



California Chaparral Field Institute, P.O. Box 545, Escondido, CA 92029
www.californiachaparral.com email: naturalist@californiachaparral.com phone: 760-822-0029

THE CEDAR FIRE: SEARCHING FOR TRUTH AFTER THE FLAMES

Richard W. Halsey

There was a time when wildfire was the furthest thing from my mind. Then the San Diego County 2003 Cedar fire blew through my life.

I wasn't impacted in a way one would expect; my house didn't burn down, I didn't know anyone whose house was, nor did I know any of those killed by the flames. Back then, like most of the civilian population, my experience with wildfire was limited to what I heard from breathless media reports and after-the-fact newspaper coverage.

What happened to me was gradual. I became mad and increasingly frustrated over all the stupid things being said about the fire by radio commentators,

INSIDE THIS ISSUE

- With the Cedar fire IC by Randy Lyle
- Readers Write: Forest fires revisited
- The Grizzly Truth by Jim Hart
- Drowning in email? See Harold (back page)

politicians, and self-proclaimed "experts", none of who knew (it became increasingly clear) what they were talking about. At first I believed some of what they were peddling, but then I took time to try to understand fire myself and realized that not only were these talking heads ignorant, but their ignorant babbling was negatively influencing public opinion. Worse, their accusations were dragging down the morale of firefighters who were doing all they could to protect lives and property. They blamed firefighters for either allowing the fire to become so

See Cedar fire pg. 3

In Memorial. A wildfire in Riverside County, California that started October 26, 2006 claimed the lives of five USFS wildland firefighters. Please consider honoring their memory and selfless dedication in some way. You can help their families at www.wffoundation.org.



Pablo Cerda, Jess McLean, Capt. Mark Loutzenhiser, Jason McKay, Daniel Hoover-Najera.
Please go to www.engine57memorial.org for more information.

ON THE GROUND AT THE CEDAR FIRE WITH THE INCIDENT COMMANDERS

RANDY LYLE

Outside the fire management profession, the details of how major wildfire incidents are dealt with are relatively unknown. In addition, very few efforts have been made by the scientific community to incorporate valuable firefighter experiences into fire research designs. This has likely led to widening the communication gap between scientific and fire management communities and allows public perceptions to

be shaped by media reports and opinions which may or may not accurately reflect the complexities of wildfire behavior and suppression.

One of the many factors determining the spread and final perimeter of a wildfire are the decisions made by the professional firefighters tasked with suppressing the flames and protecting life and property. This summary provides a brief examination of the “decision variable” in wildfire management by focusing on an incident commander’s experiences during the first 24 hours of 2003 Cedar fire in

See Lyle pg. 17

The Grizzly Truth



Opinion by Jim Hart

**At the Fire Ecology Congress:
Fuel and Nature**

I went to the Fire Ecology Congress that was held in San Diego last month. For the most part, “ecology” turned up missing in action because the focus seemed to be more on getting rid of fuel than studying relationships. Looks like we’ve gone from thinking fire is all bad to fire is all good. Smokey Bear is getting beaten up quite a bit these days.

See Hart, pg. 19

READER’S WRITE

Comments on Issue #20: "The Western Sierra: the USFS, Trees, and Fire."

The claim that sheepherders had created havoc in the forests through burning appears as common knowledge in some books (e.g. *The Men of Mammoth Forest* by Otter). Some old-timers talked of their grand-daddies dragging smoldering ropes behind their horses as they left the high country every fall, setting fire as they went. These fires were thought by many to have damaged the forests.

I've always been bothered by the anecdotal and data-free nature of the claim that sheepherder fires created significant changes. Sure, sheepherders burned, but so did the Indians before them. If we look at the fire scar record from the coniferous forests, I simply can't see any evidence that sheepherders may have changed the fire regime. In fact, at least in

See Reader’s Write, pg. 20

Cedar fire, continued from pg 1

huge or creating conditions which made a huge fire inevitable. The blame game continues in nearly every fire.

The Central Dogma of California Conflagrations

Ask many residents in San Diego County about the Cedar fire and you will likely hear some or all of the basic tenets composing the Central Dogma of California Conflagrations:

- 1) *Wildfires are the direct result of un-naturally overgrown vegetation caused by past fire suppression practices.*
- 2) *The amount of “undesirable” vegetation (“brush”) determines fire spread, size, and intensity.*
- 3) *Intense wildfires (where nothing is left) are unnatural and bad.*
- 4) *Firefighters are expected to stop wildfires.*
- 5) *Firefighters could have stopped the Cedar fire, but they failed to do so because of bureaucratic error and incompetence.*

All five beliefs are reinforced continuously by the media whenever new fires ignite as well as during individual conversations by a public who accepts them as conventional wisdom. The problem with the Central Dogma is that the supporting beliefs are either based on values instead of facts (i.e. forests are preferable to other ecosystems), unrealistic expectations (wildland fire protection is a right rather than a privilege), or are derived from misunderstanding ecological processes (chaparral fires are like forest fires). The not so subtle implication of the Central Dogma is that firefighters are to blame for the “wildfire crisis” since they are the ones who suppressed the fires that would have allegedly prevented vegetation from becoming overgrown in the first place.

The Central Dogma helps to illustrate the fundamental difference between scientific thinking and how most issues are argued publicly. Public (and private) debates typically emphasize the “Prosecutorial Model” whereby supporting facts are exaggerated, contrary evidence is minimized, and complicated issues are over simplified. In science, on the other hand, questions are not answered by ignoring inconvenient variables. Instead, the use of “multiple working hypotheses” is employed, meaning that a number of equally compelling answers to the same question are investigated. Data is not “cherry picked” to find a desired answer, but rather all the data is examined no matter where it may lead. For example, could the striking contrast between the size of fire perimeters north and south of the California/Baja border suggested by Minnich and Chou (1997) be the result of something other than differences in fire suppression practices? The fact that two different data sets were used (official records north of the border, interpretation of satellite photos south of the border) makes such a question even more compelling.

Despite the objective nature of scientific inquiry, scientists are human and favored hypotheses can still influence the interpretation of data. Thomas Chamberlin, in his famous 1889 paper concerning the importance of multiple working hypotheses, warned about the dangers of such favored theories because they can lead to an “unconscious pressing of the theory to make it fit the facts, and a pressing of the facts to make them fit the theory.” Commenting on how incorrect theories can inspire others to find the truth Chamberlin also wrote that, “an investigator dominated by a false ruling idea” may by his very errors “stimulate investigation on the part of others.”

It didn't take me long to realize that errors and biases abounded whenever the Cedar fire was publicly discussed and that the Central Dogma was fatally flawed. It was these realizations that inspired me to carry on an investigation of my own. The following is a preliminary summary of that investigation.

This study is a comprehensive analysis of the variables that determined the final fire perimeter and fire behavior at various points within that perimeter. Through both on-site investigations and extensive interviews, this study utilizes a rich data set that is frequently ignored in many fire research projects, namely the experiences of firefighting professionals. A co-authored final report will be submitted to an appropriate journal in 2007. **Although the data collected applies only to the Cedar fire, the findings may have implications for wildfire management and policy across the Western United States.**

Of those dozens of dedicated individuals who helped me along the way, I am especially indebted to Randy Lyle (CDF), Ray Chaney (CDF), Kelly Zombro (CDF), John Truett (USFS), Richard Hawkins (USFS), the crews of USFS Engine 47 and Engine 41, the Vista Grande Hotshots, Richard Leap (San Diego Fire), Brian Fennessy (San Diego Fire), Ken Kremensky (Lakeside Fire), and Andy Parr (Lakeside Fire).

The Cedar Fire:

Which Variables Made the Critical Difference

Richard W. Halsey, California Chaparral Field Institute

Brief Summary of Methods

The Cedar fire burned 110,664 ha (273,246 acres) in San Diego County, California between October 25-November 4, 2003 with an approximate final perimeter of 110 km (178 miles). The perimeter was examined regarding fuel type, presence of roads and development, time and weather conditions when the fire was extinguished, and firefighting resources deployed. Data were collected from nearby RAWS facilities, post-fire field observations, aerial surveys, Landsat imagery, and firefighter interviews. Much of the perimeter was examined on foot. Unfortunately, using RAWS data is problematic because of the limited number of stations and the nature of localized weather conditions. Although a station may record wind gusts of 15 mph, the next canyon over may be experiencing gusts in excess of 50 mph. Consequently, firefighter recollections often provided more useful information. To better understand the firefighting environment, the lead author was trained as a USFS Type II wildland firefighter.

Specific sites were selected for more detailed examinations based on their potential for having been important fire transition points. The Focused Study Sites (FSS) included: 1) San Clemente Canyon western terminus, 2) Scripps Ranch wildland/urban interface, 3) West Sycamore Canyon, 5) Volcan Mountain extension, 5) Tragedy Springs prescribed burn site, and 6) the Sweetwater River canyon overlook (see Figure 1 and 8). Only sites 1, 3, and 6 are reviewed here.

Preliminary results and discussion

What drives and stops fires is a complicated interplay of variables that can create thousands of possible outcomes. In order to better understand these variables it is helpful to group them into seven

main categories: **1) fuel type and condition, 2) time of day, 3) weather, 4) topography** and **5) fire suppression activities**. Expanding the temporal range of examination, **6) decision** variables such as past land planning decisions, firefighter experience levels, relationships between agencies, pre-fire activities, plus **7) climatic** variables including past, long-term weather patterns such as extended periods of rain or drought were considered as well. Although this study is primarily focused on the conditions present during the actual time of the fire, from October 25 to November 4, 2003, understanding the background matrix in which the fire occurred is valuable in properly evaluating the total Cedar fire event.

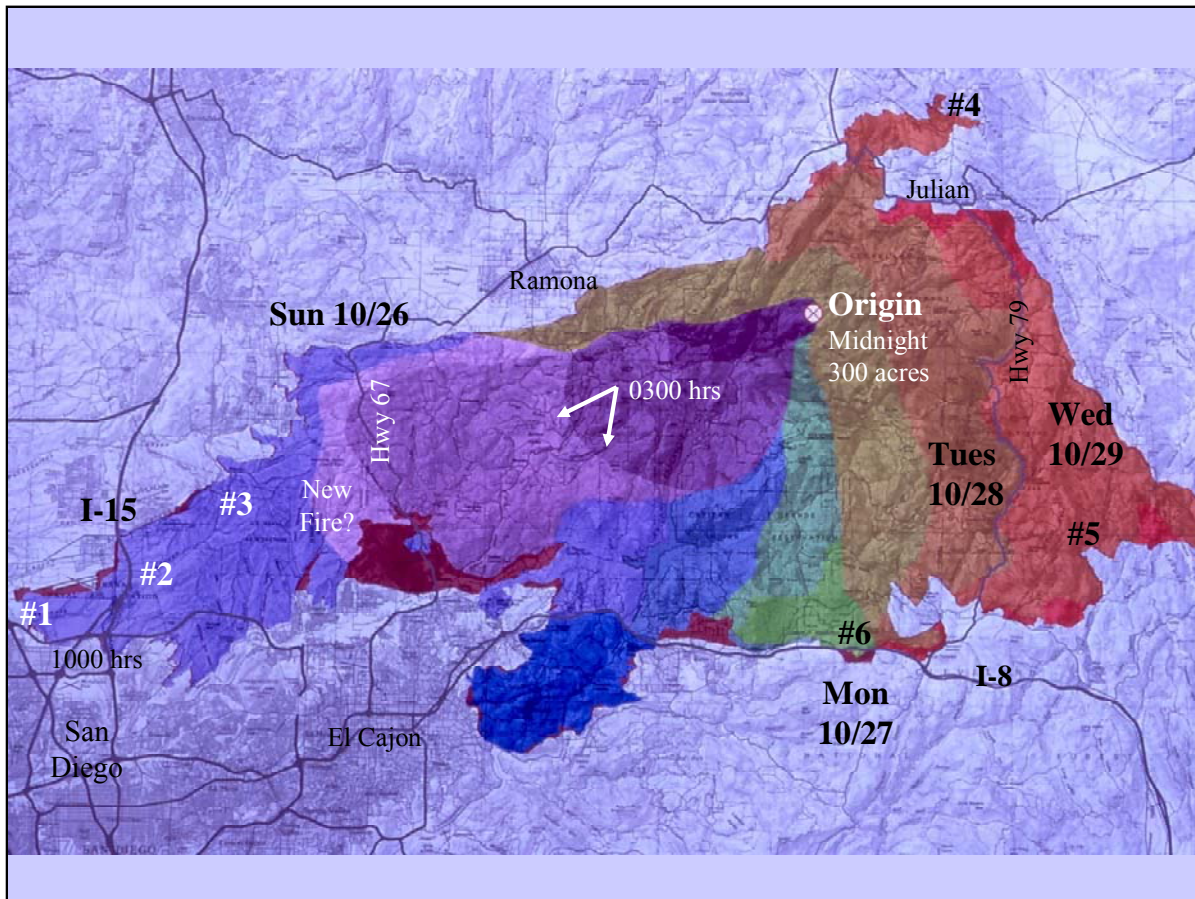


Figure 1. Cedar fire progression map. Location of special focus study sites numbered 1-6. Fire was reported at 1537 hrs. By 0300 hrs after moving southwest, the head of the fire split just north of the Barona Casino. The branch moving toward Scripps Ranch (location #2) was thought to be a separate fire at the time because the fire's dramatic rate of spread was not fully understood. Map source USFS.

Preliminary estimates of the approximate 110 km of perimeter line indicate that 30% formed after making direct contact with urban communities, 11% by fire line construction, 8% at or near the boundary of the one-year-old Pines fire scar (nearly half of which also bordered county highway S1), and 3% with backcountry roads. The remaining half formed during other fire suppression activities (such as backfiring operations and retardant drops) and by the flames simply burning out by themselves due to an interesting interplay of numerous variables. Although saving lives and structure

protection rather than perimeter control was the primary objective for firefighters during the first 24 hours of the fire, there were some remarkable firefighting actions taken that prevented the fire from spreading further. This was especially true at the Sweetwater Canyon overlook area (FSS #6) discussed later.

Sample FSS #1: Western Terminus

Figure 2 provides an aerial overview of the western terminus of the fire. The fire's perimeter is outlined in red. After jumping Interstate 15, the flame front continued to burn through relatively light fuels of sparse shrubbery and grass. The gravel pit appears to have split the front in two and may

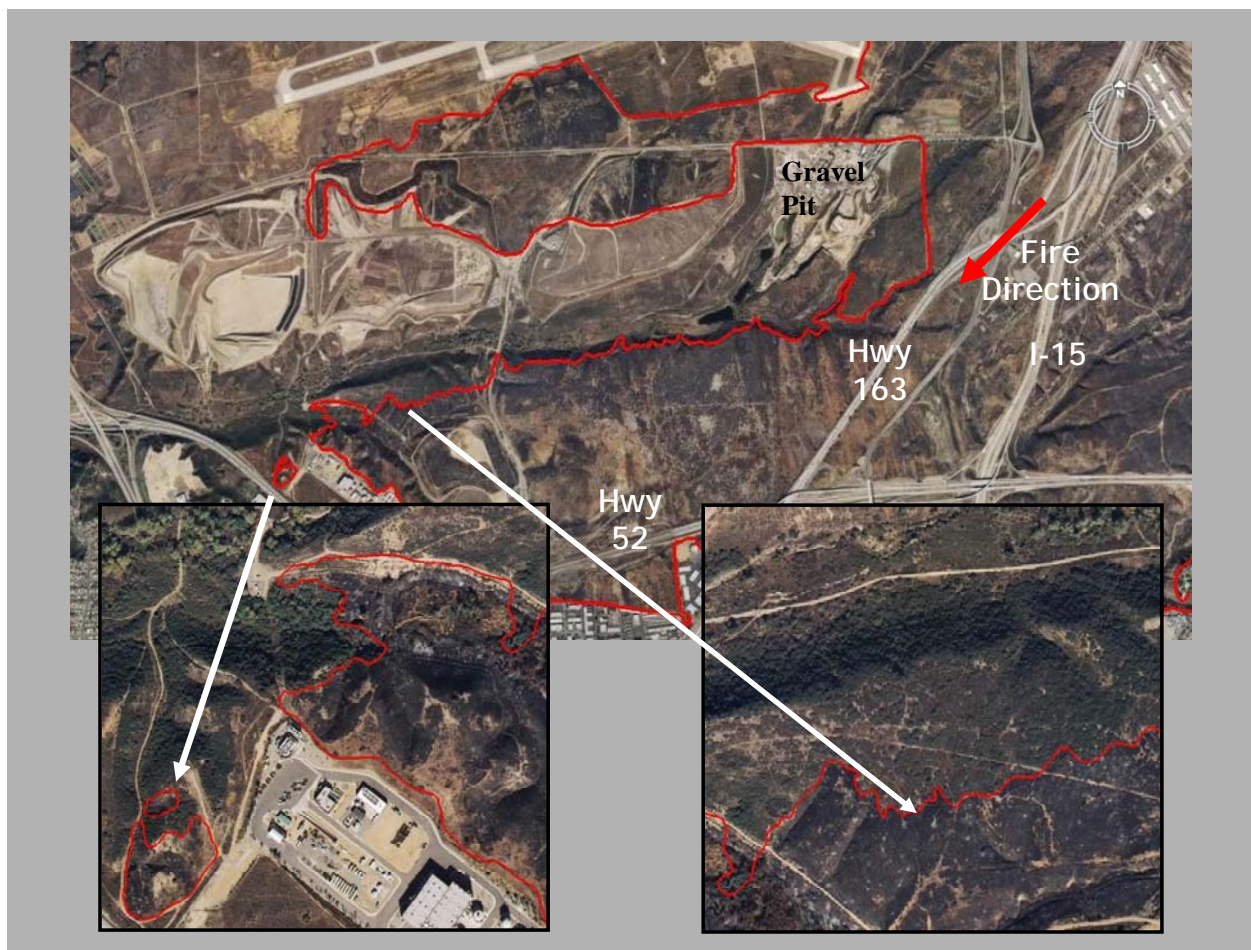


Figure 2. Western terminus of the Cedar fire on the Miramar Marine Air Base. Enlarged photo on the lower left focuses on two spot fires that represent the furthestmost western limit of the Cedar fire. The lower right photo focuses on the termination of the fire along a line of dense chaparral. The fire terminated at these two locations without active suppression efforts.

have played a role in keeping the fire out of the canyon between the two legs of the fire. At approximately the same point further west, both legs were stopped dead in their tracks. Lighter or lack of fuel was likely the dominant factor in stopping the northern leg. However, the southern leg stopped in extremely dense fuels. The black zone was subjected to rather high

intensity (only larger stems remained) while immediately next to the black zone chamise shrubs were merely scorched. **It was as if a wall of water was dumped simultaneously along the entire fire front** (see Figure 3). Fire fighting resources were not deployed in this area due to the high risk of entrapment to firefighters and the decision to focus on structure protection on the southern side of State Highway 52.

Although weather data is still being analyzed, it appears one plausible explanation for the sudden stop relates to differing air masses. The western terminus may have been the location where the dry Santa Ana winds made contact with a moist marine layer, pushing the ground hugging winds upward and preventing further expansion of the fire front.

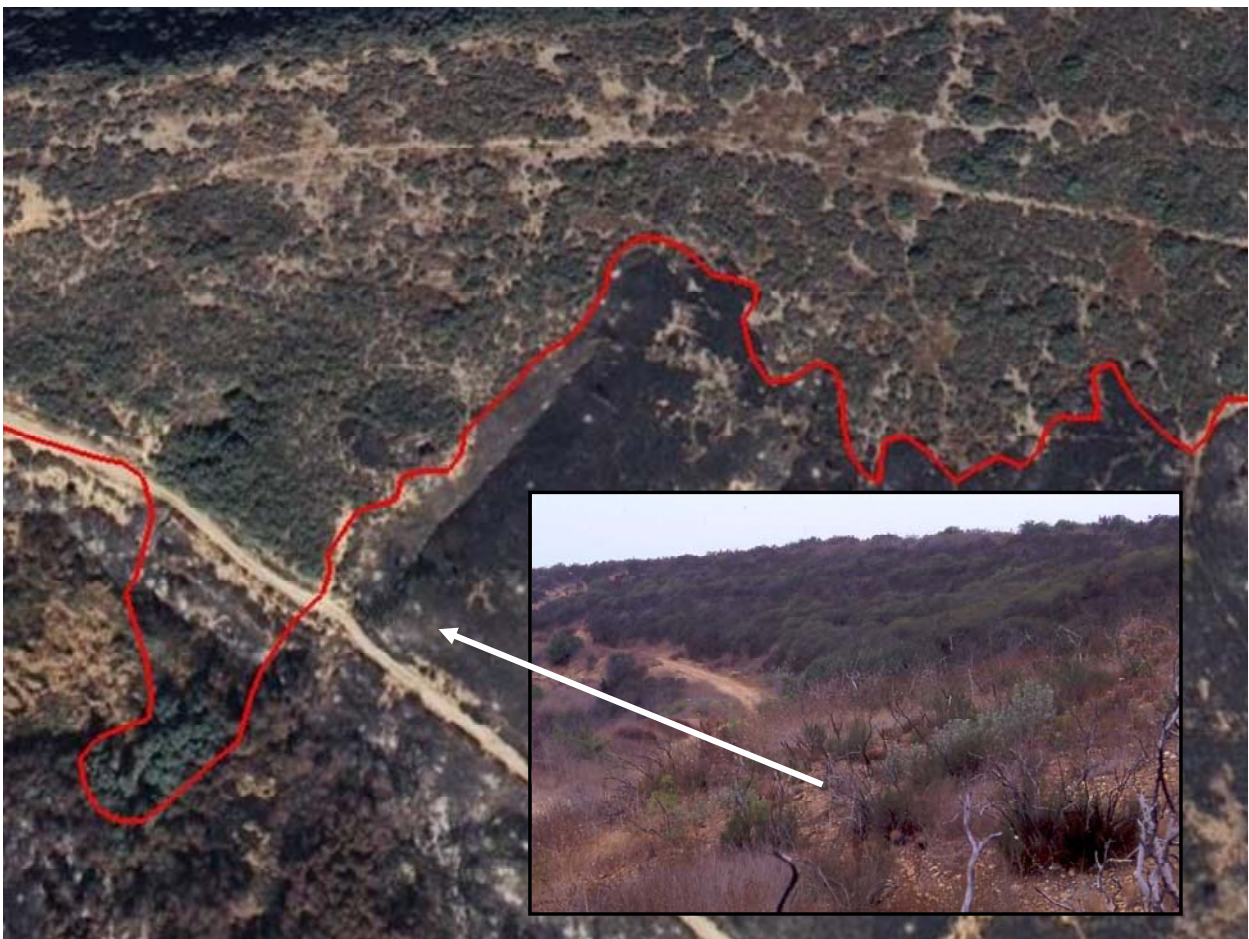


Figure 3. Close up of Site #2, Western Terminus. Photo is enlargement of lower right photo in Figure 2. Inset photo shows close-up of burned and unburned fuels (primarily chamise chaparral).

Sample FSS #3: West Sycamore Canyon

In order to better understand the termination of the Cedar fire in the Scripps Ranch subdivision (FSS #2), the area burned by the fire prior to making contact with the community was examined. This was done because of the wide, multiple fire breaks constructed near to the community as well as the interesting mosaic of mixed-aged chaparral patches in the surrounding wildland.

After jumping State Highway 67 at approximately 0530 hrs Sunday, October 26, the fire was heading rapidly southwestward toward Scripps Ranch. About 0700 hrs, approximately 6.5 km (four miles) after the highway jump, the flames made contact with several previously burned areas (1994, 1995, and 2000) spanning nearly the entire width of the final fire front at that location (Fig. 4). The chamise dominated, younger-aged fuels (9, 8, and 3 years old) in these burn scars were unusually sparse due to extended drought conditions in previous years. Maximum dimension of the previously burned area was approximately 6 km (3.72 miles) wide by 4 km (2.48 miles) deep. **The fire front moved almost precisely with the developing wind front with gusts up to 42.6 km/h, swiftly burning through the light, younger-aged vegetation in the previous burn scars.** The fire continued southwest, jumping over two 40 m (130 ft) wide fuel breaks along ridgelines before hitting the first home in Scripps Ranch around 0830 hrs. Two separate subdivisions were engulfed. The fire moved across Pomerado Road (a two-lane, paved thoroughfare) and entered another subdivision by igniting a few homes through ember ignition. Firefighters were directly responsible for stopping the fire from spreading any further.

Shake-shingle roofing appears to be the most significant factor in the ignition of individual homes in the Scripps Ranch subdivision under study (FSS #2), either directly or by the secondary ignition of surrounding homes due to their proximity to engulfed shake-shingled structures.

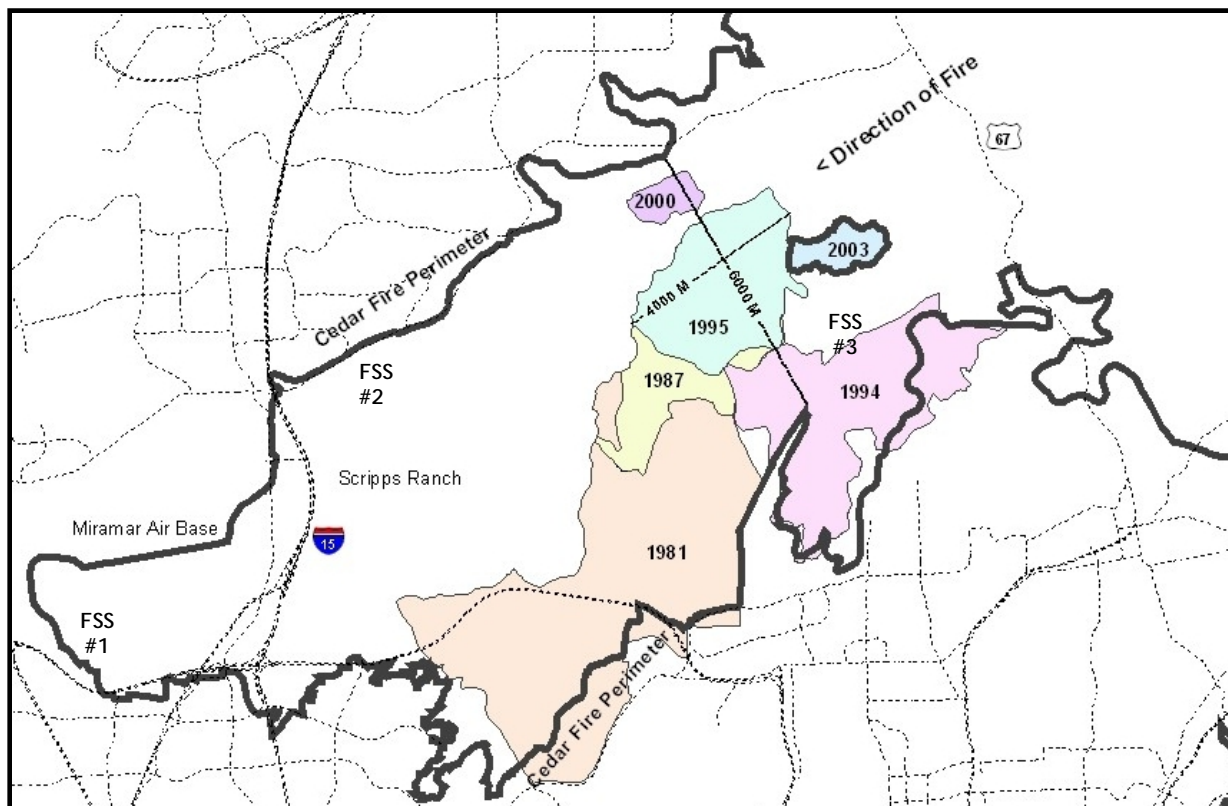


Figure 4. Previous fire scars at western terminus of the Cedar fire. Three fire scars color-coded by year burned (1994, 1995, 2000) straddled the area east of the heavily impacted Scripps Ranch community. Fire was carried by strong winds and was not impeded by the younger fuels. Cedar fire perimeter is shown as a bold, black line.

Sample FSS #6: Sweetwater Canyon Overlook Area

Embers jumped over Interstate 8 on Monday, October 27, at approximately 0800 hrs to the west of the overlook (out of photo to the left in Figure 6) igniting light fuels recovering from the 2001 Viejas fire. The Vista Grande Hotshots were on scene at about 1300 hrs but could not approach the fire due to fire intensity caused by several large shrubs burning upslope. USFS Engine 47 arrived and assisted in cooling down the fire. The Hotshots proceeded to cut a cold hand line below the fire through a thin stand of chamise chaparral while E47's crew laid hose and extinguished the flames with water. The Black Mountain Hotshots took over after a large rock outcropping and continued the line all the way to the Sweetwater River (hand line can be seen in Figure 5). Aerial support was important. Fire retardant was dropped ahead of the line (as seen in Figure 5) and helicopter water drops were made along the fire front further west in the lighter Viejas fuels. This boundary can be seen in Figure 5 to the right of the brown area labeled "Fuel Samples."

The fire was extinguished by approximately 1630 due to a number of fortuitous events and conditions. The three-year-old lighter fuels that had recovered since the 1/01 Viejas fire made it possible for firefighters to approach the area with acceptable risk. Topography reduced the winds in the canyon, although they were still blowing 10-15 mph from the NE. However, by 1800 the NE winds began reversing to blow from the NW. The flames were already moving SE downslope toward the Sweetwater River. If they had not been extinguished by firefighters within the short four hour time window, it is likely the fire would have made the jump into the heavier fuels on the other side of the canyon. Had that occurred the fire would have likely been picked up by the NW winds on Tuesday, October 28 and driven into the Pine Creek and Hauser Wilderness Areas, burning an additional 28,328 hectares (70,000 acres). This event would have coincided with the wind-driven blowup east of State Highway 79 in Cuyamaca State Park Tuesday night.

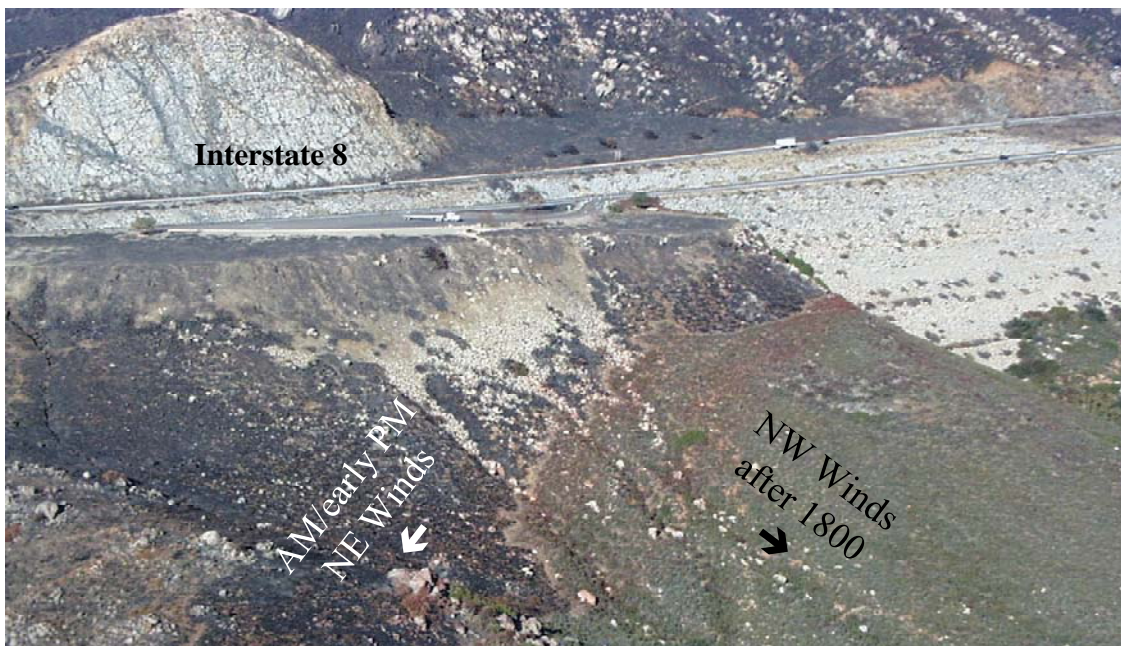
The important lesson from this site is that although a previous fire scar (the 1/01 Viejas) was instrumental in assisting firefighting efforts, it was not solely responsible for stopping the fire. As mentioned above, firefighters were critical in securing this portion of the perimeter. It is impossible to estimate how much further the Viejas scar would have re-burned if the wind had not died down and reversed, but there was sufficient fuel to carry the flames all day Monday under moderate weather conditions (Halsey and Keeley, unpublished data). The complete Sweetwater River overlook story with detailed interviews will be included in the forthcoming final paper. A short sample is provided below.

"It was Halloween before there was finally a break in the fires," Engine 47 crew member Jeff Beren remembered. "That gave all of us a chance to go home and get some sleep. When I pulled my truck into the driveway there were all these kids out Trick or Treating. I was covered in black soot and could still feel the heat of the fires on my face. You couldn't see the stars because the sky over San Diego was so thick with smoke. I don't remember much else about that night except that the kids stopped and told me I had a really cool costume."



Figure 5 (Above). Southwestern view from Sweetwater Canyon overlook showing Hotshot handline, red retardant, and four different fire scars.

Figure 6 (Below). Looking Northeast at overlook showing retardant, handline and wind direction changes. Photo source: Randy Lyle.



Summarized Data for Cedar Fire Timeline

It is important to consider that the Cedar fire was actually five different events.

- A. Ignition and spread to approximately 300 acres between 1737 hrs and 2356 hrs, Oct. 25 (Sat) under light to moderate winds.
- B. Rapid western spread due to strong Santa Ana wind conditions from 2356 on Oct. 25 through approximately 1430 hrs on October 26 (Sun).
- C. The head of the fire split at approximately 0300 hrs on October 26 north of the Barona Casino. One branch headed west, the other headed southwest down the San Diego River drainage to ultimately reach Crest and Harbison Canyon approximately 1600 hrs, Oct. 26.
- D. The backing (against the wind) eastward moving front (the back door) burned through the Palomar and Descanso Districts of the Cleveland National Forest and Cuyamaca State Park to State Highway 79 by approximately 1400 hrs on Oct. 28(Tues).
- E. Coastal westerly winds begin to shear off the top of the smoke column at approximately 1215 hrs on Oct. 28 and reach the ground at approximately 1630 hrs, pushing the eastern front of the fire across State Highway 79 toward the Sunrise Highway (S1). By approximately 1900 hrs the next evening, Oct 29 (Wed), the majority of the fire spread was complete.

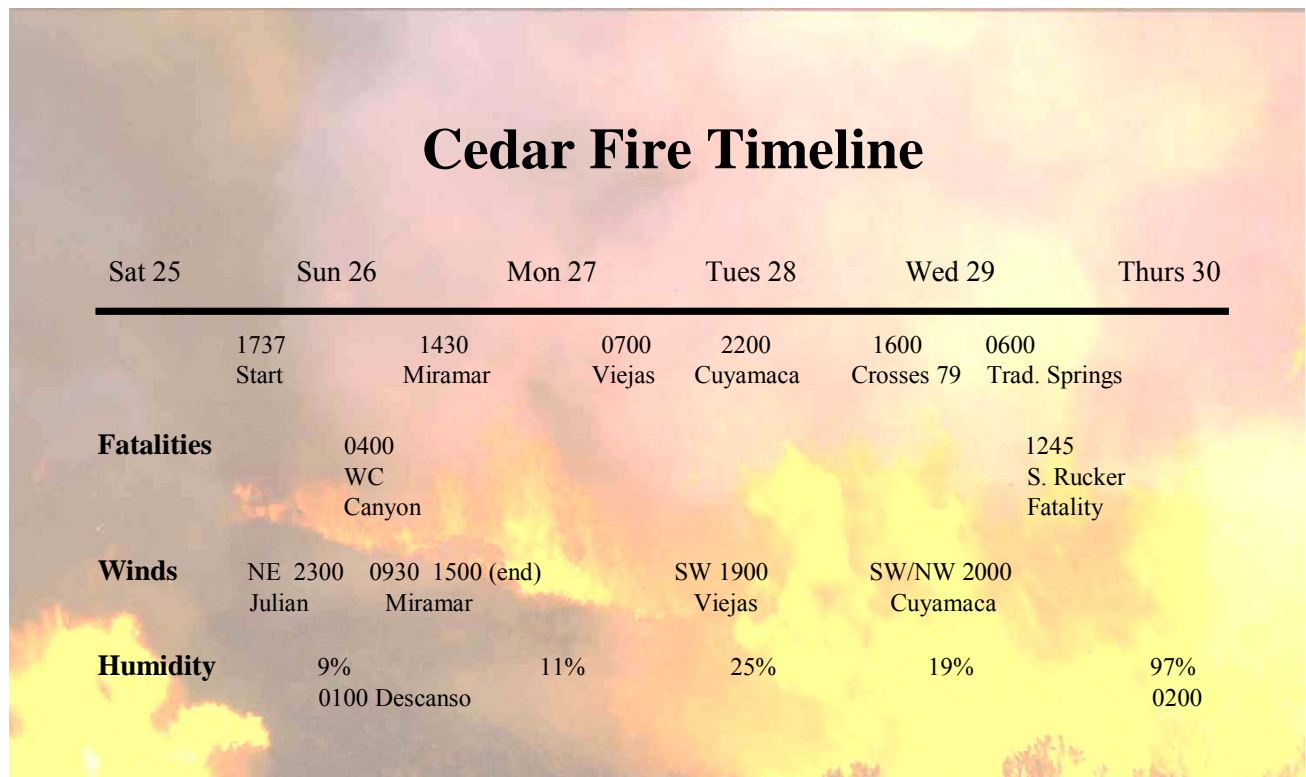


Figure 7. Cedar Fire Timeline. The basic events summarized regarding time, key areas reached, fatalities, winds, and humidity. Time indicated in 24 hour periods. Fatalities indicate 12 civilians in the Wildcat Canyon area (WC) and firefighter Steve Rucker in Julian. Two other civilians died, one near Alpine and another on the north side of Highway 52 near the Miramar Air Base.

There have been a number of estimates concerning **how fast the Cedar fire spread**. The answer varies dramatically depending on which data sources are considered. The official report indicates the fire grew at 12,000 acres per hour at its peak (USFS/CDF 2003). This may have been derived from examining the total area burned between 2300 hrs Saturday night and 0300 hrs Sunday morning, or approximately 35,000 acres.

However, by combining information from firefighter interviews and official progression maps the most rapid rate of spread occurred between 0200 hrs and 0300 hrs Sunday morning with at least 18,000 acres burning or **approximately 5 acres per second**. By 0730 hrs, approximately 89,000 acres had burned.

Figure 8. Summary of Focused Study Sites.

#	FSS location and time	Fuel Type ¹	Wind ² mph	Temp ³ °F.	Humid. ⁴ %	Topog.	Suppression	Notes
1.	SC Canyon west terminus Sun 3PM	SH5	24-11	88-86	24-31	Flat	None	Fire stopped
2.	Scripps Ranch Sun 8:30AM	Homes	18-26	80-88	28-23	Urban	Minimal	130 ft fuel break
3.	W. Sycamore Canyon Sun 7AM	SH1 & 2	≈18-26	≈75-80	≈28-36	Hills	None	3-9 yr. old chaparral
4.	Mt. Volcan extension W 7PM	Pending research	28-20	54-49	64-100	Steep slopes	Pending research	Pending research
5.	Tragedy Springs W 6AM-9AM	Black ground, 1 & 2 yr. old chap.	11-18	50-58	22-18	Steep slopes	Anchor point support	Site of previous prescribed burns
6.	Sweetwater River overlook M 8AM-4:30PM	GS3	24-16	69-78	12-9	Canyon, steep slopes	Engine, hand crews, air tankers, helicopters	3-yr. old fuels

Weather data range references the critical period at particular location. ¹ Scott, J.H. and R.E. Burgan. 2005. Standard Fire Behavior Models. GTR RMRS-GTR-153. USFS. ^{2, 3, 4} Nearest RAWS or other weather station.

Figure 9. Critical Variables

#	Favoring Extinguishment	Favoring Continued Burning
1.	Wind change, humidity, air mass interactions?	High fuel loads, temp, no suppression
2.	None	Flammable buildings, winds, temp, poor clearance
3.	Young fuels, topography?	Winds, temp, some moderate fuel loads, no suppression
4.	Under investigation	Under investigation
5.	Topography, suppression	Winds, spotting, humidity
6.	Suppression, moderate fuel load, topography, wind change	Moderate fuel load, winds

Preliminary Conclusions

1. No single variable determined fire spread or behavior. Order of relative importance at perimeter: urban contact, wildland suppression, weather, topography, wildland fuels.
2. Static perimeter maps show only fire extent, not the variables determining fire behavior.
3. Firefighters matter (perimeter \approx 11% constructed line, \approx 13% backfired).
4. Differing aged fuel mosaics within the burn scar at lower elevations did not significantly impact the fire's spread. Lighter fuels were important during flanking actions.
5. Recent (1-2 year old) fire scars at higher elevations were significant in limiting the fire's spread (black ground does not burn).
6. Total area burned with wind/weather being the major influence \approx 70% on 10/26 and again as the fire crossed State Highway 79 late afternoon/evening on 10/28-10/29. Fuel major influence \approx 30% between 10/27-10/28.

Multiple variables determine how a wildfire spreads and ends (Figure 9). This is nothing new to wildland firefighters. In fact, much in this study is already well known to firefighters. However, when attempting to deal with wildland fire risk there has been a tendency for some government entities to focus on single variables (such as wildland fuel reduction) while minimizing others. This appears to be the case for San Diego County. In a document released by the County one year prior to the Cedar fire, "Mitigation Strategies for Reducing Wildland Fire Risks," 10 of its 17 recommendations referred to vegetation management. The other recommendations dealt with policy reviews (4), fire education efforts (2), and fire-safe construction (1). In addressing wildfire behavior in general, the report claimed that, "the preponderance of evidence favors fuel as the limiting factor" (SDCBOS 2003). The report was ultimately removed from circulation after numerous scientists complained that their work had been misrepresented (Spencer et al. 2004). While it is clear that fuel must be available to have a fire, the interaction of numerous variables will determine how and if the fuel will burn.

Others have taken a more comprehensive approach to reducing wildfire risk to communities (CFRO 2006). While lower fuel loads definitely facilitated suppression efforts of the Cedar fire in some areas, it failed to do so in others because influential variables, especially wind, dominated the situation. If a fuel modification project had been placed to protect the Scripps Ranch community from an eastern wind-driven fire event, the West Sycamore Canyon FSS #3 would have been a reasonable location (Fig. 4). However, the fire failed to stop there due to extreme weather conditions despite the lighter fuels.

Properly accounting for variables in wildland fire behavior and collecting data that would provide important clues about why some things burn while others do not continues to be a significant weak point in wildland fire research, especially when it comes to the wildland-urban interface (WUI). Being the path of least resistance (when compared to building codes and land use restrictions), vegetation management is typically emphasized in attempts to reduce wildfire risk despite the lack of comprehensive studies measuring its efficacy in shrubland ecosystems.

Although an attempt was made by damage inspectors to assess what caused homes to burn in the

Cedar fire, the data collected were frustratingly incomplete. While details such as roof type and estimated vegetation clearance for destroyed homes were collected by the County of San Diego, there has been no known attempt to compare these numbers with the full data set of all homes within the fire's impact zone.

This lack of data, however, has not prevented the county from formulating conclusions about how to deal with wildfire risk within the WUI. One of their publications compared the number of homes lost in the 2003 fires built before and after 2001 (when newer fire and building codes were implemented). Since the loss rate was reported to be 14% and 4% respectively, the county claims that, "homes built under recent codes have a more than three times better chance of survival!" (DPLU 2005). Such a conclusion is not particularly valid with the limited data available.

In the raw data set of 2,041 destroyed structures investigated, 72.2% were found to have had 30 feet or less of clearance around the structure and 76% were found to be associated with hills or canyons. Unfortunately, these data sets were not cross-referenced so accurate insights into how variables interacted, such as topography and vegetation, are not possible. Although it is logical to assume that modifying shrubland communities near a structure will reduce fire risk, attempts to quantify its role in structure ignition and fire spread have been inadequate. An attempt will be made in this study to develop a more complete data set of WUI damage for the Scripps Ranch subdivision under investigation at FSS # 2.

Classifying a fire as either wind-driven or fuel-driven portrays an inaccurate image and may lead to inappropriate fire management policies. Although wind was a dominant variable during much of the Cedar fire, it appeared to be heavily influenced by topography. Classifying a fire as fuel-driven implies wind does not play a significant role when in fact it may. During the eastward movement of the Cedar on Tuesday, backing flames (moving against the wind) consumed Cuyamaca State Park. This event has been called fuel-driven and suggestions have been made that if the Park's forest had been properly thinned, much of the landscape could have been protected from the flames (Eisele 2006). Judging the efficacy of such thinning is beyond the scope of this paper, however, it can be stated that other variables other than fuel were extremely important in how the fire moved through the Park. Wind can either drive a fire forward or act as a bellows on a fire front moving in the opposite direction. Consequently, the fanning action of the easterly winds on Tuesday likely played a significant role in the fire's intensity. This may have also played a role in moving fire downslope at the Sweetwater River overlook (FSS #6). Rather than classifying backing fires as "fuel-driven", it might be helpful to see them as tacking against the wind (when present) with the wind providing an important variable in movement by increasing flame intensity (Howell 2006).

Many perceptions held by the public and reinforced by the media are incorrect. One of the primary proponents for arguing that the fire service failed during the Cedar fire was San Diego radio talk show host Rodger Hedgecock. He claimed that the US Marines stopped the Cedar fire on the Miramar Air Base with shovels and bulldozers while the San Diego Fire Department did nothing. Research conducted during this study has shown this to be a complete fabrication. A full description of his commentary can be found at the bottom half of this webpage:

<http://www.californiachaparral.org/afirepolitics.html>

Pre-fire management implications

Strategic fuel modifications can play a critical role in controlling fire spread under certain conditions. The Tragedy Springs prescribed burn project (FSS #5) north of Pine Valley project allowed firefighters an anchor point to conduct valuable fire suppression efforts. In conjunction with some mastication projects along the Sunrise Highway, the prescribed burn supported suppression efforts and became important variables in successfully keeping the Cedar fire from burning nearby Mt. Laguna.

The strategic nature of these activities, however, needs to be emphasized because general landscape level treatments proposed by some (SDCBOS 2003, Minnich and Chou 1997) would not have been effective when most of Cedar fire burned (FSS #3). They also carry with them the potential for significant resource damage if they are to be maintained. Type conversion of chaparral has been shown to occur with fire return intervals between 10-20 years (Haidinger and Keeley 1993, Jacobson et al. 2004). Sufficient fuel to carry the Cedar fire accumulated within 3-10 years after previous burns at lower elevations (below 3000 feet). Maintaining chaparral stands under the 10 year age class would likely result in the conversion of the system to alien grassland.

The Pines fire scar is typically credited with stopping the Cedar fire's eastern spread. However, since much of the Pines fire scar boundary was still black and was generally aligned with ridgeline topography and a road, its efficacy as a fire barrier alone is not particularly compelling. One way to look at the role of the Pines fire scar in stopping the Cedar fire is to consider why the Pines fire terminated where it did in 2001. Fires frequently stop at ridgelines and roads allow for opportunities to light backfires (Hawkins 2006). Would the Cedar have continued burning into the desert if the Pines fire scar had not been present? Such a question is difficult to answer, but the presence of the ridgeline and the fact that the humidity was 100% when the Cedar fire reached the area would have both heavily influenced the fire's behavior.

The more important question may be, are 1-3 year old fire scars an adequate way to measure the effectiveness of vegetation management techniques to limit wildfire spread? Probably not since ground that is maintained in a blackened state or with limited vegetative recovery is not a condition most land managers or the public would be willing to accept. The ecological costs of type-conversion would be significant as well.

We have been viewing the Cedar fire within a finite slice in time, but many variables influenced the fire's outcome years before. For example, decisions by the San Diego County Board of Supervisors in allowing development in vulnerable areas and failure to fund a countywide fire department likely influenced the fire's spread into the wildland/urban interface. Political pressure in 2002 on Southern California National Forests to remain open even during periods of high fire danger likely precluded aggressive closures to recreational use in 2003. It was deer hunting season when a hunter ignited the Cedar fire.

“Why do fires behave and stop where they do?” is not a one answer question. Efforts and policies intended to reduce wildfire risk should incorporate this fact into the decision making process as well as the full long-term economic, social, and resource costs involved in landscape management choices.

References

- CFRO. 2006. Fire Information Tool Kit. <http://firecenter.berkeley.edu/toolkit/>
- Chamberlin, T.C. 1890. The method of multiple working hypotheses. *Science*: Feb. 7. Also reprinted in 1965. *Science* 148: 754-759.
- DPLU. 2005. Wildland-Urban Interface – 2004 Code Changes, County Fire and Building Code Requirements. Informational flyer, County of San Diego Department of Planning and Land Use, Building Division.
- Eisele, B. 2006. Public commentary, Living with Fire in Chaparral Ecosystems: Providing Tools for Decision Makers Summit, Riverside, CA. 1/10/06.
- Haidinger, T.L., and J.E. Keeley. 1993. Role of high fire frequency in destruction of mixed chaparral. *Madrono* 40: 141-147.
- Hawkins, R.D. 2006. Personal communication, 4/27/06.
- Howell, B. 2006. Personal communication, 12/5/06.
- Jacobsen, A.L., S.D. Davis, S. Fabritius. 2004. Vegetation type conversion in response to short fire return intervals in California chaparral. Annual Meeting of the Ecological Society of America, Portland OR. *Abstract*.
- Minnich, R.A., and Y.H. Chou. 1997. Wildland fire patch dynamics in the chaparral of southern California and northern Baja California. *International Journal of Wildland Fire* 7: 221.
- SDCBOS. 2003. Mitigation strategies for reducing wildland fire risks. San Diego County Wildland Fire Task Force Findings and Recommendations. San Diego Board of Supervisors. August 13, 2003.
- Spencer, W. D, A. Fege, S. Fleury, B Goff, M.A. Hawke, J.L. Lincer, J. Betzler, A. Johnson, D. Younkman, M. Klein, G. Smith, J. Peugh. 2004. Letter to Walter Ekard, Chief Administrative Officer, County of San Diego, California.
- USFS/CDF. 2003. California Fire Siege 2003, The Story. California Department of Forestry and Fire Protection. 98 p.

Lyle, cont' from pg. 2

San Diego County, California and how the fire itself facilitated or prevented certain actions from being taken. A fuller examination will be included in the upcoming journal article.

The First 12 Hours

While off duty on Saturday, October 25, 2003, California Department of Forestry and Fire Prevention (CDF) Division Chief Randy Lyle received a page about 6:30PM to contact the Emergency Command Center in El Cajon. “We’ve got a fire on the Cleveland,” he was told, and was assigned to be the CDF’s agency representative. This set into motion a rapid sequence of memories and perceptions in Randy’s mind, all formulated over 32 years as a

“We’ve got a fire on the Cleveland.” This set into motion a rapid sequence of memories and perceptions in Randy’s mind, mental images of how to fight a fire without risking lives.

state firefighter; mental images of how to fight a fire without risking lives.

The fire, located above Cedar Creek about five miles southwest of the mountain town of Julian, had been reported at 5:37PM. Nine USFS and five CDF fire engines along with a complement of 320 firefighters were dispatched two minutes

Continued next pg.

Lyle from pg. 16

later. The first forces arrived on scene at 6:10PM. At approximately 7:30PM, Randy met US Forest Service (USFS) Incident Commander Division Chief Carlton Joseph at the Incident Command Post (ICP) off Boulder Creek Road, just south of Sunshine Mountain (Fig. 1).

The fire was visible just over the ridge as it burned upslope from Cedar Creek. With maps spread out on the tailgate of CDF Battalion Chief Ray Chaney's truck, Lyle and Joseph assessed the terrain and tried to locate a safe access point to approach the fire. A local resident on scene who was familiar with the area indicated she could "take them to the fire." After several failed attempts, fire service staff returned to the ICP. It is difficult to assess the impact of this diversion, but valuable planning time was lost.

Throughout the evening, one issue was paramount in everyone's mind, firefighter safety. Of the 18 basic "Watch Out Situations" every firefighter knows by heart, many were clearly evident that night including "fire not scouted and sized up," "in country not seen in daylight," "unburned fuel between you and the fire," and "terrain and fuels make escape to safety zones difficult."

Such danger signs became especially relevant to Carlton and Randy because under eerily similar conditions to the ones they now faced, five miles to the northeast on the evening of November 25, 1956, eleven firefighters had lost their lives in the 18,217 ha Inaja fire. Not only did the institutional memory of Inaja demand caution, but Carlton had an especially personal connection to those who were lost fifty years before. He was named after one of the USFS night crew bosses killed that night, 19-year-old Carlton Ray Lingo.

So without a clear, safe access point to approach the fire, the decision was made to keep the

firefighters out of harms way and develop a plan to prevent the fire's further spread once it left rugged terrain. The weather was relatively calm with only a slight western onshore flow. Santa Ana winds had been predicted since Thursday, but had failed to materialize. Still, the forecasted change in weather was a serious concern and raised the potential of two more "Watch Out Situations" developing, "weather getting hotter and drier," and "wind increases and/or changes direction."

Unlike Inaja, the vegetation had not been subjected to six days of continuous, dry Santa Ana weather conditions prior to the fire. However, fuel conditions were considered critical due to the previous six years of drought which had produced a significant amount of dead vegetation. Adding to the level of risk was the fact that seven other fires were occurring in Southern California and firefighting resources were already stretched thin.

Although Carlton was the Incident Commander at the time, the strong, professional relationship he had established



Figure 8. The Cedar fire coming over Sunrise Mountain approximately 2340 hrs. Saturday morning. Photo: Randy Lyle.

with Randy proved invaluable and both men collaborated closely during those first hours. The trigger point in which the Unified Command arrangement between the USFS and CDF would become official was determined to be the steep canyon slope of the San Diego River. If the fire reached that point, Randy and Carlton would become joint Incident Commanders. It didn't take long.

The predicted, but delayed Santa Ana conditions finally made their appearance at about 10:00PM as the wind direction shifted from the southwest to the northeast (RAWS Julian). By 11:00 PM Santa Ana winds were gaining momentum with 16mph gusts. At 11:56, with approximately 121 ha burned, the Unified Command trigger point was reached with the fire blasting out of the National Forest on its way to the San Diego County estates in Ramona. Several engines, a USFS Hot Shot crew and a bulldozer had tried to establish a fireline along Eagle Creek Road, northwest of the fire's origin, but it proved ineffective in the strong winds. By midnight, the wind gusts had increased to 26mph with more to come, and the fire became an unstoppable force.

Firefighting resources were sent to the San Diego Country Estates where Randy met CDF Battalion Chief Kelly Zombro to help coordinate structure protection. At this point, with the fire moving so quickly, trying to suppress the wildfire itself was nearly impossible. The protection of lives and property were the primary focus. Randy drove southbound on Highway 67 to scout the southwestern extension of the fire, arriving near the community of Eucalyptus Hills about a half hour before sunrise. The fire was just beginning to jump the Highway near Johnson Lake Road. Randy helped a resident evacuate from his home and then headed over to El Capitan Reservoir to meet with Carlton to assess the fire's movement there. To both men's surprise the flames were already near the southern end of the reservoir, ready to move into the Harbison Canyon, a



Figure 9. Jumping Highway 67. The Cedar fire through an Incident Commander's viewpoint. Photo: Randy Lyle.

community that had been burned during the 1970 Laguna fire. Within several hours it would meet the same fate. By 7:30 Sunday morning, the fire had burned approximately 90,000 acres, one third of the final acreage, most within the seven and a half hours after midnight.

One of the more common perceptions regarding the Cedar fire is illustrated by a statement made by an attorney for the Allstate Corporation when he claimed in an interview with the San Diego Union-Tribune on July 16, 2004 that, "little or nothing was done in the process when this fire was very, very approachable."

Firefighters are in a unique position to observe and understand wildfire events. It would be reasonable to begin making a concerted effort to include their experiences in future scientific research investigating wildfire in order to help the community at large understand the true nature of wildfire behavior and the actual capabilities of fire suppression agencies.

This article was originally published as an extended abstract for the 2006 Fire Ecology Congress held in San Diego, California.

Hart continued from pg 2

At the special session on the 2003 fires, there were some excellent presentations on recovery as well as a discussion about all those confounding assumptions driving fire policy. Hugh Safford, a USFS ecologist, laid out the issues really well. He popped up a slide of a ponderosa pine forest and labeled it as “Everyman’s Forest.” This was, of course, referring to how these historical “park-like” forest ecosystems are used as the model for fire management everywhere, regardless of ecosystem type. I need to have a cigar with this guy sometime. I say thin the grasslands to get rid of those mousehair thickets!

Hugh Safford, a USFS ecologist...I need to have a cigar with this guy sometime.

During Richard Halsey’s Cedar fire presentation, USFS fire scientist Phil Riggan asked Halsey if he would rather confront a wildfire in a fifteen-year-old stand of chaparral or a 30-year-old one, or something like that. Halsey was quiet for a moment and then finally said that he didn’t really know because it depends on the factors involved. Hard to disagree with that. Yeah, with all things being equal (no wind, moderate humidity, flat ground), any firefighter would prefer to be fighting a low-fuel loaded fire over a heavy-fuel loaded fire. But I know of some pretty thick 15 year-old stands I wouldn’t come anywhere near during a fire, Santa Ana winds or not. On the other hand, there are south facing, 30 year-old chamise chaparral stands that would be much easier to handle because they’ve accumulated a lot less fuel.

I’ve seen grass fires roar up to chaparral and just go out. Fuel moisture is the most important thing there; doesn’t take much heat to get grass ready to burn. On the other hand, chaparral takes more time (all things being equal!). Thicker material takes longer to dry out, with

grass on one end of the spectrum and tree trunks on the other.

This relates to another point discussed at the conference, the continual fuels vs. wind debate. Which is more important in driving a wildfire? I frequently hear that, well, both sides of the debate are right. That perspective is about as useful as a wet fusee. Here’s the truth. One, you’ve got to have fuel to burn. Two, any kind of fuel will carry a fire if all the variables line up (as they often do). People need to get off these one-sided, polarized, arm-chair “I know how fires work even though I’ve never been in one” attitudes.

Now that I’ve settled that issue, let’s discuss the one implication of focusing on fuels to reduce fire risk that really bugs me; *removing nature from our lives one degree at a time.*

Chris Blaylock, a fellow firefighter and natural history buff, sometimes talks about when he was a kid. He used to hang out in the chaparral covered canyons below his house and play all day long. Well, his family moved after he left for college and ended up in what was to become a Cedar fire impact zone. The rebuilt community has since transformed what was once a middle class neighborhood into a sea of fire-safe mansions. Two-hundred feet of cleared nature on the edges with goats making sure it stays that way. His little brother can’t play in nature anymore because the nearby canyons are either fenced off or goat stripped; lots of well-watered ice plant and queen palms around, however. The loss doesn’t seem to be noticed because it has been a gradual process. Chris uses the story of the cooking frog when describing this.

If you want to cook a frog you can’t just drop it into a pot of hot water. It will jump out. But

See Hart continued next page

Hart continued from pg. 19

if you put the frog in cold water and gradually turn up the heat, you can boil it up real nice. That's what we're doing with our families, slowing cooking nature right out of their lives without them noticing.

In our haste to protect ourselves from wildfire, we're gradually pushing nature away. A little ice-plant here, 100 feet there, a herd of goats every year, and pretty soon nature is so far removed from our daily experience that it no longer has any meaning. What was once seen as worth protecting is now viewed with fear. Keep the evil brush away and all will be good. Never mind Bob next door has a shake-shingle roof and John and Marge's Mediterranean-styled rain gutters are filled with pine needles.

Is there a need to manage all that nature out there around communities? Of course there is, but you can't manage something right unless you take care of everything in a balanced way. It complicates things and gives some of my friends in the CDF hives, but it's not just about fuel. **It's about creating a sustainable environment with an edge to it.** Nature provides that edge; a necessary edge, so our families can still connect with the thorns, the dirt, and yeah a rattler once and awhile.

There's value in natural experiences and people who don't understand that ought to get out of the public policy business. We hire these people to do the right thing, not just taking the easy way out.

Times have changed. We're not farmers anymore. We need to purge all that cattleman rhetoric about clearing the brush and realize that "brush" (i.e. chaparral) is the best place for us urbanites to get our desperately needed nature fix. The green felt you see covering our canyons, hills, and mountains is not the enemy. It's our home. It's pure California. It's time we start treating it that way.

-Jim
aka "The Griz"

**Reader's write continued from pg. 2**

Sequoia National Park, fire frequency started to drop off in the mid-1800s (just as sheepherders were arriving), with no subsequent spikes that might be attributed to anybody (except when prescribed fire began in the late 1960s). Based on dozens of widely-dispersed tree-ring fire histories from all elevations, the median date for the last fires among all these locations is 1875.

Based on such fire-scar records, I've come to conclude that sheepherder or cattlemen fires may not even have been enough to replace the loss of Indian fires, at least in the southern Sierra. Of course, it is probably also true that some localized areas (such as near mills or towns) might have experienced and increase in fires in the late 1800s. But I see no evidence of that being a widespread phenomenon in the southern Sierra.

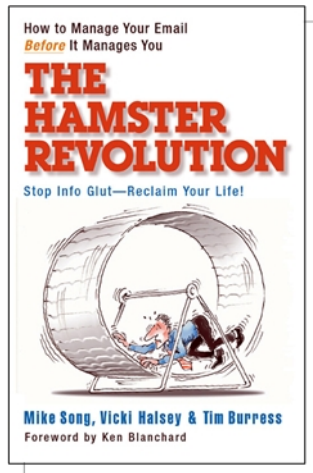
The fire scar records I cite are from the Sequoia National Park region, and that region did experience very heavy grazing by both sheep and cattle, as documented by Clarence King, John Muir, photographs in our archives, and old Superintendents' reports (the Superintendents went nuts trying to keep sheep and cattle out of the parks). So the absence of increasing fire frequency can't be attributed to the absence of sheepherders and cattlemen.

Ranchers really did burn, and that part of the story has almost certainly been correctly passed down through the generations. But I think an assumption got tacked on a long time ago -- the assumption that this burning was unusual (compared to what came before) and was damaging to the forest. The burning by ranchers was going on back in the era when many (or even most) people thought of fires as only caused by humans (not by lightning), and bad. And since people like John Muir both (1) despised the "hoofed locusts" stripping the meadows bare, and (2) thought fire was intrinsically bad, it's not much of a leap to demonize ranchers for lighting fires and destroying nature's beauty.

-A friend in the southern Sierra Nevada

Drowning in email?

Have you noticed more and more emails arriving that are confusing, lengthy and just clogging your mind (excluding the ones from us of course). A wonderful woman (who happens to be the inspiration behind everything we do here) has just coauthored her first book, *The Hamster Revolution* which is all about getting control of email before it controls you.



Read how Harold, an overwhelmed HR director who has become a hamster due to the repetitious nature of email, gets control of his life again by properly managing his email deluge. Vicki's powerful book is filled with practical advice that really works. Available at Amazon.com or your local bookstore.



Sample tips from the HAMSTER REVOLUTION

- ***Strengthen your subject lines:** Weak subject lines confuse recipients and make it hard to locate e-mails later. Use one-word categories—such as “Request” or “Confirmation”—along with specific information like dates, times, and locations.
- ***Use bullets** and synthesize your message so it is actionable for the recipient.
- ***Send Less/Quit boomeranging:** Send five e-mails, and you get three replies. Put a lid on this “boomerang effect” by eliminating just one out of five outgoing e-mails. You’ll shrink your volume and save time on needless back-and-forth exchanges.

Please Join the California Chaparral Field Institute and support our research and educational efforts to help promote a better understanding and appreciation for California's most characteristic wilderness, the chaparral!

_____ \$30 Citizen Naturalist: *The Chaparralian* plus one additional benefit (check preference below).

_____ \$50 Chaparralian: *The Chaparralian* plus TWO additional benefits (check preferences below).

_____ Signed Book: “Fire, Chaparral and Survival in Southern California”

_____ DVD of the KPBS/Huell Howser's California's Green “Secrets of the Chaparral” show

_____ California Chaparral T-Shirt. Please circle size: S M L XL

Please send this application with your name, address, and email with a check made out to the California Chaparral Field Institute and mail to: CCFI, PO Box 545, Escondido, CA 92033.

Or join on our website at www.californiachaparral.com