

When the Bull Fire made its run toward the Burma Road community area (yellow arrows show fire spread), the 35-acre Burma Unit of the Burma Road Extension Hazardous Fuels Reduction Project helped firefighters prevent the fire from spreading into the northwest corner of the Kernville community.



**Success Story:**

**How Prior Fuel Break Implementation and Interagency Cooperation Saved Homes and Protected Lives from California’s Bull Fire**

**October 2010**



“ The Burma Road ‘shaded’ fuel break was designed for a wildfire outbreak such as the Bull Fire that broke out on Monday July 26, 2010.

The concept was to provide defensible space for firefighters to work safely in. We knew it was just a matter of time before down-drainage winds pushed a fire from the Bull Run Creek area toward this neighborhood.

The network of fuel breaks built in the Kernville area by the Kern County Fire Department, sponsored by the Kern River Valley Fire Safe Council, are a good investment in community protection. Many home owners have been doing a good job of improving defensible space in their yards along Burma Road for several years now.

That really helps.”

**Scott Williams,  
Fire Management Specialist,  
U.S. Forest Service,**

**Adaptive Management Services Enterprise Team – AMSET**

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### Highest Fire Danger in the United States

During the fire season months, the Kernville, Calif. area experiences and represents some of the highest fire danger indices in the United States.

These indices—especially for the area’s predominant shrub fuels—is due to consistent high winds, desert-influenced dryness, and the steep canyon characteristics that funnel the winds—often downslope toward communities.

The Kernville area has a recent history of large wildfires: the 2008 Piute Fire – 37,000 acres, the 2002 McNally Fire – 151,000 acres, the 2000 Manter Fire – 76,000 acres, and the 1990 Stormy Fire – 25,000 acres.

The July 2010 Bull Fire—that, as this report informs, was influenced by hazardous fuel treatment areas—burned a total of 16,000 acres.

Six weeks after the human-caused Bull Fire is ignited, the human-caused Canyon Fire breaks out in Kern County, a few miles south of the Bull Fire area. The Canyon Fire threatens the communities of Havilah, Myers Canyon, and Bodfish and burns 9,800 acres. (See more details on this fire on page 29.)

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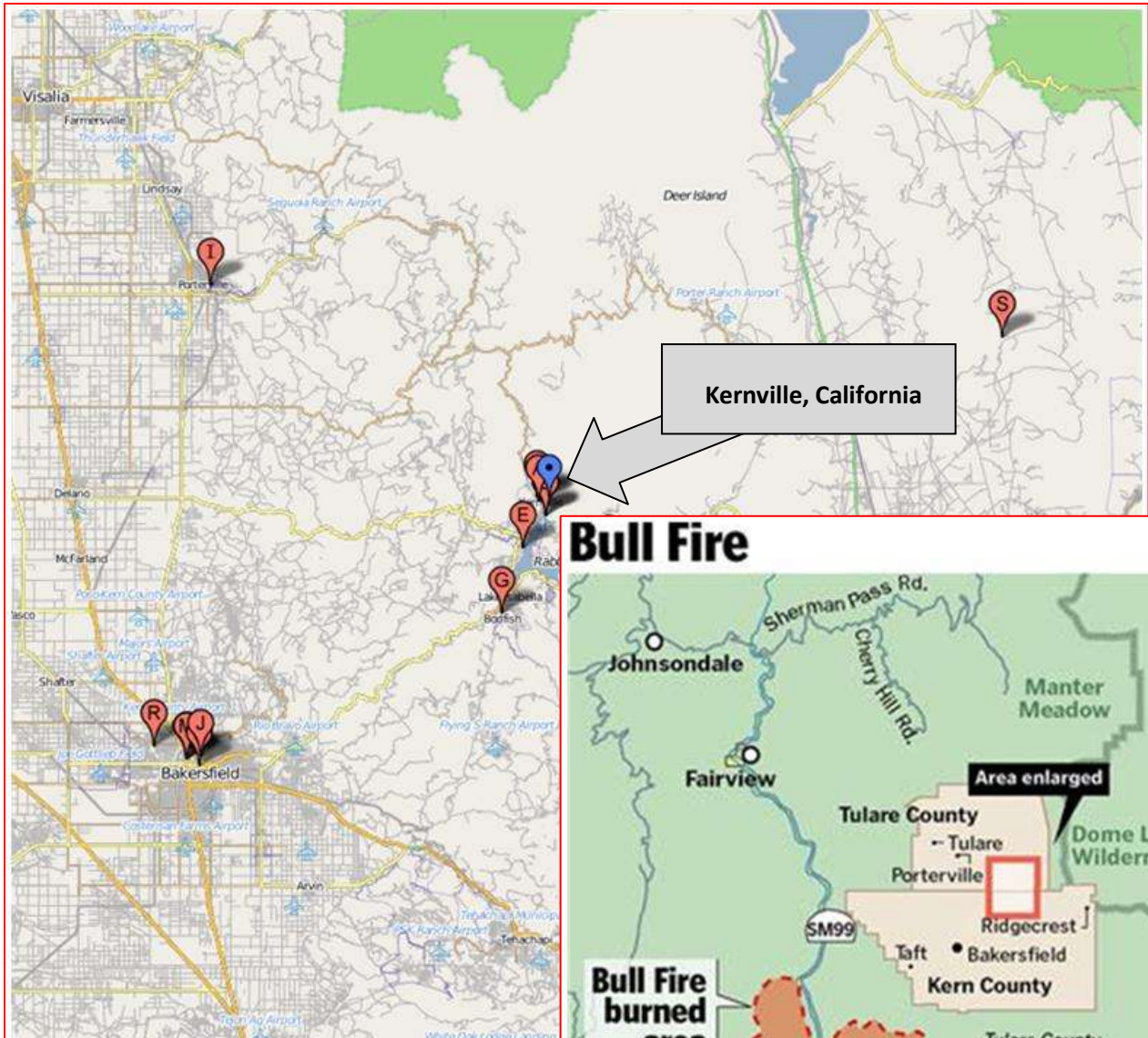
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#### Cover Photos

**Top Photo:** One of the many aerial photos displayed in this report that originally appeared in the *Bull Fire Fuels Treatment Effectiveness Report* by the U.S. Forest Service’s Adaptive Management Services Enterprise Service, Kern River Valley Fire Safe Council, Kern County Fire Department, and the Bureau of Land Management’s Bakersfield Field Office. **Inset Photo on Left:** The Bull Fire threatens the Riverkern community. Photo by Laura Beatrice Rosales.



### Fuel Breaks Help Knock Down Fire Spread – Protect Homes

The Bull Fire, an unwanted, human-caused fire, ignited July 26, 2010. It quickly spread down Bull Creek drainage and across Kern River Canyon, threatening the communities of Kernville and Riverkern.

The fire burned into or through previously established shaded fuel breaks adjacent to homes on the north end of Kernville and burned entirely around the Riverkern community.

As this report outlines, these fuel breaks significantly modified fire intensity, allowing for effective fire suppression control by firefighters.

Due to other suppression priorities and staffing limitations, even though the fuel break on the east side of Riverkern could not be staffed by firefighters, this previously treated and maintained fuel break successfully protected homes “on its own.” (See photos on page 21.)

### Success Story:

How Prior Fuel Break Implementation and Interagency Cooperation Saved Homes and Protected Lives from California’s Bull Fire

## Fuel Breaks:

### ***'First Line of Defense Against the Winds that Flung the Bull Fire at this Northwest Corner of Kernville'***

**“** *Some would say we were lucky. I would disagree.*

*The footprint of fire clearances around our neighborhood had been clearly visible. Firewise property owners had worked hard cutting brush, weed-eating, raking grass, and limbing trees. The Fire Safe Council had gotten the grant money and the fire crews had done the work of extending the property owners' clearances with fuel breaks. Those fuel breaks were our first line of defense against the winds that flung the Bull Fire at this northwest corner of Kernville on Monday afternoon.*

*In a watershed famous for 150,000-acre wildfires . . . as the fire is coming over the hill at us Monday afternoon, first two dozers, then Rio Bravo Hotshots, parked big fire trucks among our homes and head up the hill toward the flames.*

*Silently cheering them on, hope returns as we frantically close windows and pack valuables into cars. By early evening, the dozers are following the fuel breaks, tying ridges to roads with wide firelines. And Rio Bravo is going direct, cutting fireline on the edge of the flames to pinch-off this corner of the Bull Fire—16,000 acres of wildfire that did not get Burma Road.*

*“ . . . For the fuel breaks to defend our neighborhoods, thank you to the Kern River Valley Fire Safe Council, the Sequoia National Forest, and the Kern County Fire Department.*

*And to all of the firefighters who battled the Bull and saved Kernville:*

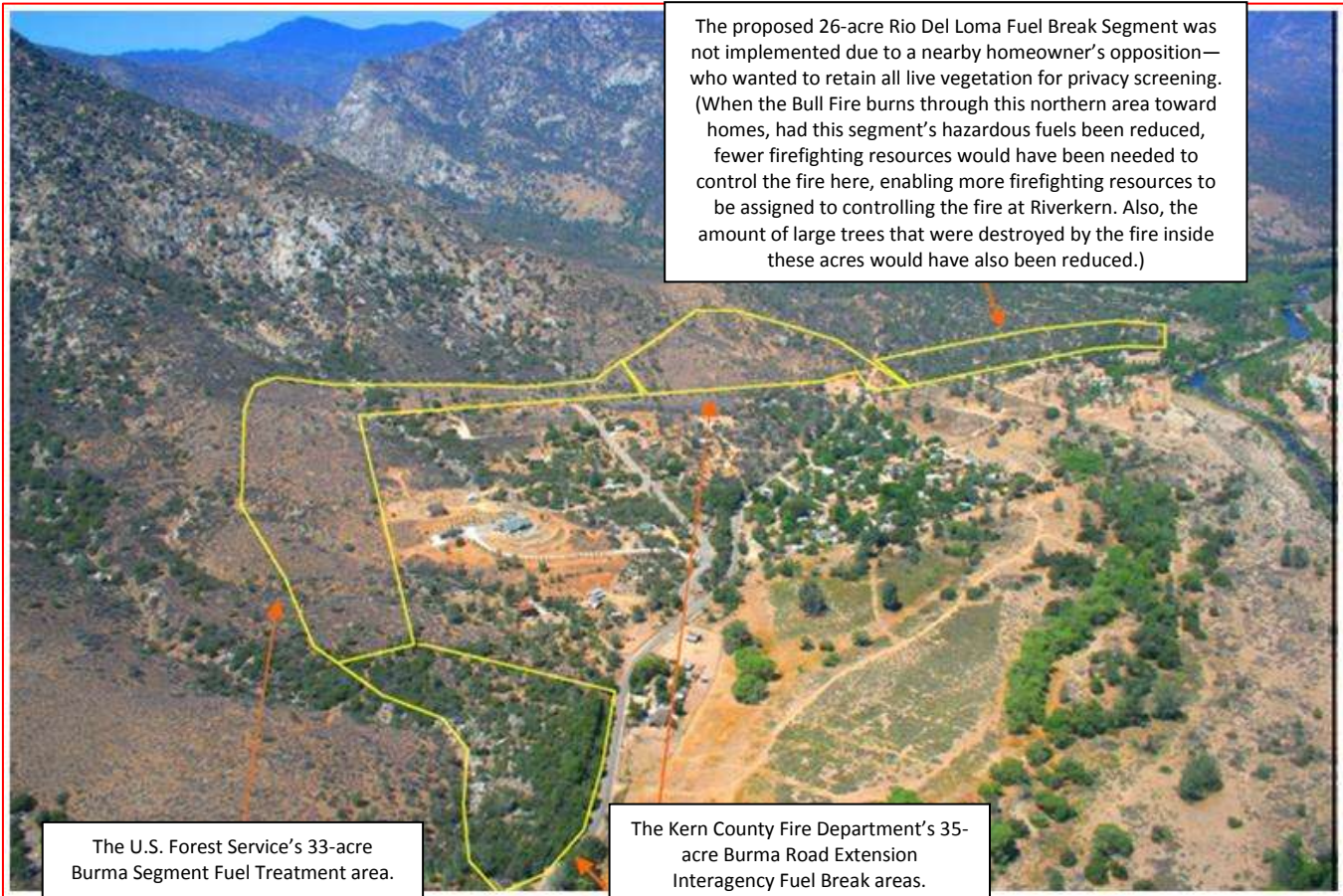
*Thank You. ”*

**Linda Adams, Burma Road Homeowner  
Kernville, California**



*Photos show how intense and severe the 16,000-acre Bull Fire burned in the areas where no fuel treatments had occurred.*

# One The Treatment on the Land – Before the Fire



## **September 2008 Kernville Hazardous Fuel Treatments**

Reduced brush—from ongoing hazardous fuel treatment maintenance work—is visible on the hillsides above and on both sides, surrounding this community on Burma Road in September 2008. This photo shows the U.S. Forest Service's 33-acre Burma Segment Fuel Treatment area and Kern County Fire Department's 35-acre Burma Road Extension Interagency Units fuel break areas. The proposed 26-acre Rio Del Loma Segment (top right) was not implemented due to a homeowner's opposition who desired retention of live fuels vegetation for privacy screening.



### **Before the Fuel Treatments**

*April 2005 photo shows the vegetation in areas where hazardous fuel reduction work has since occurred on the ground to protect homes and people: Burma Road area on left and Bull Creek drainage area in middle (indicated by orange arrows). Due to a neighbor's objection, the Rio Del Loma Road area (on right) did not receive treatments.*

## **A. Longtime Interagency Collaborative Effort—Involving Local Organizations and Federal Land Agencies—Achieves and Assures Hazardous Fuel Reduction**

Between 2000 and 2010, the Kern River Valley Fire Safe Council utilized more than \$1 million in National Fire Plan grants (awarded by the California Fire Safe Council's grants clearinghouse) to complete hazardous fuel reduction on private property in ten projects across 420 acres throughout four geographic areas: Kern River Valley, Walker Basin, Kelso Valley, and Kennedy Meadows.

In 2010, the Kern River Valley Fire Safe Council also received an additional \$400,000 in grants for three more hazardous fuel reduction projects on 280 acres. One of these undertakings, the Burma Road Extension Interagency Fuel Break, was near completion when the Bull Fire occurred.

All of these projects represent defensible-space shaded fuel breaks near homes as well as fuel breaks along escape routes that citizens could potentially be using to evacuate from fire.

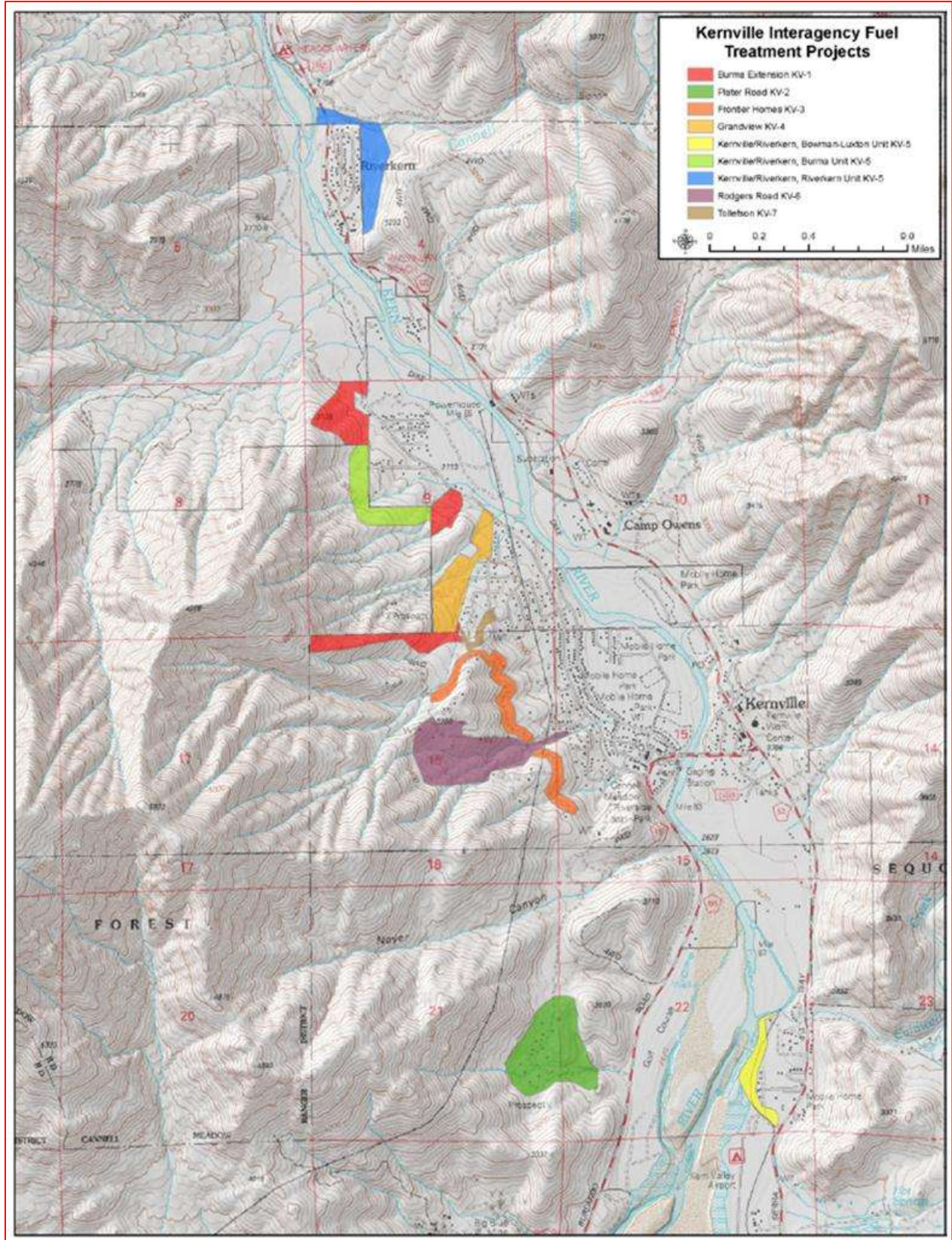
In all of these areas, shrubs and tall herbaceous plants are continually cut and removed and trees are limbed up to approximately six feet. Cuttings are disposed by chipping or pile burning during winter months.

The Kern River Valley Fire Safe Council oversees an interagency collaborative group comprised of the Kern County Fire Department; Sequoia National Forest, U.S. Forest Service; and the Bakersfield Office, Bureau of Land Management. These agencies cooperate in the planning, implementation, and maintenance of 33 hazardous fuel reduction projects. Seven of these projects are located in the Riverkern and Kernville areas. The federal land management agencies use allocated hazardous fuel management funds for project planning and implementation.

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### Success Story:

How Prior Fuel Break Implementation and Interagency Cooperation Saved Homes and Protected Lives from California's Bull Fire



**B. Kernville Interagency Fuel Treatment Projects**

Success Story:  
How Prior Fuel Break Implementation and Interagency Cooperation Saved Homes and Protected Lives from California's Bull Fire





## **Fuel Break Maintenance**

*Forest Service crews limb trees and reduce brush in the Riverkern Hazardous Fuel Reduction Project area during February 2009. This project comprises 25 acres of shaded fuel break—approximately 100 to 400 feet wide—on National Forest lands adjacent to private homes along the north and east sides of the community of Riverkern.*

*As the Bull Fire approached, the fuel break along the east side of Riverkern was not able to be staffed by firefighters adjacent to backyards of homes along Cowbelle Boulevard.*

*Even so, without any fire suppression actions in this location that day, this fuel break significantly reduced fire intensity—protecting these adjacent homes. Even though the main fire burned through this area, the fuel break mitigated the fire's potential impacts to the homes "on its own".*



Photos by Cindy Thill, U.S. Forest Service

**“** *The purpose of the proposed treatment is to increase defensible space on national forest lands to reasonably protect houses located on private property close to these lands. Doing so will significantly reduce the risk of wildfires burning from national forest land onto private property and damaging or destroying houses and associated structures. This action will improve public and firefighter safety and improve protection of adjacent wildlife habitat.* **”**

**2005 Decision Memo  
for the Kernville Hazardous Fuels Reduction Project  
Environmental Analysis**

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### **C. Riverkern Hazardous Fuels Reduction Project**

The 75-acre Riverkern Hazardous Fuels Reduction Project comprises 25 acres of shaded fuel break—approximately 100 to 400 feet wide—on Sequoia National Forest lands adjacent to private homes along the north and east sides of the rural Riverkern community, located north of Kernville.

Approximately 300 residents live in the Riverkern community. Some of these resident’s homes and property lines are located within 20 feet of Forest Service lands.

The project’s primary objectives:

- Create defensible space around the community of Riverkern.
- Reduce the amount of natural fuels.
- Reduce the threat of wildland fire from entering or leaving the community of Riverkern.

This project's National Environmental Policy Act (NEPA) environmental compliance was completed by the Forest Service in 1998. Most initial project work occurred the following year. Forest Service fire crews removed brush and limbed trees, piled the cuttings and burned the piles during winter months. The shaded fuel break is maintained in this way every year—or every other year. It was last maintained during the winter of 2009. (See photos on previous page.)

### **D. Kernville Hazardous Fuels Reduction Project**

The Kernville Hazardous Fuel Reduction Project comprises brush reduction and shaded fuel breaks in two separate segments:

- The Burma Segment – Approximately 33 acres at the west end of Burma Road, located in the northwest corner of the community of Kernville. This unit is adjacent to eight private homes.
- The Bowman/Luxton Segment – Approximately 24 acres located on the west side of Bowman Road at the south end of Kernville adjacent to 25 private homes.

The Forest Service completed NEPA compliance for this project in 2005. It includes shaded fuel breaks—up to 400 feet wide—on Forest Service lands.

### **Forest Managers Realized the Potential for Fire to Threaten Communities**

Due to a thermal low that sets up over the desert to the east, Forest Service staff realized the potential for strong down-drainage winds in the north fork of the Kern River. If a wildfire started in the Bull Run Creek drainage or north of Kernville in Kern Canyon, they knew that these down-drainage winds had the potential to threaten Kernville area homes.

Kernville Hazardous Fuel Reduction Project planners on the Sequoia National Forest modeled potential fire behavior. They included this information—which outlined fire spread and flame length potential in specific areas if fuel reduction did *not* occur in proposed treatment areas—in their project scoping.

From the beginning, the Kern River Valley Fire Safe Council endorsed the proposed project.

Long-term maintenance of these various fuel breaks occur through Kern River Valley Fire Safe Council contracts with Kern County Fire Department for use of their fire crews in implementing National Fire Plan grant-funded projects.



Cindy Thill, U.S. Forest Service

*Members of the U.S. Forest Service's Rincon Fire Crew, based in Kernville, cut and pile brush adjacent to a home in the Burma Segment hazardous fuels treatment area during the fall of 2006.*

**“** *These projects have significantly reduced the threat of wildfires burning from national forest land onto private property and damaging or destroying houses and associated structures; and have improved firefighter and public safety, and improved the protection of adjacent wildlife habitat.* **”**

**National Fire Plan  
Community Fuel Reduction Projects Update  
September 2008**

For several years, defensible space work has occurred in the project area on private property by the Kern County Fire Department and fire crews have been improving defensible space in dozens of locations throughout the Kern Valley area.



### **Before the Bull Fire**

Aerial photo shows, prior to the Bull Fire, the approximate location of the interagency hazardous fuel reduction areas on Forest Service lands adjacent to private homes—representing a population of 300 people—in the Riverkern community.

“ Over the years, I have been present for many presentations by our local Kern River Valley Fire Safe Council. . . I always come away with new information and amazement at the accomplishments of the Fire Safe Council members; each presentation is for me a new experience.

K.R.V. Fire Safe Council originated in 2000 and is one of the first Fire Safe Councils to be formed in California. They are a non-profit, 501c3 organization and all volunteer. The work they do to promote fire protection awareness is truly awesome and I take every chance I get to promote their efforts. I urge those of you who want to make a difference in our community to look their way to donate your time. They need your help and you will certainly feel rewarded for making our valley a safer place to live.

Their Mission Statement: *‘To provide awareness through education and information exchange, and to facilitate interagency coordination, fire protection and fire safety projects within the Kern River Valley.’* They partner with the Kern County Fire Department, Forest Service, Bureau of Land Management, the business community, property owners associations, civic groups and individuals to make their mission statement not just a promise but also a reality.

The Kern River Valley Plan was a pioneering document that became a model for similar plans throughout California. It is still their primary guiding document and is updated annually. ”

**Marsha Smith, Publisher  
Kern Valley Sun Newspaper  
August 2009**

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## **E. The Burma Road Extension Interagency Hazardous Fuels Reduction Project**

The Burma Road Extension Interagency Hazardous Fuels Reduction Project represents a 35-acre shaded fuel break that ties into the “Burma Segment” of the Kernville Hazardous Fuels Treatment Project area.

This project was initially proposed for a National Fire Plan community protection grant by the Kern River Valley Fire Safe Council (awarded by the California Fire Safe Council) in 2009. The grant monies were received by the council in 2010.

The Kern River Valley Fire Safe Council contracts with the Kern County Fire Department to use the department’s crews to implement these grant-funded projects on the ground.

In addition, home-based in nearby Lake Isabella, the Rio Bravo Hotshots—started by the Kern County Fire Department in 1989—have performed defensible space work in the project area and on adjoining private properties for several years. (The Rio Bravo Hotshots are the only nationally recognized local government interagency hotshot crew in the nation.)

Two  
July 2010 –  
The Fire



Martine McGuire



Laura Beatrice Rosales

### **The Bull Fire**

Pushed by gusting winds and influenced by dry fuels and single-digit humidity, the Bull Fire approaches Kernville's Burma Road area (left photo). The Bull Fire also burns into the Riverkern community (right photo). Will the prior hazardous fuel reduction program maintenance work successfully slow the fire's spread, diminish its intensity—and aid firefighters—in protecting people's homes?



Martine McGuire

*Firefighters build fireline to help protect Burma Road area homes from the approaching Bull Fire along the Burma Road Extension Interagency Hazardous Fuel Break.*

## **A. Utilizing Fuel Break with Suppression Tactics Stops Fire Before it Reaches Homes**

The human-caused Bull Fire is reported at 2:30 p.m. on Monday, July 26, 2010. (An interagency task force is investigating who started the fire.)

Burning in dry, flashy fuels—including Sierra foothill shrubs, live oaks, and gray pine—it is moving and running approximately one mile up Bull Run Creek from the north fork Kern River. The Bull Run Creek drainage is a steep-sided canyon that rises to 5,000 feet in elevation along the Greenhorn Mountains crest. Gusting winds and single-digit humidity is encouraging the fire's downhill spread.

While the fire is initial attacked by local ground and air resources, it is too intense to be stopped from spreading down the creek drainage. Strong down-drainage winds are driving the fire east—toward the wildland urban interface in Kernville. Combined with strong Kern Canyon winds from the south, the Bull Fire also spreads northeast toward the community of Riverkern.

### **Success Story:**

How Prior Fuel Break Implementation and Interagency Cooperation Saved Homes and Protected Lives from California's Bull Fire

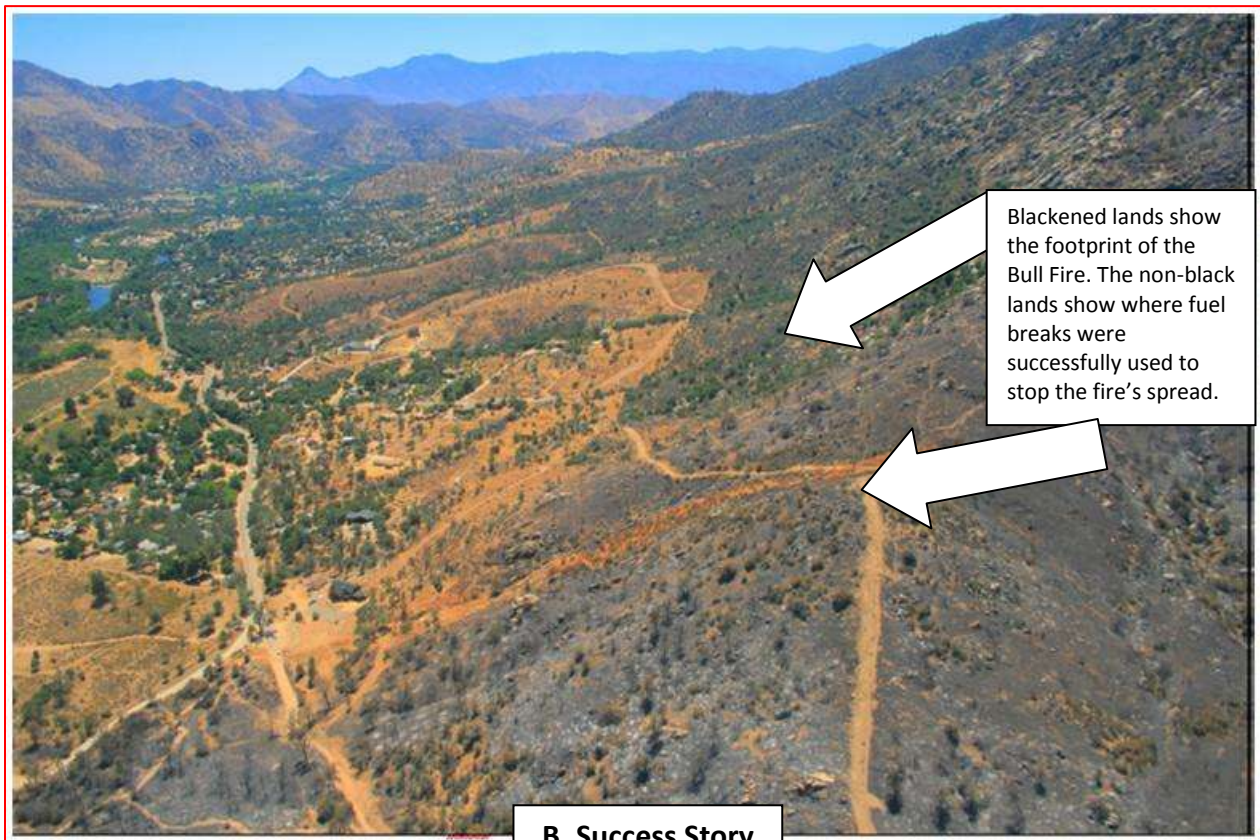
“ Sean Collins, Kern County Fire Spokesman, noted the massive (suppression) effort Monday afternoon was aided by a pre-fire, grant-funded fire break on the west side of the river that was credited with saving all the homes. ”

**Bakersfield Californian Newspaper  
Tuesday, July 27 news story**

### **Bull Fire Approaches Burma Road Extension Interagency Hazardous Fuel Break in Kernville**

At approximately 4 p.m., the Bull Fire approaches the Burma Road Extension Interagency Hazardous Fuel Break. On the west side of this fuel break, firefighters (from Kern County Fire Department, U.S. Forest Service, and Bureau of Land Management) build a dozer line on top of a ridge. In preparing for their line burnout and holding operations, they also construct hand lines and dozer lines near homes.

These suppression actions, combined with helicopter water drops and firefighters engaging with the fire’s perimeter, successfully stops the fire’s spread inside the Burma Segment and the Burma Road Extension Interagency Hazardous Fuel Break project areas—before it reaches homes (see photo below).

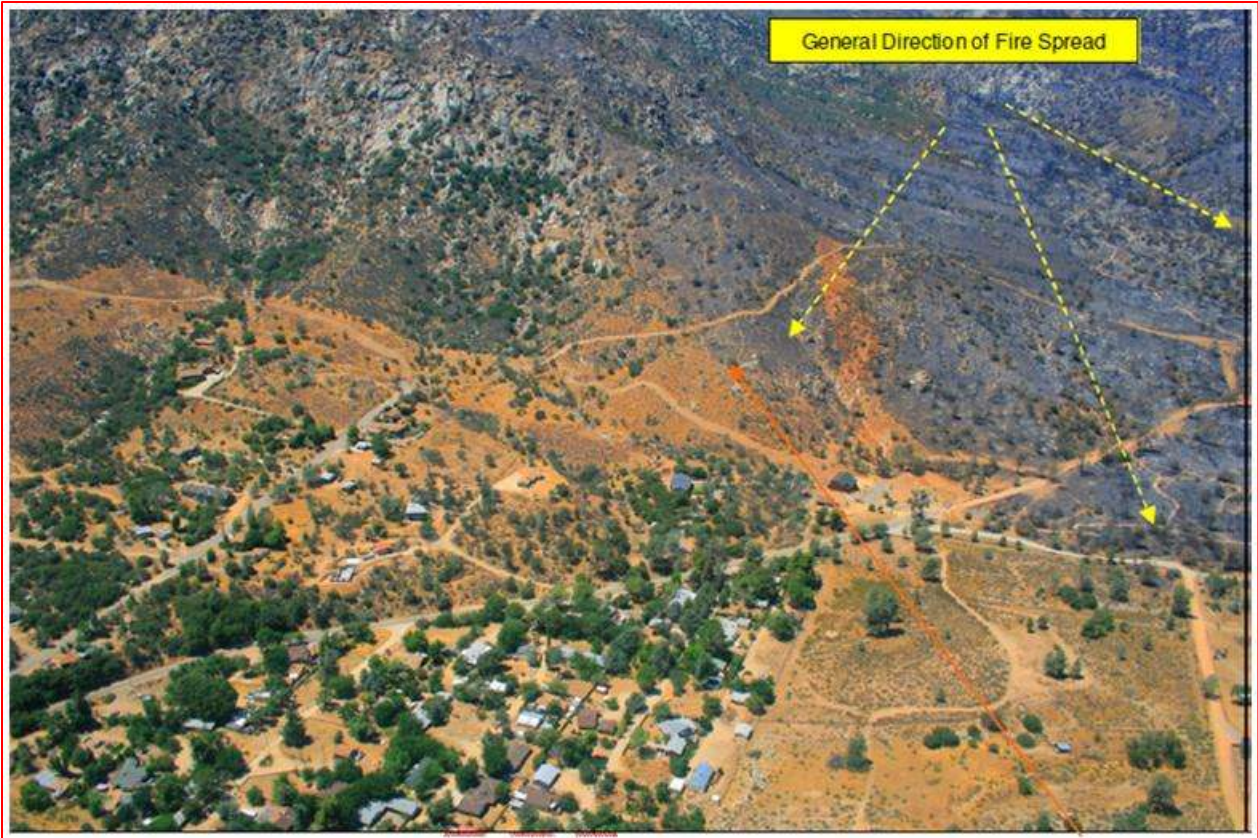


Aerial photo shows how the network of interagency—Kern River Valley Fire Safe Council, Kern County Fire Department, and U.S. Forest Service—hazardous fuel breaks maintained along the western edge of the community Kernville, helped stop the Bull Fire’s spread into homes. Notice how—due to the fire’s intensity and fuel and weather conditions—the dozer lines at the top of the ridge did not stop the fire’s spread (fire-blackened lands appear on both sides of roads/dozer lines). However, the fuel breaks—in concert with the firefighters using these areas with reduced fuels in their suppression tactics—did stop the fire’s spread. The Burma Road Extension Hazardous Fuel Break is pictured in the foreground.

**Success Story:**

How Prior Fuel Break Implementation and Interagency Cooperation Saved Homes and Protected Lives from California’s Bull Fire





*When the Bull Fire made its run toward the Burma Road community area (yellow arrows show fire spread), the 35-acre Burma Road Extension Interagency Hazardous Fuels Reduction Project (indicated by orange arrow) helped firefighters prevent the fire from spreading into the northwest corner of the Kernville community. (The blackened areas indicate lands burned by the fire. Non-blackened areas are lands successfully untouched by fire.)*



*Yellow arrows show how the Bull Fire threatened homes on Rio Del Loma Road in Kernville. Thorough fuel reduction and defensible space on private property around these homes helped to save them.*

**Success Story:**  
How Prior Fuel Break Implementation and Interagency Cooperation Saved Homes and Protected Lives from California's Bull Fire

“ I want to thank you personally for your foresight and efforts in shepherding the fuel break along my Burma Road neighborhood. We knew this fire was coming, we just didn't know when. For our neighborhood, at least, it was a happy outcome. ”

**Christy McGuire, Kernville Resident**  
**In a post Bull Fire e-mail to Scott Williams,**  
**Fire Management Specialist, U.S. Forest Service**



Casey Christie/The Bakersfield Californian

*A Bureau of Land Management fire crew, along with several U.S. Forest Service firefighters, work together on a large backburn operation on the Bull Fire.*

As the main fire approaches the Burma Road Extension Hazardous Fuel Break, it also reaches the nearby Rio Del Loma Road vicinity.

Firefighters, with engine and helicopter water-drop support, work along this road to prevent the fire from spreading onto properties located on the east side of the road. Firefighters are able to work here because of the defensible space clearances on the large lot properties. The homes here are also generally set back from the road and located closer to the Kern River.

### **C. Main Fire Spots Across the Kern River into Riverkern Community**

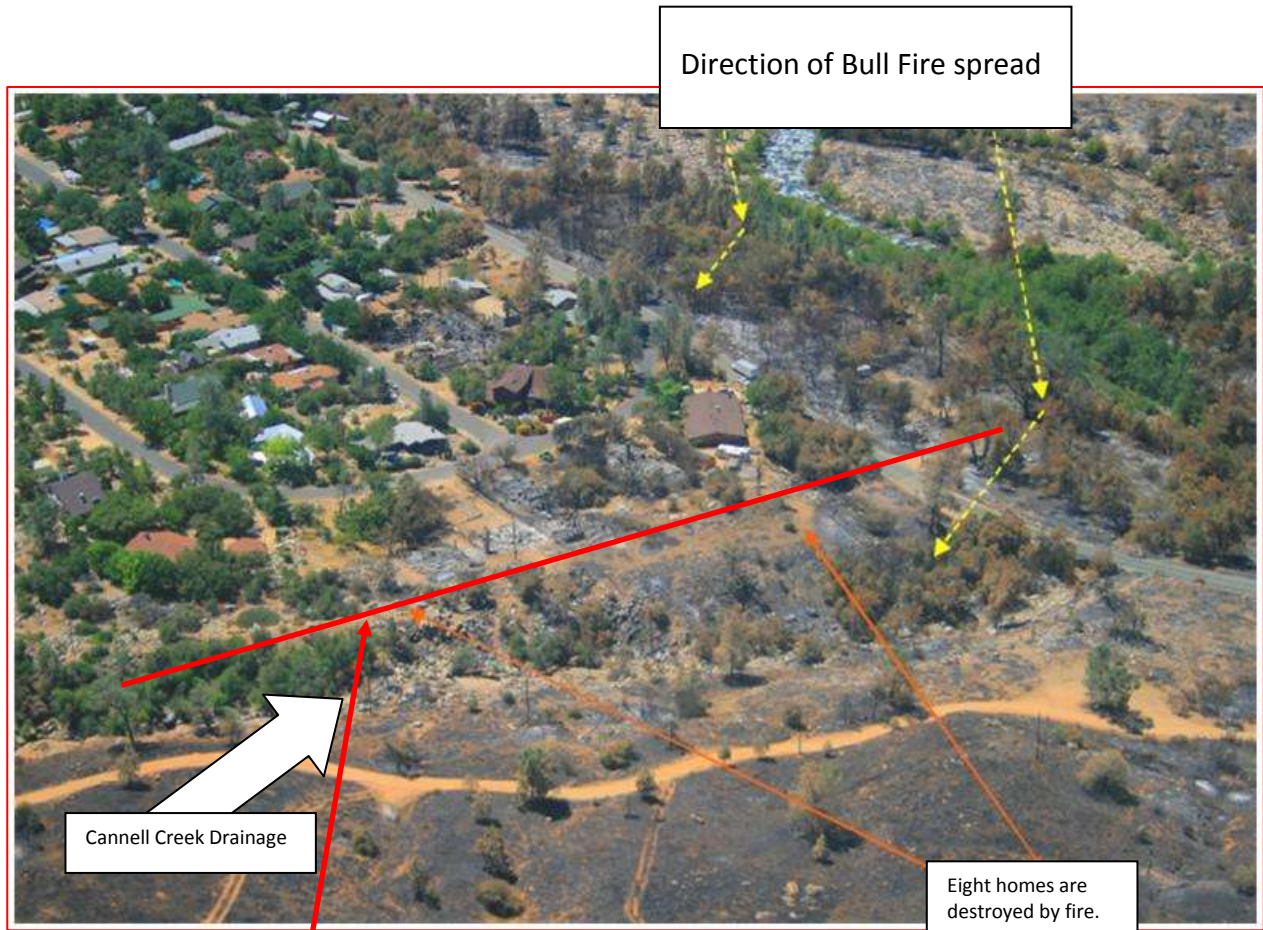
When the main fire approaches the Kern River near the Riverkern community, it spots across the river in several locations. The Forest Service's Riverkern Hazardous Fuel Reduction Project area located on the north side of Riverkern adjacent to homes was the most open area within the project. It was basically an open field. However, the nearby riparian vegetation along Cannell Creek was more thick. The fire burns through portions of this dense riparian vegetation on private property along the west side of Riverkern and spots into the community. Eight homes and six adjacent structures are destroyed. (See photo on next page.)

The Cannell Creek drainage to the north of the homes—with this dense fuel component—most likely acted as a "chimney"—accelerating fire intensity and fire brand production toward the homes.

In addition, the structures were also positioned close together. Burning—and spreading—from one structure to another may have served as a significant factor, contributing to this multiple structure ignition.

Success Story:

How Prior Fuel Break Implementation and Interagency Cooperation Saved Homes and Protected Lives from California's Bull Fire



Direction of Bull Fire spread

Cannell Creek Drainage

Eight homes are destroyed by fire.

Approximate location of Forest Service boundary.

*The Forest Service property along Cannell Creek drainage (located in lower portion of photo above) in Riverkern was inhabited with dense riparian vegetation. When the Bull Fire burned into this fuel, the drainage acted like a “chimney”—accelerating fire intensity and fire brand production toward the adjacent homes. Eight homes were destroyed—the only homes claimed by the Bull Fire.*



Casey Christie/The Bakersfield Californian

*Bureau of Land Management Battalion Chief Debbie Santiago gets a nod of appreciation from Riverkern resident Bill Phillips.*

On the east side of Riverkern, the Riverkern Hazardous Fuel Break could not be staffed by firefighters adjacent to backyards of homes along Cowbelle Boulevard. As the fire burned through this area—without any suppression actions that day—the fuel break significantly reduced fire intensity adjacent to these homes. No structures burned. In other words, the fuel break mitigated the fire's potential impacts to the homes, saving them "on its own." (See photos on page 21.)



Derrick Davis, Kern County Fire Department

*Looking west as the main Bull Fire front burns into the northern portion of the 35-acre shaded fuel break Burma Extension that ties into the "Burma Segment" of the Kernville Hazardous Fuels Treatment Project area.*

*This Burma Extension was initially proposed for a National Fire Plan community protection grant by the Kern River Valley Fire Safe Council (awarded by the California Fire Safe Council) in 2009. The grant monies were received by the council in 2010.*



**Fuel Break  
Saves Homes  
'By Itself'**

*The eastern portion of the Riverkern Hazardous Fuels Reduction Project lands helped reduce, slow, and stop the Bull Fire's forward progression—without any suppression activities by firefighters.*

*No significant property damage occurred here on the east side of the Riverkern community.*



*These photos, taken after the fire, illustrate how the prior fuels treatment kept the fire on the ground, out of the trees, and, thus, protected homes—even without any assistance from firefighters.*

## What was the approximate range of flame lengths and rate of spread when the main fire burned through Riverkern?

“ Based on what we saw when we arrived (in the Riverkern area), I would say a rapid rate of spread with numerous spots. Probability of ignition had to be 80 percent or better. While we were there, it seemed like every ember would get established, although they would not spread very rapidly due to the lack of continuous receptive fuels around the structures. ”

**Michael Wood**  
Engine Captain

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### Bull Fire Burns More Than 16,000 Acres

On its second day, a Type 1 Incident Command Team was assigned to the Bull Fire. A 16-mile stretch of Mountain Road 99, from Kernville to Fairview is closed. Suppression priority is structure protection throughout the area.

Fourteen days later, on August 9, after burning 16,442 acres, the Bull Fire is contained.



Derrick Davis, Kern County Fire Department

**Left Photo** – Looking northwest where main Bull Fire burns toward Rio Del Loma Road. Adjacent fuel breaks (Kern County Fire Department’s Burma Extension Unit and the Forest Service’s Burma Segment) helped save homes.



Casey Christie/The Bakersfield Californian

*Riverkern residents express their appreciation.*

## D. Thank You Firefighters



Casey Christie/The Bakersfield Californian

*Kernville area resident Robin Little thanks firefighters for their hard work on the Bull Fire at a community information meeting held the week of the fire, attended by 60 community members. The Bakersfield Californian newspaper reported that comments were mostly positive at the meeting: “. . . with several rounds of applause from the crowd on behalf of firefighters’ efforts. Local authorities even gave the crowd a round of applause for the work they’d done in clearing brush and other combustibles.”*



Casey Christie/The Bakersfield Californian

*Joe and Cindy Knight (left) post their appreciation for firefighters who helped to save Joe’s mother’s Riverkern home when the Bull Fire swept down through this community. Another Riverkern resident (right) likewise posts a sign to express gratitude for the interagency firefighters’ successful suppression efforts.*

## Three

### Conclusion – Post Fire Treatment Effectiveness Analysis



Valerie Alexander





Richard Rowe

*The Bull Fire on the evening of July 26, its first day.*

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## **A. Scientific Evidence that Fuel Treatments Reduced Bull Fire Intensity and Minimized Impacts**

### **Burn Severity**

A Burned Area Emergency Response (BAER) Team assigned to the Bull Fire produced a Burned Area Remote Classification (BARC) analysis based on fire impacts to soils. This information is useful for gauging how hot a fire burned.

This Burned Area Remote Classification analysis confirmed that the Bull Fire:

- Burned through the Burma Road Extension Interagency Fuel Break with low severity.
- Burned the north side of the Riverkern fuel break with mostly moderate severity and the east side with low severity.
- Burned with mostly moderate severity along Rio Del Loma Road in the Riverkern area.

## Fire Behavior Modeling

A comparative analysis was performed using the BEHAVE system<sup>1</sup> to illustrate fire behavior that *could have* occurred in the treatment units *if* the treatments had *not* been implemented.

The July 26<sup>th</sup> (day of Bull Fire start) conditions and fuel moistures when the fire entered the hazardous fuel treatment areas were used for generating these fire behavior outputs.

This analysis determined that if the units had *not* been treated, the model predicted flame lengths would have been from 9 to 22 feet in length. However, in actuality, with the treatment, fire lengths inside these units were, in fact, only 6.5 feet—significantly less intense. As was proved on the Bull Fire, these shorter flame lengths are extremely important for firefighting suppression effectiveness.

## B. Key Fuel Treatment Observations

1. Fire danger conditions on July 26 (the day the Bull Fire was ignited) were around the 60<sup>th</sup> percentile level. If the fire had burned during very high or extreme conditions the impacts to communities could have been much more extensive.
2. The Riverkern fuel break contributed to the protection of homes along the community's northeastern and eastern edge. A combination of both 1.) untreated riparian vegetation in Cannell Creek and 2.) structure ignitability and closeness of these structures to one another, contributed to the loss of eight Riverkern homes.
3. Interagency leadership and coordination provided by the Kern River Valley Fire Safe Council created a network of shaded fuel break projects along the western edge of Kernville that contributed to the protection of homes during the Bull fire.
4. The shaded fuels breaks adjacent to homes provided firefighters safer defensible space from which to base their suppression activities. Firefighting efforts are much more efficient performed in such defensible space shaded fuels breaks compared to struggling in back yards.

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<sup>1</sup> The most commonly used software tool for predicting fire behavior in wildland fuels is the BEHAVE Plus Fire Modeling System which predicts fire rate of spread. BEHAVE Plus can be used during fires for real-time predictions of either wildfire or prescribed fire behavior. It can also be used in prescribed fire planning and the dispatch of initial attack fire crews. The BEHAVE system can estimate wildland fire behavior under various fuel, weather, and topographic situations.

# Four The Future



## **A. More Work Still Needs to be Completed**

Throughout the Kern River drainage, under the auspices of the Kern River Valley Fire Safe Council, significant improvement to the protection of homes has occurred over 10 years.

The following agencies deserve credit for achieving this fire-safe protection for people and their homes and lands:

- The Kern River Valley Fire Safe Council,
- Kern County Fire Department,
- U.S. Forest Service, and
- Bureau of Land Management.

More work needs to be implemented and accomplished to successfully provide a reasonable measure of security for this area's residents.

These necessary future actions include:

- Expand outreach to and education of home owners about their fire protection responsibilities and how to protect their properties.
- Expand the assistance of home owners with the disposal of hazardous fuels by sponsoring "chipper days".
- Maintain the existing network of 33 hazardous fuels reduction projects throughout the Kern River Valley Fire Safe Council zone of influence.
- Expand the network of projects to include new areas that were ranked lower priority during earlier planning.

## **B. The Bull Fire Won't Be the Last Fire to Threaten Homes Here**

2010's Bull Fire won't be the last wildfire to threaten homes in this area. Nobody denies that the general Kernville area is a fire-prone region with a history of large fires—that will no doubt continue to occur into the future.

Case in point, six weeks after the human-caused Bull Fire is ignited, the human-caused Canyon Fire breaks out in Kern County, a few miles south of the Bull Fire area. The Canyon Fire threatens the communities of Havilah, Myers Canyon, and Bodfish and burns 9,820 acres. (See more details on this fire on next page.)

That is why it is so important to continue to ensure that the existing interagency fuel breaks are maintained, and future hazardous fuel area treatment areas are also identified and treated.

*"I look out my window and I go: 'Oh my gosh, not another one.' "*

**Barbara Harper, Kernville**  
**Owner of the Blue Bear Cafe**



The Kern Valley Sun Photo  
*The Canyon Fire on its second day, Sept. 13, 2010. This human-caused blaze threatened communities and burned 9,820 acres.*

### **Six Weeks after the Bull Fire, the Canyon Fire Threatens More Area Communities**

The human-caused Canyon Fire, which ignites just six weeks after the human-caused Bull Fire, burns 9,820 acres and threatens three communities in Kern River Canyon—just south of the Bull Fire area.

The Canyon Fire starts at 2 p.m. Sunday, September 12 in Kern River Canyon beside the Kern River. Later that afternoon, the fire—exhibiting 50-foot flame lengths—jumps the river as well as Highway 178, threatening the communities of Havilah, Myers Canyon, and Bodfish. Many residents are evacuated.

Initial assessment and attack begins immediately by a unified command consisting of: Kern County Fire, the U.S. Forest Service, and the Bureau of Land Management.

California Governor Arnold Schwarzenegger declares a state of emergency to free up resources to be assigned to the fire.

"It's bound to happen," local resident Judy Neukirchner comments about the Canyon Fire. "It's really dry this time of year and we had a lot of rain so the grass is high."



*The Canyon Fire on Sept. 14, 2010. Photo by Kern County Fire Department.*



#### Success Story:

How Prior Fuel Break Implementation and Interagency Cooperation Saved Homes and Protected Lives from California's Bull Fire

# Five Acknowledgements

This report was requested by **Tim Sexton**, U.S. Forest Service Fire Use Program Manager.

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