

# The Wildland/Urban Interface



## Part C: The Citizen

### Wildland Fire Preparedness & Basic Concepts

(Rev. 12/1/04)

# Objectives



Students will learn:

- The factors that influence fire behavior
- The relationship between fire, fuels and structure survivability
- Urgent fuel modification methods
- Pre-treatment methods
- The concepts and associated risks of “stay and defend”

# Factors Influencing Fire Behavior



# Fire Behavior

**Three factors influence the behavior of wildfire:**

WEATHER

TOPOGRAPHY

FUELS



# Weather...

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- Temperature
- Relative humidity
- Atmospheric stability
- Wind speed and direction
- Precipitation

# Weather...

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- **TIME:**

- All aspects of weather change continuously, affecting vegetative curing and fuel moisture

- **ELEVATION:**

- Changes in weather patterns occur with changes in topography

*Effects on Fire Behavior:*

- These factors can greatly increase the rate of fire spread & rate of fire intensity

# Topography



- Elevation
- Position on slope
- Aspect
- Shape of the country
- Steepness of slope

# Topography

- **TIME:**

- Generally considered to be constant

- **ELEVATION:**

- Changes can be considerable especially in mountainous terrain.

*Effects on Fire Behavior:*

- These factors effect the rate and spread of fire.





# Fuel Factors

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- Fuel loading
  - weight; how much
- Size & shape
  - 12-inch v. 10-feet
- Compactness
- Horizontal continuity
- Vertical continuity
- Chemical content (i.e., oil)

# Fuel Factors



- **TIME:**

- Dead and live fuel moistures change.
- Insect infestations/disease, harvesting/manipulation of vegetation, prescribed burns, and weather can alter fuels.

- **ELEVATION:**

- Weather and topography alter fuels.

*Effects on Fire Behavior:*

- Fire intensity increases as more fuel becomes available to burn.

# The Relationship Between Fire, Fuels and Survivability

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# The Wildfire Environment

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## Weather

- Heat can modify or produce local winds
- Heat can contribute to atmospheric instability
- Heat can cause cumulus cloud development

## Fuels

- Fuel Temperature
- Fuel Moisture Content



# The Wildfire Environment

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**Spot Fires, Brands & Burning Embers** are influenced by:

## **CONVECTION**

- Small pieces of burning material lifted in a convection column
- Carried a distance ahead of the fire front



# The Wildfire Environment

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**Spot Fires, Brands & Burning Embers** are influenced by:

## WIND

- Causes short-range spotting of firebrands.
- When combined with strong convective currents:
  - Carries firebrands considerable distances downwind, causing long-range spotting.



# The Wildfire Environment

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**Spot Fires, Brands & Burning Embers** are influenced by:

## GRAVITY

- Responsible for spotting of firebrands down slope.
- The steeper the slope, the greater the spotting problem.
- Burning material rolls down slope.

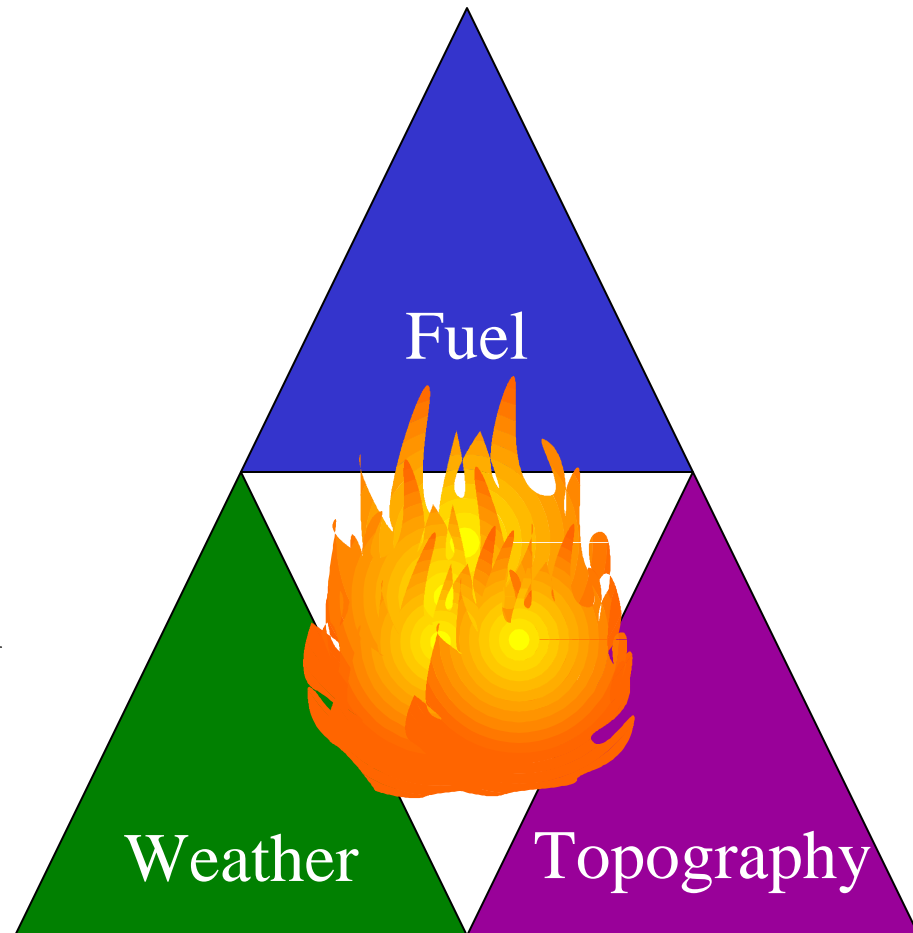


# Fire, Fuels and Survivability

The relationship of

- **Fuels,**
- **Topography**
- **Weather**

is similar to our original  
fire triangle...





# Fire, Fuels and Survivability

While we can't change **topography**,  
and we can't change the **weather**,

**We CAN...**

**Remove the fuels**



# Fire, Fuels and Survivability

Or,  
Modify the fuels



# Just Waiting For the Wrong Moment...

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# Urgent Fuel Modification

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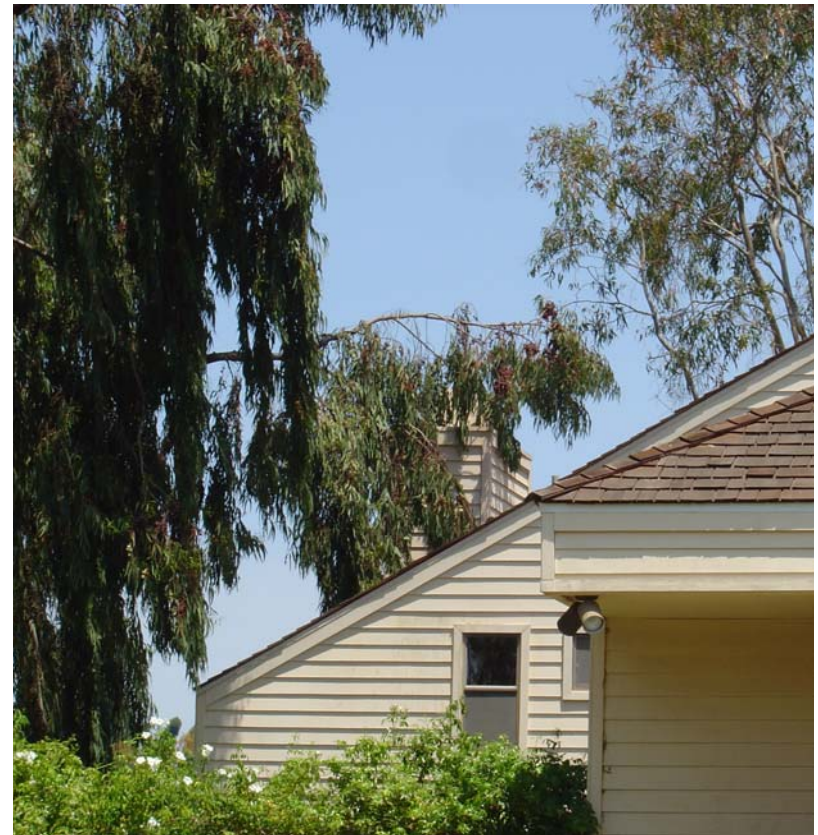
- Quickly reduce/remove flammable vegetation around structures:
  - 30-foot perimeter
  - 100-feet or MORE, depending on slope
- Separate trees/shrubs by at least 1 ½ times their height
- Keep weeds and grasses trimmed below 18-inches in height
- Tree limbs should be trimmed up at least 6-feet from the ground



# Urgent Fuel Modification

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- Remove leaf litter/needles from roofs, gutters & porches
- Stack lumber/firewood at least 30-feet from structures.
- Trim any limbs overhanging the house.
- Keep tree limbs and flammable shrubs at least 10-feet away from chimneys, heat vents, roof lines, eaves, and decking
- Work with neighbors.



# Fuel Modification Safety

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## *ALWAYS:*

- Operate in pairs
- Operate within the scope of your training
- Wear appropriate safety gear and clothing
- Use ladders safely
  - Beware of unsafe roofs (i.e., Spanish tile, slate, etc.)
- Use a spotter when working with and around trees

## *DO NOT:*


- Use steel blades on weed trimmers
- Use mowers



# Pre-Treatment

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Three ways to protect your home from wildfire:



Water  
Foam\*  
Gel\*

\*Only use USDA Forest Service Approved  
foams and gels (elastomers)

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# Water...

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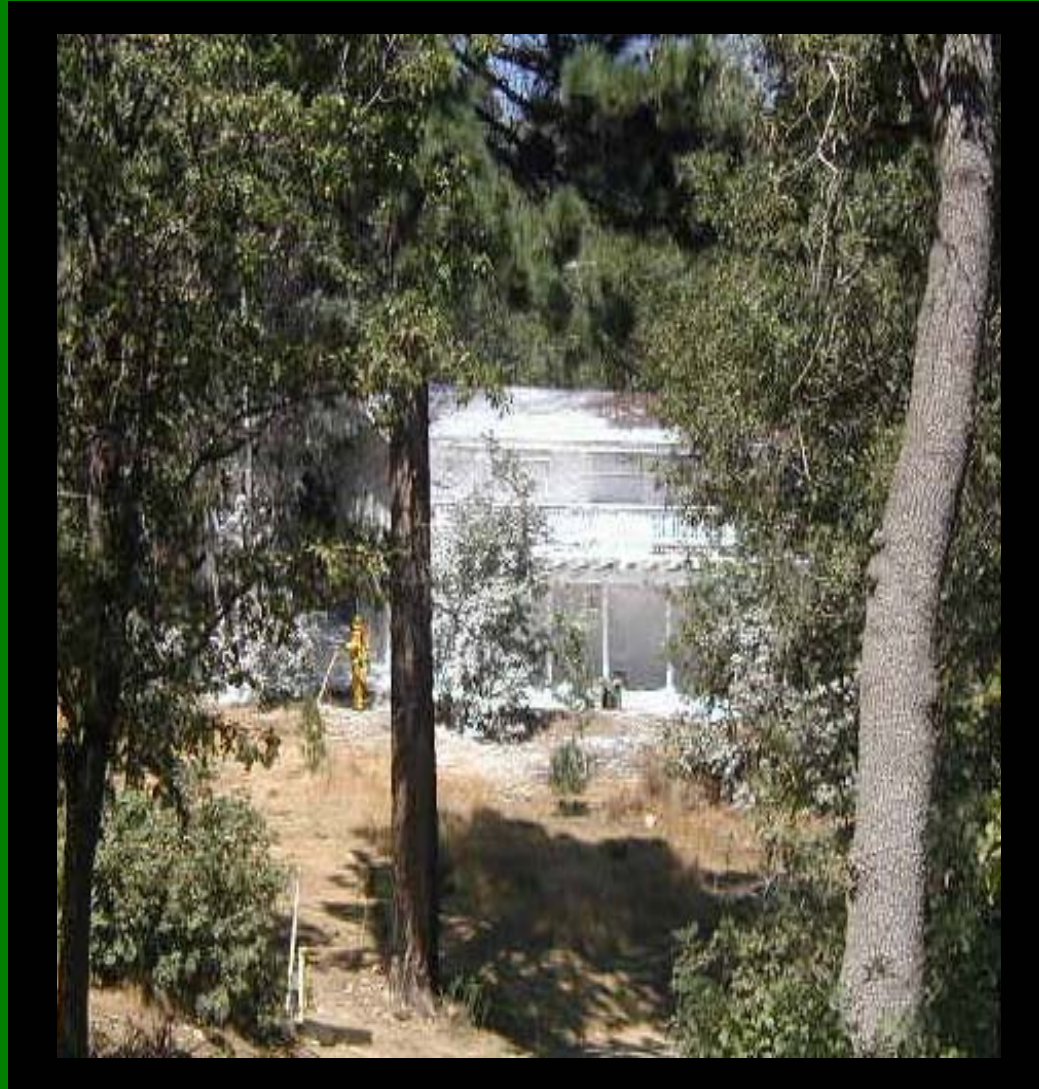
- Typically applied by a yard sprinkler system.
- *This is a most unreliable method*
- Other problems:
  - evaporates quickly
  - need a large volume of water
  - requires constant application
  - need a constant water source
  - compete with other water users





# Envelope your home with foam

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# Foam...

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- Easy to apply, with minimal training and appropriate equipment.
- Coat the ENTIRE structure:
  - roof
  - exterior walls
  - eaves
  - doors
  - windows
- Foam will eventually dissipate, reducing its ability to protect.



- Foam may also be affected by the wind, but can be reapplied regularly.

# Envelope your home with gel



# Gel...

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- Easy to apply, with minimal training and equipment.
- Coat the ENTIRE structure:
  - roof
  - exterior walls
  - eaves
  - doors
  - windows
- Gel will eventually dry, but will reactivate with small amount of water spray.



# Stay & Defend?

**“Stay and Defend” = “Risk your Life”**

- Various fire equipment vendors will teach you how to treat your home.
- None will recommend you stay behind to fight
- The *best* method is to treat your home, then *evacuate!*



# Summary

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- Wildland fires are extremely dangerous.
- Wildland fire behavior is *very* difficult to predict.
- Pre-treat a structure three ways:
  - Water (not recommended)
  - Foam (has sustainability)
  - Gel (has sustainability)
- After a structure is pre-treated, evacuate **IMMEDIATELY**. Once prepared and pre-treated, the site should be able to stand on its own.
- The “stay & defend” concept requires additional training, and is not an approved **CERT** module.



# The CERT Wildland/Urban Interface Module

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