AgriLIFE RESEARCH
Texas A&M System

Prescribed Fire Safety

Charles "Butch" Taylor

Prescribed-Burn Blamed For 6,200-Acre Bosque County Fire

A prescribed burn that flared out of control was the cause of a wildfire that scorched 6,200 acres in Bosque County.

Reporter:
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The fire in Bosque County scorched thousands of acres.

Story | 20 Comments

BOSQUE COUNTY (March 13, 2011)—A wind-whipped wildfire that scorched 6,200 acres in northern Bosque County about 3 miles northeast of Walnut Springs was at least 75 percent contained Sunday.

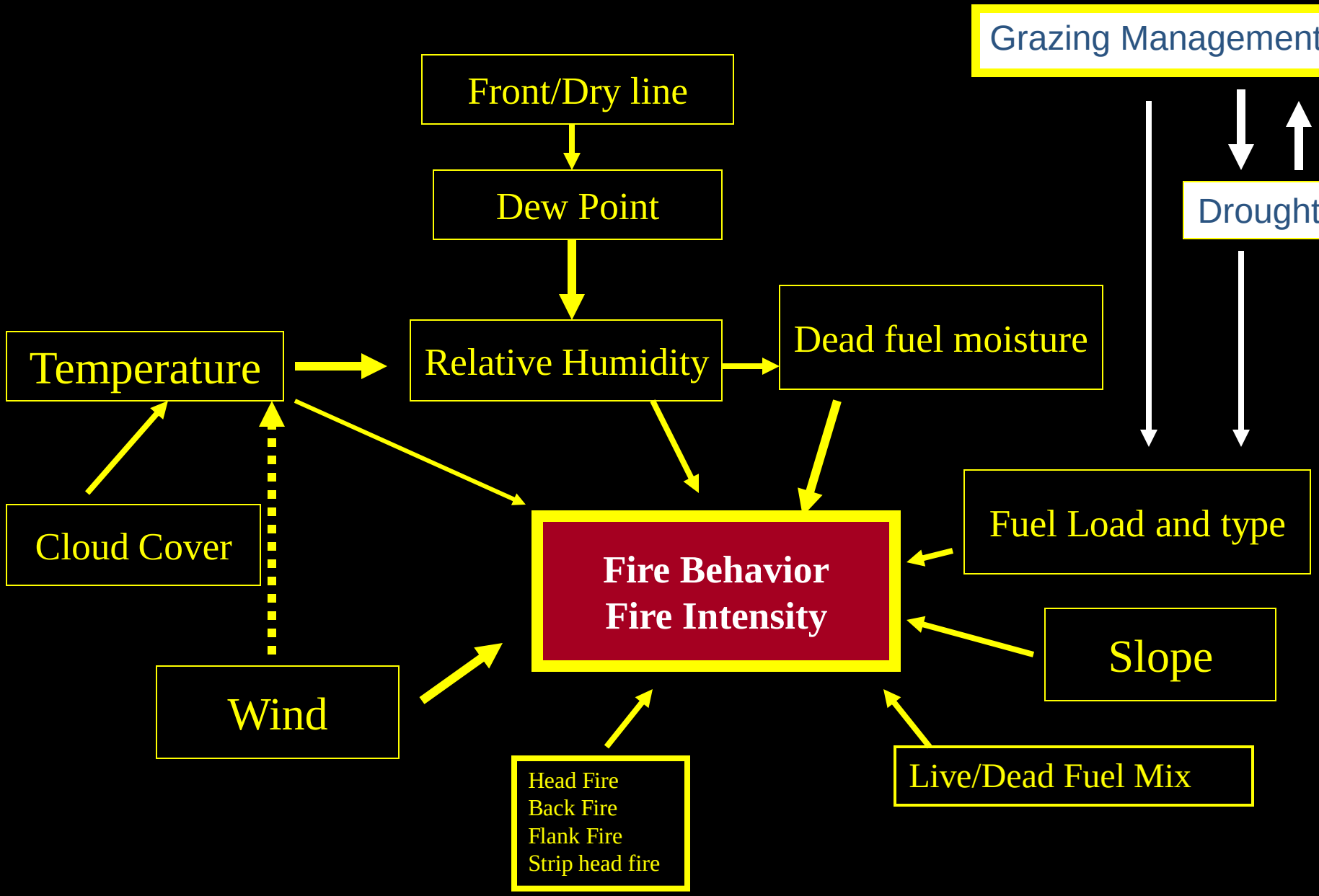
At one point the fire threatened about 150 homes, but none was lost, the Texas Forest Service said.

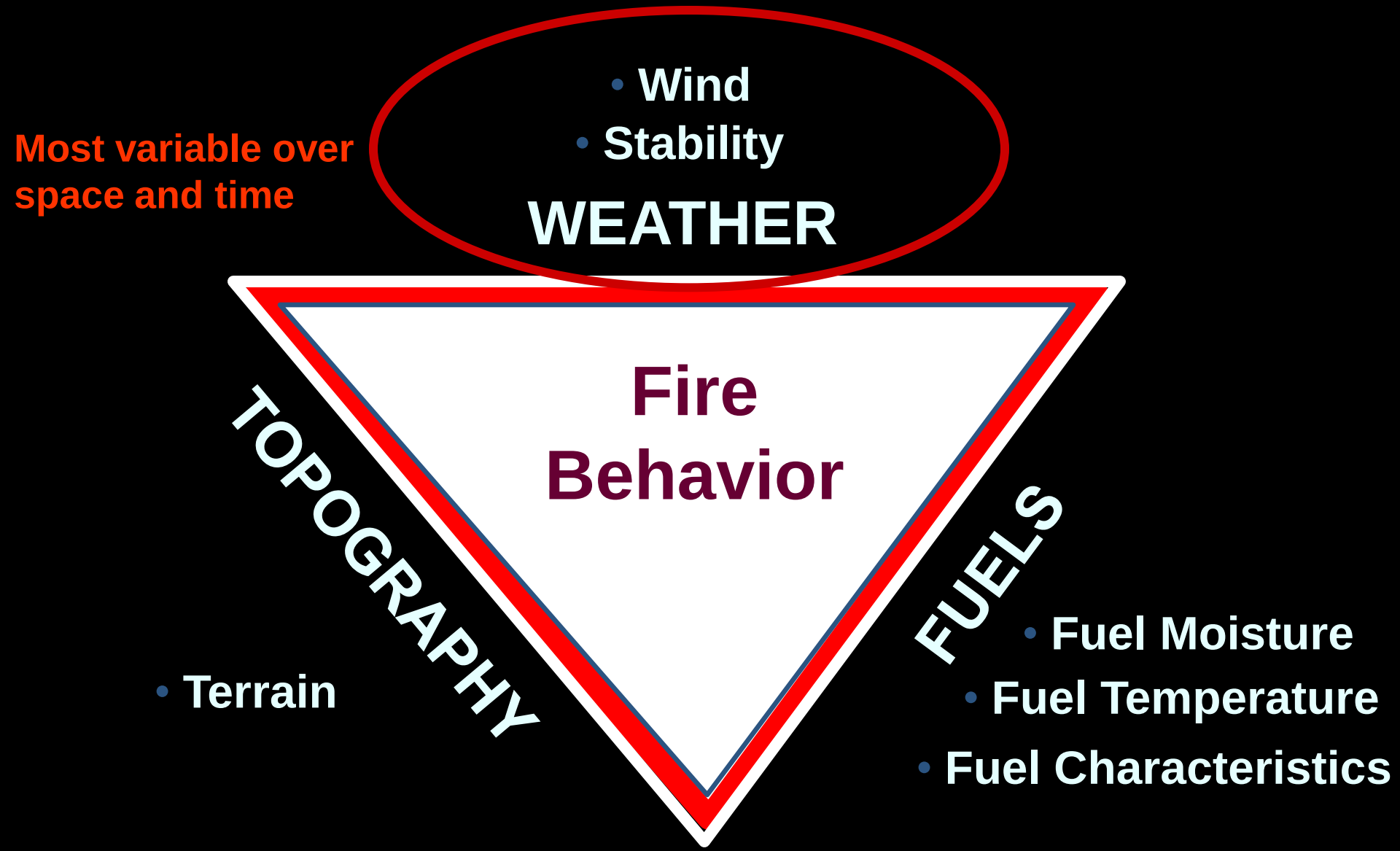
A prescribed burn that flared out of control was the cause of the fire the Forest Service said.

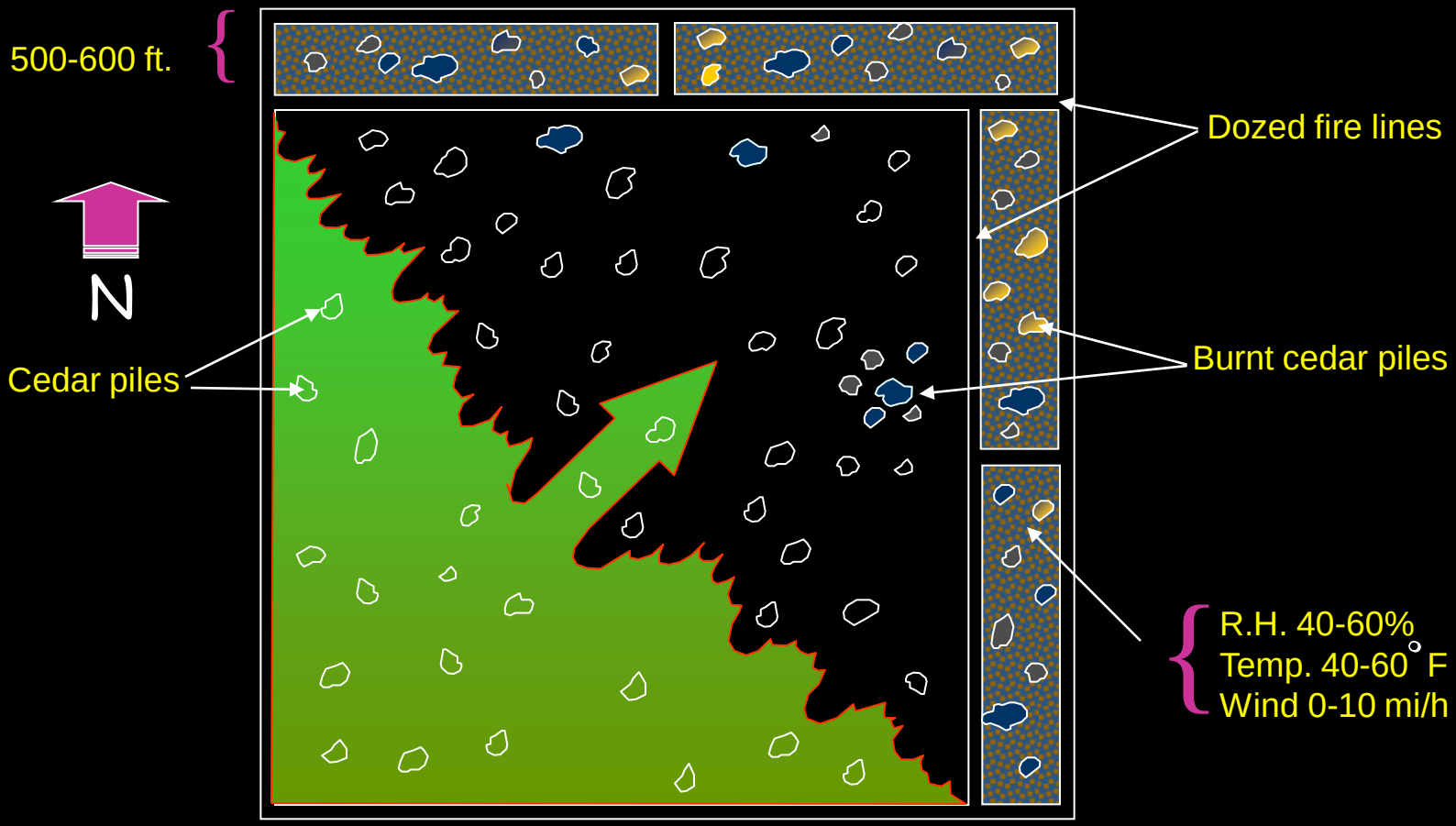
As a landowner…

- Rationale for a prescribed fire (why am I burning).
  - What are my goals and objectives?
    - Brush management
    - Forage quality
    - Removal of dead/unpalatable vegetation
  - Can I use prescribed burning?
  - When?
    - Spring, Summer, Fall, or Winter
  - Where?
    - What pasture(s) or patches?
  - What is required to see this through?
    - Time and money
    - Brush work
    - Pasture deferment
    - Training
    - Hire Commercial Certified Prescribed Burn manager?
    - Long-range planning (start planning for burn 1-3 yrs in advance)

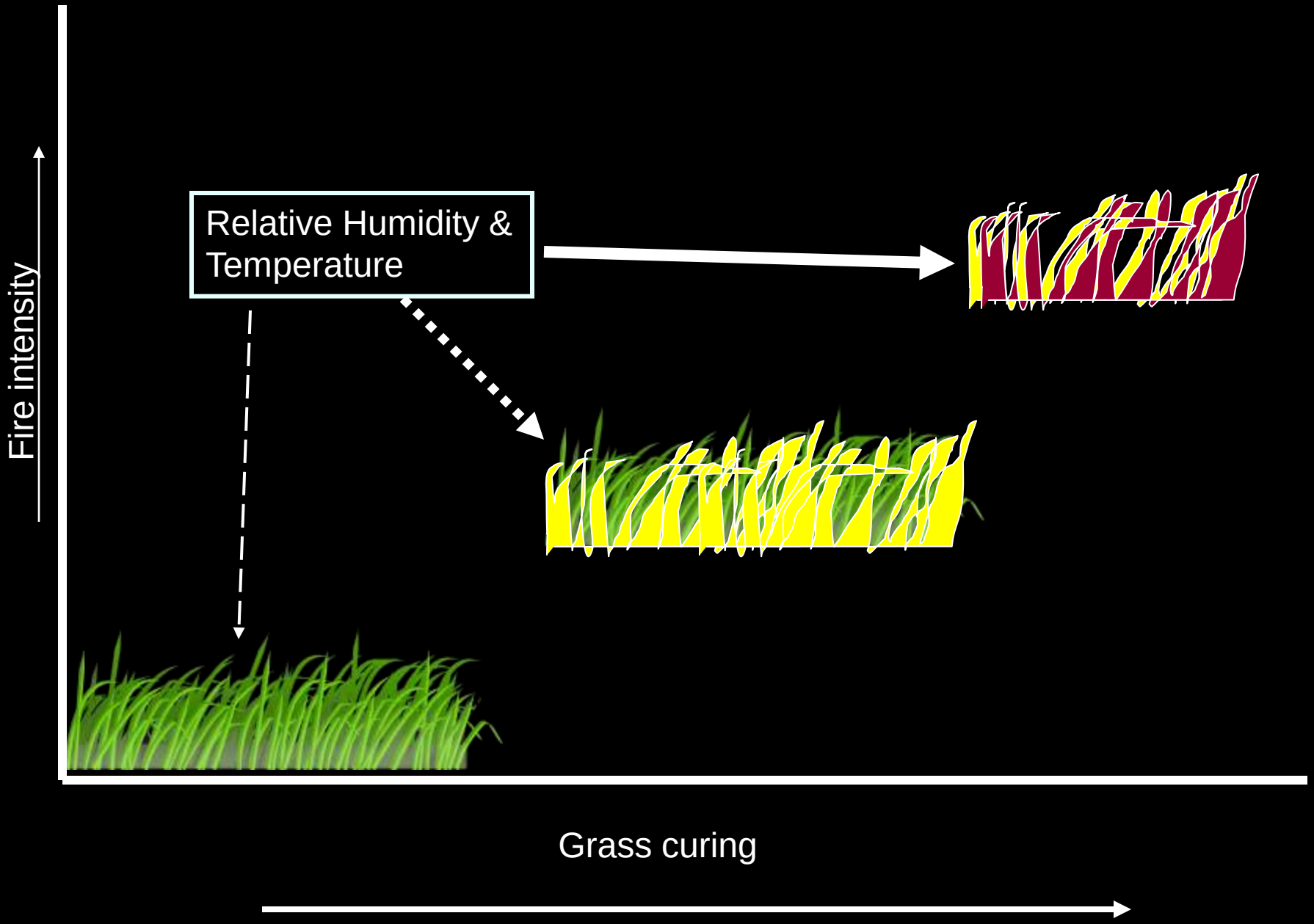
Factors Affecting Fire Intensity




Most variable over space and time
• Wind
• Stability
WEATHER
Fire Behavior
TOPOGRAPHY
• Terrain
FUELS
• Fuel Moisture
• Fuel Temperature
• Fuel Characteristics

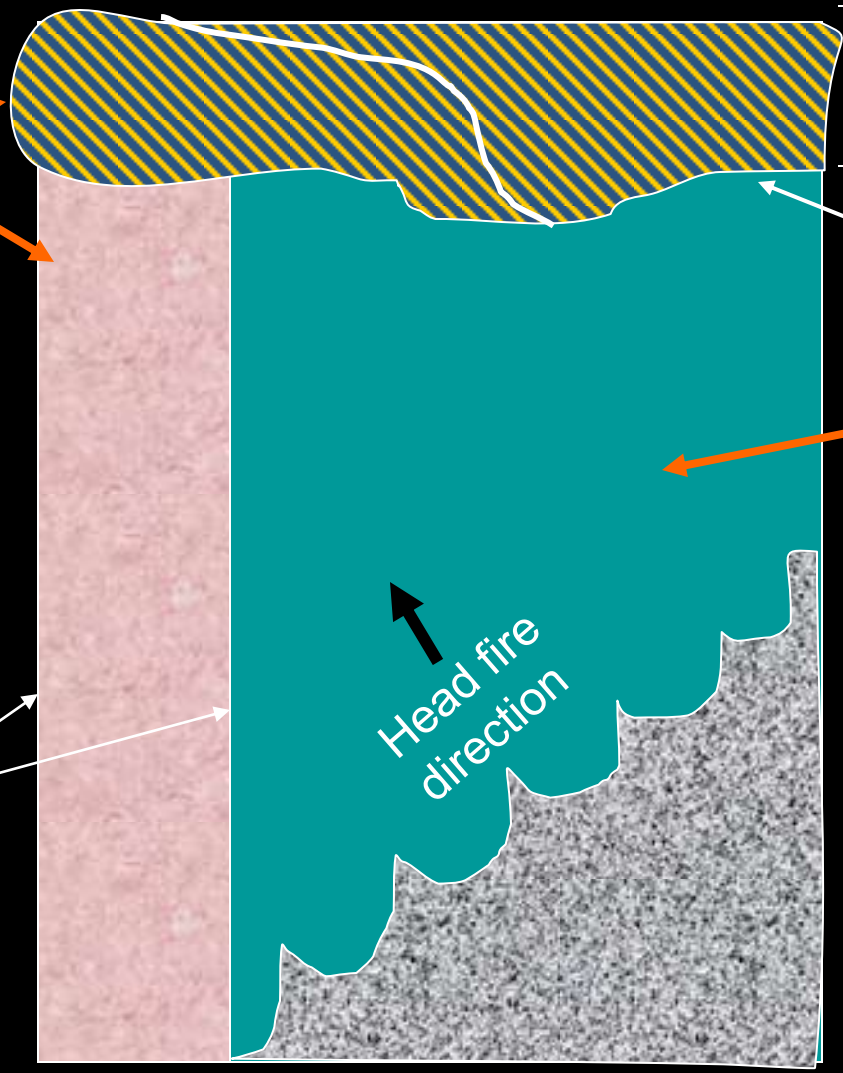


When the grass is green, burn juniper piles in the 500-600 ft. strip on the downwind sides (north and east) are burned with wind velocities less than 10 mi/h and relative humidity above 45%. When grass is dormant the grass in the 500-600 ft., strip is burned (strip-headfire technique) when the wind speed is less than 10 mi/h and relative humidity is between 40 and 60%.


Relative Humidity &
Temperature
Fire intensity
Grass curing


03/20/2009
03/20/2009

Burned under moderate conditions (i.e., winter burn). Livestock are used to maintain low fuel load.

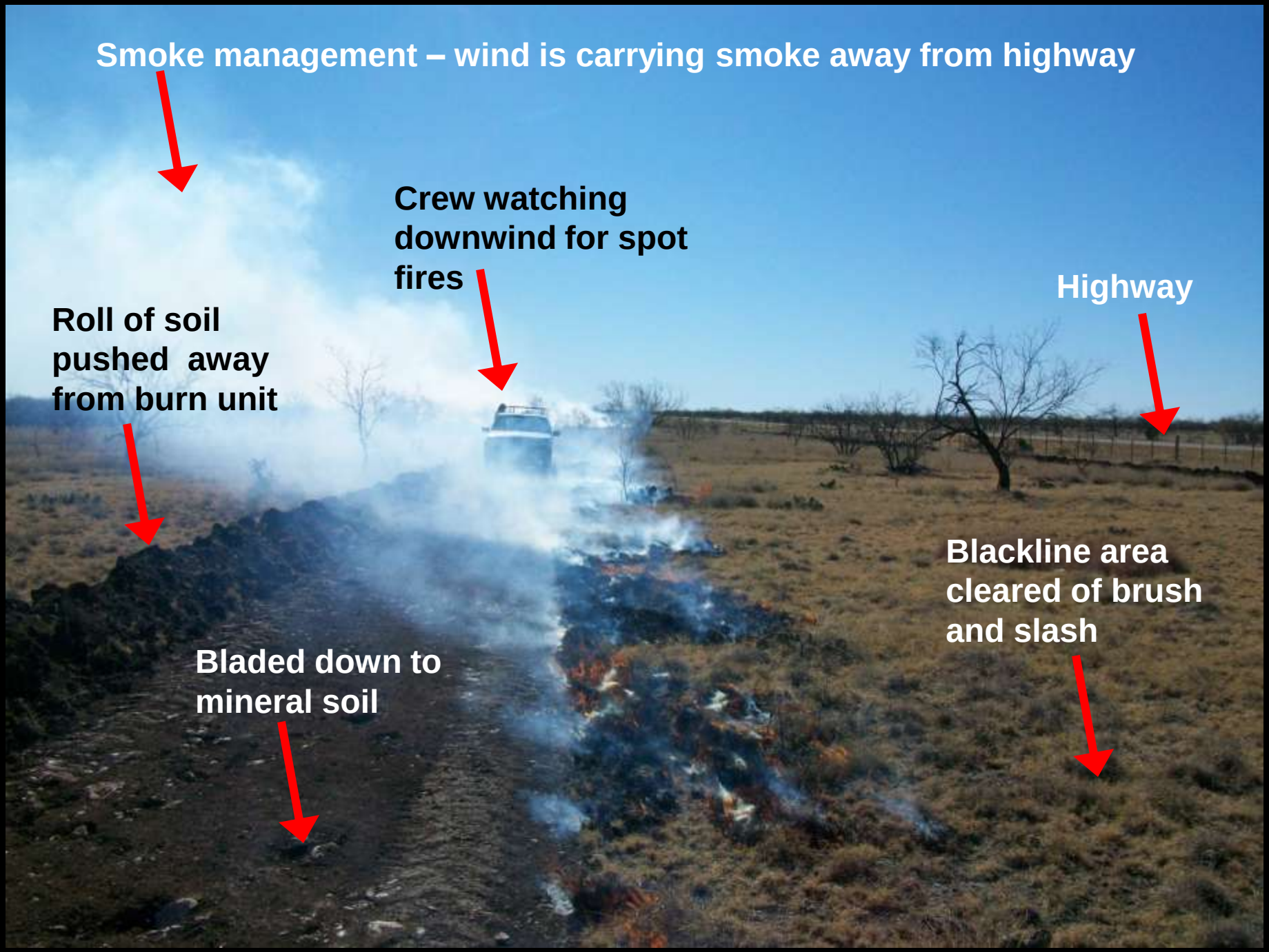


Burned in hot, dry summer time for maximum effect on juniper and prickly pear.

Planned Prescribed fire during summer of 2008

Prescribed fire March 7, 2008

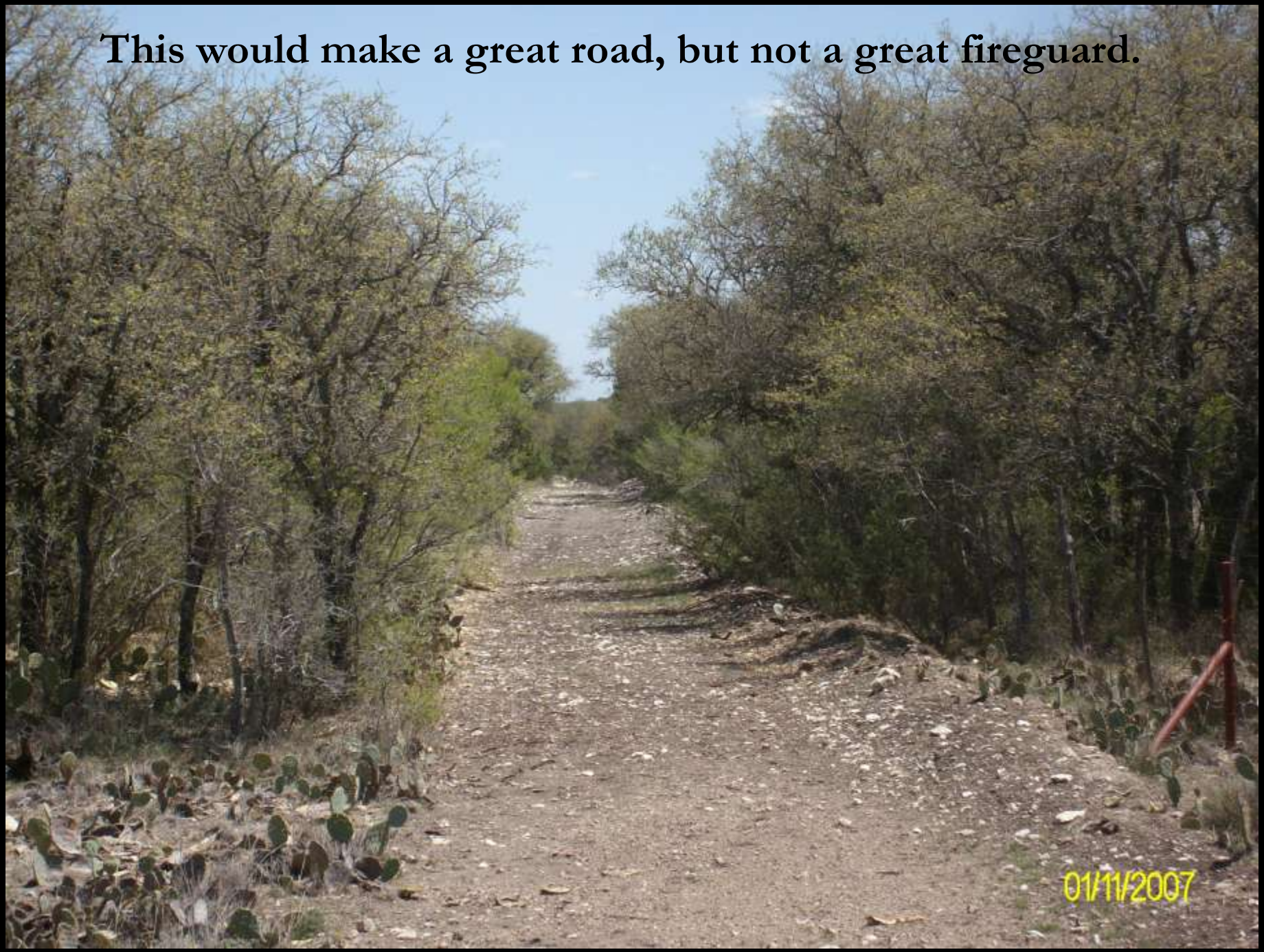
R.H. ≤20%; Temp ≥100; W.D.= S-SE; W.S. > 6mph ≤ 20 mph; 1-hr time lag fuel moisture <5%

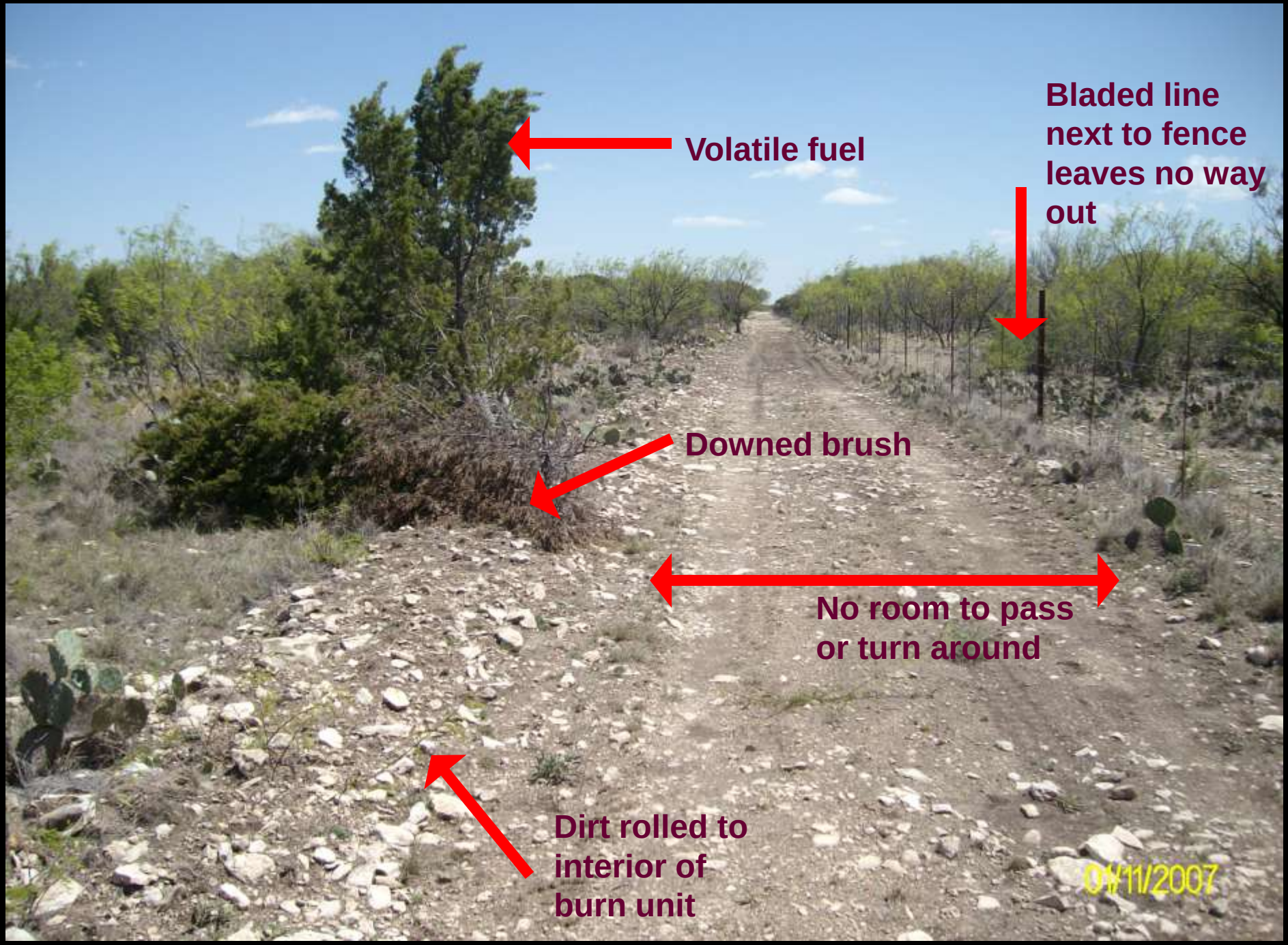

Smoke management – wind is carrying smoke away from highway
Crew watching downwind for spot fires
Highway
Roll of soil pushed away from burn unit
Blackline area cleared of brush and slash
Bladed down to mineral soil

In some situations existing roads can be used as firebreaks


Watch out for grass bridges in your bladed lines
01/12/2007


Give yourself a way out.

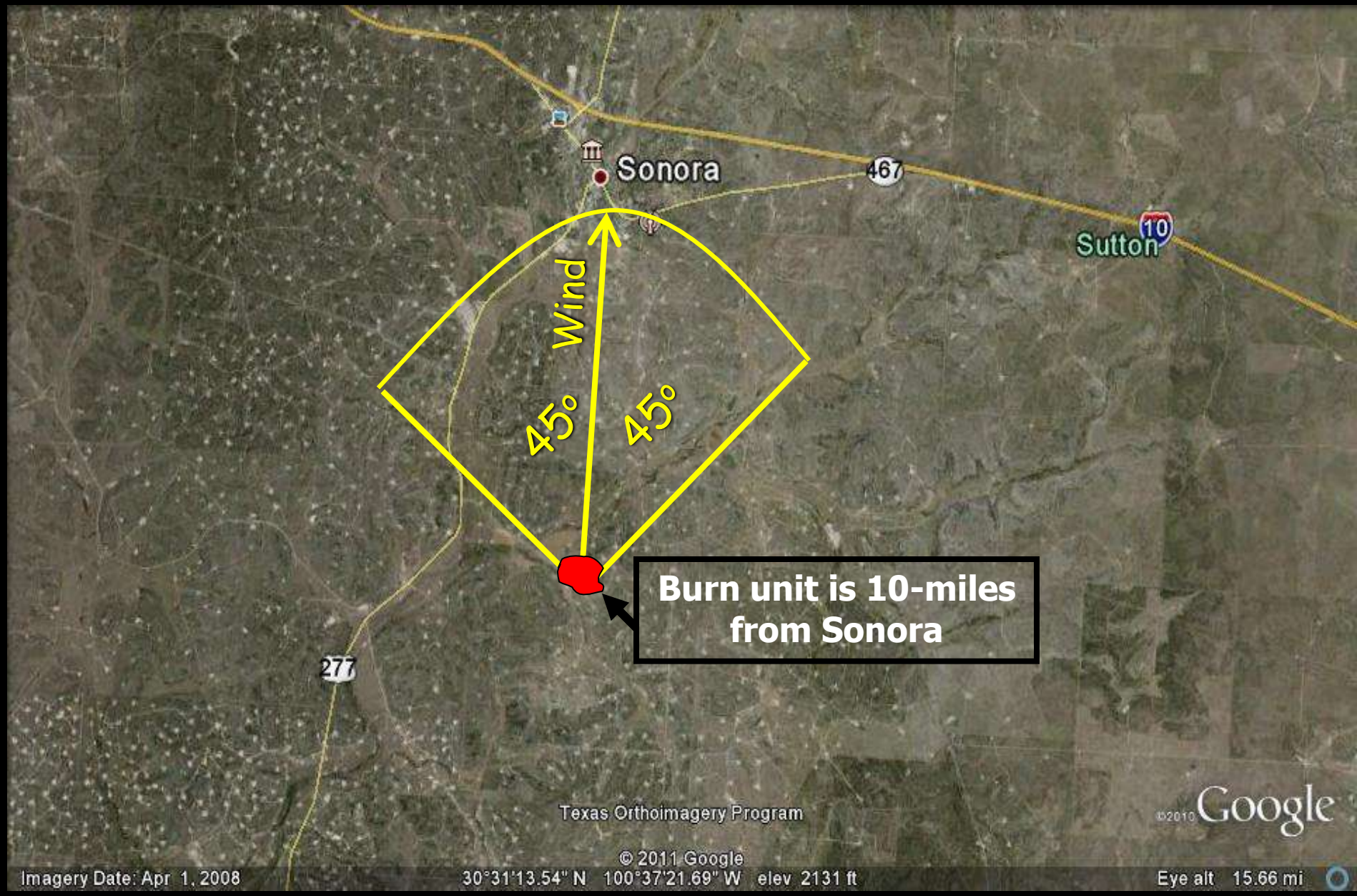

This would make a great road, but not a great fireguard.
01/11/2007


Volatile fuel
Bladed line next to fence leaves no way out
Downed brush
No room to pass or turn around
Dirt rolled to interior of burn unit
01/11/2007

Texas Commission on Environmental Quality Page 7, Chapter 111 states "..(3) Burning shall be commenced and conducted only when wind direction and other meteorological conditions are such that smoke and other pollutants will not cause adverse effects to any public road, landing strip, navigable water, or off-site structure containing sensitive receptor(s).

If at any time the burning causes or may tend to cause smoke to blow onto or across a road or highway, it is the responsibility of the person initiating the burn to post flag-persons on affected roads."

TXDOT- only law enforcement, governmental entities with jurisdiction over a roadway, or a contractor of a governmental entity with jurisdiction over a roadway have the authority to control traffic on Texas roadways.


Sonora
467
10
Sutton
Wind
45°
45°
Burn unit is 10-miles from Sonora
277
Texas Orthoimagery Program
© 2011 Google
Imagery Date: Apr 1, 2008
30°31'13.54" N 100°37'21.69" W elev 2131 ft
Eye alt 15.66 mi
Google

Determine Screening Distance

Minimum number of miles to screen downwind for smoke sensitive areas.

Burn Type	Category Day				
	I	II	III	IV	V
Backfire (<1000)	NB*	10	5	2.5	0.75
Headfire (<1000)	NB*	20	10	5	0.75
>1000	NB*	20	10	5	0.75
Brush piles	NB*	30	15	8	0.75

*NB = no burn

acres

Four General Models Provide Information for Smoke Management Planning

1. **Simple Smoke Screening model**
   (http://shrmc.ggy.uga.edu/maps/screen.html)

   (http://shrmc.ggy.uga.edu/maps/vsmoke.html)

2. **VSmoke/VSmoke-GIS**
   (http://webcam.srs.fs.fed.us/tools/vsmoke/)

3. **Fire Emission Production Simulator (FEPS)**
   (www.fs.fed.us/pnw/fera/feps/index.shtml)

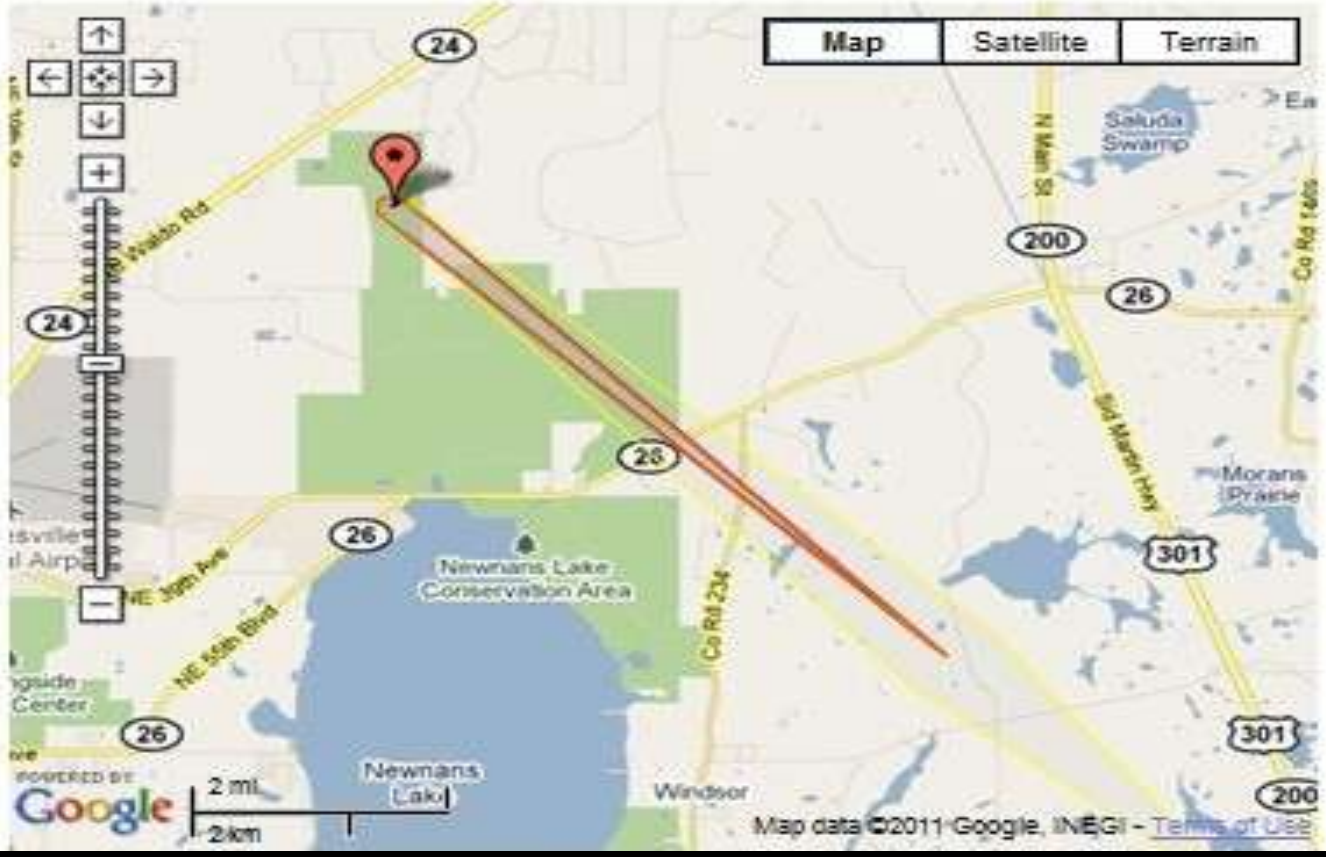
4. **HYSPLIT (www.arl.noaa.gov/HYSPLIT_info.php)**

   Estimates how the smoke plume is expected to disperse during the day as winds shift direction.

VSmoke-Web

FCAMMS · SHRMC · Smoke · VSmoke

Estimating Prescribed Fire Smoke Impacts



Fire & Weather Info

1. Location

Lat: 29.72860743

Lon: -82.2271728

2. Fire Size

Acres: 25

Duration: 4 hours

Ignition Method:

Backing/Spot

3. Fuel Load

Fuel Type:

Shrub - Mod

Tons/Acre: 8

4. Fuel Consumption

Fuel Moisture Scenario:

There can be only 1 burn boss!

- If a burn has been postponed due to weather or other factors, there is a tendency to feel some pressure to get the burn in even when all the conditions are not quite right. *Do not force it!*
- Do not burn just because you have everyone here, lunch is prepared, and everone came to see a fire.
- Landowner – If you have hired someone to act as burn boss for your burn, do not pressure that person to burn. It is the burn boss's decision to burn or not burn depending on the situation.
- Burn manager – Do not give in to pressure from the landowner or others to burn if you feel the situation is not right to burn.

Conclusions

- Write a burn plan and do not burn unless you have weather conditions that meet your prescription
- Plan for scenarios such as fire escapes, spot fires, equipment failures, weather changes, etc.
- For most burns, a 12-person crew generally works well
  - 3-4 pumpers (6-8 people)
  - 2-4 ATVs (2-4 people)
  - 1-2 drip torch carriers (1-2 people)
- Plan on watching the burn unit for at least 24 hours following the burn
- A good time to clean up the fire line is at night following the burn. Many burning/glowing materials are visible in darkness that were not easily seen during daylight.