



# Development and Implementation of Fuels Reduction Projects

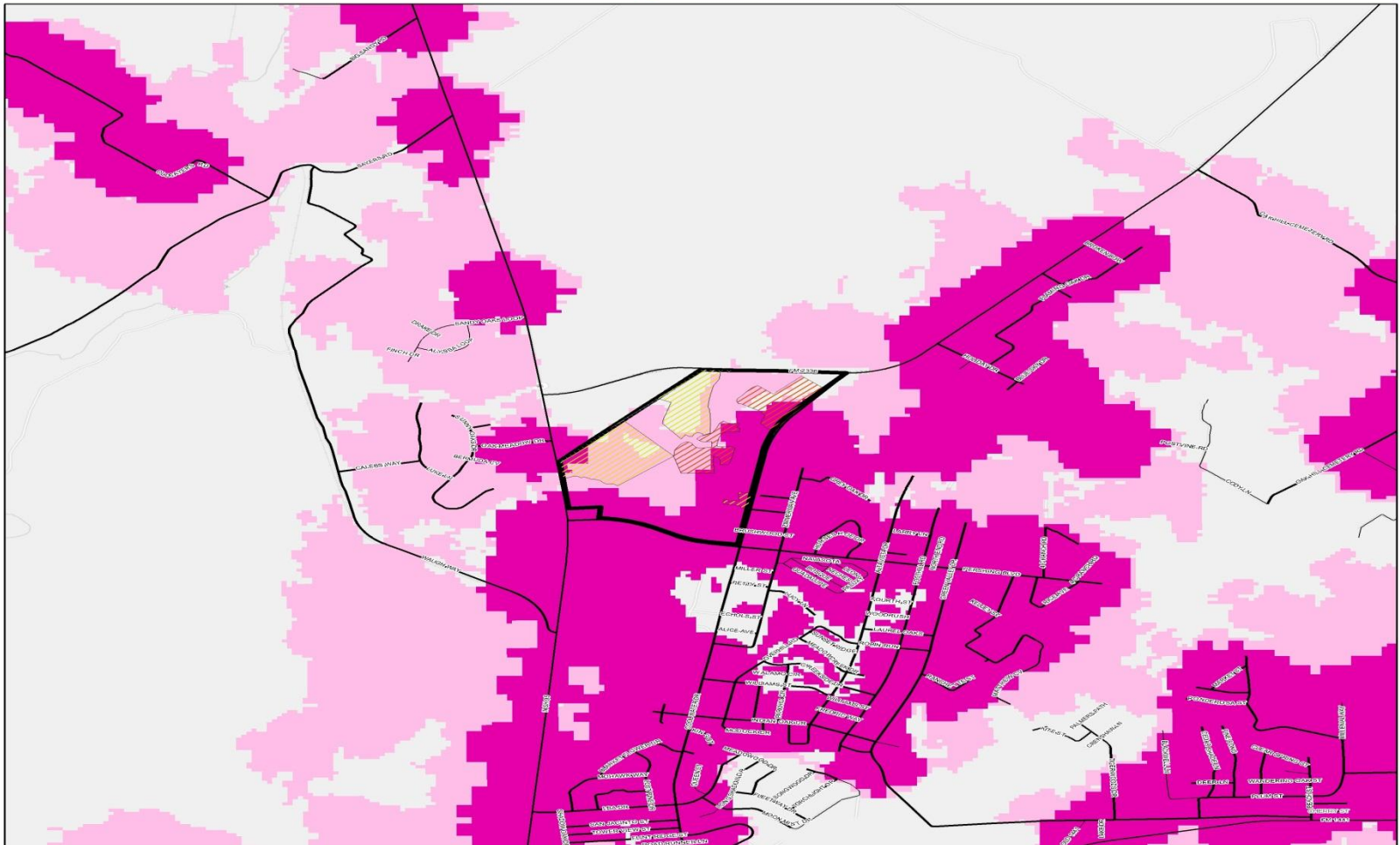
**Rich Gray**  
**State Fuels Reduction Coordinator**

# Assess the Risk





# UT Cancer Research Center - Bastrop Texas Community Protection Zone



**Property Boundary**

**Primary**

**Secondary**

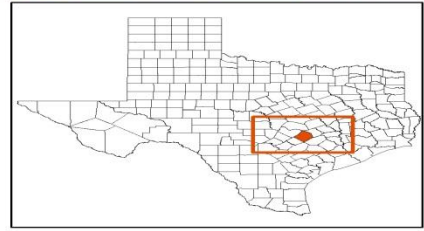
**Treatment Areas**

- 1st Priority - 41 acres
- 2nd Priority - 98 acres
- Fuel Break 60 Feet - 6.4 acres

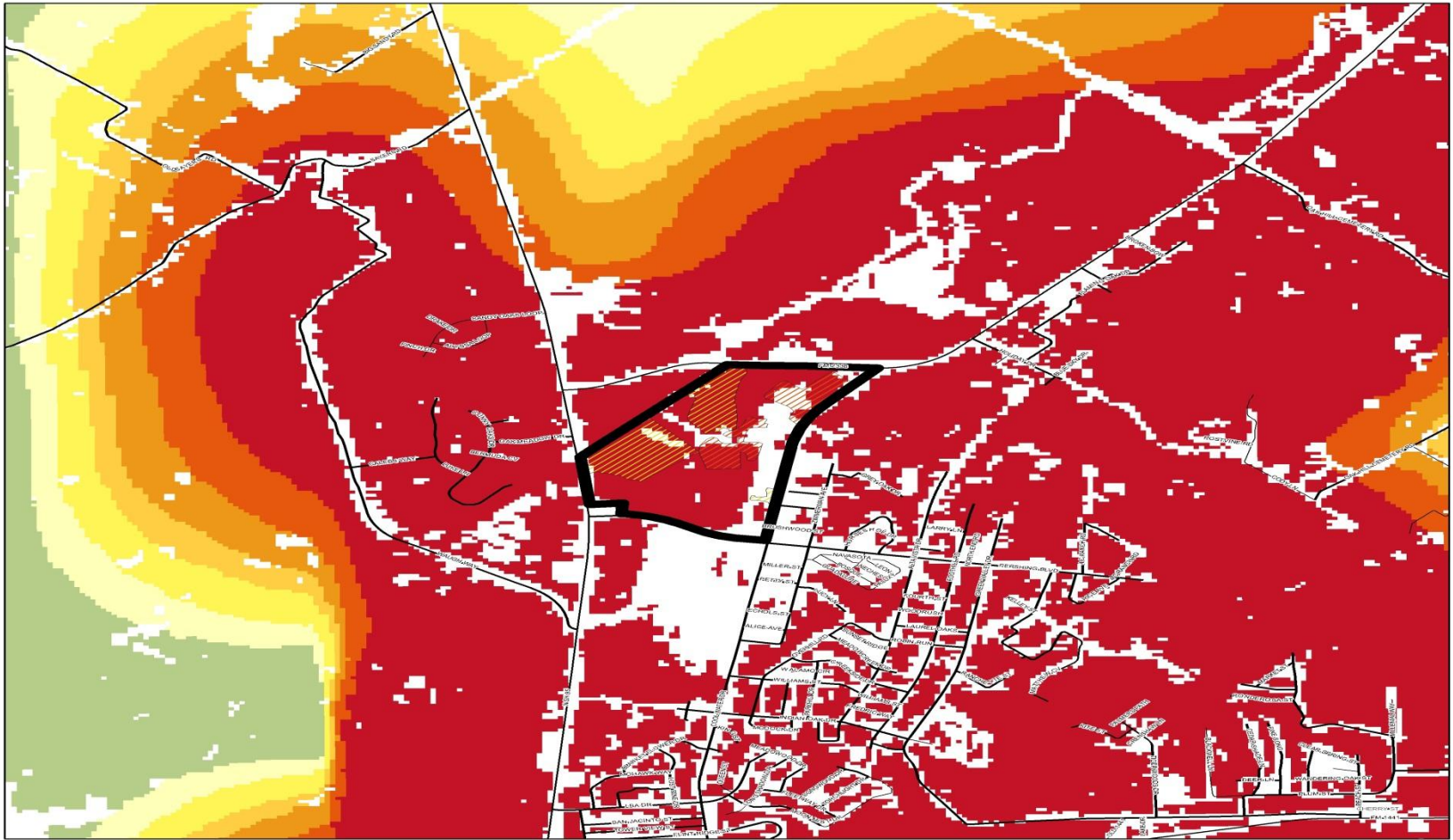
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Projection: NAD83 - Texas Central Feet  
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K. Ridenour, GIS Specialist TFS



# UT Cancer Research Center - Bastrop Texas Wildfire Ignition Density



**Property Boundary**

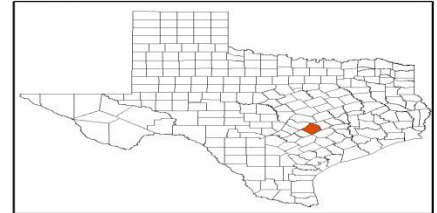
**Wildfire Ignition Density**

- 1 (Low)
- 2
- 3 (Moderate)
- 4
- 5 (High)
- 6
- 7 (Very High)

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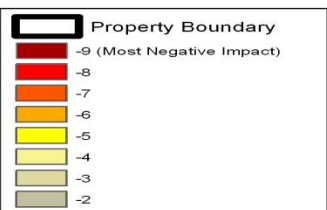
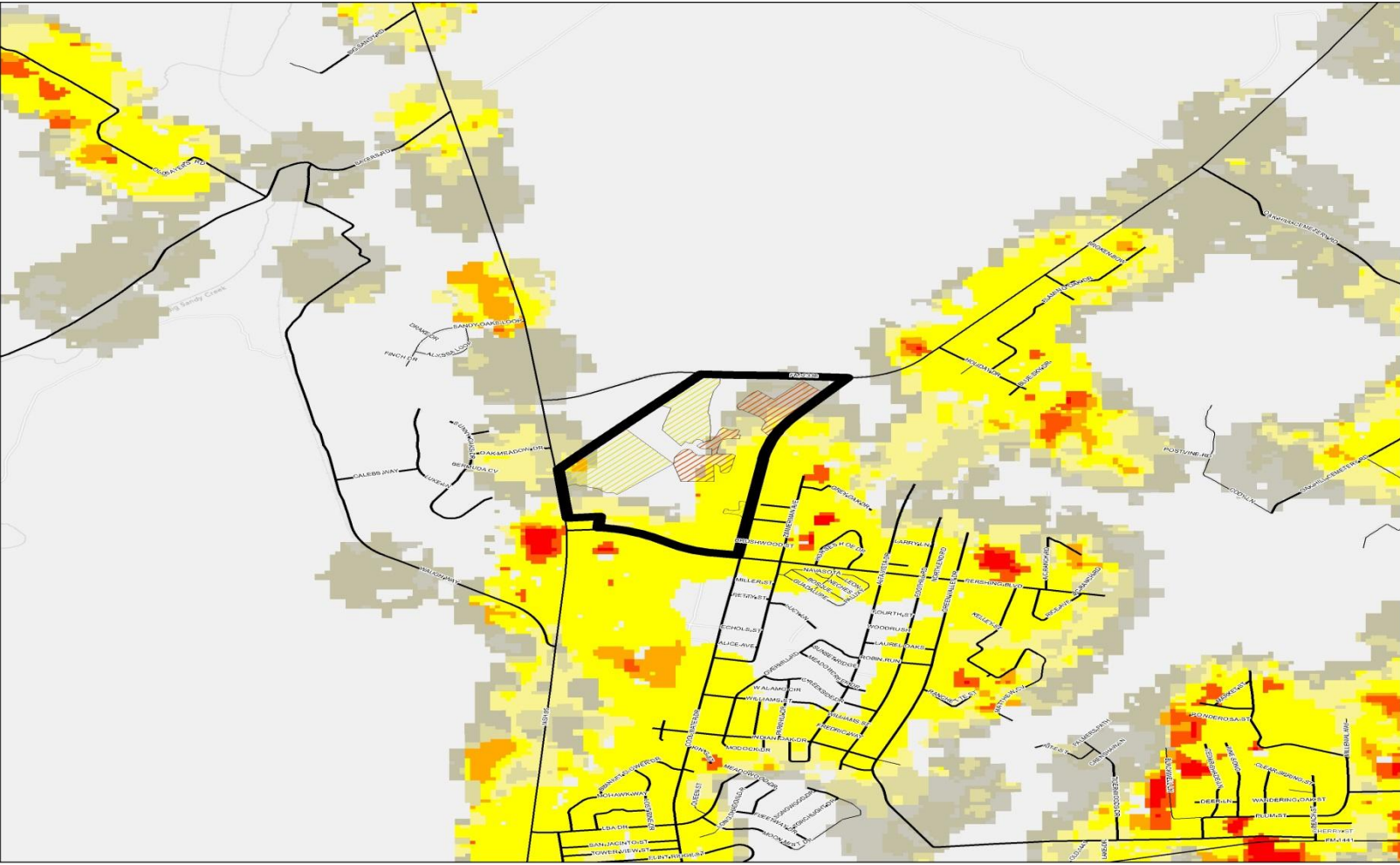


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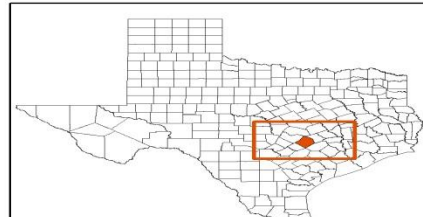




## UT Cancer Research Center - Bastrop Texas WUI Response Index



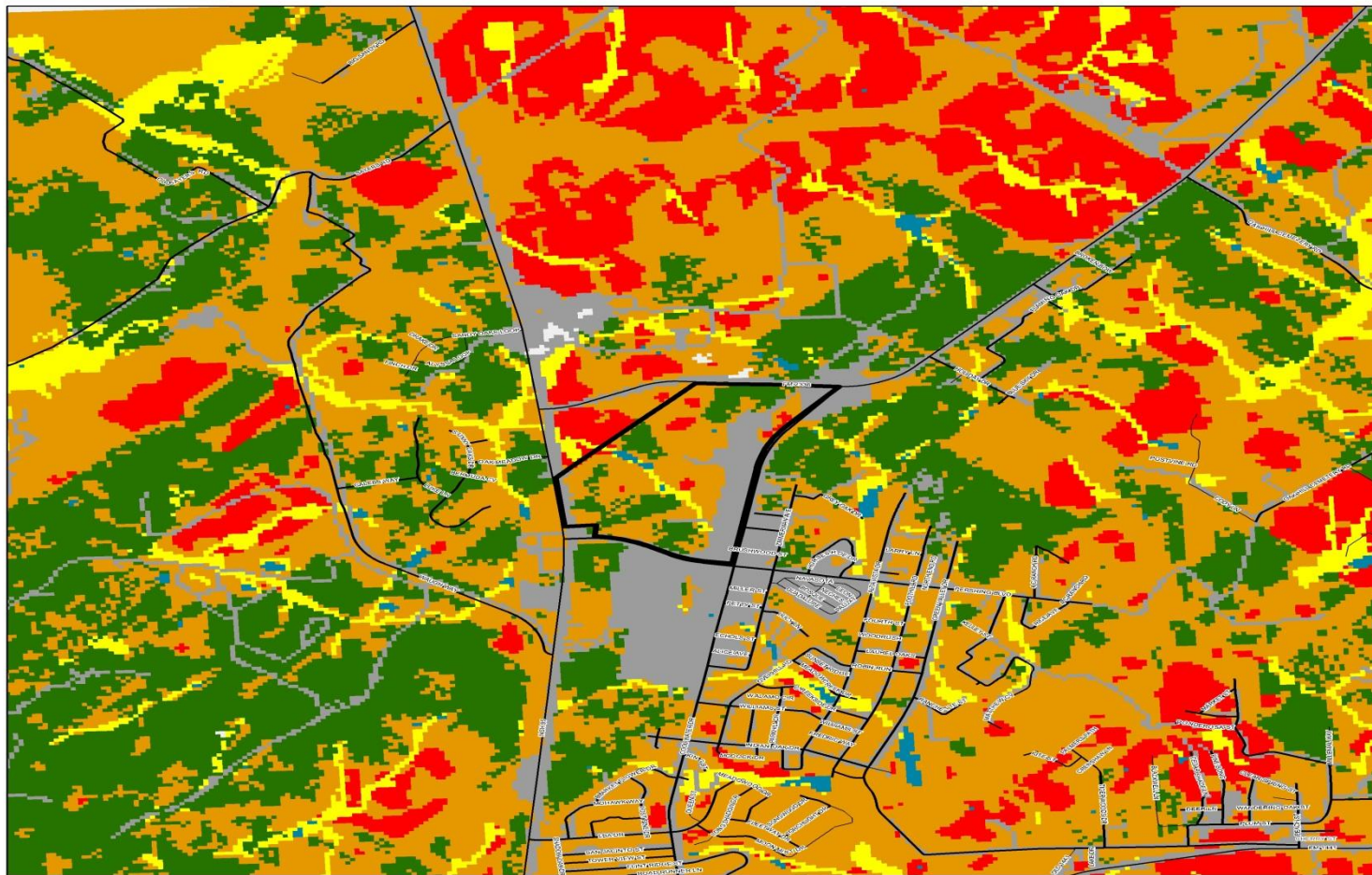
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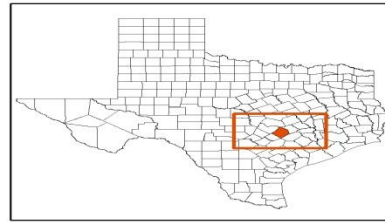


# UT Cancer Research Center - Bastrop Texas Fire Regime Condition Classes



	Property Boundary
	FRCC I
	FRCC II
	FRCC III
	Water
	Urban
	Agriculture

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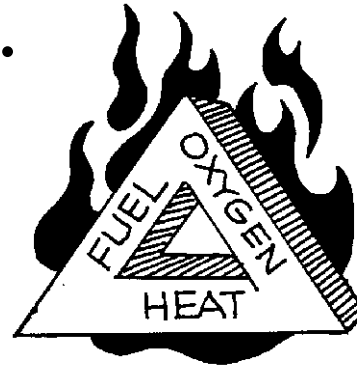


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K. Rosenour GIS Specialist TFS

# FIRE TRIANGLE

•The surface, or smoldering mode of combustion, is represented by the fire triangle.

- Fuel
- Oxygen
- Heat



•Normal air contains 21% oxygen, approximately 16% is required for the fire triangle.

•A heat source must also be present.

•A fuel source of a gas, liquid or solid must be present.

# Radiation

**Burning objects release energy in the form of heat. In most cases, radiant heat from a wildfire will not ignite materials on homes at distances greater than 30 feet from the house.**

**During prescribed fires in the Urban Wildland Interface, fire professionals carefully monitor the amount of radiant heat being released from the flaming fire front.**

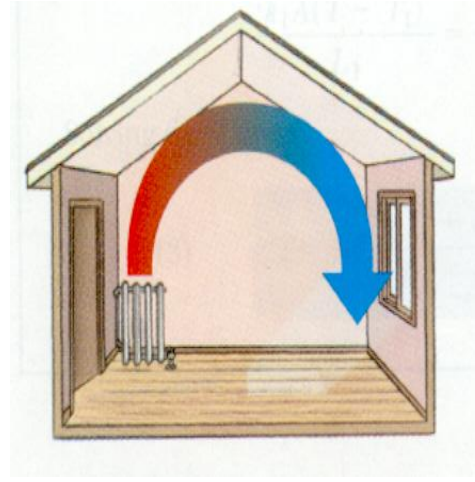
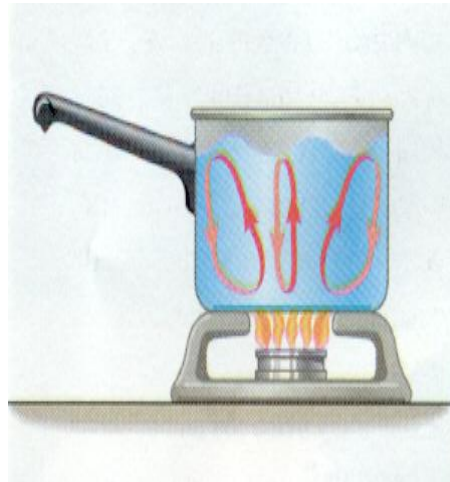
**Vinyl Siding Damaged From Wildfire**





# Convection

- Heat transfer through convection tends to move upward. During wildfires, burning materials on the forest floor create convection currents that preheat the leaves and branches of shrubs and trees above the fire.
- Spotting and can result in rapid advancement of the fire.
- Firebrands can also ignite homes directly if they land on flammable roofing or accumulations of leaves or needles in gutters or on roofs.



# Conduction

**Conduction carries heat through fuels, such as logs or house walls, and can raise their temperature to ignition points. Heat transfer through conduction can only occur within the same object or between objects that are touching.**



# **Lessons Learned**

## **From this Devastating Fire Event**





# **Primary Mechanism of Home Ignition**

- **Rolling and Wind Blown Embers**
  - **Direct Fire Travel**
  - **Residual Heat Sources**
- **No Breaks in Continuous Fuels**
- **Outbuilding/Vehicle to Structure Damage**
  - **Decks and Fences**



## Primary Causes

**Flammable Skirting**

**Wooden Decks**

**Open Foundation**





## Primary Causes

Unscreened vents in attics

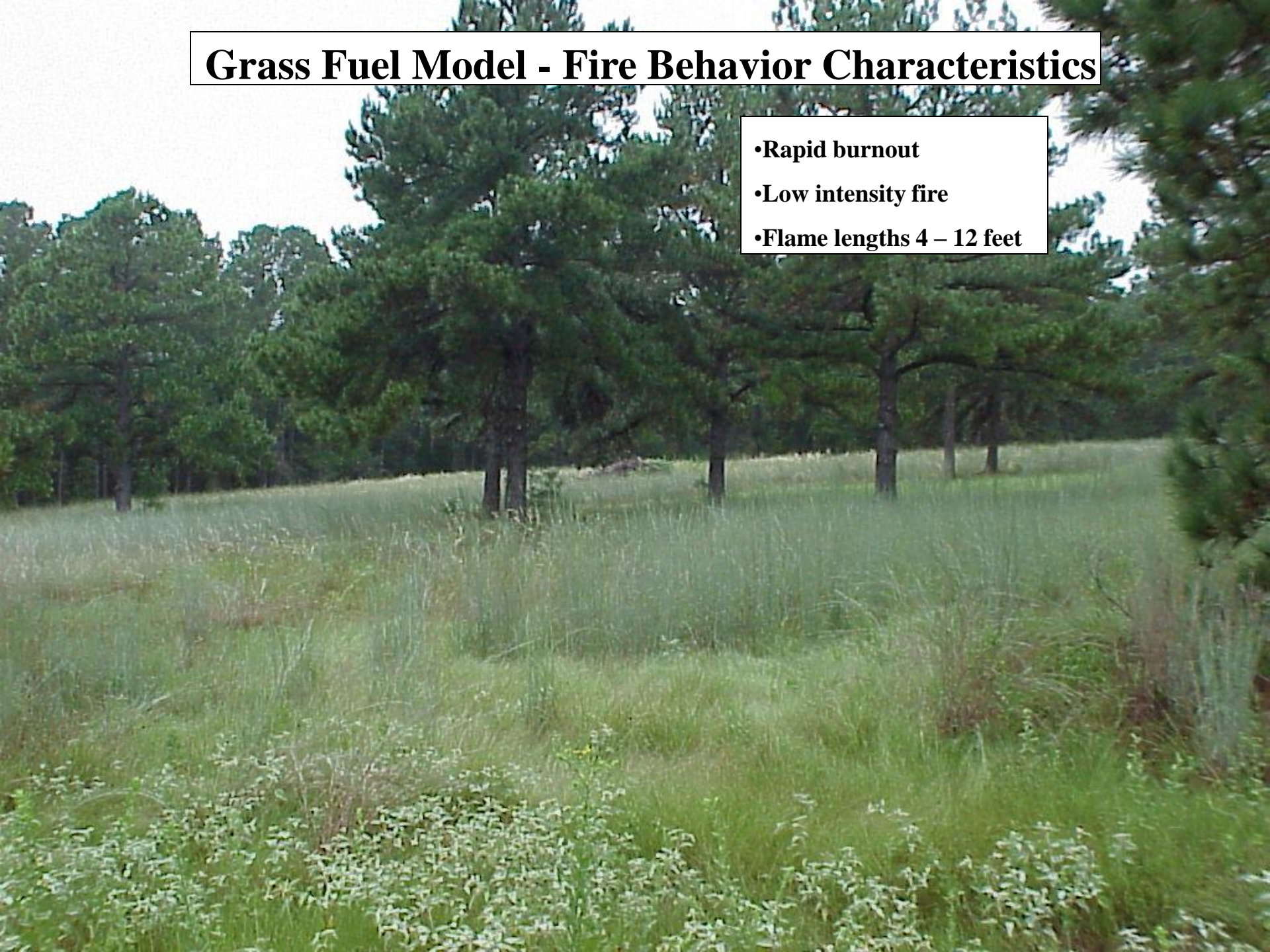
Unenclosed soffits

Wooden Decks



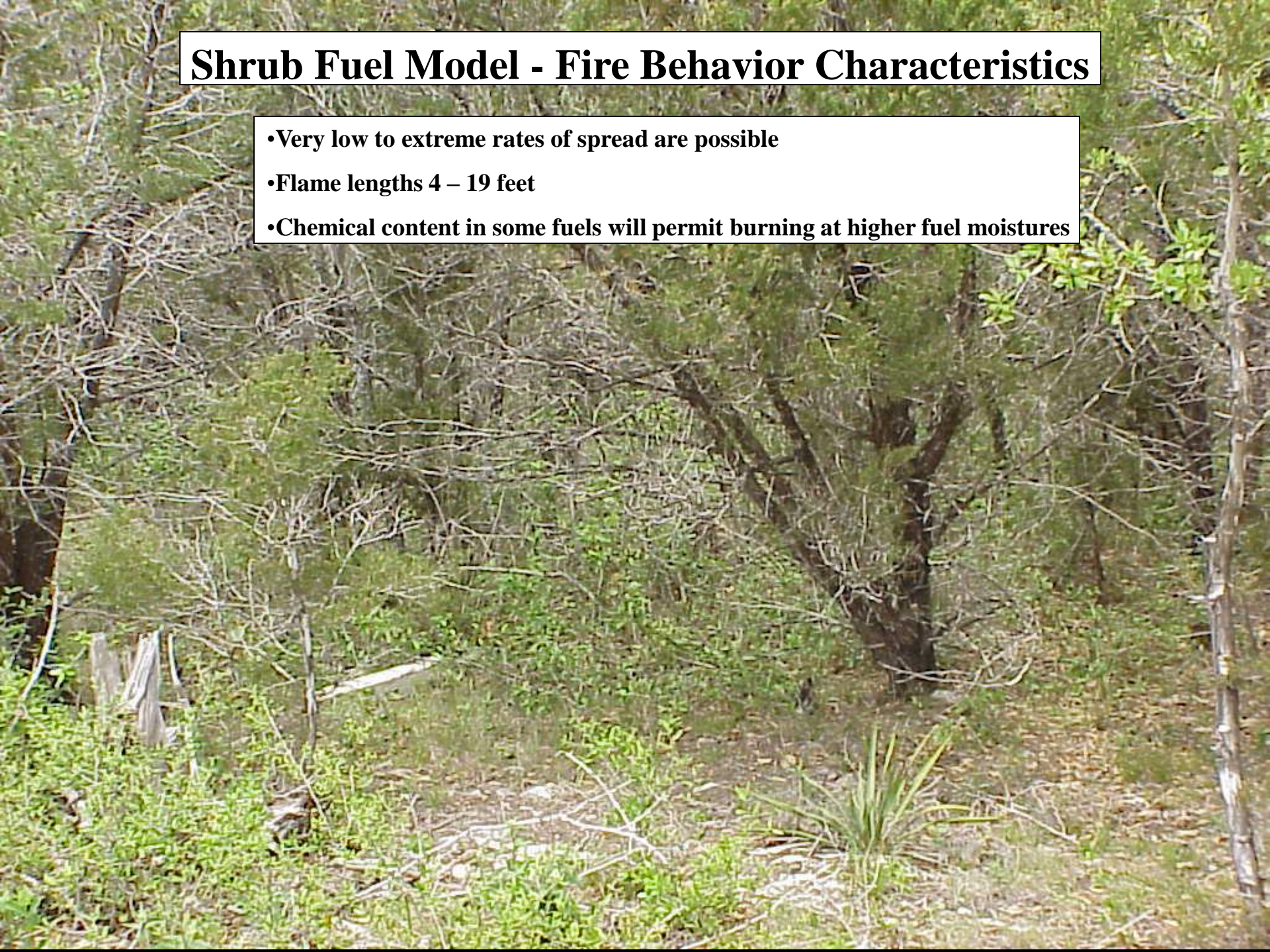
# Grass Fuel Model - Fire Behavior Characteristics

- Rapid burnout
- Low intensity fire
- Flame lengths 4 – 12 feet



## **Shrub Fuel Model - Fire Behavior Characteristics**

- **Very low to extreme rates of spread are possible**
- **Flame lengths 4 – 19 feet**
- **Chemical content in some fuels will permit burning at higher fuel moistures**





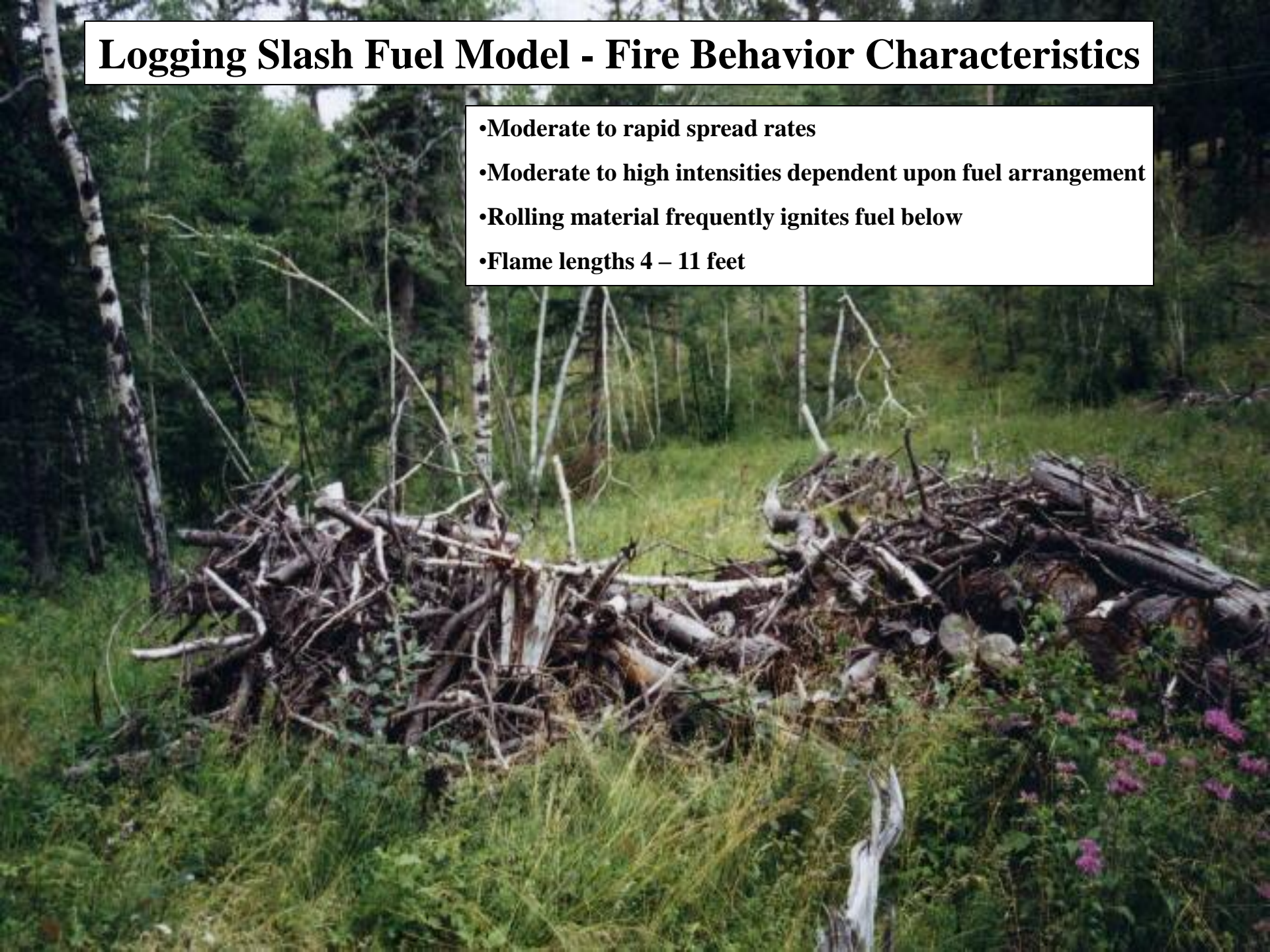
## **Timber Fuel Model - Fire Behavior Characteristics**

- Range from slow burning to running surface fires
- Occasional torch outs to running crown fire possible
- Flame lengths 1 – 5 feet



# Logging Slash Fuel Model - Fire Behavior Characteristics

- Moderate to rapid spread rates
- Moderate to high intensities dependent upon fuel arrangement
- Rolling material frequently ignites fuel below
- Flame lengths 4 – 11 feet



# Fire Breaks in Wildland Fuels

## Stopping a Disaster







Hasler Blvd  
Childers St  
 LOOP EAST  
 150  
 EXIT 1 MILE

104 SOUTH  
Ed Burleson  
Ln  
SPEED  
LIMIT  
5

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**Fuels Project are Designed to  
Modify the Expected Fire  
Behavior in a Geographic Area**





# Who Should Participate in Fire Planning?

- Partners:
  - Local Fire Districts
  - Local and County Governments
  - Texas Forest Service
  - Citizens
  - Neighborhood Associations
  - Federal Land Managers: (USFS, BLM, NPS, USFWS, DOD)
  - Social Service Agencies
  - Community Organizations
  - and others!





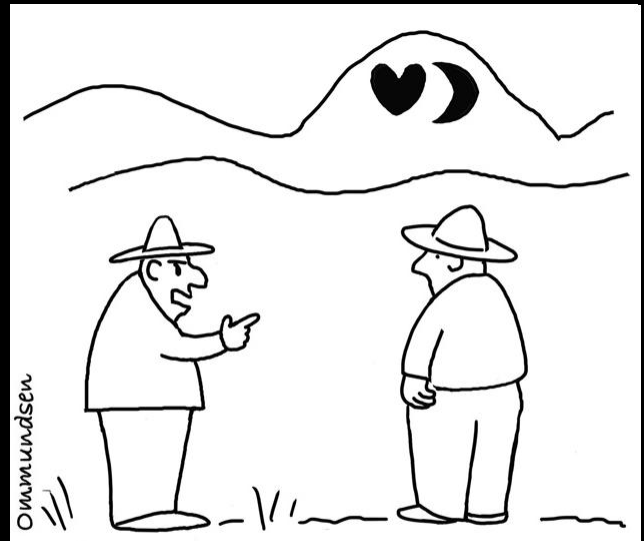
# Trial and Tribulations



"Hey, Pete, what are you doing out here, Pete? Trying to avoid me, Pete? Huh, Pete? Huh, Pete?"



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"Whoever did the controlled burns on Blueberry Hill is to report to my office."



**Fuels Project are Designed to  
Modify the Expected Fire  
Behavior in a Geographic Area**





# Implementation

After all the Paper Work is Completed





# Building Shaded Fuel Breaks





# Guidelines for Creating Shaded Fuel Breaks

**For timbered areas**

**Follow contour lines**

- **30' wide core min.**
  - **Large trees pruned up to ten feet**
  - **Remove low-growing brush species**
- **20'-30' on both sides of core**
  - **Thin trees to a crown spacing of 10'**
  - **Remove ladder fuels to a height of 5'-8'**
  - **Break-up concentrated pockets of brush**
- **Minimum width of 30' increasing to 100' on slopes**





# Area Fuel Treatment Shaded Fuel Break









# **Guidelines for Creating Shaded Fuel Breaks**

**For closed canopy woodlands.**

**Follow contour lines**

- **30' wide core min.**

- **Large trees pruned up to six feet**

- **Remove shrubs that are 4" in diameter and under 12' tall**

**As well as dead wood and debris.**

- **Retain large trees crowns to promote shade to reduce growth of fine fuels**

- **Remove ladder fuels and small saplings under leave trees**

- **Minimum width of 30' increasing to 100' on slopes**







# Guidelines for Creating Shaded Fuel Breaks

**For open woodlands**

**Follow contour lines**

- **30' wide core min.**
  - **Large trees pruned up to eight feet**
  - **Remove low-growing brush, dead wood and grass**
  - **from with in 10 feet of canopy of trees.**

**Large trees crowns should not overlap.**

- **Minimum width of 30' increasing to 100' on slopes**





# Prescribe Burns Reduce Fuels





31 10:47AM



# Defensible Space

•Zone 1

•Zone 2

•Zone 3

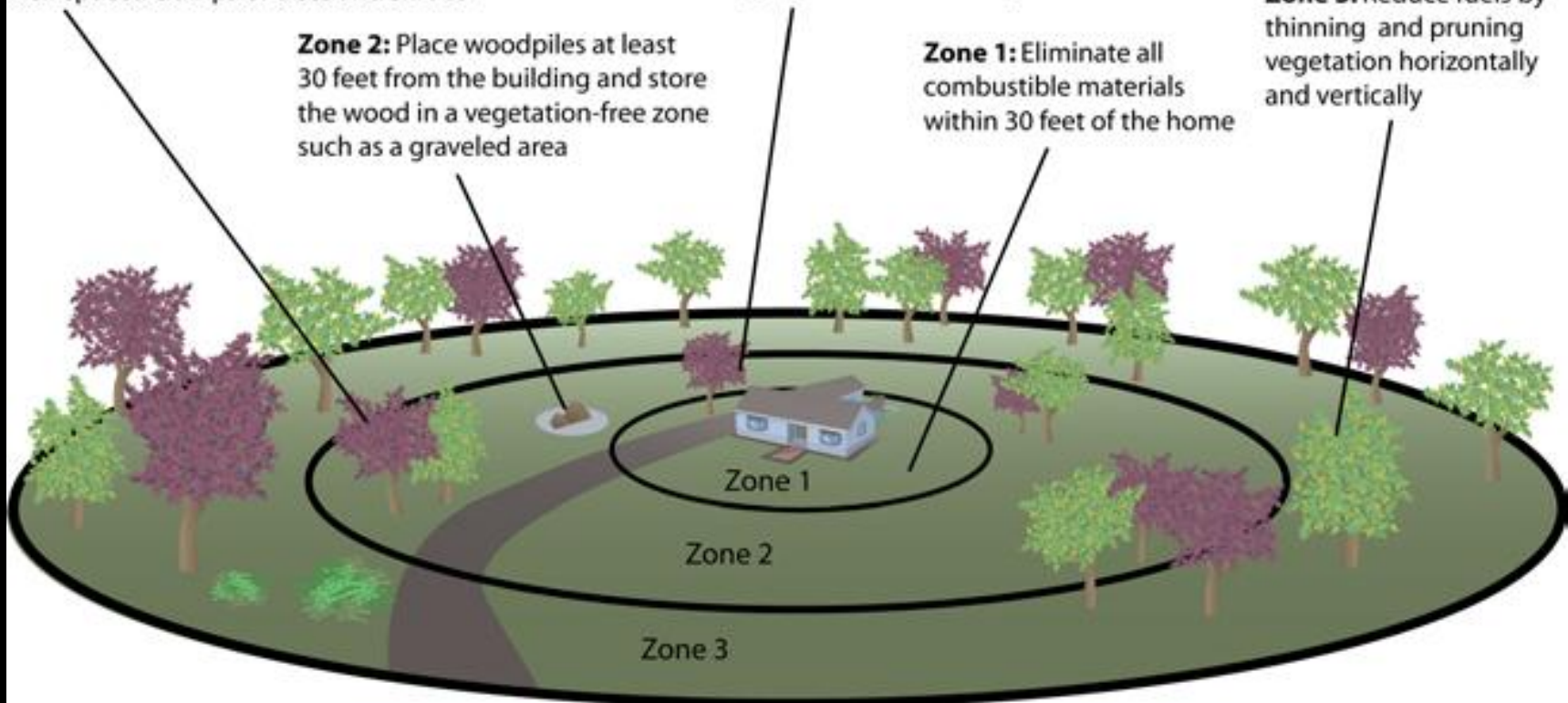
**Zone 2:** Prune and remove dead and dying branches from individual and well-spaced clumps of trees and shrubs

**Zone 1:** Remove combustible litter on roofs and gutters and trim tree branches that overhang the roof and chimney

**Zone 3:** Reduce fuels by thinning and pruning vegetation horizontally and vertically

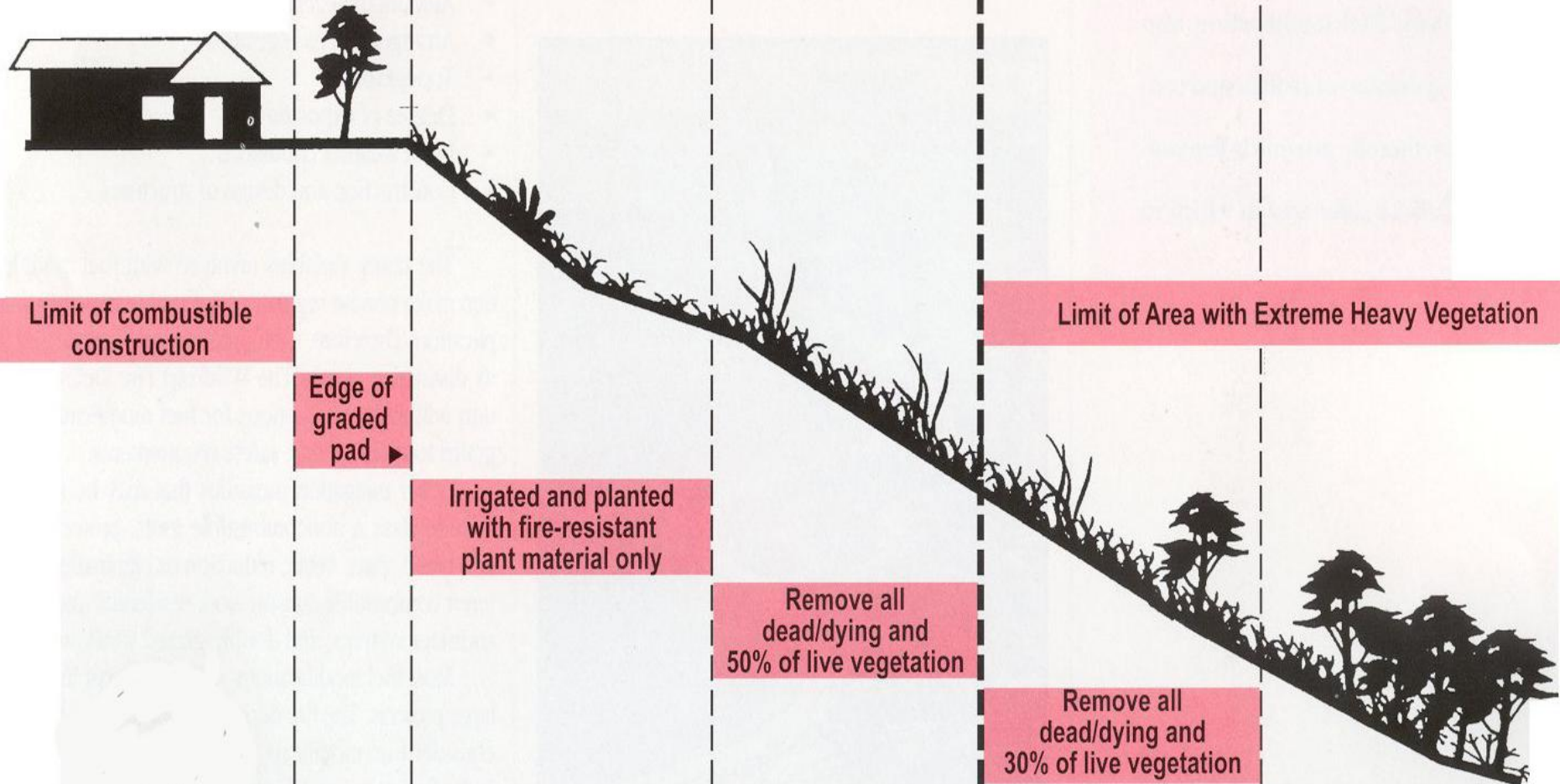
**Zone 2:** Place woodpiles at least 30 feet from the building and store the wood in a vegetation-free zone such as a graveled area

**Zone 1:** Eliminate all combustible materials within 30 feet of the home



# Fuel Modification Diagram

A ZONE	B ZONE	C ZONE	D ZONE	Natural Vegetation
20'	50' min.	50' min.	50' min.	
setback zone	wet zone	thinning zone	thinning zone	



# Select & Use Fire Resistant Materials

- **Roofing:** Metal, tile or fire-resistant roofing
- **Fireplace and Chimneys:** Install spark arrestors
- **Gutters:** Remove plant debris and install screens if possible
- **External Walls:** Stone, brick, stucco or fire-resistant siding
- **Skirting:** Use solid skirting around decks and porches
- **Doors and Windows:** Select products with heat-insulating properties. (*I.e. Tempered glass vs. non-tempered glass.*)
- **Eaves, Soffits, Overhangs and Vents:** Box in eaves and overhangs if possible and screen any vents and openings
- **Decks, Porches, Etc.:** Construct with masonry if possible or enclose areas under wooden structures
- **Fencing Materials:** Consider metal and stone options
- **Driveways and Sidewalks:** Use concrete or gravel walkways as fire breaks instead of wooden platforms



Limb Up  
Trees 6  
- 10 Feet  
from the  
Ground







And in  
Zones 3  
and 4...



...The  
Mitigation  
Continues.





















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