



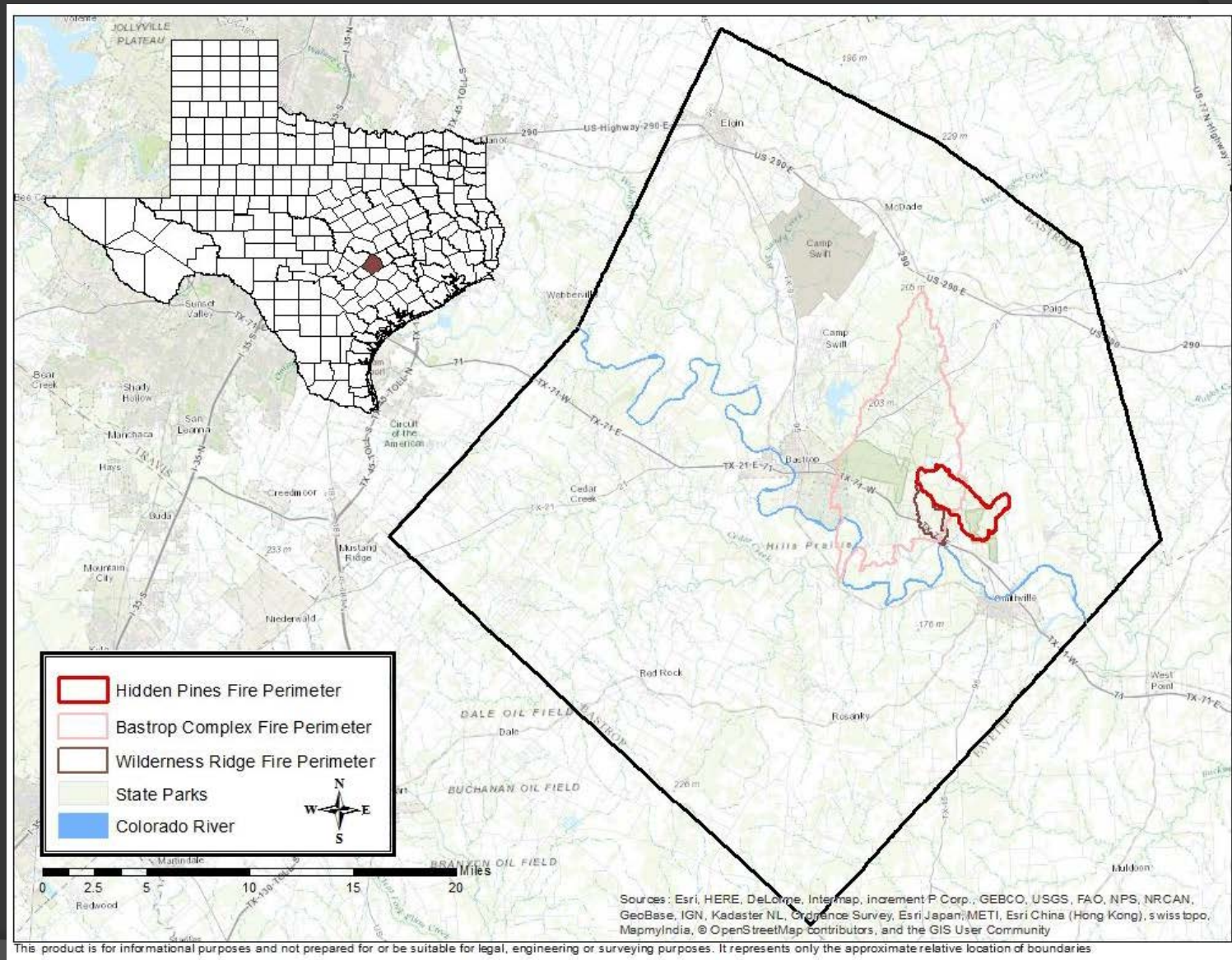
**UNDERSTANDING  
WILDFIRE RISK  
&  
HOW TO MANAGE  
FOR IT**

- Bastrop County Wildfire  
History
- Variables Affecting Wildfire
- Mitigation

# Fire Triangle



# Bastrop County Wildfire History



# Historic Wildfires Values

Fire name & acreage	LFM % Loblolly Pine	LFM % Yaupon	LFM % Eastern red cedar	RH %	Wind direction	Wind speed mph (gusts)
Wilderness Ridge (1,491 ac.)	112	97	84*	~25	N	9 (23)
Bastrop County Complex (32,400 ac.)	83	52	54	21	N	12 (27)
Hidden Pines (4,582 ac.)	113	79	81*	34→8	N	8 (16)

## Red Flag Warning Criteria for Central TX:

1. RH at 25% or less
2. Wind speeds of 15 mph or more
3. Temperature 10% above average

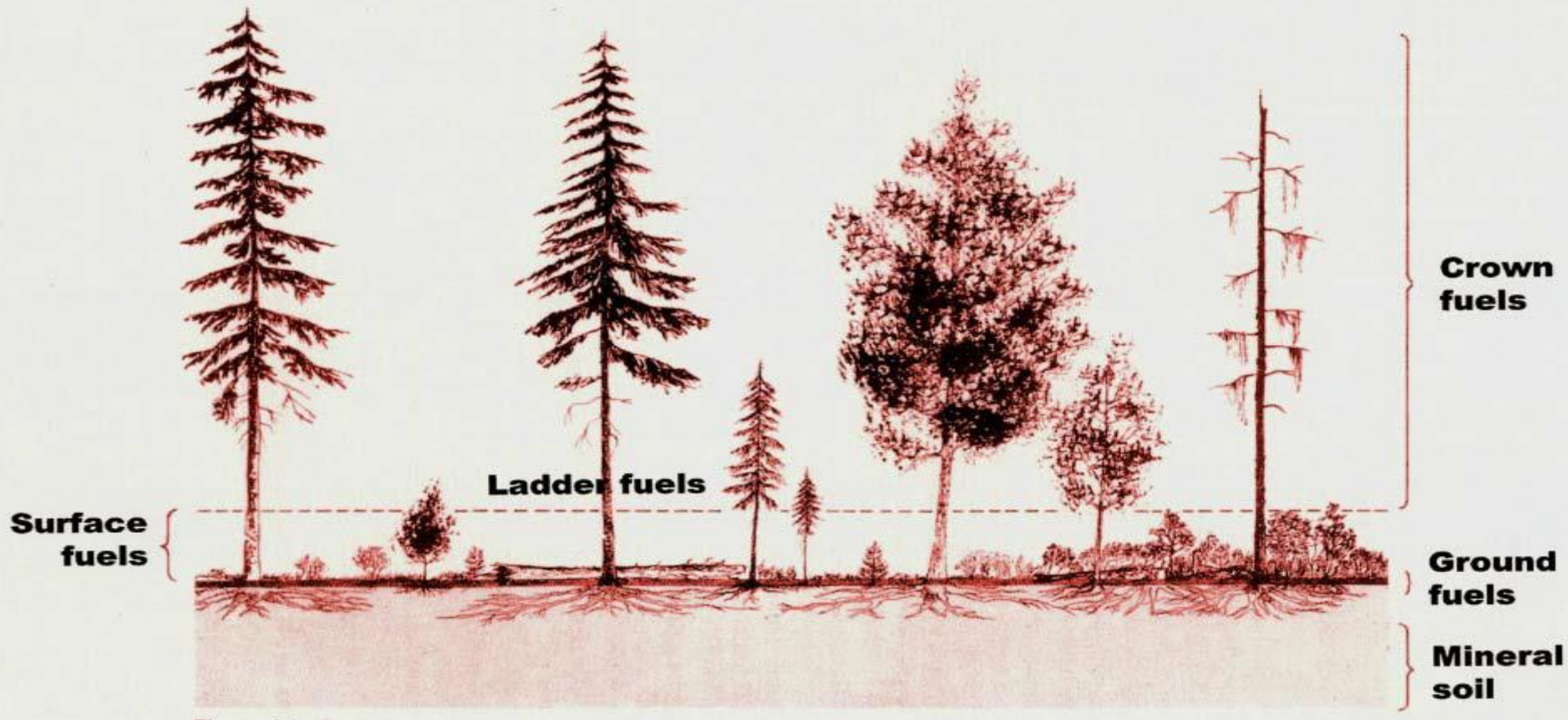
## Common Denominators:

1. Humidity near or less than 25%
2. Gusty northerly winds
3. Extreme or exceptional drought

# VARIABLES AFFECTING WILDFIRE SPREAD & SEVERITY

- Fuels structure & volume
- Weather
- Fuel moisture

# Fuels Structure





Surface fuels: Grasses, pine seedlings, pine needles

Ladder fuels: Yaupon

Crown fuels: Loblolly pine



# Weather

## Temperature

- The higher the air temperature, the greater fire potential

## Relative Humidity

- The lower the relative humidity, the greater fire potential

## Wind Speed

- The higher the wind speed, the faster the spread

# Fuel Moisture

## DEAD fuel moisture

- Fallen leaves, needles, dried grasses, downed limbs & logs, etc.
- Dormant or dead fuels react to relative humidity (RH) dependent on the size of the fuels
- Time Lag: A measure of the rate at which a specified size of dead fuel gains or loses moisture
  - 1-hr fuels: <1/4"
  - 10-hr fuels: 1/4-1"
  - 100-hr fuels: 1-3"

## LIVE fuel moisture (LFM)

- Standing live vegetation
- Critical Live Fuel Moisture Levels for Central Texas
  - Eastern red cedar:  $\leq 80\%$
  - Yaupon:  $\leq 100\%$
  - Loblolly pine:  $\leq 120\%$
- As LFM decreases, flammability of those live fuels increases

# Timelag Fuel Classes



The shorter the timelag, the more responsive the fuel is to changing weather conditions. Fire danger can be very high even right after a heavy rain if the subsequent weather conditions allow the 1-hour fuels to dry out.

# Severe Fire Behavior Potential Related to Relative Humidity and Dead Fuel Moisture Content

RH %	1-HR FM %	10-HR FM %	Relative ease of chance ignition & spotting
26-40	11-14	10-12	High ignition hazard – matches always dangerous; occasional crowning, spotting caused by gusty winds
15-30	5-7	5-7	Quick ignition, rapid buildup, extensive crowning; any increase in wind causes increased spotting, crowning, loss of control; fire moves up bark of trees igniting aerial fuels; long distance spotting in pine stands
<15	<5	<5	All sources of ignition dangerous; aggressive burning; spot fires occur often and spread rapidly, extreme fire behavior probable

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# Fire Danger Resources

Texas Fire Weather – [twc.tamu.edu/tfd](http://twc.tamu.edu/tfd)

**twc** Texas Weather Connection

KBDI

TFD

NEXRAD

## Texas Fire Danger (TFD)

The **Texas Fire Danger (TFD)** map is produced by the National Fire Danger Rating System (NFDRS). Weather information is provided by remote, automated weather stations and then used as an input to the Weather Information Management System (WIMS). The NFDRS processor in WIMS produces a fire danger rating based on fuels, weather, and topography. Fire danger maps are produced daily. In addition, the [Texas A&M Forest Service](#), along with the [SSL](#), has developed a five day running average fire danger rating map. [Browse reference materials.](#)

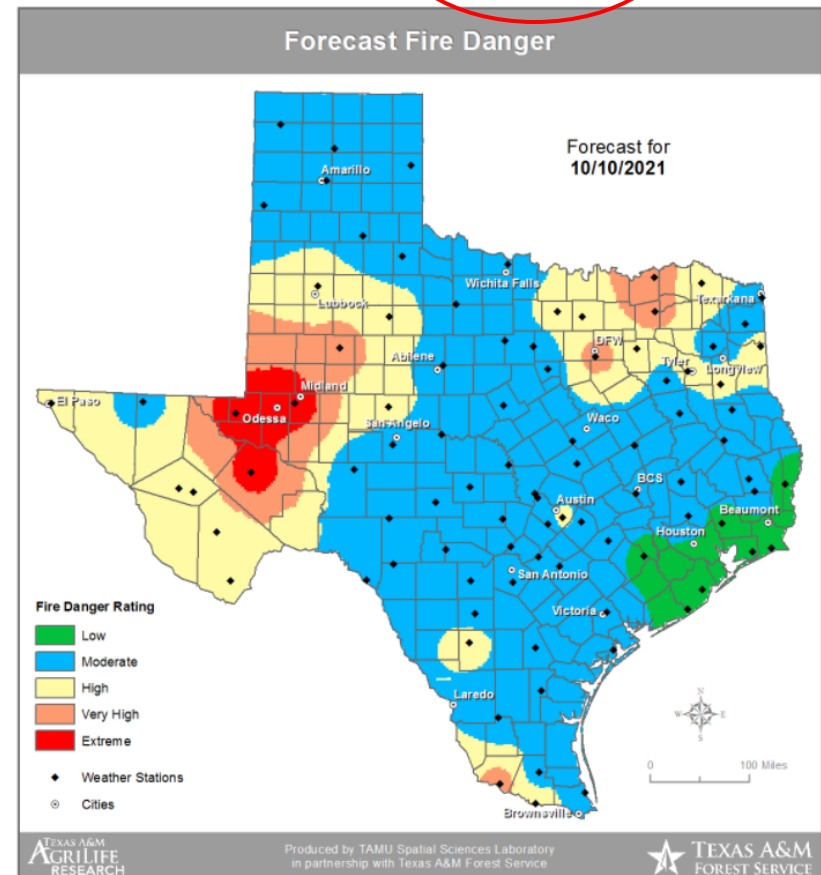
Daily RAWs information is derived from an experimental project - DO NOT DISTRIBUTE

Download data for 10/10/2021 or select another date below:

Observed data for 10/10/2021 and forecasts for 10/11/2021 are updated by approximately 4:30 p.m. 10/10/2021.

Oct		2021					
Su	Mo	Tu	We	Th	Fr	Sa	
						1	2
3	4	5	6	7	8	9	
10	11	12	13	14	15	16	
17	18	19	20	21	22	23	
24	25	26	27	28	29	30	
31							

- Forecast Fire Danger
- Forecast Energy Release Component Percentile
- Forecast 100 Hour Fuel Moisture Percentile
- Forecast 10 Hour Fuel Moisture Percentile
- Forecast Fuel Dryness
- Forecast Burning Index Percentile
- Forecast Significant Fire Potential
- Texas NFDRS Forecasts
- Forecast 1 Hour Fuel Moisture



## Keetch/Byram Drought Index (KBDI) – [twc.tamu.edu/tfd](http://twc.tamu.edu/tfd)

0 – 200: Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. Typical of early spring following winter precipitation.

200 – 400: Fuels are beginning to dry and contribute to wildfire intensity. Heavier fuels will still not readily ignite and burn. This is often seen in late spring or early summer.

400 – 600: Lower litter and duff layers contribute to fire intensity and will burn actively. **Wildfire intensity begins to increase significantly.** Larger fuels could burn or smolder for several days. This is often seen in **late summer and early fall.**

600 – 800: Often associated with more severe drought with increased wildfire occurrence. **Intense, deep-burning fires with extreme intensities can be expected.** Live fuels can also be expected to burn actively at these levels.

Live fuel moisture - <https://www.wfas.net/index.php/national-fuel-moisture-database-moisture-drought-103>

## Texas State Forestry

CNTX_Bastrop_TX - Bluestem, Little					
Date	04/15	06/15	07/15	08/15	09/15
Percent	132	45	187	146	113

CNTX_Bastrop_TX - Oak, Post					
Date	04/15	06/15	07/15	08/15	09/15
Percent	254	110	103	96	95

CNTX_Bastrop_TX - Pine, Loblolly								
Date	01/15	02/15	03/15	04/15	06/15	07/15	08/15	09/15
Percent	124	117	123	114	149	168	122	158

CNTX_Bastrop_TX - Redcedar, Eastern								
Date	01/15	02/15	03/15	04/15	06/15	07/15	08/15	09/15
Percent	111	99	100	103	135	112	133	113

CNTX_Bastrop_TX - Yaupon								
Date	01/15	02/15	03/15	04/15	06/15	07/15	08/15	09/15
Percent	119	102	105	199	131	130	121	119

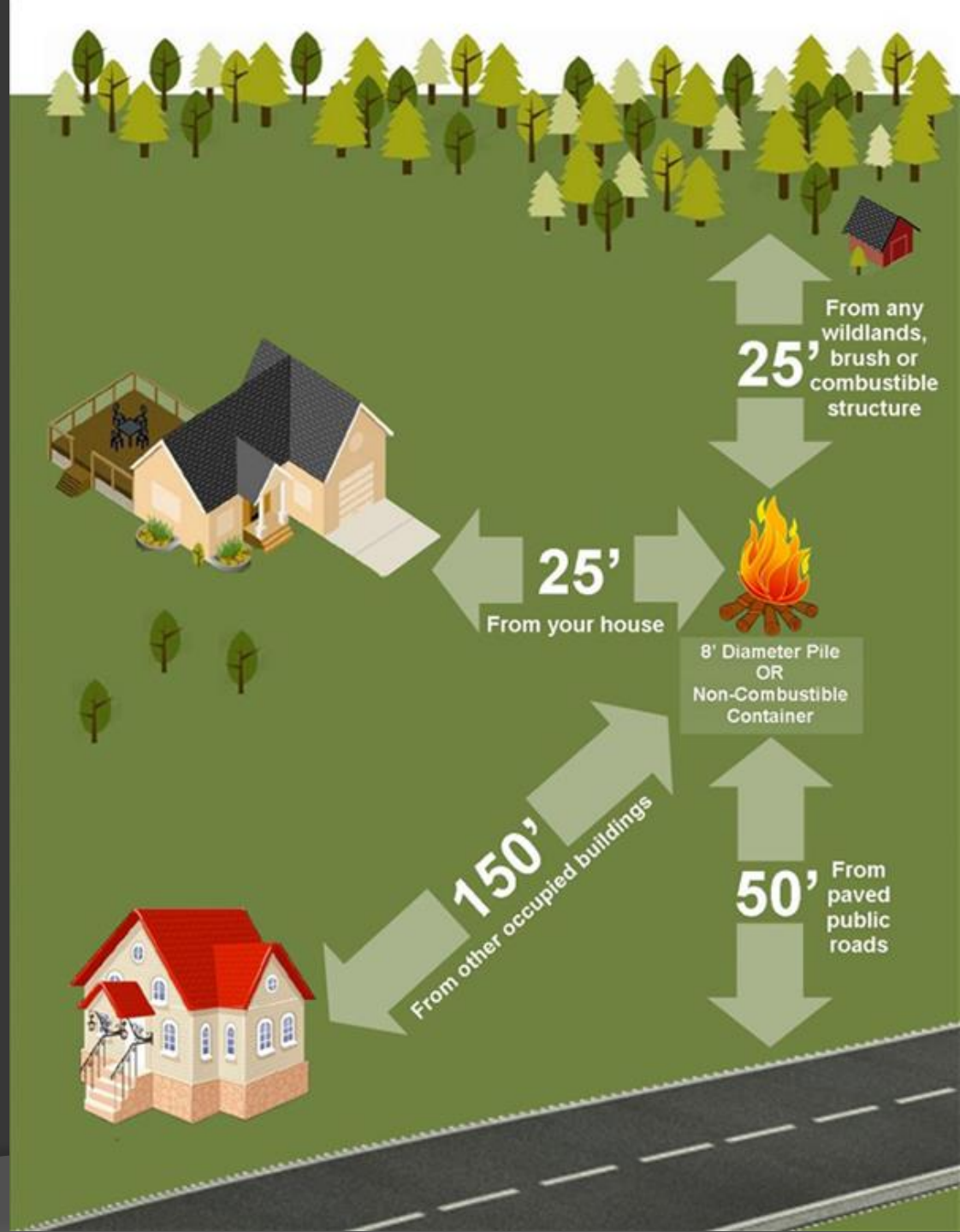
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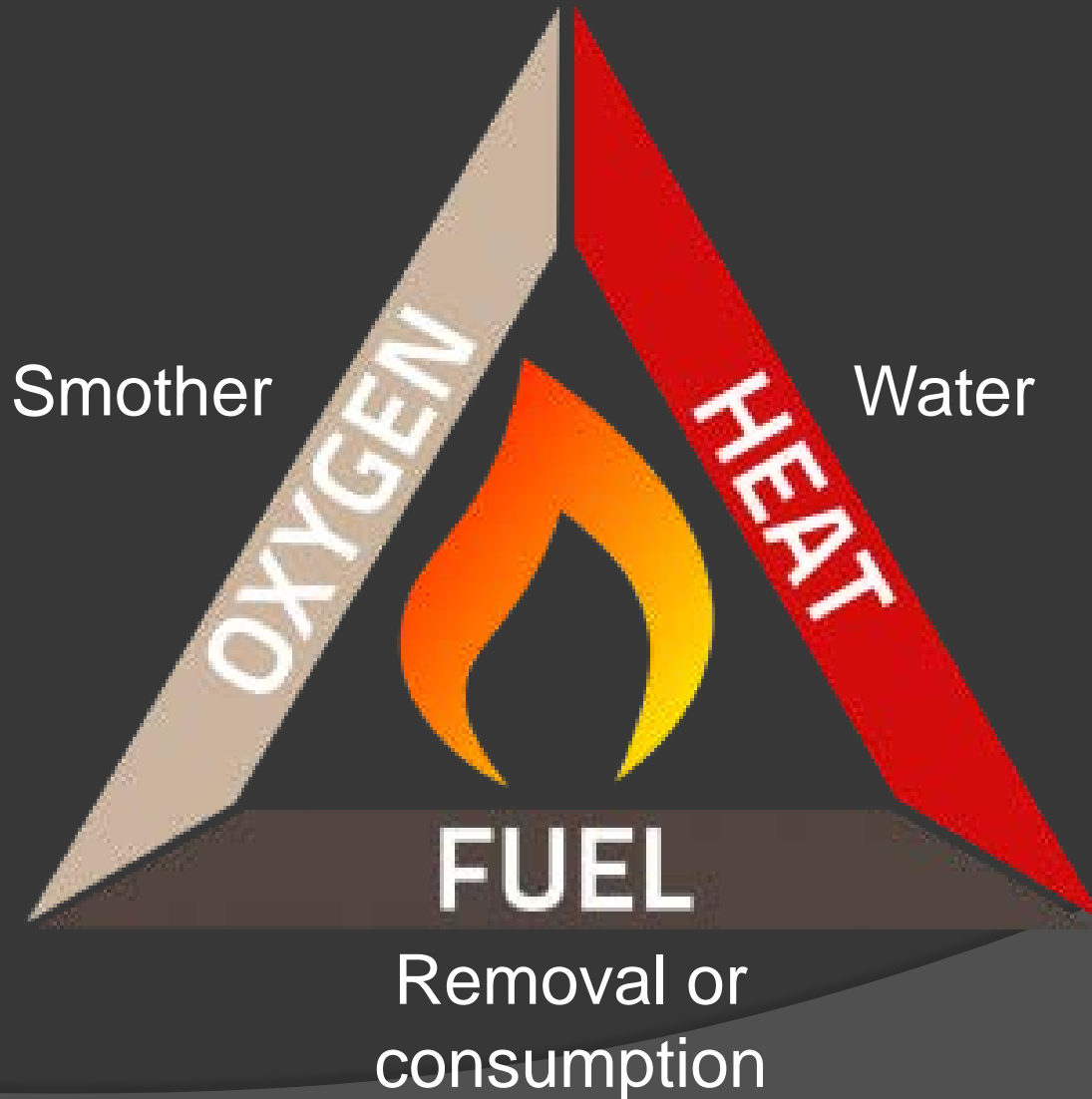


# PILE BURNING

- Preparations
- Equipment
- Ignition
- Monitoring
- Best Practices



# Fire Triangle



# Preparations



Ideally, create a disked area with no live or dead vegetation.

At a minimum, mow around the brush pile and saturate it with water prior to ignition. Then, periodically moisten the area.

# Equipment



# Ignition



Ignite on the downwind side for better control.

# Monitoring



# Best Practices

- Contact the Sheriff's Office Dispatch before lighting
- Keep suppression water resources and tools handy in case the pile needs to be extinguished.
- Continuous weather monitoring during the burn is equally as important as weather monitoring before and after lighting.
- Never leave a brush pile actively burning without appropriate supervision.
- After the pile is no longer actively burning, ensure that all brush or debris is either burned completely or cold to the touch before leaving the area.

# Best Practices, cont.

- ⦿ Large logs and tree trunks may continue to smolder for weeks after the fire's flaming phase is complete. These larger fuels may still emit embers under volatile weather conditions and ignite wildfires. Be sure to look at the weather forecast before, during, and after igniting brush piles.
- ⦿ Remember, safety is a priority at all times. Stay hydrated, keep communication open, and have a first aid kit on hand.

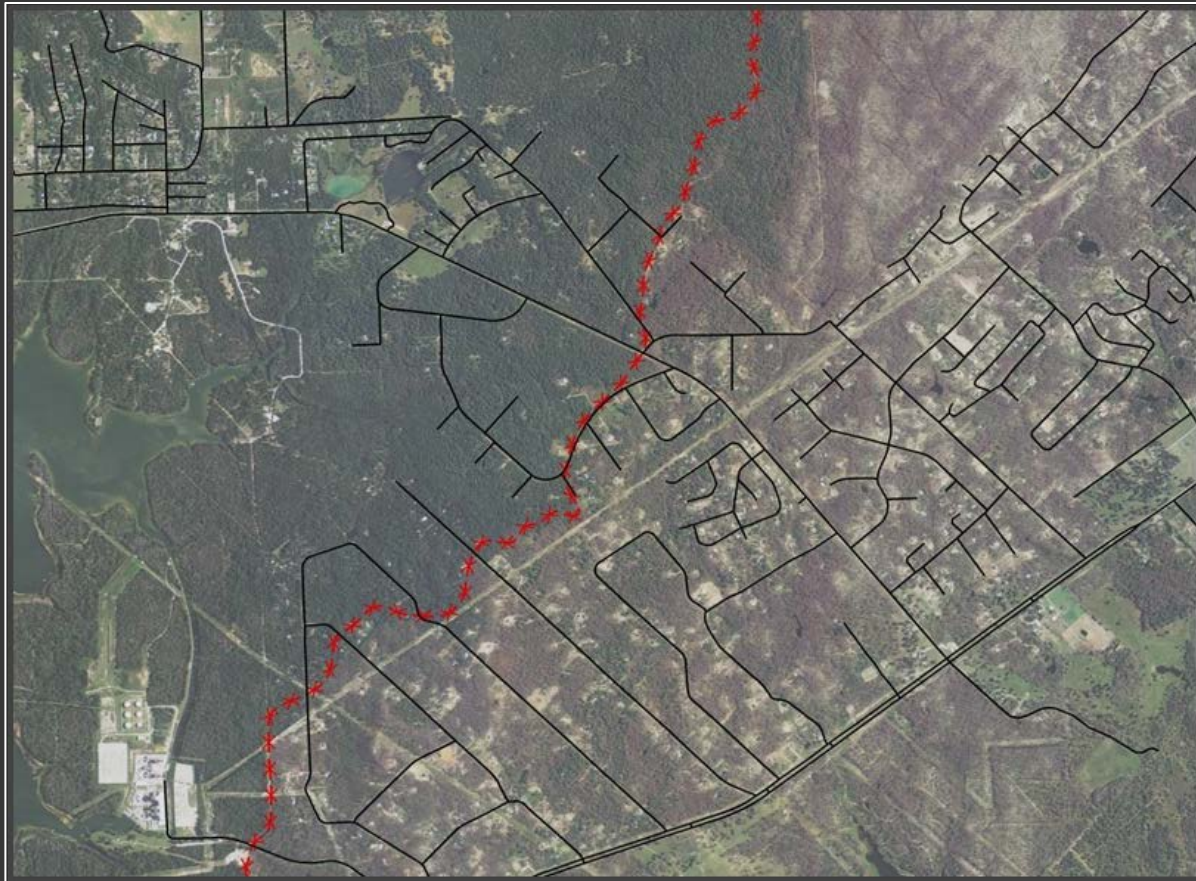


# MITIGATING FOR THE NEXT WILDFIRE

## Firewise principles

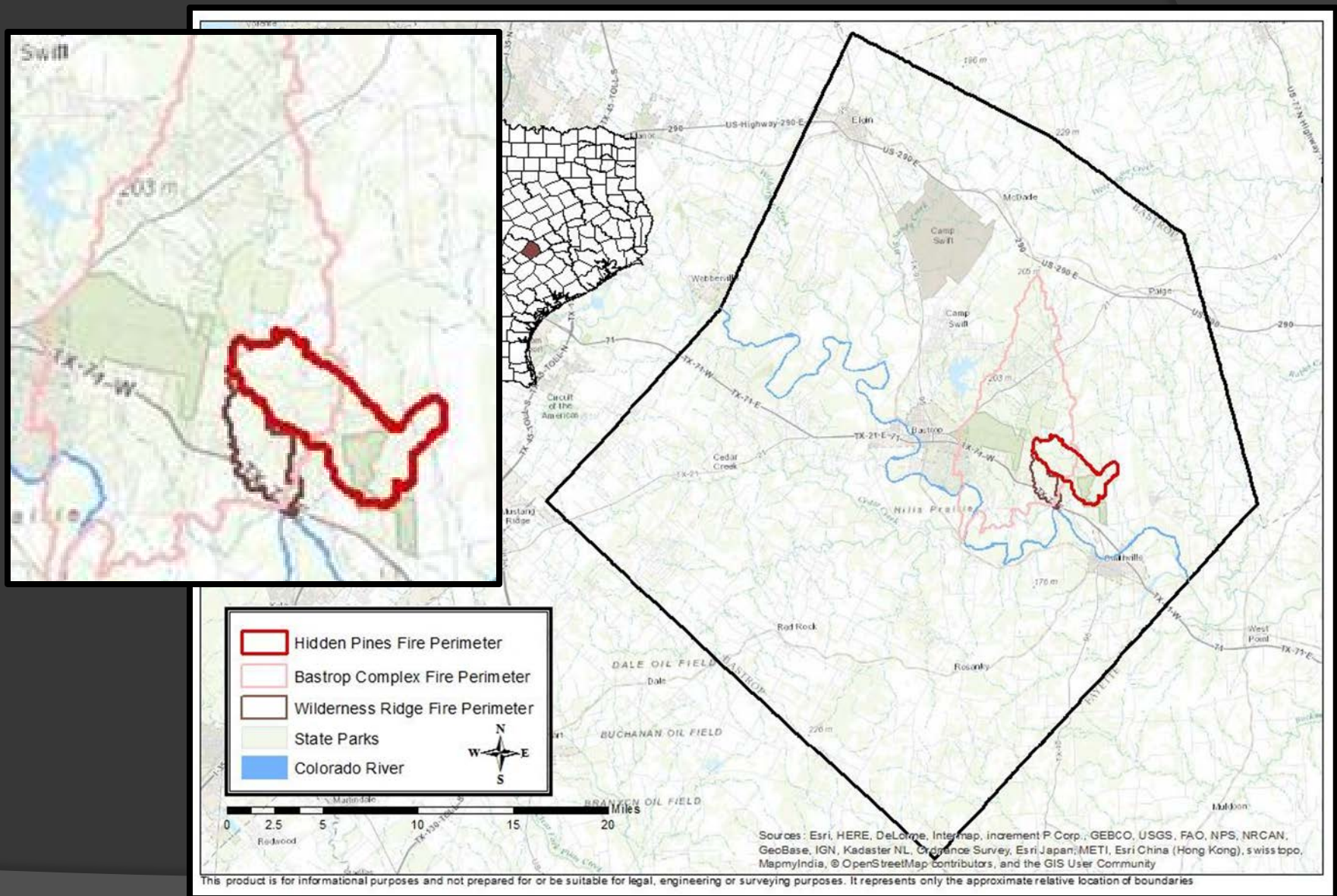
- Defensible space
- Vegetation management
- Landscaping
- Building materials

# What is the wildland/urban interface (WUI)?

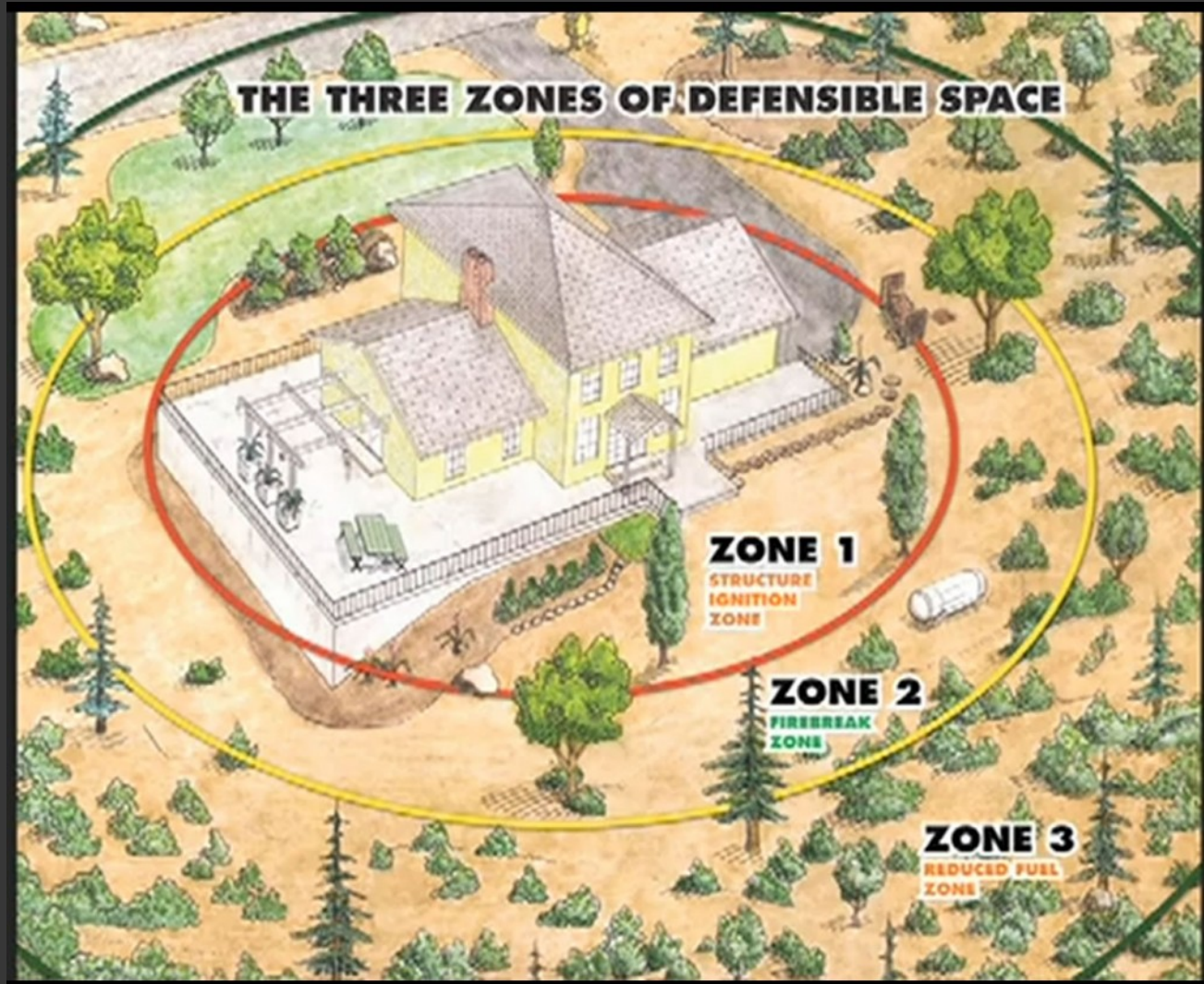


An area where homes are built near or among land prone to wildland fire, such as Bastrop County's Lost Pines

# Could it burn again?



# Defensible Space



# Why Homes Burn

Common denominators of home destruction (TFS 2011)

- Combustible building materials
- Combustible items located adjacent to the home
- Windows not designed to withstand heat
- Landscapes with highly combustible vegetation



# Construction Checklist

- Create 30 feet of defensible space
- Use non-combustible roofing materials
- Install guards on metal gutters
- Keep roof clean of debris
- Box in eaves with non-combustible material
- Screen all vents with 1/8-inch screening
- Use non-combustible material for siding
- Install double-pane and tempered-glass windows
- Install window screens (fiberglass or metal)
- Use metal window frames or aluminum coverings
- Clear underneath deck of any vegetation
- Screen the underside of deck
- Use non-combustible decking material
- Create buffer between fencing and home
- Use non-combustible skirting

## 30 FOOT DEFENSIBLE SPACE



# Landscaping



Choose plants that:

- Have high moisture content
- Are slower-growing
- Are low-growing
- Are less dense in structure
- Lack resins, oils and volatiles

Highly combustible plants will produce a lot of heat and large flame lengths.

# Vegetation Management

- Prune and remove dead branches.
- Rake and remove leaves and pine needles from under vegetation.
- Remove ladder fuels.
- Maintain crown spacing.
- Trim lower branches to 6-10 feet off the ground.
- Remove dry and tall grass near your home.
- Keep your defensible space green and healthy.





# What to Consider When There's A Wildfire

Where is the fire and where is your property in relation to it?

Evaluate the following criteria . . .

- Relative humidity – Is it less than or equal to 40%?
- Burn Ban – Has the county declared a burn ban?
- Wind speed – Are there gusty winds of 15 mph or more?
- Wind direction – Is my property downwind from the fire? And, is the wind forecasted to change direction?

# Evacuation

- Close windows & doors; leave doors unlocked
- Remove flammable window coverings
- Move flammable furniture to the interior of the home or into the yard and away from the home
- Shut off the gas
- Turn on lights
- Shut off the air conditioning
- Make ladder available

# RESOURCES

## Weather & Fire Danger

- Texas Forest Service – [tfsweb.tamu.edu](http://tfsweb.tamu.edu)
- NOAA – [weather.gov](http://weather.gov) or [noaa.gov](http://noaa.gov)

## Mitigation

- Texas Forest Service – [tfsweb.tamu.edu](http://tfsweb.tamu.edu)
- National Fire Protection Association – [nfpa.org](http://nfpa.org)