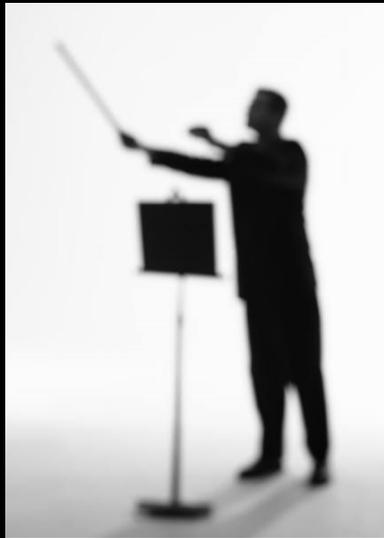


## Shelter-In-Place as an Alternative to Evacuation during Wildfires - An historical perspective



Dr. Chris Dicus  
Cal Poly State University  
San Luis Obispo, CA

## A delightful medley...



- Chris Dicus (Cal Poly)
  - Historical perspective
- Cliff Hunter (RSF Fire District)
  - Fire Marshal's perspective
- Charles Finkbiner (RSF resident)
  - Homeowner's perspective
- Mike Gibbs (RSF Fire District)
  - Firefighter's perspective
- Noel Humphrey (RSF Crosby Development)
  - Developer's perspective
- Robin Church (RC Biological Consulting)
  - Environmental perspective
- Timothy Reinhold (Institute for Business & Home Safety)
  - Case Study
- Pamela Jakes (USFS Research)
  - Resident readiness
- Sarah McCaffrey (USFS Research)
  - Australia vs. U.S. models

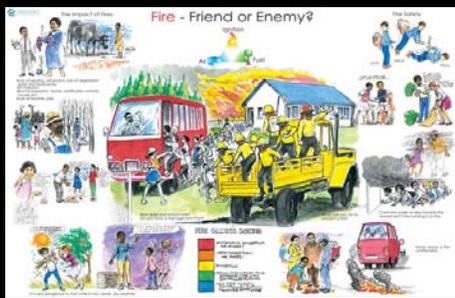


## Greek Perspective...



- Their response???
  - Run!!!
- 84 dead in 2007
  - Blame placed on lack of government *response*
- Seems familiar...

## South African Perspective



- FireWise is good in the Veld-Urban Interface
  - Seems eerily familiar...
- If can't run from fire, then find safe zone
  - DON'T PANIC and run at the last moment

## Australian Perspective

- Leave Early, or... Prepare, Stay, and Defend
- Houses save people, people save houses
- How did they get there???

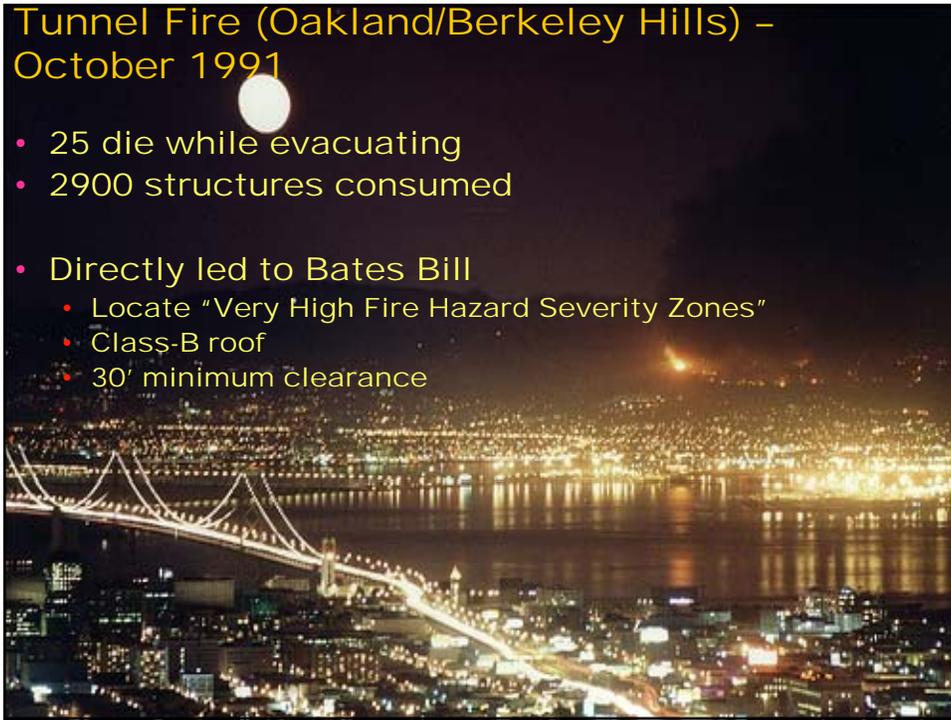


## Trial by fire down under...

- Black Friday
    - 1939 (Victoria)
    - 71 dead
    - 3700 buildings
  - Black Tuesday
    - 1967 (Tasmania)
    - 62 dead
    - 900+ injured
    - 1700 buildings
  - Ash Wednesday
    - 1983 (Victoria & S. Australia)
    - 75 dead
    - >5000 structures destroyed
  - Canberra Bushfires
    - 2003
    - 5 dead
    - 500 buildings
- We're relearning our lessons
- Peshtigo
  - Big Blowup
- 18.01.2003

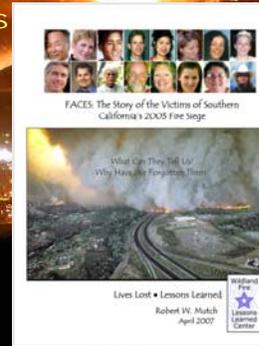
## Tunnel Fire (Oakland/Berkeley Hills) – October 1991

- 25 die while evacuating
- 2900 structures consumed
- Directly led to Bates Bill
  - Locate “Very High Fire Hazard Severity Zones”
  - Class-B roof
  - 30’ minimum clearance



## Cedar Fire (San Diego, October 2003)

- 15 die while evacuating
- 4847 homes
- Directly led to 100' clearance in VHFHSZ's
- Directly led to 2008 WUI Building Standards
- Led to questioning paradigms
  - Can't rely on fire service to save us
  - People die evacuating



## Rumblings...



- International FireWise Conference
  - Denver 2006
- James Hubbard
  - Deputy Chief, U.S. Forest Service
    - "We will NEVER have shelter in place in the United States"
      - San Diego Fire Congress 2006

## Shelter-in-Place...

*...If You Can't Evacuate*

Shelter-in-Place Communities:

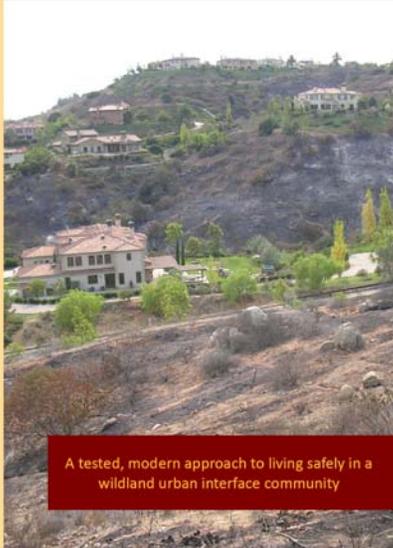
4S Ranch

The Bridges

Cielo

The Crosby

The Lakes



[www.rsffire.org](http://www.rsffire.org)

A tested, modern approach to living safely in a wildland urban interface community

## Silly politicians...

- Rancho Santa Fe already doing it
- How does RSF compare to Aussies???
- PREPARE
  - Vegetation
  - Setbacks
  - Construction
- Stay if you have to
- Get the hell out

## Witch Fire (San Diego 2007)

- Directly leads to...
  - Legitimizing Shelter-in-Place

"Thank you for not listening to me..."



## Crazy Californians...

### VENTURA COUNTY WILDFIRE ACTION PLAN

Saving Lives and Property Through Advance Planning

The fire season is now a year-round reality in Ventura County, requiring firefighters and residents to be on heightened alert for the threat of wildfires throughout the year.

Each year, wildfires consume hundreds of homes in the Wildland/Urban Interface (WUI). However, the California Department of Forestry and Fire Protection (CAL FIRE) estimates that as many as 80 percent of the homes lost to wildfires could have been saved if their owners had only followed a few simple fire-safe practices. In addition, wildfire-related deaths occur because people wait too late to leave their home or prepare inadequately to stay and defend it.

The Ventura County Fire Department takes every precaution to help protect you and your property from wildfire. However, the reality is that in a major wildfire, there will simply not be enough fire engines or firefighters to defend every home.

Successfully preparing for a wildfire requires you to take personal responsibility for protecting yourself, your family and your property. In this publication, we hope to give you the tips and tools you need to prepare and be successful.

Fire is, and always has been, a natural part of the beautiful area where we've chosen to live. Our brush-covered hills, canyons and forests burned periodically long before homes were built here. Wildfires, fueled by a buildup of dry vegetation and driven by seasonal hot, dry winds, are extremely dangerous and impossible to control. However, many residents have built their homes and landscaped without fully understanding the impact a fire could have on them, and few have adequately prepared their families for a quick evacuation or the prospect of staying to defend their home from fire.

It's not a question of **if** but **when** the next major wildfire will occur. That's why the most important person in protecting your life and property is not the firefighter, but you. Through advance planning and preparation, we can all be ready for wildfire. I hope you find the tips in the next pages helpful in creating heightened awareness and a more fire-safe environment for you and your family.

Bob Roper  
 Ventura County Fire Chief

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This publication was prepared by the Ventura County Fire Department, Special Thanks to the South-San Gabriel County Fire Service, Northridge Council, Fresno Communities, the American Red Cross, the National Fire Protection Association and many other organizations for their contributions to content. Portions of this publication were adapted from Living with Fire - A Guide for the Homeowner written by Ed Smith, University of Nevada Cooperative Extension. Additional resources on pages 9-11 provided by Home Safe Home and Fireworks, LLC.

Publication of the Wildfire Action Plan was made possible by a generous grant from Fireworks Fund and the U.S. Forest Service.

Fireworks Fund

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### "Should I stay or should I go?"

#### Santa Barbara County Wildfire Action Plan

Evacuate Early? or Stay and Defend.

If you live in the Wildland/Urban interface area, then you are in danger of experiencing a wildfire. During wildfires, evacuations are put in place to protect lives. Your property can be replaced, but your life cannot. Therefore, we recommend that you evacuate when told to do so by authorities.

Brushfire fatalities most commonly occur when people leave their home too late or are overtaken by fire. If you live in an area that's at high risk for brushfire, it's important for you to decide now whether you're going to evacuate early or stay and defend your home.

Sheltering in place, or staying to defend your home, requires considerable planning. Fire agencies cannot make that decision for you. It's up to you to determine whether you are capable of staying and defending your home.

So, grab a pen or pencil, and use this guide to develop your Wildfire Action Plan.

---

**If you live in an area prone to brushfire,**

- Your property should be well-prepared before a wildfire arrives.
- Appropriately prepared and constructed buildings offer protection during brushfires, reducing the likelihood of injury or death.
- Firefighting resources cannot always protect every property. Those planning to stay and defend their home must be prepared to be self-sufficient.
- A decision to stay and defend a well-prepared property or to evacuate early must be made well ahead of the arrival of a wildfire.
- In planning to leave early, you must know where you are going, how you will get there and what "trigger points" you will use to initiate your plan.
- Those who doubt their ability to cope with a wildfire should leave well before fire impacts their area.
- Evacuation at the last minute, ahead of a brushfire, is very dangerous.
- Large-scale, mass evacuations of communities require significant lead times. The safest course of action is to have a well-rehearsed plan in place to evacuate early or stay and defend long before the onset of a wildfire.

#### POP Quiz:

- Are you physically fit to fight spot fires in and around your home for up to 10 hours or more?
- Are you and your family members mentally, physically and emotionally able to cope with the intense smoke, heat, stress and noise of a brushfire while defending your home?
- Can you protect your home while also caring for members of your family, pets, etc.?
- Do you have the necessary resources and equipment to effectively fight a fire?
- Does your home have defensible space of at least 100 feet and is it cleared of flammable materials and vegetation?
- Is your home constructed to resist fire?

If you answered "No" to any of these questions, then plan to evacuate early.

# Crazy Californians...

**PREPARE • STAY • DEFEND**  
www.Prepare-Stay-Defend.org

**EMPOWERING HOMEOWNERS AGAINST WILDFIRE**

Welcome to Prepare-Stay-Defend.org and please read the following disclaimers. If you agree, then you will be cordially invited to enter our "Empowering the Homeowner Against Wildfire" web site. Part of the "Empowerment of Homeowners" requires that a thorough understanding of the hazards and risks associated with this effort be obtained by all participating homeowners. We at PSD believe in forthrightness to our customers which is, above all else, the overriding reason for these disclaimers.

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• Note the CYA principle in action...

• Just another California fad...

# Crazy like a fox...

NATURAL RESOURCES SERIES  
**FORESTRY**  
by F.C. Dennis

**Forest Home Fire Safety** no. 6.304

**Fire Protection in Rural Areas**  
Colorado's rural areas are undergoing increasingly greater development. More people are building homes in forests or brushlands to take advantage of these natural environments. Often, these sites are quite remote. However, people moving from urban settings expect traditional fire and emergency services. They do not understand the fire protection limitations that exist in rural areas.

**Quick Facts...**  
Take steps now to protect your home from a future wildfire. This can spell the difference between your property's destruction or survival.

During a wildfire, law enforcement officials may ask you to evacuate with little warning. Take precautions now to prepare for that possibility.

Even if you are forced to evacuate your home, there are some things you can do to help firefighters defend it.

**Homeowner Preparations**  
Homeowners can do a great deal to prepare their property for wildfire. Some of these things are detailed in these fact sheets:  
6.302. Creating Wildfire Defensible Zones;  
6.303. Fire-Resistant Landscaping;  
6.305. Fire-Resistant Materials; and  
6.306. Grass Seed Mixes to Reduce Wildfire Hazard.

The following checklist and guidelines will help you prepare for fire safety, evacuations and home defense. Use it as a guide to enhance home safety.

**This is an annual checklist. Don't wait until a fire is approaching to perform these tasks.**

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Cooperative Extension, 508  
Residence 4022  
www.ext.colostate.edu



**Utah Forest News**  
Utah Forest Landowner Education Program Newsletter  
Volume 13 Number 1  
Winter 2007

**Prepare, Stay, and Defend: A Down-Under Approach to Protecting Homes from Wildfire**

An Australian approach to protecting homes from wildfire is gaining the attention of fire managers and ecologists in the United States. At the Third International Fire Ecology and Management Congress held in San Diego last November, John Gledhill, chief of the Tasmania Fire Service in southern Australia, outlined the successful strategy being pursued in Australian communities threatened by wildfire instead of evacuating their homes during a fire, residents are encouraged to prepare, stay, and defend.

The prepare, stay, and defend approach (also referred to as "sheltering-in-place") is based on research in both the United States and Australia that shows how homes actually burn during a wildfire. These studies have revealed that it is not a dramatic wall of flames that consumes properly prepared homes during a wildfire. Instead, these disasters are usually caused by flying embers, or fire brands, that provide a fire and land on vulnerable portions of houses and landscapes. Fire brands can provide the flaming front of a wildfire by considerable distances – a quarter of a mile is not uncommon, and occasionally they fly over a mile. These clouds of burning wood can be easily distinguished with a garden hose, bucket of water, shovel, or even a nut towel. But a brand left unattended in the corner of a deck, in a

*This well-prepared home survived a hot crown fire which passed nearby.*

*continued on next page*

**INSIDE THIS ISSUE:**

- ❑ Home Logging at Sandstone Resort
- ❑ New Book Beetle Publications
- ❑ Annual Meeting of the Utah Forest Products Association

*The annual meeting of the Utah Forest Products Association is coming up! See page 7 for details.*

# It's pandemonium...



**SIP & DIP - Stay In Place & Defend In Place**  
By: NEMA

When a fire alarm system is activated and many of the occupants do not leave, is that bad or good? In most cases, the system design is intended to initiate evacuation. So when people ignore or choose to not leave, the fire safety objectives have been compromised. However, there are circumstances where the fire safety objectives include provisions for partial evacuation or relocation of the occupants away from the immediate fire or smoke zone. There are also situations where only those persons in the most immediate area of the fire need to be moved. All others Stay In Place, while passive, active, automatic and manual fire protection systems are used to Defend In Place.

Figures 1 and 2 show part of the Fire Safety Concepts Tree from NFPA 552-1 The Fire Safety Concepts Tree is an event tree using logical "AND" gates (multiplication symbol) and "OR" gates (addition symbol) to relate various combinations of sub-events that lead to the top level successful event. An "AND" gate indicates that all events immediately below that event must occur for the event to be a success. For an "OR" gate, the probability of success is determined by multiplying the probabilities of the lower events. For an "OR" gate, the probability of success is determined by adding the probabilities of the lower events.

© IFE Winter 2007 11

## Alternatives to Evacuation—Protecting Public Safety during Wildland Fire

Travis Pawaglio, Matthew S. Carroll, and Pamela J. Jakes

**Abstract:** Remaining inside in-sole structures or a designated safety zone to actively defend against wildland fire events is an underresearched area of vulnerability. Although research on chemical spills and nuclear fire has identified a number of viable options during certain types of emergency situations, its applicability to the field of wildland fire management appears only infrequently in conference and academic arena active areas of participants in meeting their safety. This article reports for the literature model of fire response, "prepare, stay and defend, or leave early," may emerge as a viable alternative to evacuation in some, but not all, wildland-urban interface (WUI) fire situations. Several constraints in the field have begun to explore opportunities for alternatives to evacuation during wildland fire. Because of the lack of its experience with these types of responses during fire events we attempt to draw lessons from disaster and risk communication literature related to other types of hazards. In an era of expanded fire literature will provide judgment and insight into fire events as a large social context. We examine the literature provide insight into the conditions, practices, and social ways needed to bring the applicability of the literature model of "prepare, stay and defend, or leave early" during wildland fire events throughout WUI population.

**Keywords:** wildland, evacuation

One of the most socially disruptive consequences of uncontrolled fire in the wildland-urban interface (WUI) is the evacuation of potentially large numbers of people, frequently with little or no warning, for undetermined periods of time (Taylor et al. 2005, Carroll et al. 2006). This disruption not only occurs in response to the actual movement of people from their homes to children or to the homes of friends and family, but also from being on evacuation stand-by for days or weeks at a time (Cohen et al. 2006). No agency or group records the number of evacuations or number of people evacuated each year because of wildland fire, but there are reports from individual fires. For example, during the March 2003 Texas Panhandle Fire, eight towns with a total population of more than 4,000 were evacuated (Zane et al. 2006). The Southern California Fire Complex of 2003 included the evacuation of more than 100,000 people (Blackwell and Turek 2003). Early-morning evacuations from the October 2007 California fire indicated that over 100,000 people were evacuated (MNSBC 2007).

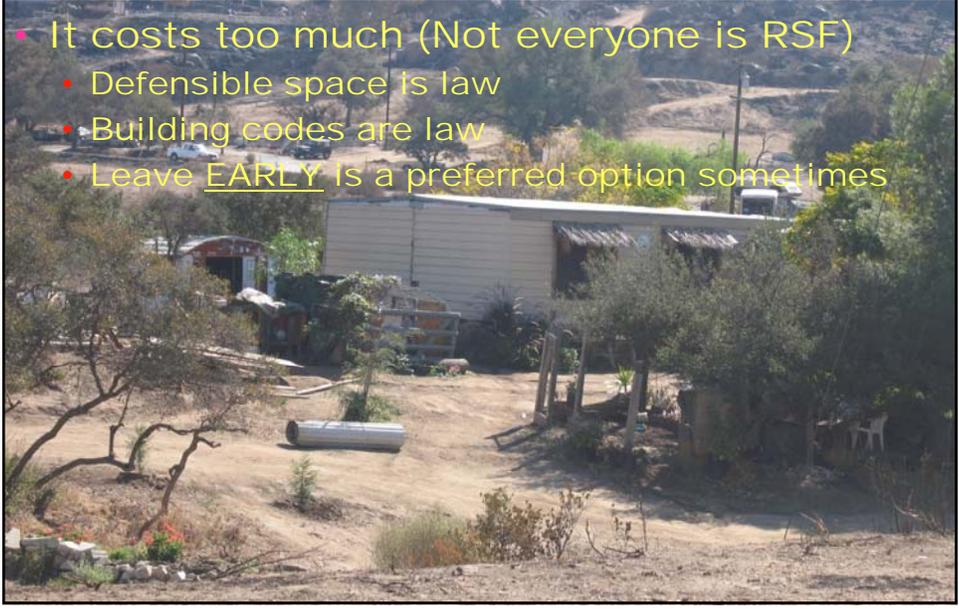
Thanks to WUI resident safety from wildland fire are unlikely to decrease anytime soon in fire forecasts of an expanding WUI and recent fire statistics point toward an increased prevalence (Stewart et al. 2006, National Intergovernmental Fire Center 2007). As wildland fire continues to pose a threat to WUI residents, evacuation will continue to be a possibility for thousands of communities. However, a debate has begun over alternative to evacuation as a means of protecting the lives of homeowners, business owners, residents, visitors, and firefighters in areas threatened by wildland fire. There is a small but growing body of literature indicating that evacuation may not always be the ideal strategy, because mass migration can create traffic problems or reduce the affected population to more risk than if they stayed at home (Cova and Church 1997). Our intent in this article is to highlight these arguments against evacuation and advance recommendations for alternatives to this process.

Journal of Fire Ecology • March 2008 65

Yeah, but...

# Common arguments against...

- It costs too much (Not everyone is RSF)
  - Defensible space is law
  - Building codes are law
  - Leave EARLY is a preferred option sometimes



## Common arguments against...

- What about liability?
  - What about liability of evacuations???



## Common arguments...

- They don't have training!
  - So train them
- Aussie way
  - Multi-day workshops
    - "Fiery Women"
  - Psychological prep
- Training to PREPARE
  - Defensible space turns into survivable space
- Training to DEFEND
  - Get off the roof ya goofball!





Prepare the battlefield!!!

Prepare the soldier!!!

Thank you Kate Dargan & Tonya Hoover

Not for everybody... (But it is for some)





## We've come a long way baby...

- But got a long way to go
- Bottom line
  - Shelter-in-Place works
    - *PREPARE* battlefield
  - Citizens can be an asset
    - Stay and *DEFEND* (if trained)
  - Leaving *EARLY* is better option for many