

Wildfire Simulations

Placitas
Resilience &
Emergency
Preparedness Alliance



computer simulation of wildfire behavior

Wildfire Spread Probability:

Computer Simulations of Wildfire Behavior in Placitas



Agenda:

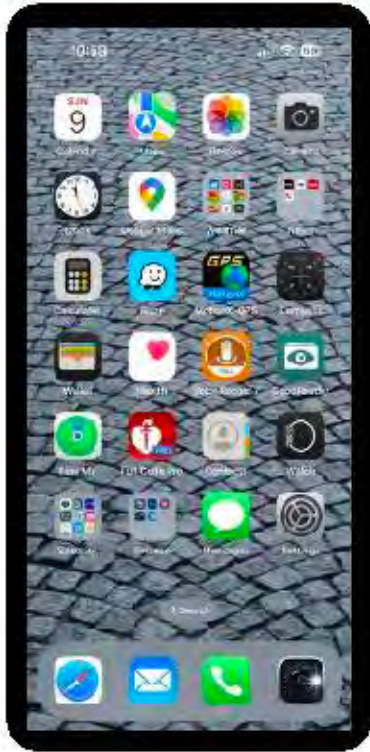
Welcome & Housekeeping

- ✧ Housekeeping (Safety, etc.)
- ✧ Introductions
- ✧ Executive Summary
- ✧ Introduction to PREP & the "Placitas Area"
- ✧ About the PREP website
- ✧ Program
- ✧ Q&A



✧ Ken Born – District Ranger
US Forest Service

Evacuation Notification . . .



**County
Officials
Execute
Notification**

SIGN UP FOR EMERGENCY ALERTS



**Text SANDOVALNM
to 888777
or go to
www.sandovalcountynm.gov/scan**



Introduction to PREP



The Premise:

When disasters and emergencies occur, both emergency services agencies and ordinary individuals have important roles in responding, surviving and recovering. Emergency preparedness on the part of both individuals and emergency services agencies is often the key to a swift and effective response that saves lives and reduces injury and damage.

What we do:

The **PREP Alliance** is a volunteer, nonprofit organization that organizes community programs and activities that cultivate emergency preparedness and resilience within and among individuals, organizations and the communities in the Placitas Area.

... common sense measures to help you prepare for, and survive, any kind of significant emergency

For more information about PREP visit our website:

website:

www.PREPalliance.org

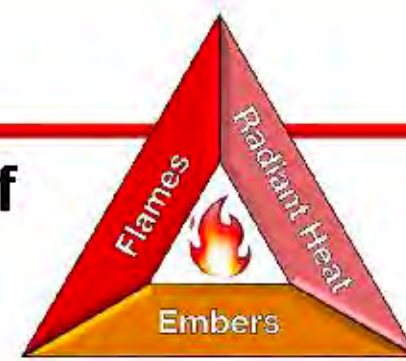
email:

info@PREPalliance.org

PREP Community Briefings



The **PREP Alliance** conducts a regular series of community briefings:



✓ ✧ **Fire Mitigation and 'Defensible Space'**
6/17 ○ What homeowners can do to help protect homes against wildland fire

✓ ✧ **Emergency Evacuation:**
10/14 ○ How to navigate an evacuation event
○ What to do to prepare in advance of an evacuation

✓ ✧ **Homeowner's Insurance: Wildland fire impact on Availability & Cost**

01/20 ✧ **Wildland fire in Placitas – computer simulations**

July ✧ **Shelter-in-Place**
○ Why would this happen (esp. power outage)
○ Emergency supplies

Oct ✧ **Fire Extinguisher – practice using one!**
✧ **Neighbors-helping-Neighbors**
✧ **How to survive a Medical Emergency**
✧ **Smart Phone – Emergency Preparedness Tool**
✧ **Emergency Response: What happens in an emergency**



Go-Bag



– September –
Annual Meeting

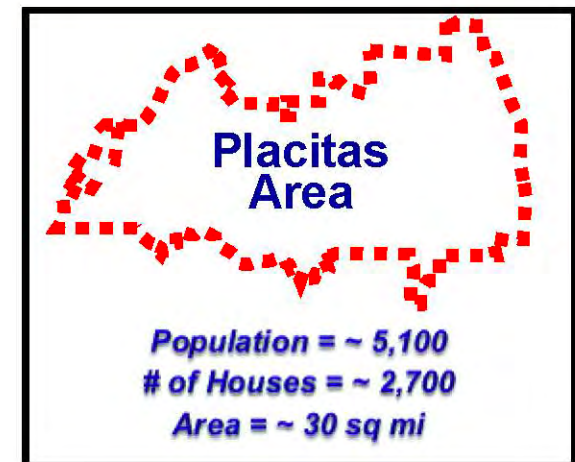
Input from the
Placitas Community

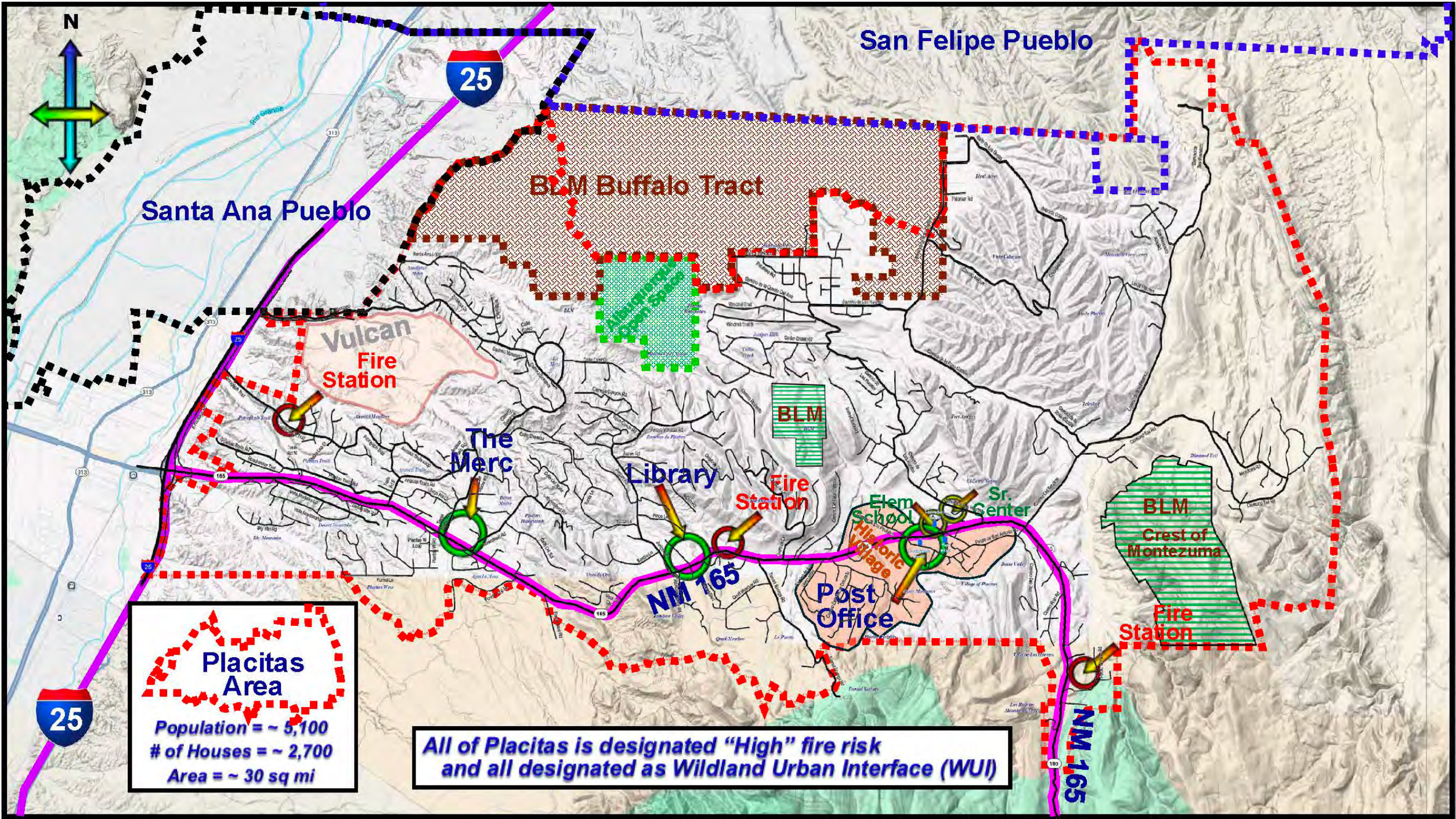
**PREP wants to hear
from you !!**



“The Placitas Area”

How PREP looks at it . . .





San Felipe Pueblo

Santa Ana Pueblo

BLM Buffalo Tract

Vulcan
Fire Station

The
Merc

Library

Fire
Station

Elem
School

Sr. Center

Post
Office

BLM
Crest of
Montezuma

Fire
Station

Placitas
Area

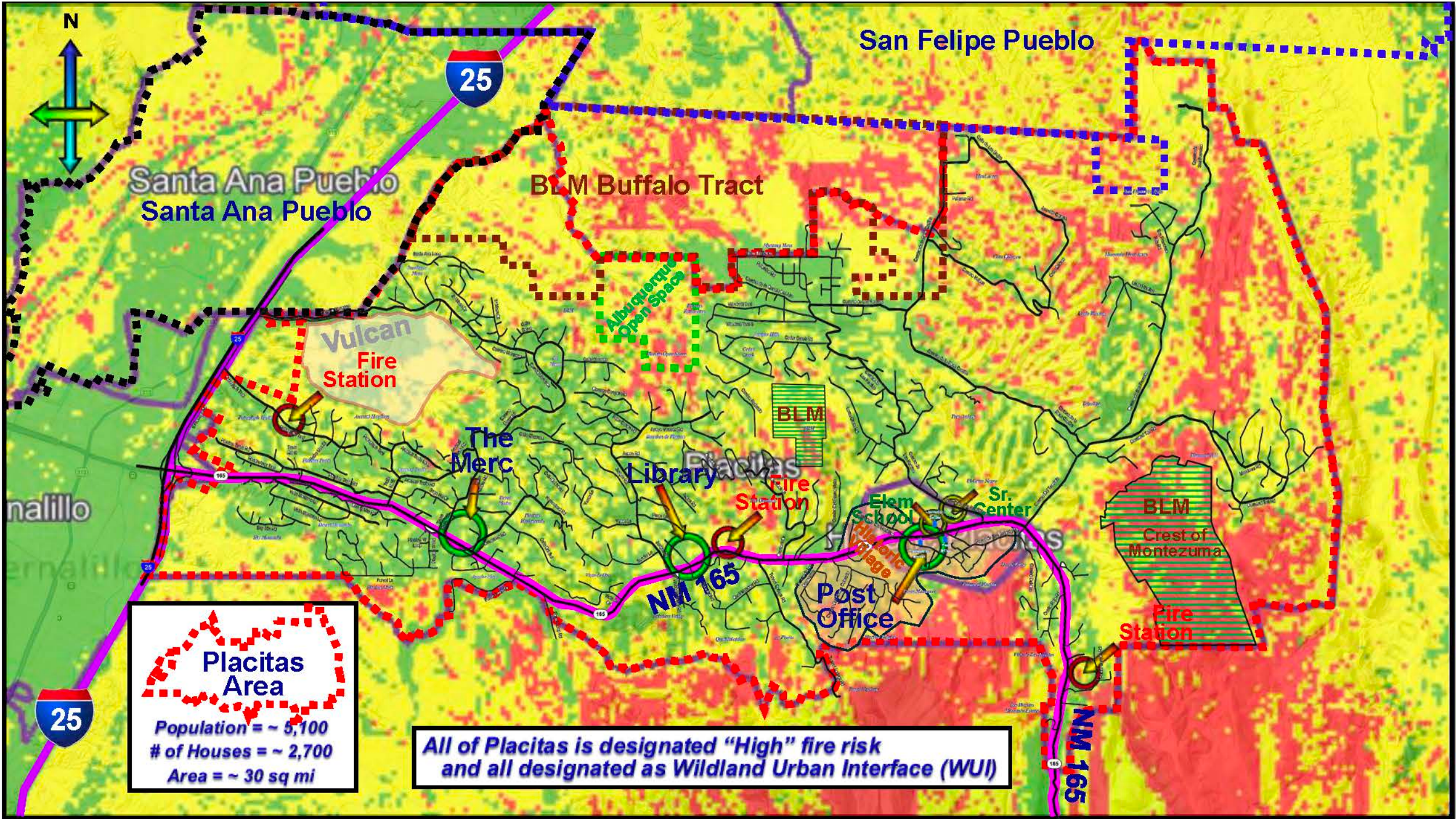
Population = ~ 5,100
of Houses = ~ 2,700
Area = ~ 30 sq mi

All of Placitas is designated "High" fire risk
and all designated as Wildland Urban Interface (WUI)

25

NM 165

NM 165



San Felipe Pueblo

Santa Ana Pueblo
Santa Ana Pueblo

BLM Buffalo Tract

Vulcan
Fire Station

The Merc

Library

Fire Station

Elem School

Sr. Center

Post Office

BLM
Crest of Montezuma

Fire Station

Placitas
Area

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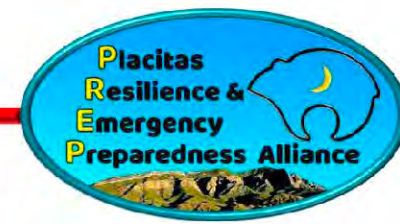
NM 165

NM 165

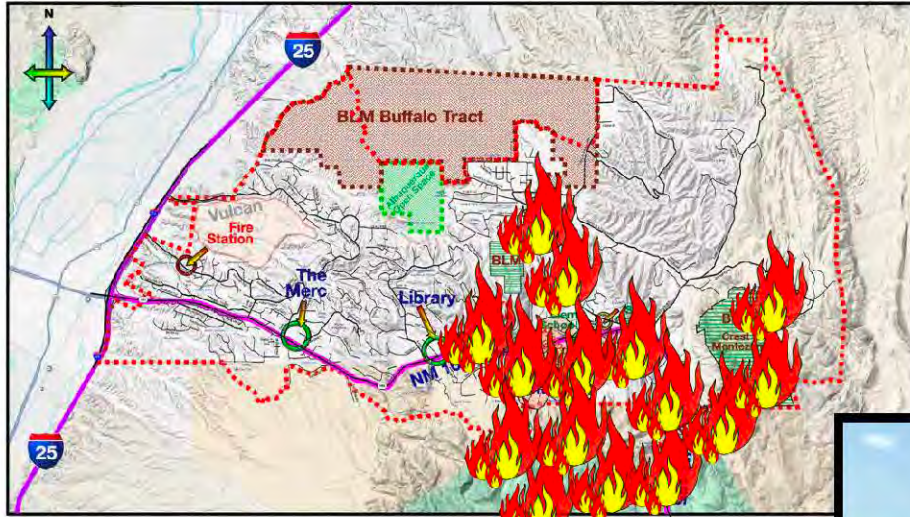
Albuquerque



What “risks” are we trying to reduce?



1 – The SPREAD of wildland fire



2 – Structure ignition

... even if a wildfire burns through your area, individual homes can survive if proper fire mitigation work has been completed

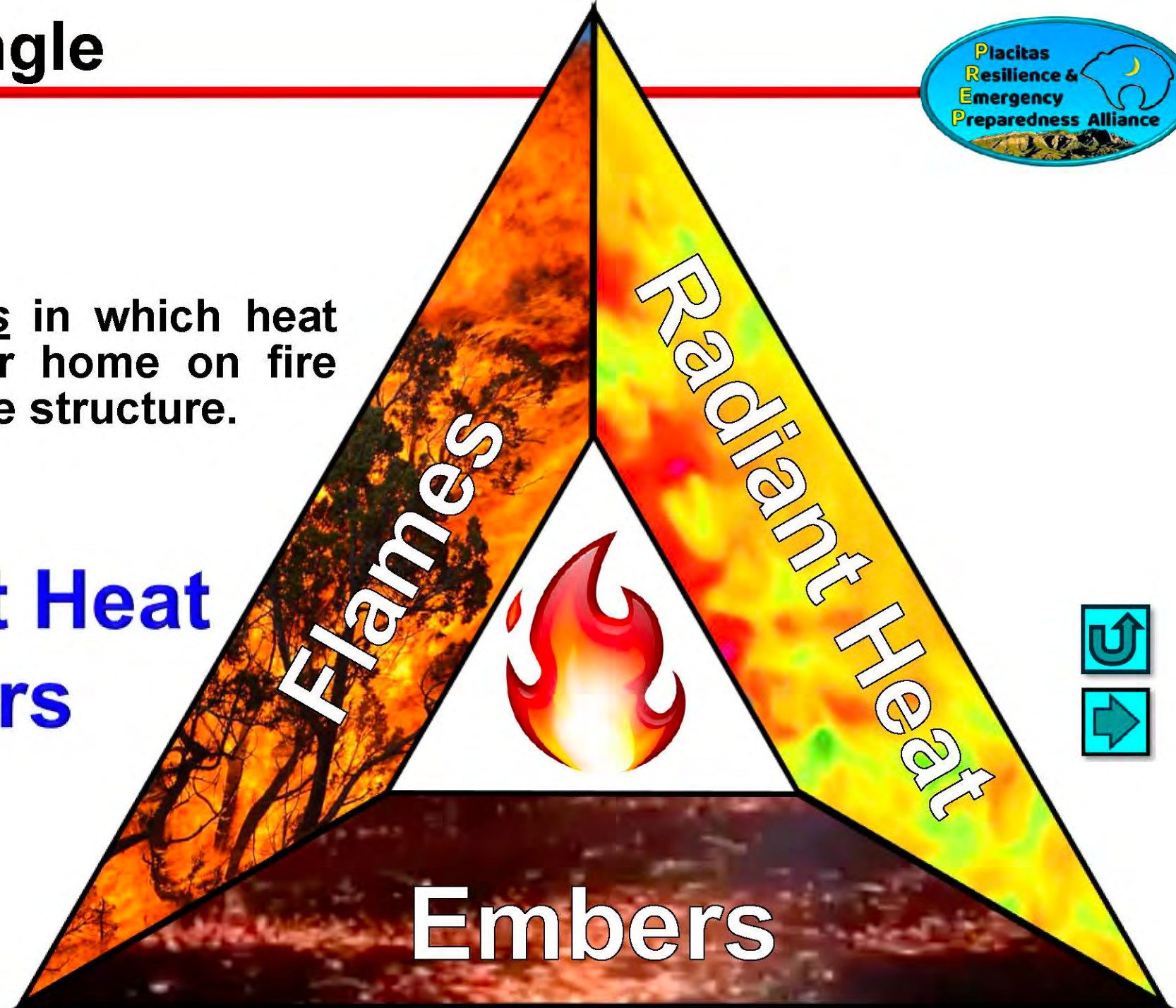


The Ignition Triangle



There are three ways in which heat sufficient to set your home on fire gets transmitted to the structure.

- ✦ **Flames**
- ✦ **Radiant Heat**
- ✦ **Embers**



The Flame Front . . .



*This is what worries most people.
They understand that the flame front poses a danger to their home.*



The Ember Shower . . .



The EMBER SHOWER is the real problem . . .



Wildfire Spread Probability:

Computer Simulations of Wildfire Behavior in Placitas



Program:

✧ Ken Born – District Ranger

- ✧ About the US Forest Service
- ✧ Wildfire in Placitas:
 - ✧ Assumptions about where the fire might start and what the weather might be
 - ✧ Computer simulations of a few scenarios of wildland fires in the Placitas area
 - ✧ How those might spread
 - ✧ What the impact might be
- ✧ Wildfire Response from the Forest Service
- ✧ Q&A



US Forest Service



Forest Service
U.S. DEPARTMENT OF AGRICULTURE

FS 1265 | March 2025

154
National
Forests

20
National
Grasslands

193
Million
Acres

43
States

WORKING FOR THE AMERICAN PEOPLE

FORESTRY

The Forest Service cares for the health of America's forests and keeps them sustainably working.

PROVIDES **3 BILLION** BOARD FEET ANNUALLY

\$5 BILLION TO U.S. GDP

\$190 MILLION INVESTED IN 482 MILLS, MANUFACTURERS, AND ENERGY PRODUCERS*

51,200 AMERICAN JOBS

WILDFIRE RISK REDUCTION

The Forest Service operates one of the largest wildland firefighting forces in the world.

\$700 BILLION WORTH OF HOUSING AND CRITICAL INFRASTRUCTURE PROTECTED IN HIGH-RISK AREAS**

15.5 MILLION ACRES TREATED TO REDUCE THE THREAT OF WILDFIRES*

45+ MILLION PEOPLE BENEFITED FROM LOWER FIRE RISK*

AMERICA'S FOOD SUPPLY

National forests and grasslands provide 74 million acres of livestock grazing land, furthering an American heritage.

\$645 MILLION TO U.S. GDP

6,000 GRAZING PERMITS

FOOD FOR **MILLIONS** OF AMERICANS

14,200 AMERICAN JOBS

* Total since 2021. Other information is based on annual data.
** Total from 2021 to 2023.

CREATING AMERICAN JOBS AND GROWING THE ECONOMY

ENERGY INDEPENDENCE

National forests provide access to critical minerals and energy.

2,844 OIL AND GAS LEASES PRODUCING
43 MILLION TONS OF COAL AND
609 MILLION GALLONS OF
LIQUID NATURAL GAS

\$7.6 BILLION TO U.S. GDP

37,800 AMERICAN JOBS

OUTDOOR RECREATION

Americans rely on national forests and grasslands for recreation and most live within 2 hours of access.

160 MILLION VISITORS

\$16 BILLION TO U.S. GDP

167,300 AMERICAN JOBS

CRITICAL INFRASTRUCTURE

National forests supply critical infrastructure and clean water to millions across the United States.

PROVIDING **80 MILLION** AMERICANS
DRINKING WATER WORTH **\$8 BILLION**

65,000 MILES OF ROADS FOR **13+ MILLION** PEOPLE IN RURAL COMMUNITIES

3,000+ DAMS

USDA is an equal opportunity provider, employer, and worker.

Wildfire Spread Probability – Ken Born





Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Cibola

National Forest & National Grasslands



MISSION

Sustain the health, diversity,
and productivity of the
Nation's forests and grasslands
to meet the needs of present
and future generations.

MOTTO

Caring for the Land and
Serving People

PREP Alliance Meeting

Placitas, NM

May 12, 2026



Heidi McRoberts, Forest Supervisor

McRoberts has been the Forest Supervisor on the Cibola for the last two years and previously held the position of Deputy Forest Supervisor on the Kootenai National Forest in northwest Montana and northeast Idaho. She provided leadership and was responsible for all aspects of managing the forest's vast resources of 2.2 million acres of National Forest System Lands. Her prior land management experiences were on the Umatilla National Forest in Pendleton, Oregon and the Nez-Perce Clearwater National Forests in Idaho. McRoberts spent 22 years working for the Nez Perce Tribe, including 10 years as the Deputy Director for the Department of Fisheries Resource Management/Watershed Division. McRoberts holds a bachelor's degree in environmental science from the University of Dubuque in Iowa, a master's degree in Fisheries Resources and PhD in Natural Resources, both from the University of Idaho.

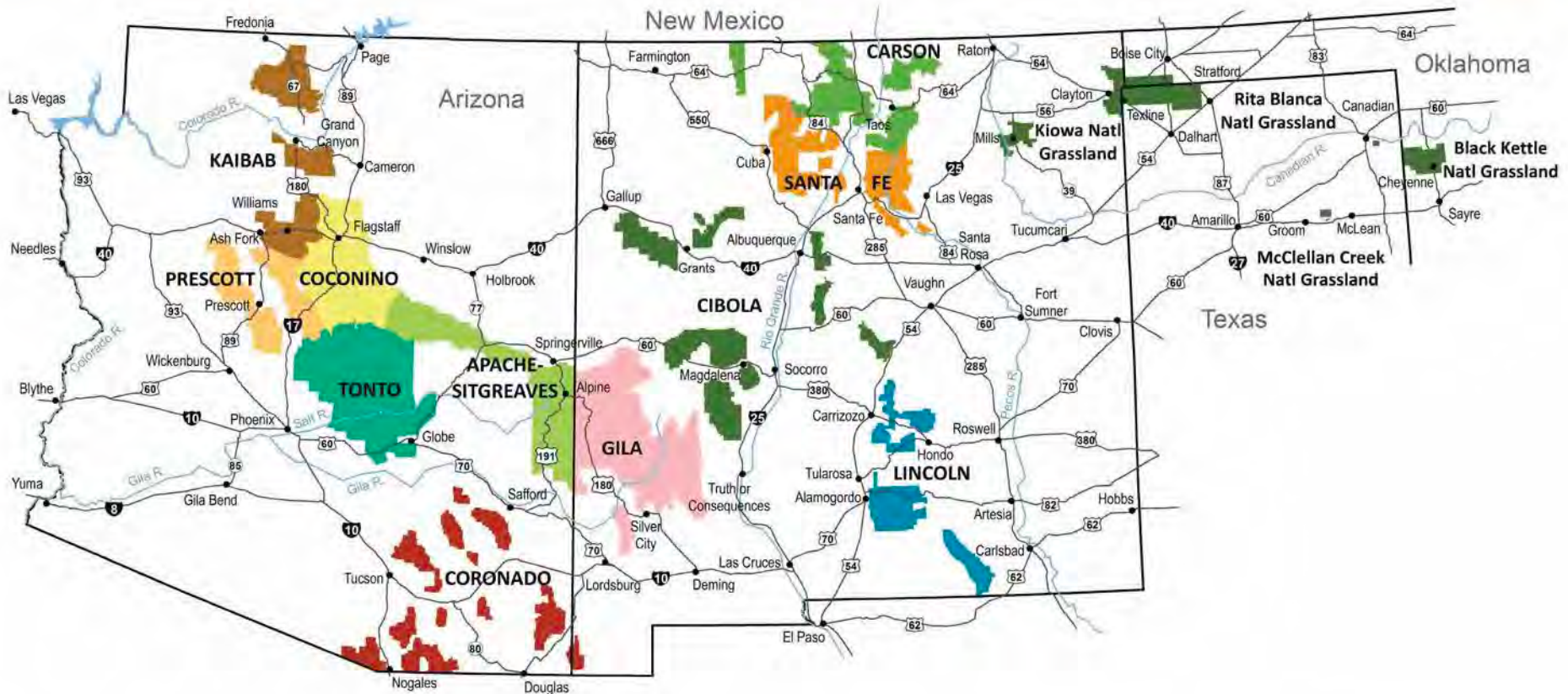
heidi.mcroberts@usda.gov o: 505-346-3804



Yolynda Begay, Deputy Forest Supervisor

Yolynda has worked for the US Forest Service since May 2010. Formally, she has served as the Regional Tribal Relations Program Manager for the Southwestern Regional Office 2015-2019 and as the Mount Taylor District Ranger 2019-2022. Yolynda earned her master's degree in Community and Regional Planning and Bachelor of Criminology from the University of New Mexico. Yolynda is a proud member of the Navajo Nation. yolynda.begay@usda.gov o: 505-346-3890

FOREST SERVICE – SOUTHWESTERN REGION

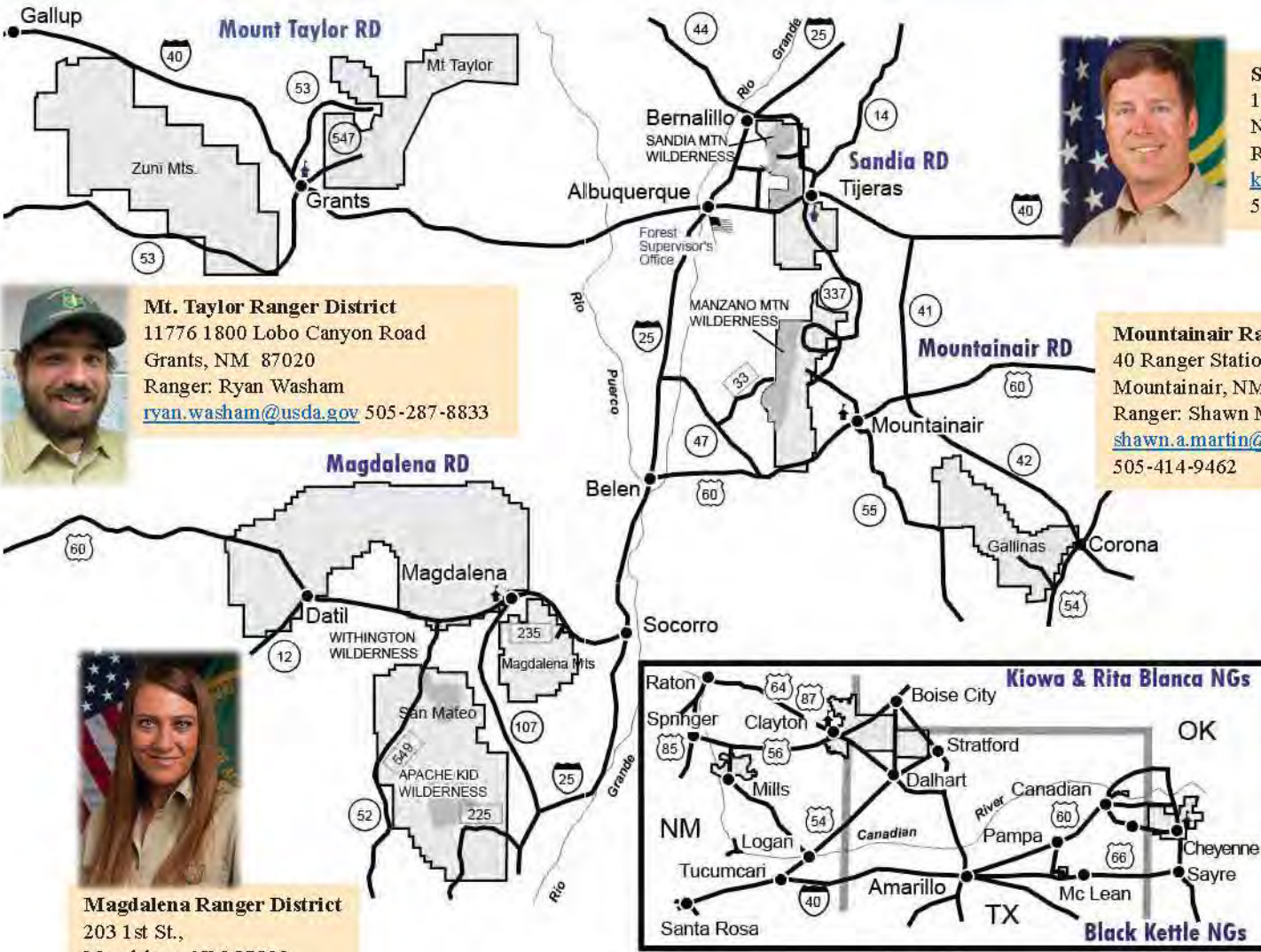


The **Cibola National Forest and National Grasslands** are 1.9 million acres located in New Mexico, Texas, and Oklahoma.

The 4 forest mountain districts cover more than 1.6 million acres in New Mexico with elevation range from 5,000 ft. to 11,301 ft.

The Cibola also administers four National Grasslands which cover 263K acres in northeastern New Mexico, western Oklahoma and northern Texas.

CIBOLA NF & NGs – District Leadership



Mt. Taylor Ranger District
 11776 1800 Lobo Canyon Road
 Grants, NM 87020
 Ranger: Ryan Washam
ryan.washam@usda.gov 505-287-8833



Sandia Ranger District
 11776 Hwy. 337 Tijeras,
 NM 87059
 Ranger: Ken Born
kenneth.born@usda.gov
 505-281-3304



Mountainair Ranger District
 40 Ranger Station Rd.
 Mountainair, NM 87036-0069
 Ranger: Shawn Martin
shawn.a.martin@usda.gov
 505-414-9462



Magdalena Ranger District
 203 1st St.,
 Magdalena, NM 87825
 Ranger: Tina Cason
tina.cason@usda.gov
 575-854-2281



Kiowa/Rita Blanca National Grasslands
 714 Main Street
 Clayton, NM 88415
 Ranger: Levi Irwin
levi.irwin@usda.gov
 575-374-9652



Black Kettle McClellan Creek National Grasslands
 18555 HWY 47A
 Cheyenne, OK 73628
 Ranger: Tom Smeltzer
thomas.smeltzer@usda.gov
 580-497-2143

CIBOLA NF & NGs – Program Area Staff Officers



Matt Rau
Fire Staff Officer



Jay Turner
Natural Resources
and Planning



Christa Osborn
Recreation,
Engineering,
Archaeology, Lands &
Minerals (REALM)



Magdalena Ranger District – Eastern view from Langmuir Observatory

Why We're Here – Partnership with PREP

We value community partnership above almost everything else in how we approach fire management.

PREP reached out and invited the Forest Service because this community is engaged, informed, and asking exactly the right questions.

Tonight is part of an ongoing conversation. Join the District Ranger in Placitas on the 4th Friday of the month at the San Antonio de las Huertas Land Grant office during open office hours.



Placitas in Context

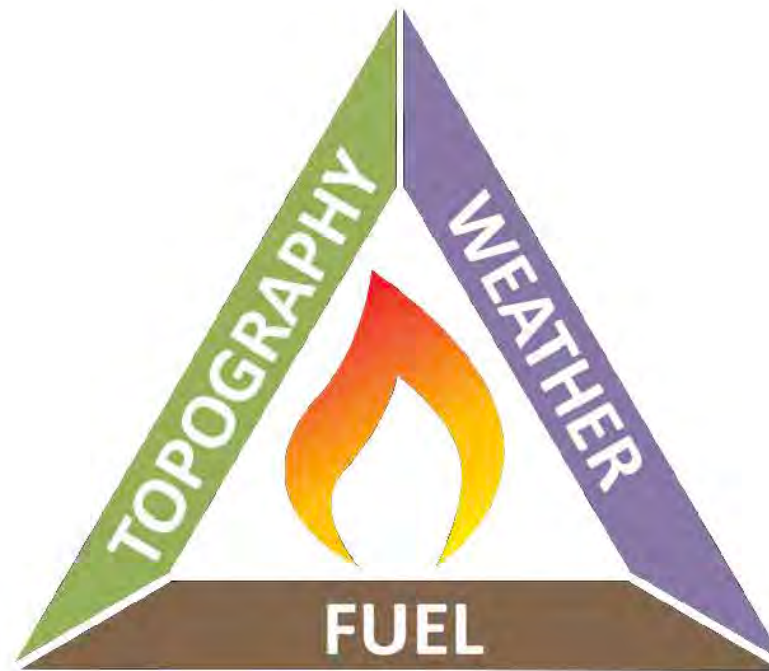
Placitas sits in Sandoval County, tucked between the northern edge of the Sandia Mountains and the high desert benchlands sloping toward the Rio Grande.

The community is accessed primarily via NM-165, which threads through Las Huertas Canyon — that corridor is both a defining feature of this place and a critical factor in how we think about fire here.



The Fire Environment: Fuel, Weather, Topography

Every wildfire is a product of three interacting factors:



**Fire Behavior
Triangle**



Who's Responsible in the Event of a Wildfire

1. **US Forest Service:** We are the primary suppression agency on National Forest System lands above and east of Placitas.
2. **Bureau of Land Management:** BLM manages lands in the lower canyon and bench areas between the forest boundary and the community. BLM has its own suppression responsibility on those acres and we operate under shared interagency agreements.
3. **NM State Forestry Division:** Has primary suppression responsibility for wildland fires on private and state land. This means that once a fire crosses from federal land onto private property – State Forestry may become the lead wildfire suppression agency.



Who's Responsible in the Event of a Wildfire

4. **Sandoval County:** County Fire and Sheriff's Office have a distinct but complementary role – structure protection, traffic and evacuation management, and public safety. The Sheriff's Office holds evacuation authority. When you hear a siren or see a county unit they're managing
5. **Sandia and San Felipe Pueblo:** Wildland fire protection on federal trust lands held for federally-recognized Tribes is generally handled by the Bureau of Indian Affairs (BIA) Division of Wildland Fire Management.
6. **Private Landowners:** Defensible space is not just a good idea – it is the point where your actions and the agency response intersect.



What is FSPro?

- FSPro is the modeling system the Forest Service uses to estimate how likely a wildland fire is to spread from a given starting point or perimeter across a landscape over a defined timeframe.
- It takes a hypothetical fire start and then runs thousands of computer simulations of how that fire might spread, given the historical range of weather conditions this area has experienced, the fuel types on the ground, and the terrain.
- The output is a probability map. Warmer colors (reds and oranges) indicate areas where fire spread is statistically more likely under the modeled conditions. Cooler colors indicate lower relative probability.
- **This is not a prediction that fire will occur in those areas. It is a picture of the landscape's historical fire vulnerability.**



What goes into the model?

- **Historical weather data:** FSPro draws on the historical record of wind speed, wind direction, temperature, and relative humidity for this geographic area. Not current forecasts — history. The model asks: given the range of weather conditions this area has seen, how might fire behave?
- **Fuel data:** Detailed mapping of vegetation types across the landscape along with estimates of fuel moisture content. Dry fuel carries fire faster and with more intensity than moist fuel.
- **Topography:** Digital elevation models capture slope, aspect, and terrain features. Slope matters enormously: fire moves faster uphill, and steeper slopes produce faster rates of spread. Aspect — which way a slope faces — affects how much sun exposure and drying a site receives.



What assumptions are built into the model?

- **No suppression actions:** Every simulation assumes the fire spreads without any intervention (no engines, no air tankers, no hand crews, no retardant drops). In a real event, suppression response can dramatically reduce the outcome relative to what the model shows.
- **Weather is consistent throughout the day — ERC/FM/WS/WD collected during peak burn period conditions:** FSPro assumes the worst-case daily weather window holds for the entire simulation.
- **Foliage moisture (FM) is the same regardless of aspect or elevation:** In reality, a north-facing slope in a canyon holds more moisture and grows different vegetation than a south-facing slope in the open.
- **100% FM content, cannot be changed:** FSPro's outputs under current drought conditions are likely conservative. The actual fire environment right now may be more severe than the maps suggest.



What assumptions are built into the model?

- **Winds and FM are independent:** FSPro treats these as statistically independent variables, sampling from their historical distributions separately rather than as a coupled system.
- **Assumes historical climate:** FSPro draws on the historical weather record for this area, typically 10 or more years of weather station data.
- **Uniform fuels across the landscape:** What this means practically is that maps show landscape-scale probability patterns, not property-level risk.
- **May or may not capture a rare weather event:** FSPro samples from the historical weather record, which means extremely rare but high-consequence weather events may be underrepresented.
- **FSPro results show probability contours — NOT daily progression perimeters:** Color zones on the map are not fire perimeters. They do not show where a fire will be at the end of day one, day two, etc. They are cumulative probability contours representing how frequently fire spread reached each location across the entire modeled timeframe.



Reading the Probability Maps

The legend and maps show seven burn probability categories:

- **80–100% (dark red):** Across thousands of simulations run, fire spread reached this area in 80 to 100 out of every 100 runs under these wind and fuel conditions.
- **60–79% (tan):** Fire reached this zone in roughly 6 out of 10 simulations.
- **40–59% (yellow-orange):** Fire reached this zone in roughly 4 to 5 out of 10 runs.
- **20–39% (light blue):** Roughly 2 to 3 in 10 simulations.
- **5–19% (lighter blue):** Lower probability spread, but still meaningful at scale.
- **0.2–4% (blue)** and **<0.2% (pink):** Low probability spread zones.



What the Model Cannot Tell Us

A few things to notice:

- FSPro does not predict where or when an ignition will occur
- It does not account for real-time drought conditions, current fuel moisture, or upcoming weather forecasts
- **It does not capture human behavior — ignition sources, evacuation decisions, firefighting response**
- Model outputs represent historical probability distributions, not deterministic outcomes
- The landscape changes — fuels treatments, drought, post-fire vegetation recovery all shift the fire environment over time, and models always need to be periodically updated

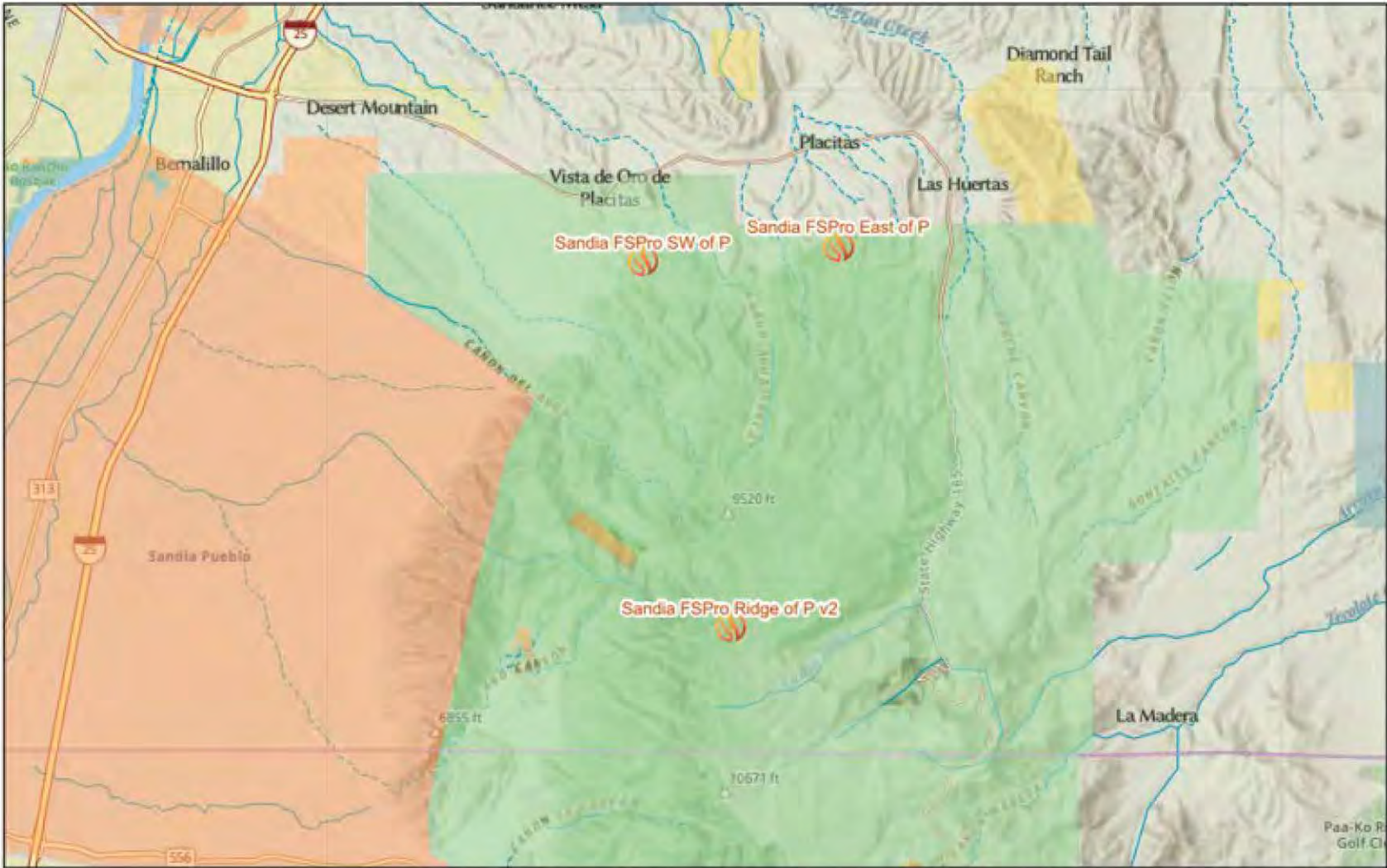


Model Ignition Points

1. South of Vista de Oro (FS Pro SW)
2. South of the Historic Village (FS Pro S)
3. Near the Crest and 10k Trails, north of Canon Osha and North Sandia Peak (FS Pro Ridge)



Wildfire Spread Modeling - FSPro



4/27/2026

WFDSS Initiated Decisions

 Ignitions

Jurisdiction Units

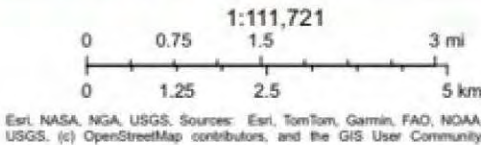
 BIA, Tribal

 BLM

 USFS

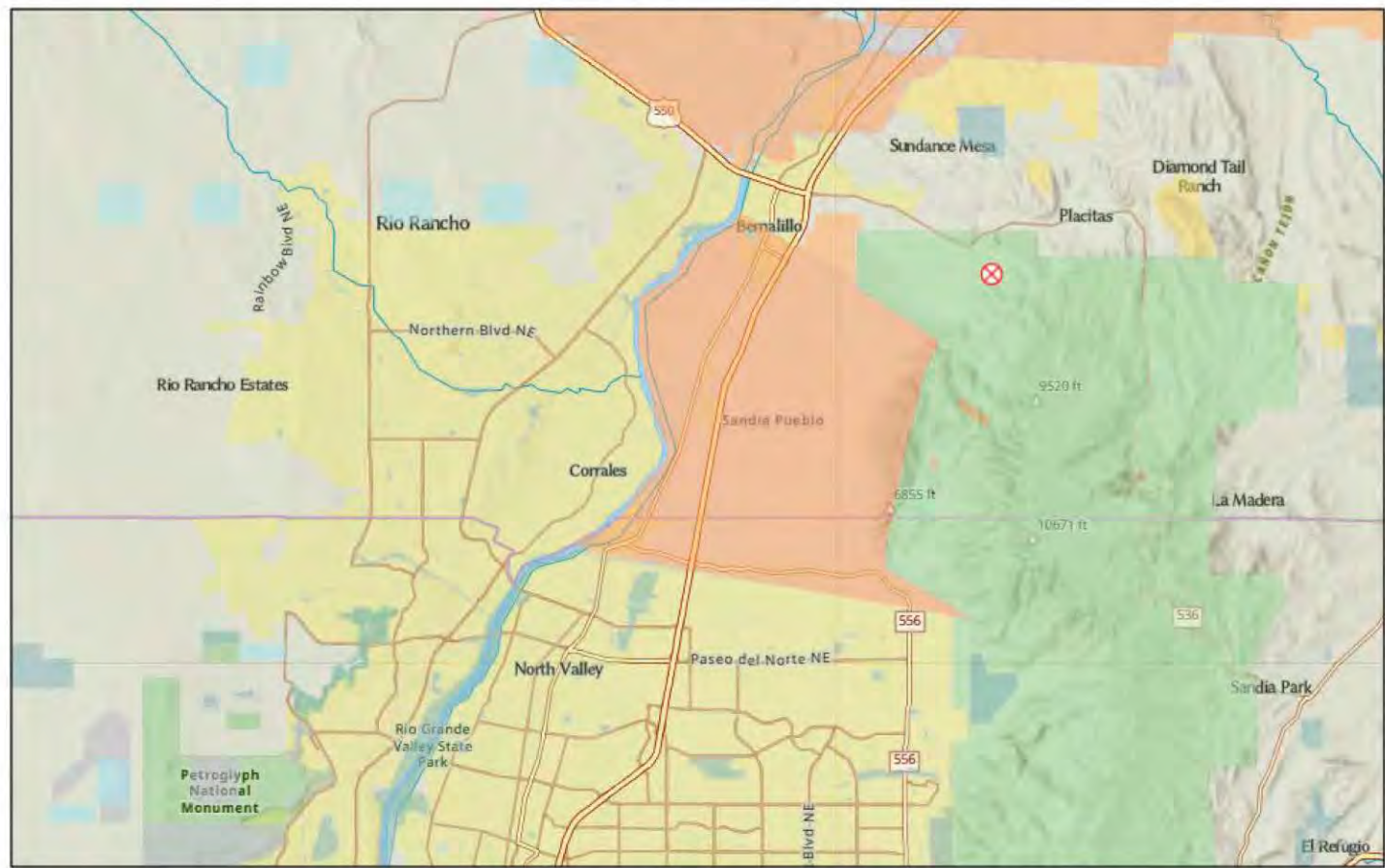
 City, County, Other Local

No Unit

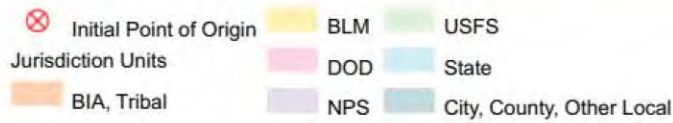


Wildfire Spread Modeling - FSPro

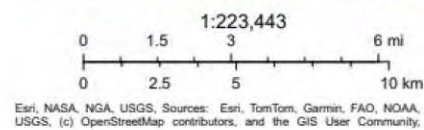
Sandia FSPro SW



4/28/2026



No Unit



- Inputs:
- 7 days – mid June 2025
 - 1,500 fires simulation
 - T 90-100° and RH 5-10% during peak burning period
 - Winds either 2-3 mph South or 10-12 mph South (High Winds)

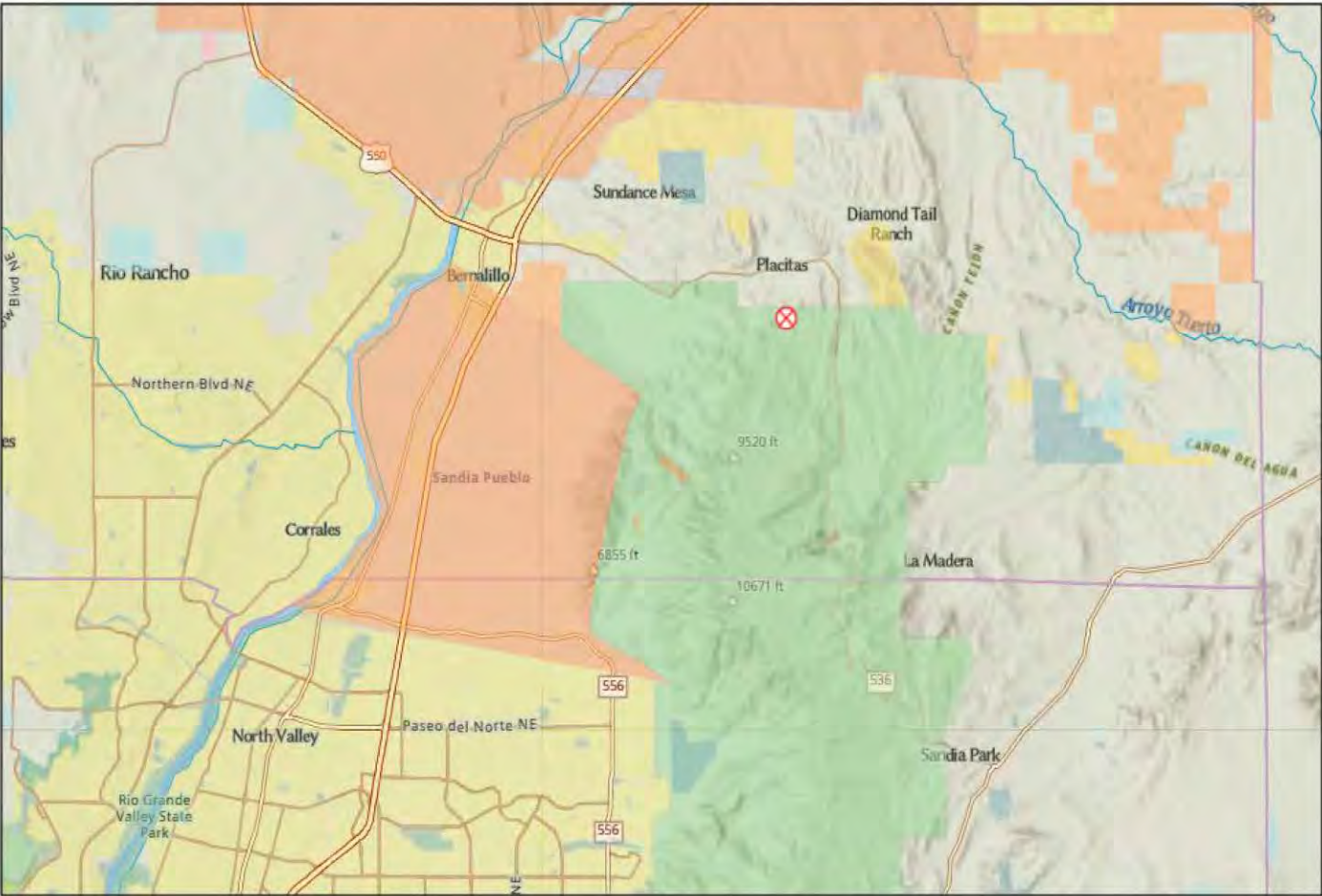
Viewing the Model Runs

The three model runs generated for the South of Vista de Oro ignition point (FS Pro SW) can be viewed at the Sandia Ranger District Office in Tijeras or during District Ranger Open Office Hours in Placitas (generally 4th Friday of each month).

Please contact the Ranger Station at (505) 281-3304 to make an appointment.



Sandia FSPro South



4/28/2026

⊗ Initial Point of Origin

Jurisdiction Units

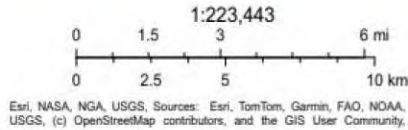
BIA, Tribal

BLM USFS

DOD State

NPS City, County, Other Local

No Unit



- Inputs:
- 7 days – mid June 2025
 - 1,500 fires simulation
 - T 90-100° and RH 5-10% during peak burning period
 - Winds 2-3mph South or 10-12mph South (High Winds)

Viewing the Model Runs

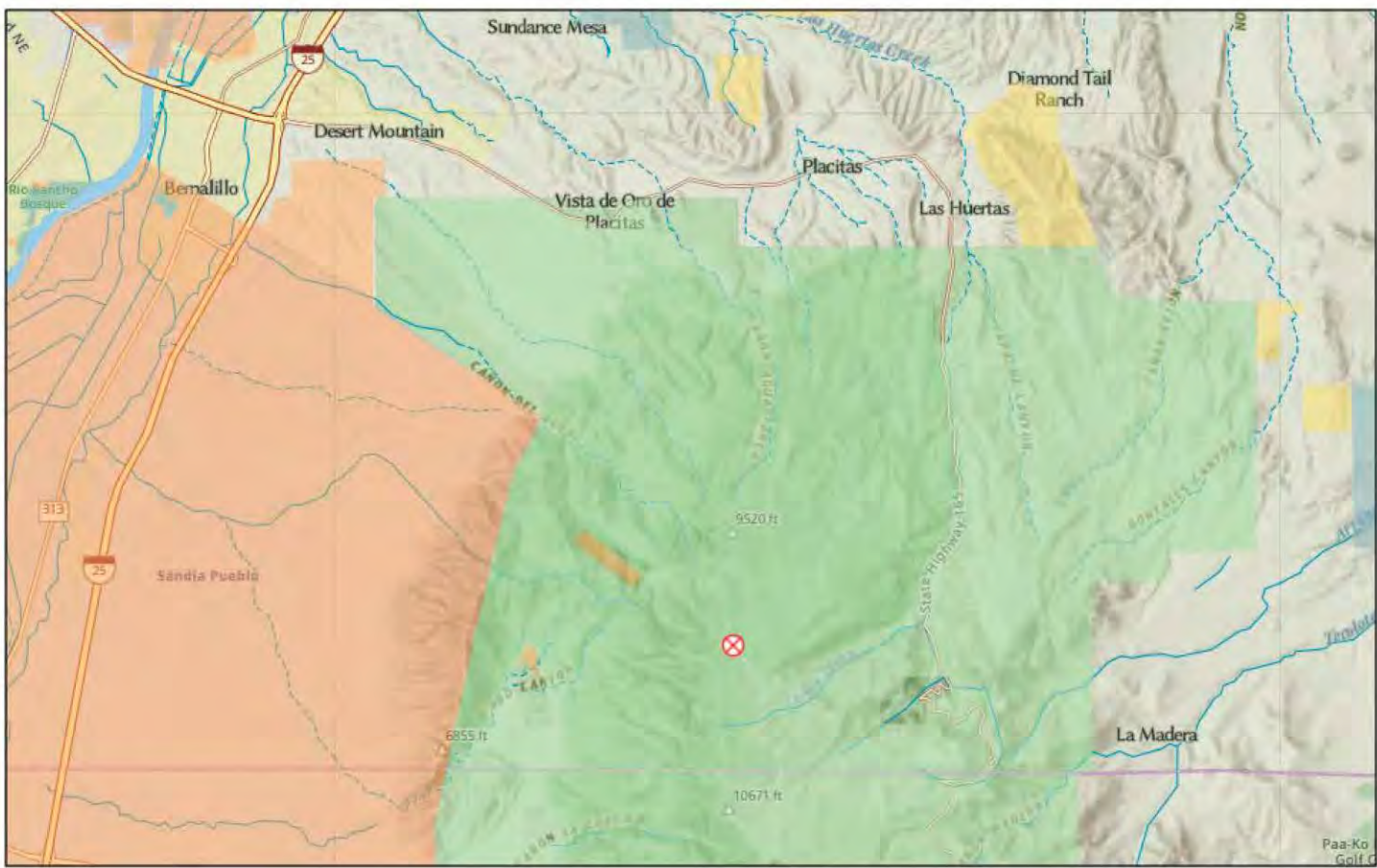
The three model runs generated for the South of the Historic Village ignition point (FS Pro S) can be viewed at the Sandia Ranger District Office in Tijeras or during District Ranger Open Office Hours in Placitas (generally 4th Friday of each month).

Please contact the Ranger Station at (505) 281-3304 to make an appointment.



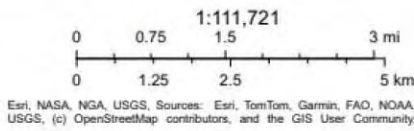
Wildfire Spread Modeling - FSPro

Sandia FSPro Ridge



4/27/2026

- Initial Point of Origin
- BLM
- City, County, Other Local
- Jurisdiction Units
- USFS
- No Unit
- BIA, Tribal



- Inputs:
- 7 days – mid June 2025
 - 1,500 fires simulation
 - T 90-100° and RH 5-10% during peak burning period (used low elevation station)
 - Winds: 2-3 mph South or 15-17 mph South

Viewing the Model Runs

The three model runs generated for the Crest and 10k Trails/north of Canon Osha and North Sandia Peak ignition point (FS Pro Ridge) can be viewed at the Sandia Ranger District Office in Tijeras or during District Ranger Open Office Hours in Placitas (generally 4th Friday of each month).

Please contact the Ranger Station at (505) 281-3304 to make an appointment.



How Fire Response Works: Initial Attack

When a fire is reported in or near the Sandia Ranger District — whether called in by a resident, spotted by lookout, detected via aircraft, or triggered by a lightning storm — here is what happens:

- **Detection and report:** Fires are reported to the Albuquerque Interagency Dispatch Center (AIDC), which coordinates initial attack resources for the district and surrounding area.
- **Initial attack (IA):** The goal of initial attack is to stop a fire while it is still small, typically within the first operational period (the first day). Speed is critical. Our initial attack resources are pre-positioned during high-risk periods precisely because of this.
- **Extended attack:** If a fire escapes initial attack and continues to grow, it transitions to extended attack status. Additional resources are ordered through the dispatch system.



Sandia District Fire Resources

The Sandia Ranger District maintains fire suppression capability through a combination of permanent and seasonal staffing and equipment.

- **Engine modules:** Two Type 6 engines carry water and hose and are the primary structure and initial attack resource.
- **Prevention and patrol:** Fire prevention patrol is active during high fire-danger periods. District fire staff monitor conditions, enforce campfire restrictions, and provide public education in the field.
- **Aerial resources:** Sandia Helibase hosts a Type 3 Helicopter with a 6-10 person crew.



Southwest Coordination Center (SWCC)

When district-level resources are exhausted, resources are ordered through SWCC. SWCC facilitates the movement of aircraft, crews, engines, and IMTs to where they are most needed.

- **Southwest Area (SWA):** One of ten Geographic Areas in the national fire coordination system.
- **Incident Management Teams (IMTs):** Complex IMTs are highly trained teams that take over management of complex, large, or extended fires. They bring command structure, logistics, and specialized resources. Ordering a Complex IMT team typically reflects a fire that has grown beyond local and regional initial attack capacity.
- **National Interagency Coordination Center (NICC):** Boise-based NICC tracks resource availability nationally and coordinates movement of resources between Geographic Areas when regional demand exceeds supply.



Fire Resources Usually Available in Area

- **Albuquerque Tanker Base:** Located at ABQ Sunport, one of the busiest air tanker bases in the country during peak fire season.
- **Large Air Tankers (LATs):** Fixed-wing aircraft capable of carrying between 1,800 and 3,000 gallons of retardant per load.
- **Very Large Air Tanker (VLAT):** The heavy lifter of the fixed-wing tanker fleet. The most common VLTA in the national system is the DC-10 or 747 Supertanker, capable of carrying 9,400 to 19,000 gallons of retardant in a single load.
- **Type 1 & 2 Helicopters:** These helicopters are critical in terrain like the Sandia Wilderness, where fixed wing drops are difficult and ground access is limited.



Ready — Be Informed

- **Sign up for SCAN:** Sandoval County Alerts and Notifications is the county's emergency mass notification system. If you haven't registered, do it tonight. It is how official evacuation notifications reach you during an emergency.
- **Know your fire danger:** Monitor New Mexico fire information at nmfireinfo.com and InciWeb (inciweb.nwcg.gov). The Forest Service posts fire restrictions and closures at fs.usda.gov/r03/cibola
- **Know your neighborhood:** Understand which of your neighbors may need assistance evacuating. PREP's 'neighbors helping neighbors' model is exactly right — in the first hours of a fast-moving fire, first responders are managing traffic and structure protection, not individual house-to-house checks.



Set — Situational Awareness

- **Defensible space:** Zone 1 (0–5 ft): non-combustible zone immediately around the house. Zone 2 (5–30 ft): reduced fuel zone. Zone 3 (30–100 ft): lean and clean. Flying embers from a wildfire can travel over a mile ahead of the flame front and land in gutters, vents, and decks.
- **Home hardening:** Vents, eaves, and decks are the most common ignition points in WUI fires. Even modest improvements — vent screens, composite decking, non-combustible mulch in Zone 1 — substantially reduce ignition risk.
- **Go-bag:** Keep a go-bag ready with documents, medications, contact lists, and enough supplies for 72 hours. Keep it near the door. If you have horses or livestock, your evacuation plan must account for them well in advance.



Go — Act Early

- If you smell smoke or see fire, do not wait for an official evacuation order if you have reason to believe your route may be threatened. Leaving early saves lives.
- NM-165 is the primary evacuation route for the Placitas community. Know your secondary routes, if they exist. Discuss them with your household tonight.
- If an evacuation order is issued, go immediately. Emergency services cannot guarantee they can reach individuals who shelter in place during an active WUI fire.





Forest Service
U.S. DEPARTMENT OF AGRICULTURE

**THANK YOU,
PREP ALLIANCE,
FOR ALL YOU DO**

Cibola National Forest & National Grasslands

Sandia Ranger District

11776 Hwy 337, Tijeras, NM 87059

(505) 281-3304

www.fs.usda.gov/r03/cibola x.com/cibola_nf www.flickr.com/photos/cibola_nfq

USDA is an equal opportunity provider, employer and lender.

Thank you – Ken

Fire

Embers

Behavior

Ignition

D-Space

Evac

Q&A

Questions



Q&A

You have

Questions

We have

Answers

PREP Membership



For more information about *joining the PREP team*:

- ✧ Talk to any of the PREP members
- ✧ Email us at: info@PREPalliance.org
- ✧ See information on the PREP website
- ✧ Call Allen Saville – 303.588.6600



www.PREPalliance.org

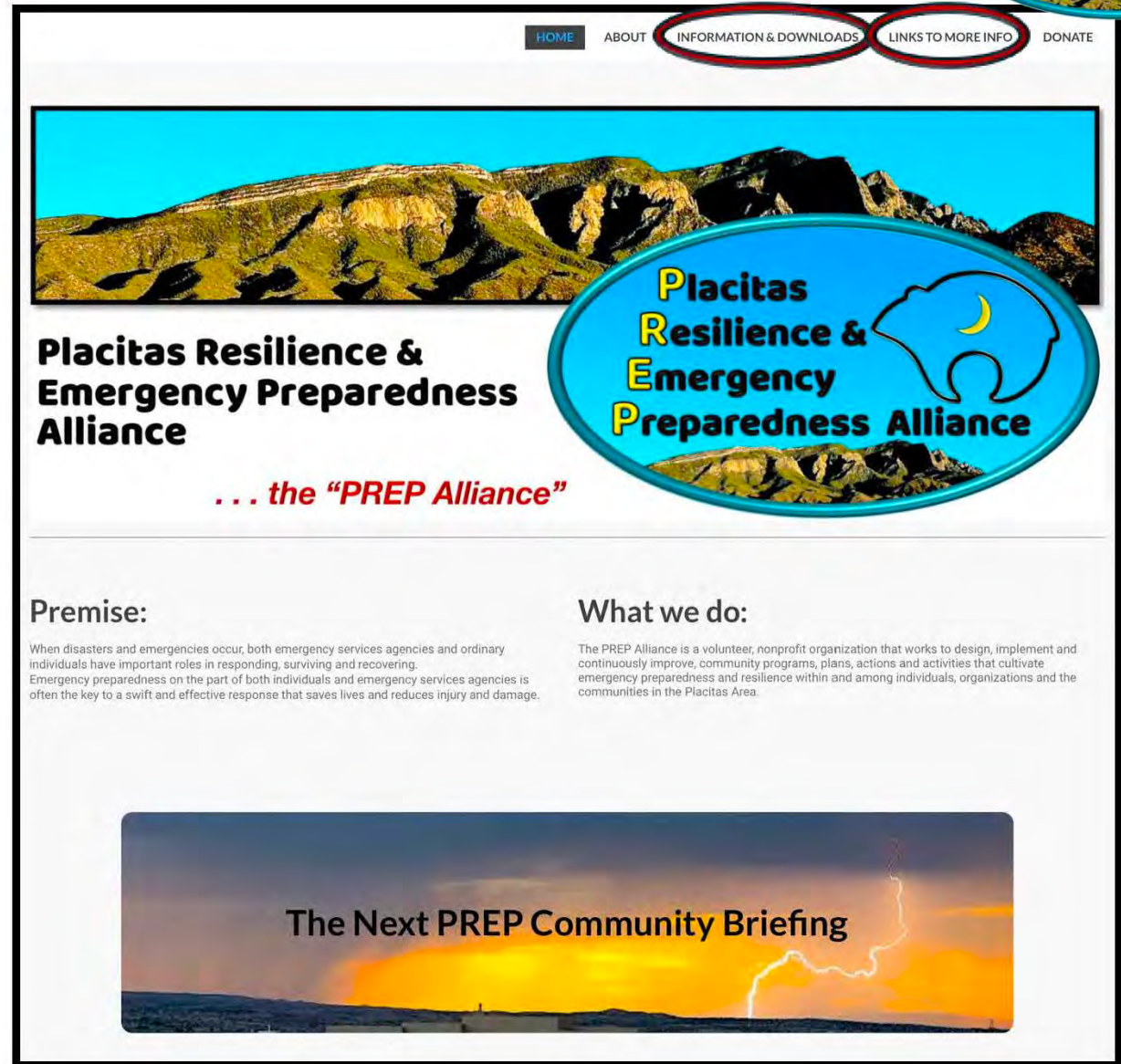
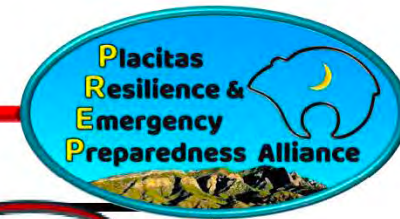
PREP Website

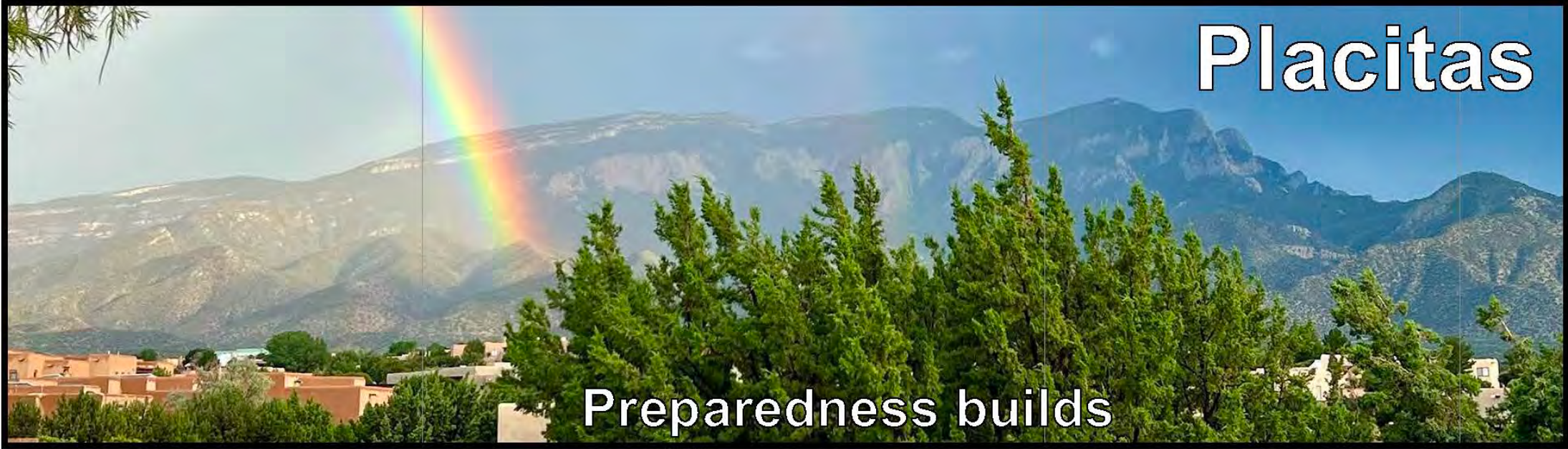
For more information
about:

✦ Emergency
Preparedness
✦ PREP Alliance

**PREP
Website**

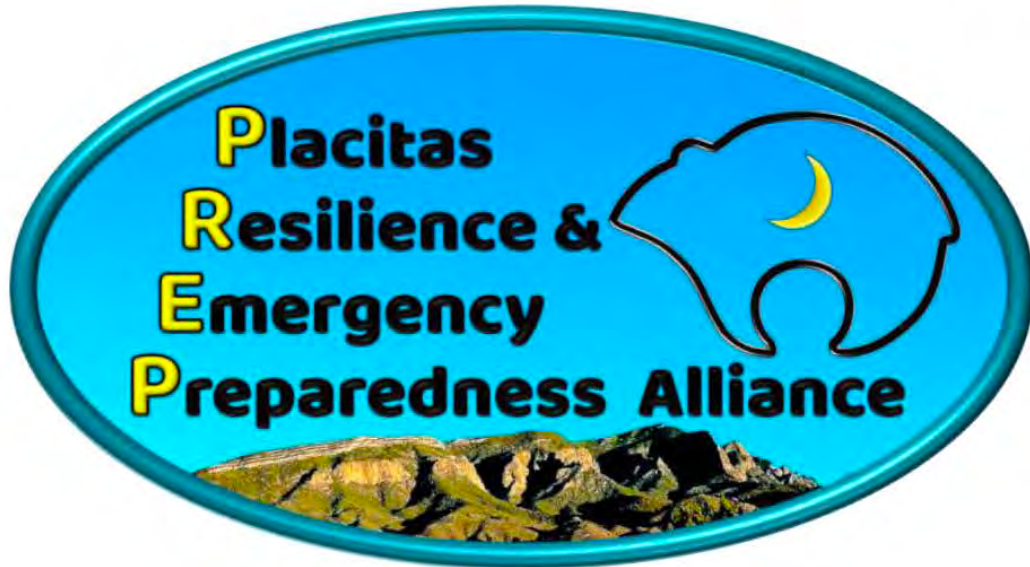
www.PREPalliance.org





Placitas

Preparedness builds
resilience



Thank you!