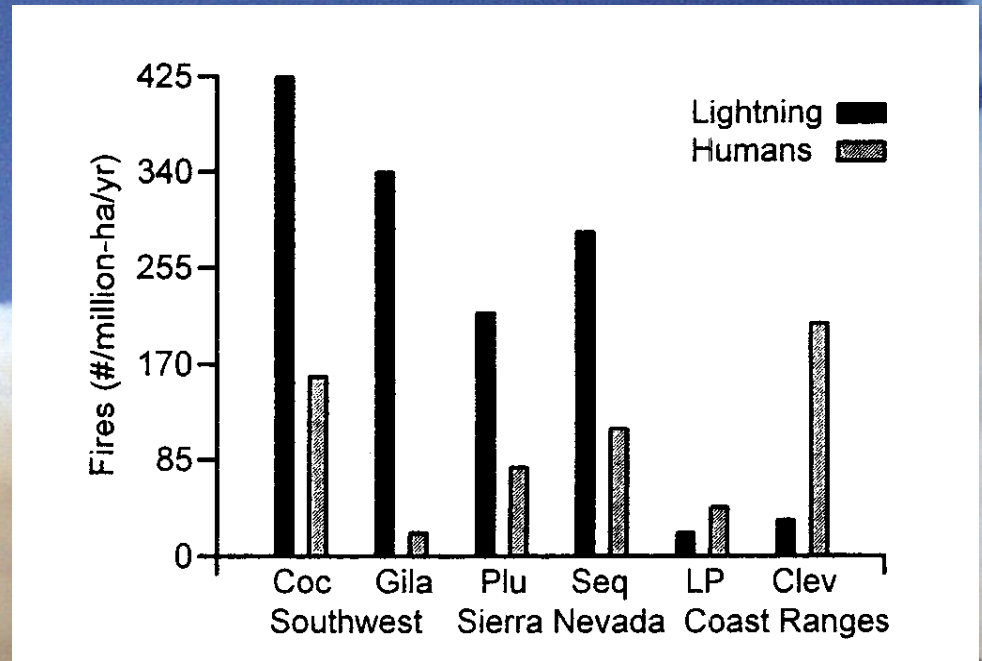


Being dense, impenetrable and prone to huge, intense fires is the natural condition of chaparral.*

*it's not the fault of conservationists or the fire service



What's "natural?"



J.E. Keeley



Ishi

Native Americans?
Significant impact probably
for less than 5,000 years.
What happened before
that?



Are large fires inevitable in Southern California?

During the past three or four days destructive fires have been raging in San Bernardino, Orange and San Diego... It is a year of disaster, wide-spread destruction of life and property - and, well, a year of horrors.

*The Daily Courier, San Bernardino
September, 1889*

Time since the last fire...


2003 Cedar Fire



2007 Witch Fire re-burn



Photos: Wayne Spencer

A dramatic scene of a wildfire with a person on a roof. The background is a massive, intense fire with bright orange and yellow flames reaching into a dark, smoky sky. In the foreground, a person in a blue shirt and shorts stands on the roof of a house, holding a hose. The house is partially obscured by dense green foliage and trees. The overall atmosphere is one of a severe natural disaster.

The most effective way to live safely in a fire-prone environment is to adapt to nature rather than attempting to force nature to adapt to us.*

*nature will always win

A. Location

C. Fuel Management Zones

B. Building Design

A. Location – Community Planning



A. Location – Community Planning



A. Location – Community Planning

- Defensible space helped save this community



B. Building Design

Eaves

Wildland

Vents

Roofing
Class B or
Better



C. Fuel Management Zones

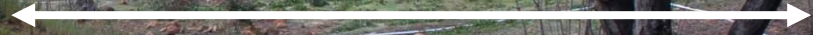
- Most approaches are anecdotal and not based on experimental design
 - Often highly destructive to the environment with inconsistent outcomes
- Awarded research grant from US Navy
 - Ecologically Sustainable Fire Risk Reduction (ESFRR)
 - Co-PI with Dr. Jon Keeley
- Scientific study with the following mutual goals:
 - Develop science based fuel management strategies
 - Ecologically sustainable (supporting natural habitat)
 - Lower water & maintenance requirement
 - Aesthetically pleasing
 - `

C. Fuel Management Zones

- Most strategies encompass a zonal approach within the first 100 feet of a home



Zone 1 or A is usually 30-50'



Zone 2 or B is usually 50-70'

C. Fuel Management Zones

- Zone 1 or A
 - The zone most critical to defensible space



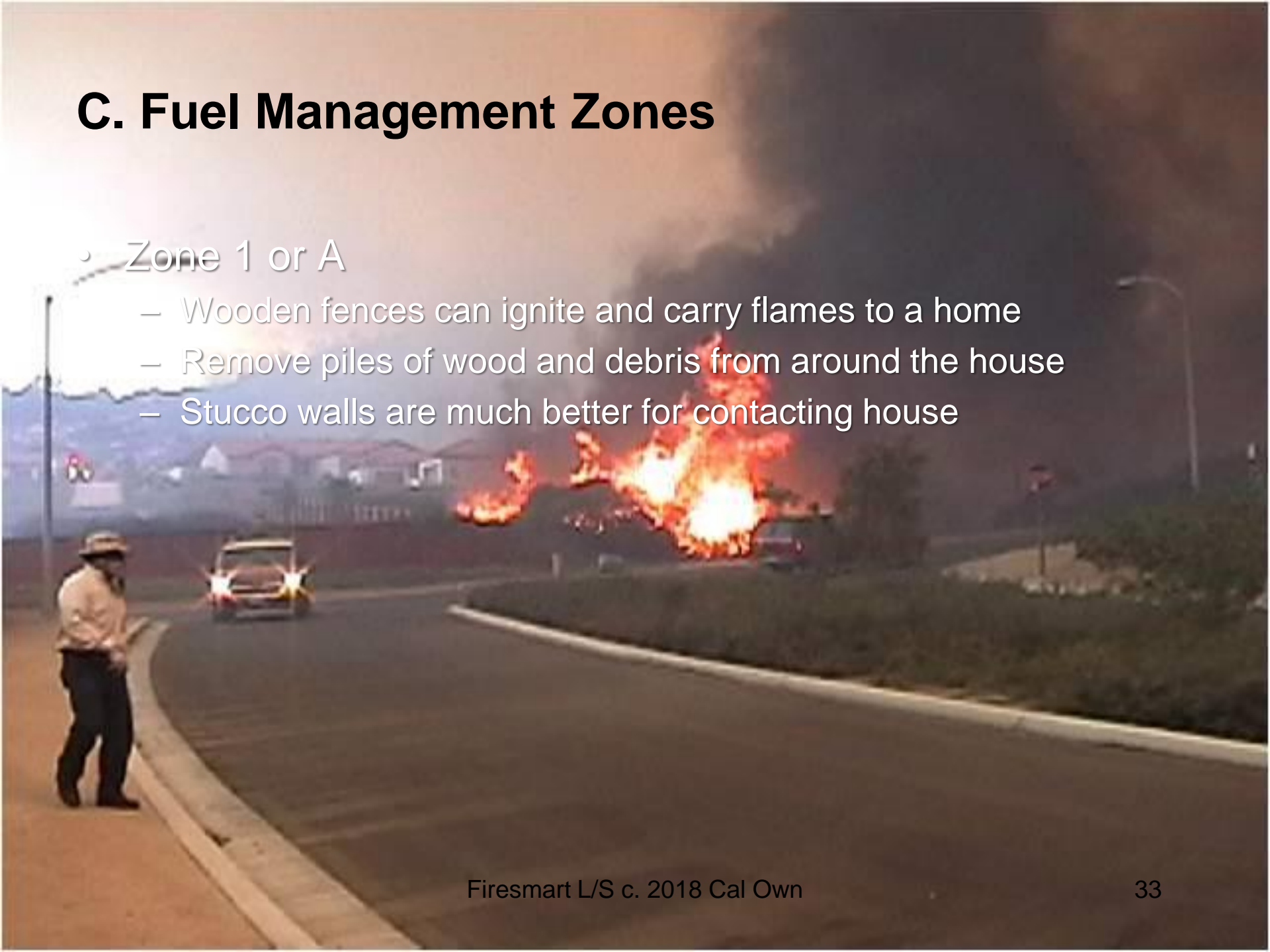
30-50 feet

C. Fuel Management Zones

- Zone 1 or A
 - Spot fires can result from flying embers or burning animals

C. Fuel Management Zones

- Zone 1 or A
 - Wooden fences can ignite and carry flames to a home
 - Remove piles of wood and debris from around the house
 - Stucco walls are much better for contacting house



C. Fuel Management Zones

- Zone 1 or A
 - Don't plant under the eaves
 - Use concrete, gravel, or decomposed granite aprons



C. Fuel Management Zones

- Zone 1 or A
 - Lots of hardscape

C. Fuel Management Zones

- Zone 1 or A
 - Permanently irrigated plantings
 - Native lawn substitute using *Carex praeegracilis*

You can mow it, too....

C. Fuel Management Zones

- Zone 2 or B
 - Starts at 30-50' and extends to 100 feet from the house
 - May extend to 150 feet or more from house



50-70 feet

C. Fuel Management Zones

- Zone 2 or B
 - Managing existing native vegetation
 - Site Hygiene is Critical

C. Fuel Management Zones

- Zone 2 or B
 - Managing existing native vegetation
 - Remove non-native weeds and dead limbs

This site was cleaned up prior to the fire

C. Fuel Management Zones

- Zone 2 or B
 - Managing existing native vegetation
 - Prune up large shrubs and trees to 3X understory height



C. Fuel Management Zones

- Zone 2 or B
 - Managing existing native vegetation
 - Thin naturally existing plant communities to ~50% coverage

Removes about 70% of the fuel volume

C. Fuel Management Zones

- Zone 2 or B
 - Managing existing native vegetation
 - Run lots of paths that double as firebreaks
 - Carve out a mature native landscape!

C. Fuel Management Zones

- Zone 2 or B
 - Landscaped areas
 - Light, permanent irrigation is critical to fire resistance



C. Fuel Management Zones

- Zone 2 or B
 - Landscaped areas
 - Even experimenting with light hydration of natural plants

C. Fuel Management Zones

- Zone 2 or B
 - Landscaped areas
 - Create wide paths that double as firebreaks
 - In this example, we ran a road all the way around the house

C. Fuel Management Zones

- Zone 2 or B
 - Landscaped areas
 - Create wide paths that double as firebreaks

C. Fuel Management Zones

- Zone 2 or B
 - Landscaped areas
 - Create wide paths that double as firebreaks
 - We also installed an 8 foot wide decomposed granite apron all the way around the house
 - Plants are in spaced out groupings
 - This house has survived **THREE** wildland fires!

Plant Selection

- Hydration takes precedence over plant lists
 - An unscientific burn test with native plants exposed to ~.25" of rainfall a week earlier...



Plant Selection

- Hydration takes precedence over plant lists
 - But add dead or dormant, dry weeds to the mix...

Natives require much less water to hydrate than non-natives

Plant Selection

- Basic types of plantings for fire resistant slopes include:
 - Nothing at all – bad option
 - Iceplant
 - Drought tolerant non-natives and Succulents
 - Natives
- All have advantages and disadvantages

Plant Selection

- Iceplant:

- Advantages:

- Cheap and readily available
- Quick fill
- Green

- Disadvantages:

- Moderate to poor erosion control
- Need lots of water
- Invasive
- Can form thatches that burn
- Boring to downright ugly

Plant Selection

- Drought tolerant non-natives and Succulents

- Advantages:

- Better availability than many natives
- Many beautiful plants-can be very colorful

- Disadvantages:

- Need ~2X more water than natives to achieve hydration
- Better slope stabilizers than iceplant but not nearly as good as natives
- Higher maintenance than natives (more deadheading)
- Less wildlife value

Plant Selection

- Natives
 - Advantages
 - Much less water required to achieve fire resistance
 - Soil biology is naturally soil stabilizing
 - Evergreen natives are virtually no maintenance
 - No fertilizer or soil amendments are used
 - Great bird and butterfly habitat. Lend a sense of regional identity
 - Naturally weed resistant at >70% coverage
 - Disadvantages
 - Not as many suppliers
 - Don't like ornamental horticulture or drip irrigation
 - Can be susceptible to Argentine ants

Plant Selection

- Most are dependent on soil biology
 - Mycorrhizae
 - Endomycorrhizae

Plant Selection

- Most are dependent on soil biology
 - Mycorrhizae
 - Endomycorrhizae
 - Ectomycorrhizae

Plant Selection

- Mulch is important biologically, for moisture retention, and erosion control
 - Shredded redwood bark is the best for slopes
 - Must be well consolidated - less oxygenated
 - Leave oak leaf litter in place

Plant Selection

- Great Slope Natives
 - Arctostaphylos 'Howard McMinn'
 - Manzanita

Plant Selection

- Great Slope Native
 - Arctostaphylos 'John Dourley'
 - Groundcover manzanita

Plant Selection

- Great Slope Natives
 - Arctostaphylos 'Sunset'
 - Manzanita

Plant Selection

- Great Slope Natives
 - Baccharis 'Pigeon Point'
 - Dwarf coyote brush

Plant Selection

- Great Slope Natives
 - Ceanothus 'Blue Jeans'
 - Wild lilac

Plant Selection

- Great Slope NativeS
 - Ceanothus 'Frosty Blue'
 - Wild lilac

Plant Selection

- Great Slope Natives
 - Ceanothus 'Joyce Coulter'
 - Groundcover wild lilac

Plant Selection

- Great Slope Natives
 - *Dendromecon harfordii*
 - Island bush poppy

Plant Selection

- Great Slope Natives
 - *Eriogonum arborescens*
 - Santa Cruz island buckwheat

Plant Selection

- Great Slope Natives
 - Erigeron 'WR'
 - Seaside daisy

Plant Selection

- Great Slope Natives
 - *Vitis californica* 'Roger's Red'
 - Wild grape

Plant Selection

- Great Slope Natives
 - Zauschneria (Epilobium) spp.
 - Hummingbird or California fuschia

Design

- 75% of the planting should be evergreen
 - One of THE most important principles
 - Avoids dead/dormant appearance
 - Foliar color and texture lend year-round interest
 - Important for fire-resistance

Design

- The remaining 25% is comprised of specimen plants and perennials
 - Colorful perennials should be located at the edges
 - Mix blooming cycles

Site Preparation

- Clean up and removal of the old landscape
 - Remove undesirable plants and weeds
 - Kill the lawn
- Kill the grass & cut the sod 2" below the surface
- Remove any other features you're not keeping
- Rough grade
- Install flatwork, rocks and paths, followed by irrigation

Irrigation

- Drip is not a part of native upland ecology
- Negatively impacts most drought tolerant **NATIVE** landscapes
 - Natives are less forgiving of non-ecological approaches
- Micro-sprays are fine & a great way to convert existing drip systems to overhead application
- Overhead irrigation is important for even foliar hydration

Planting

- Recommend smaller plants (1-5 gallon) for faster and better establishment
- Lay out planting beforehand, spacing for final size

Planting

- Steep slope example – 2 weeks post planting

Planting

- Planting 14 months later

Planting

- “Dig a hole and stick them in!”
 - Do not amend or fertilize in most cases
 - Make the hole ~1/2”-1” shallower than the root ball, and about twice as wide
 - Backfill with soil and tamp with feet
 - You can create a temporary basin to hold the initial watering, especially on slopes
 - Place 6-12” boulders on root ball if available

Planting

- Then water, water, water
 - 1-5 gallons in clay soil, 5-30 gallons in well draining soil PER 1 gallon plant, that day
 - Best way to remove air pockets and settle the soil
- Now is the time to put down a granular pre-emergent if desired
 - Won't harm growing plants
 - Kills shallow seed bank, which may total 10-100K per ft³!

Mulching

- Apply mulch
 - Shredded redwood bark is best organic mulch, 3-4" deep
 - Virtually all natives love having 6-12" boulders placed right on their root balls
- Overhead watering for hours will consolidate mulch

Maintenance

- Pest control
 - Argentine ants nesting in root balls could be the single largest cause of death in native landscapes
 - They usually remove soil from the root mass
 - Ants place & protect sucking insects on roots
 - They plant weeds like crazy & may spread disease
 - Slow acting baits can help control colonies
 - Pyrethroid, Neem oil, & Superthrive root soak may be required to save a collapsing plant

Case Histories



Case Histories

- Most fire-involved native landscapes of any contractor
 - Poomacha (1)
 - Pines (2)
 - Cedar (7- 1 in Santa Ysabel, 3 in Ramona, and 3 in Poway)
 - Witch creek (6 - 3 in Ramona, 3 in RB)
 - Harrison (2)
 - Hidden meadows (1),
 - a fire marshal for the city of Encinitas who ran actual burn tests on Gorilla hair during the Lux Art Institute installation.

Case Histories

A customer's yard after the Cedar Fire



Case Histories



Case Histories



Case Histories



Case Histories



Case Histories



Case Histories



Case Histories

- Witch Fire 2007 – Rangeland Development, Ramona



Case Histories



Case Histories



Case Histories

- Witch Fire 2007 - Rangeland

Case Histories



Case Histories

- Witch Creek Fire - Rangeland



Case Histories

- Same property 3 years later



Case Histories

- Other Homes in Rangeland – Cleared well over 100 feet (some to 300 feet)



Case Histories

Cleared 200-300 feet...



Case Histories

Cleared 200-300 feet. Lawn is still Green!



Case Histories

- The Harris Fire STOPPED at the edge of this native landscape in Jamul!

Case Histories



Erosion Control

A photograph of a dry, eroded hillside. The terrain is covered in sparse, brown, and charred-looking vegetation, indicating a post-fire landscape. The soil is light brown and shows signs of erosion, with a central gully or path cutting through the slope. The sky is clear and blue.

Erosion Control

Debris dams across gullies



Erosion Control

Set T-posts 3-4 feet apart



Erosion Control

Weave burned branches through posts



Erosion Control

Don't Seed after a fire!



Nature on the re-bound

Del Dios, 2008







Landscape on the re-bound

Let Nature Have Her Way

This site was
seeded



Firesmart L/S c. 2018 Cal Own

Let Nature Have Her Way

This is how it
should look



Firesmart L/S c. 2018 Cal Own

Let Nature Have Her Way

One Year
Later



Firesmart L/S c. 2018 Cal Own

Five Years Later - Here/There



Firesmart L/S c. 2018 Cal Own