Emergency Management Case Study: Southern California Firestorms 2003

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Introduction and Background

The Firestorms that raged in Southern California from October 21 to November 4, 2003 were one of the worst fire disasters in U.S. history. At the height of the firestorms, no less than 14 major wildland and wildland-urban interface fires were burning in portions of Ventura, Los Angeles, San Bernardino, Riverside and San Diego counties. Across the 14 fires, a total of 750,043 acres were burned, 3,710 homes were lost and 24 people lost their lives, including one out-of-area firefighter. Firefighting resources throughout the Western U.S. and particularly in California were stretched to the limit. Firefighters from as far away as Michigan were called into the area to bolster beleaguered and fatigued local, regional, state and federal firefighters. The Cedar Fire in San Diego County was the largest wildland fire in California history, consuming over 1/3 of the total acreage of the firestorms, although losses from this fire did not exceed those from the Oakland Hills fire in 1993. This case study will summarize major emergency management decisions and lessons learned from San Diego County fires and will focus in particular on actions related to the Cedar Fire.

Prevention and Preparation

Several actions before the onset of the Firestorm were destined to influence the full impact of the disaster. Some were organizational in nature, and some were environmental. Some of these actions had positive results, others had negative results.

Some organizational factors which played a role in the 2003 Firestorm included the time of year and the normal schedule of maintenance for air tanker assets. Normally the fire season begins to die down in October as the rainy season begins in Southern California, but as it turns out, many of our worst fires have occurred in October through January. In the Fall of 2003, only about 1/3 of the normal air tanker assets were available for immediate duty. On the positive side, pre-planned fuel breaks, formation of the Mountain Area Safety Taskforce in the San Bernardino Mountains and the Forest Area Safety Taskforce in the San Diego Cleveland National Forest were effective in reducing fire losses.

One environmental factor that played a definite role in the spread and intensity of the fires was the amount of dry vegetation fuel available in the fire locations, some of which were made worse by the number of trees suffering from drought and a beetle infestation (**Exhibit A** shows the spread of this infestation in San Diego County alone). Another environmental factor was the unfortunate presence of Santa Ana wind conditions which typically bring a hot, dry wind from the Southwestern deserts across the coastal areas of Southern California. This condition lowers the relative humidity below 10%, and in addition brings wind gusts sometime exceeding 40 MPH, both of which combine to make the fire danger extreme. The onset of these weather conditions is enough warning to bring firefighting resources to a high state of alert. In this case, a brush fire that broke out at Marine Corps Base Camp Pendleton (the Roblar 2 Fire that started on October 21) had the effect of bringing outside resources into the area before any of the other fires erupted, thus providing a degree of preparedness that otherwise might have taken longer to attain.

Emergency Management

Operations Summary of the Cedar Fire. Of the 14 fires that made up the 2003 firestorms, the Cedar Fire had arguably the most controversial beginning. The fire started at 1737 hours on October 25, or about ½-hour before sunset (sunset was at 1805 hours on that day), after being set by a lost hunter. The fire was not considered arson per se, but the hunter could be prosecuted for involuntary manslaughter because of the prevailing conditions when the fire started and the

subsequent high loss of life. A San Diego County Sheriff's helicopter was in the vicinity of the fire searching for the hunter and saw the first wisp of smoke. The call was made to the SD Sheriff dispatcher who forwarded the call to the California Department of Forestry and Firefighting (CDF) for response. At this point the fire was just a few square yards in size and could have easily been suppressed with air assets. However the long standing policy of no air support flights within one half hour of sunset prevented the timely launch of helicopters with water buckets to respond. Ground assets were dispatched, eventually reaching over 300 personnel by Midnight, but the ruggedness of the terrain prevented easy access to the fire location, thus giving the fire time to get a solid foothold in the tinder-dry surrounding chaparral brush. From that decision point, the die was cast for the progression of this fire and its path of destruction due to the high Santa Ana winds that developed during the evening of October 25. This is one case (in 20/20 hindsight) where standing policy should have been reviewed in light of prevailing weather conditions and the forecast for that evening. To this day, the decision not to fly on that fire haunts many residents of San Diego County and has led to a review of aerial firefighting flight policies.

The Cedar Fire entered the City of San Diego from the East and Northeast on the early morning of October 26, around 0630 hours. Early 911 reports from the area of the Scripp's Ranch residential community were discounted by fire dispatchers as being associated with known fire activity 20 some miles to the East. The westward progression of the fire during the night had surprised everyone; advancing 30 miles in just 10 hours (see **Exhibit B**). At this point the fire was approaching one of the largest residential areas in the City just east of the I-15 freeway. Eventually 337 residences were lost in this area. In the mid-morning hours on Sunday, the fire jumped 14 lanes of the I-15 freeway, igniting brush on the west side of I-15 and causing the evacuation of the FAA Terminal Radar Approach Control (TRACON) Sunday afternoon. This had a major impact on commercial air operations throughout the U.S. as this center controls all arrivals and departures into all Southern California airports. By this time the fire had also jumped SR-52, an east-west freeway that crosses I-15, and was threatening homes in the Tierrasanta residential area and businesses in Kearny Mesa, all South of SR-52. The San Diego Fire Department was clearly under siege at this time as little help was available to combat the spread of the firestorm into the City due to the other fires raging in San Diego County and elsewhere in Southern California. To make matters worse, a light aircraft departing Montgomery Field (just south of the major fire areas) crashed on the SR-163 freeway on Sunday afternoon due to the heavy smoke in the area (see **Exhibit C** for the geography of these events). The fire also burned into the Miramar Marine Corps Air Station on the west side of I-15, stopping only when reaching the natural firebreak of the runways.

One of the serious side effects of the Cedar Fire, especially on October 26 and 27, was the worsening air quality from smoke. The offshore winds persisted into Monday when the winds shifted back to their normal onshore direction, blowing a huge pall of smoke over much of the heavily populated coastal areas of San Diego County. Smoke was a major issue in all the Southern California fires causing thousands of motorists and residents to don breathing masks.

With the shifting of the prevailing winds on Monday, October 27, the firefighting emphasis shifted from the City of San Diego to the eastern portions of rural San Diego County. In this part of the County, the winds shifted between gusty offshore conditions to equally gusty onshore conditions, causing the Cedar Fire to become very erratic and unpredictable. In some areas the intensity of the flame front caused local high wind conditions. The two major battlegrounds for the Cedar Fire on October 28 and subsequent days were the mountain community of Julian and the Cuyamaca State Park. The Julian battle became a victory although it would claim the life of one firefighter from outside the region but the Cuyamaca battle was lost as the fire destroyed most of the

State Park. A wildland fire that had burned a substantial area of east San Diego County in 2002 would become a natural firebreak that allowed firefighters to gain the upper hand on the Cedar Fire as it continued to burn eastward under the onshore wind pattern. By Friday October 31, the weather conditions had markedly improved with favorable wind conditions, lower temperatures and a low pressure area that brought moisture into the area. Throughout the period from Monday through Friday, additional resources continued to pour into the county as other fires north of San Diego were contained.

Air Resource Management. Air assets were thin at the outset of this disaster, although rapid recall and deployment of CDF aircraft in contract maintenance and the request and use of military helicopters and fixed wing aircraft were a major factor in limiting a further loss of life and property. Before the Cedar Fire started, CDF recalled 5 of 10 air tankers that had been deactivated for annual maintenance based on the prevailing weather conditions and the fires that were already burning further north. The proximity of Navy and Coast Guard helicopter assets in San Diego County is a luxury not commonly found in other areas of the U.S. and these resources were employed in an aggressive manner. Although there was a delay in obtaining support from the military's Modular Airborne Fire Fighting System (MAFFS), these assets proved decisive in the fires burning in Ventura County, the area closest to their Air National Guard base offshore in the Channel Islands. (See **Exhibit D**). The County of San Diego is the largest county in the state without a dedicated county fire department. Because of this, there are no dedicated air assets that can be tasked for San Diego County fires. An evaluation program for a regional firefighting and rescue helicopter has been ongoing for a year, but lack of dedicated funding has prevented its permanent deployment. This helicopter had been assigned to a fire outside San Diego County but was returned home for assignment on October 27.

EOC Operations. The SD County Sheriff's Department Operations Center was the first Operations Center in the region to be activated at 0300 hours on October 26. The decision to activate the San Diego County Operational Area Emergency Operations Center was made by the County Office of Emergency Services Director at 0520 hours on October 26. This was the first time that the County EOC had been activated on such a wide scale for an actual disaster in the history of its existence. The City of San Diego EOC was activated at 0945 hours on that day. The City's EOC had more activation experience, having been used for two Super Bowls, a Republican National Convention and the midair collision of a PSA 727 over the city in 1978. The San Diego PD Departmental Operations Center activated at 0900 hours and the Fire Department's DOC activated at 1000 hours. The Fire Department acknowledged in their After Action Report that their DOC should have been activated earlier.

One of the emergency management issues that surfaced in the various After Action Reports was the lack of qualified personnel to staff the various EOC's. The major problem appeared to be in the County EOC, which had a paucity of fire and law enforcement staffing due to the various public safety departments having to staff Incident Command positions as well as the City EOC and their internal DOC's. Other EOC's were staffed in the County including the Water Department and California Highway Patrol. Coordination among the various operations centers in the County was effected but relied largely on manual communications. One suggestion that should be studied is to establish a regional EOC network that would allow the major EOC's to exchange vital information in real time. Additionally it was not clear to me that there is effective communications between the IC staffs on the front lines and the EOCs that are supporting their efforts. This is an area that should be further investigated before another major disaster or terrorist attack unfolds.

Agency and Public Notification Systems. Public safety personnel recall systems did not always work as advertised, especially in the SDPD. The Police Department is on a common pager system with the Fire Department who has the higher priority in pager call-outs. The County Alert Service System (CASS) was not activated for this disaster as it had not been properly configured to support this scenario. In a similar vein, civilian evacuation warning systems were non-existent or not effective. Most evacuations in the Cedar Fire were accomplished by SD County Sheriff's deputies acting on their own initiative or on requests through their Communications Center. The County's Emergency Alert System was not activated by the County Sheriff for a variety of reasons, chief among these the rapidly changing situation and lack of evacuation route information. This situation was worsened by the rapid spread of the Cedar Fire in the early morning hours on a Sunday. Most of the fatalities that occurred in the Southern California Firestorm happened on Sunday, October 26 in the Cedar Fire due to its rapid spread and the lack of alternate evacuation routes for many affected rural areas in the county. This period accounted for 13 of the total 14 fatalities in this fire (the 14th was a firefighter lost in the line of duty on October 29). This situation underscores the need for better public education on planning and preparing for emergency evacuations.

Use of the Incident Command System. Incident Command of the Cedar Fire transitioned quickly to a Unified Command with a State Incident Command Team assigned on October 26. On October 27, the Cedar Fire was split into a West Command which remained at the state level, and an East Command which was headed by a Federal National Incident Command Team. On October 28, a Unified Area Command was established for the Cedar Fire and an adjoining fire in North San Diego County, the Paradise Fire. Similar flexing of the Incident Command System took place in the other Southern California fires during the period October 25 to November 4. The Multi-Agency Coordination System (MACS) was activated for the fires in San Bernardino County on October 25. MACS is designed to allow agencies to coordinate the allocation of resources among competing incidents. Resource management was definitely a major issue during the 2003 Firestorm as the number of fires burning simultaneously in Southern California severely tasked available fire engines, firefighter personnel and air resources. At the peak of the fires on October 28, 1659 engines were committed along with 65 helicopters and 13,371 personnel on the fire lines. This was the largest commitment of local fire engines through mutual aid by the California Office of Emergency Services (OES) in the history of the state.

Decision Support Tools. Some of the tools that help firefighting decision makers to rapidly assess needs and assign resources in major incidents and disasters include the California Multi-Incident Resource Processing System (MIRPS) and the federal Resource Ordering Statusing System (ROSS). Unfortunately MIRPS and ROSS are not interoperable, causing IC staff to have to enter resource requests twice. MIRPS interfaces with California state and federal wildfire resources while ROSS interfaces to the National Interagency Fire Center in Boise, Idaho. Neither system includes local firefighting resources. This was a situation where the right tools existed, but their lack of inclusiveness and interoperability caused additional work loads for already overworked ICS staffs. The lack of Geographic Information Systems and associated emergency management applications was cited in all After Action Reports as an area needing improvement. Typically it is difficult to fund permanent equipment and software tools for a center that only activates on rare occasions, but this situation has possible solutions that should be investigated and implemented.

One shortcoming that I observed in studying the After Action Reports was the general lack of knowledge at EOC's concerning transportation resources. San Diego has a regional Transportation Management Center (TMC) jointly operated by the California Department of Transportation (Caltrans) and the California Highway Patrol (CHP). This center contains a number

of systems that would be of value in managing an incident of this magnitude. These include the CHP dispatch system (which was used heavily during the incident to publish road closures on the CHP statewide web site), the Caltrans Advanced Transportation Management System (ATMS) which provides real-time data on traffic flows on all freeways in the region, access to real-time Closed Circuit TV (CCTV) video imagery and control of Changeable Message Signs (CMS) that warn motorists of major events affecting freeway or arterial travel times. Workstations that are connected to the ATMS system would be highly useful in an EOC that is seeking to access all available information on transportation resources.

Recovery

Major activities that occurred during the recovery phase of this disaster included the formation and deployment of Damage Assessment Teams, sheltering and support for evacuated residents, restoration and management of basic utilities and continued staffing for Joint Information Centers to disseminate critical information to the public. In general, Damage Assessment Teams were rapidly formed and sent into the field to reduce the time it would take to quantify damage levels and provide assistance to homeowners seeking federal compensation for losses. The fires in all areas had affected electrical power to massive areas, especially in Los Angeles County, and electrical crews worked around the clock to restore power. In almost all cases water management was not an issue as water utilities ensured that pumping stations and pipelines would continue to provide adequate water pressures where they were most needed. One issue that surfaced in the City of San Diego phase of the Cedar Fire was the need for better communications between the Fire Department and Water Department. The Water Department found it difficult to manage water supplies not knowing where the fire boundaries were or the strategies that were being employed by firefighters. In general, information on fire progression was sparse for most, if not all the fires in the 2003 Firestorm. This can be attributed to the scarcity of staff resources at Incident Command bases to provide a continuous information flow. Joint Information Centers were effective in keeping the media informed without distracting the Incident Commanders and their staffs from their operations function.

Summary

The Firestorm of 2003 brought unprecedented levels of damage in terms of acreage burned, homes destroyed and lives lost throughout a five-county area in Southern California. The Cedar Fire in San Diego was the largest wildfire in California history. The results could have been much worse had it not been for the eventual onset of favorable weather conditions and the heroic efforts of firefighters working under stressful and fatiguing conditions, with at time inadequate numbers of personnel and other resources. Although California had suffered from several major fires in past years and applied many lessons learned to operational and institutional issues, this event provided a new source of lessons learned. In general population warning was not as timely as it could have been, evacuations were at times chaotic, communications interoperability suffered as always and lack of timely information dissemination on the progress and status of fires prevented more effective action and frustrated the civilian populace. The need to seriously review policies on the commitment of air resources and military support was underscored. Continuing management of wildland brush and residential building codes is a must. Once again we have proven that development on the fringes of vast open areas of brush and timber is fraught with danger and the ever-present risk of human and property losses from wildland-urban interface fires will not likely diminish if history is a guide.

Resources

[1] California Division of Forestry and Firefighting (2004). *California Fire Siege 2003: The Story*. Retrieved on April 4, 2004 from World Wide Web: http://www.fire.ca.gov/php/fire_er_siege.php

[2] San Diego Union Tribune (2004). SignOnSanDiego.com. *After the Fires, Failure of Evacuation System is Explained*. Retrieved April 5, 2004 from World Wide Web: http://www.signonsandiego.com/news/fires/20040331-9999-news_2m31crest.html

[3] San Diego Union Tribune (2004). SignOnSanDiego.com. *The Week of Fire, Reinforcements Rushing In*. Retrieved April 5, 2004 from World Wide Web: http://www.signonsandiego.com/news/fires/weekoffire/20031028-9999_1n28resource.html

[4] County of San Diego Office of Emergency Services (2004). *After Action Report – Firestorms 2003*. Retrieved April 5, 2004 from World Wide Web: http://www.sdcounty.ca.gov/oes/pdf/AARFinalWhole.pdf

[5] City of San Diego (2003). *Manager's Report to the Mayor: Initial 30-Day Post-Fire Overview*. Retrieved April 12, 2003 from the World Wide Web: (includes SDFD After Action Report, SDPD After Action Report and EOC After Action Report as Attachments 1, 2 and 3) http://clerkdoc.sannet.gov/RightSite/getcontent/local.pdf?DMW_OBJECTID=09001451800ab1e5

Author Note

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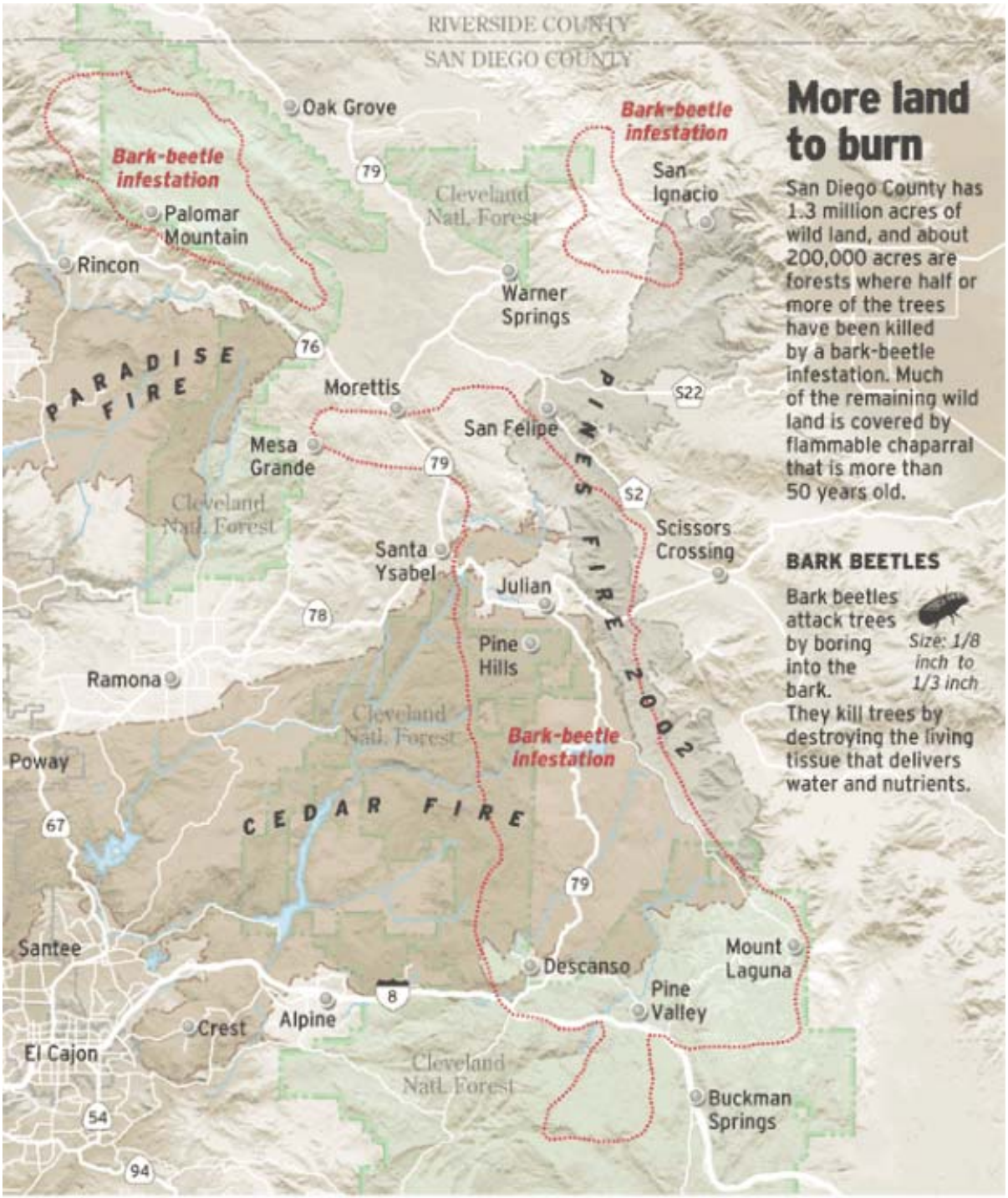

SOURCE: California Department of Forestry and Fire Protection

BRIAN CRAGIN / Union-Tribune

Exhibit A

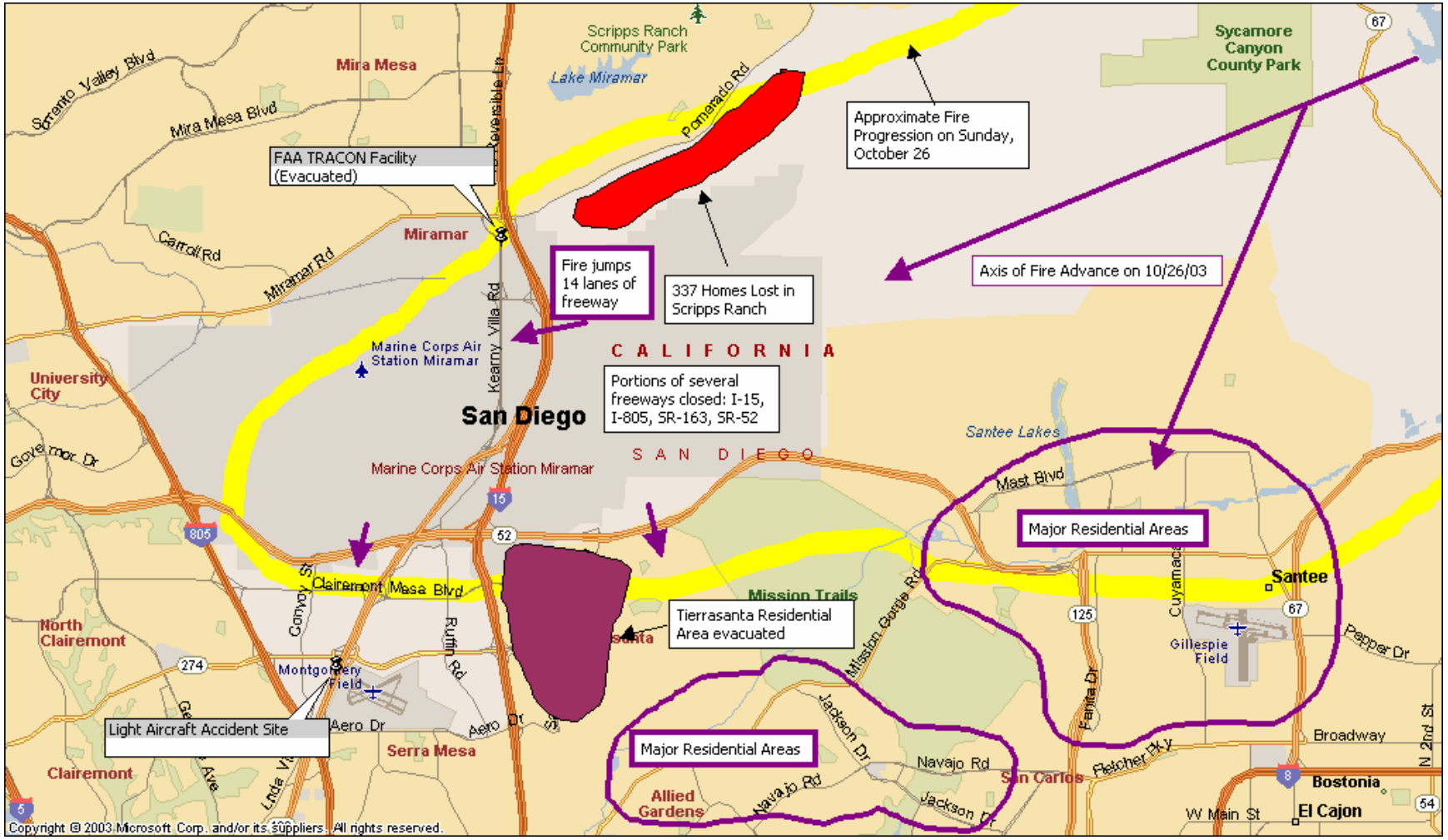
Scripps Ranch Community Park
Lake Miramar
Sycamore Canyon County Park
Mira Mesa
Sorrento Valley Blvd
Mira Mesa Blvd
Reversible Ln
Pomerado Rd
FAA TRACON Facility (Evacuated)
Approximate Fire Progression on Sunday, October 26
Carroll Rd
Miramar
Miramar Rd
Fire jumps 14 lanes of freeway
337 Homes Lost in Scripps Ranch
Axis of Fire Advance on 10/26/03
Kearny Villa Rd
Marine Corps Air Station Miramar
C A L I F O R N I A
University City
Portions of several freeways closed: I-15, I-805, SR-163, SR-52
San Diego
S A N D I E G O
Santee Lakes
Marine Corps Air Station Miramar
Mast Blvd
Major Residential Areas
Clairemont Mesa Blvd
Mission Trails
Tierrasanta Residential Area evacuated
Santee
North Clairemont
Gillespie Field
Pepper Dr
Mission Gorge Rd
Fanita Dr
Montgomery Field
Light Aircraft Accident Site
Aero Dr
Serra Mesa
Major Residential Areas
Jackson Dr
Navajo Rd
Broadway
Clairemont
Allied Gardens
San Carlos
Fletcher Pky
Bostonia
El Cajon
W Main St
N 2nd St
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Exhibit B

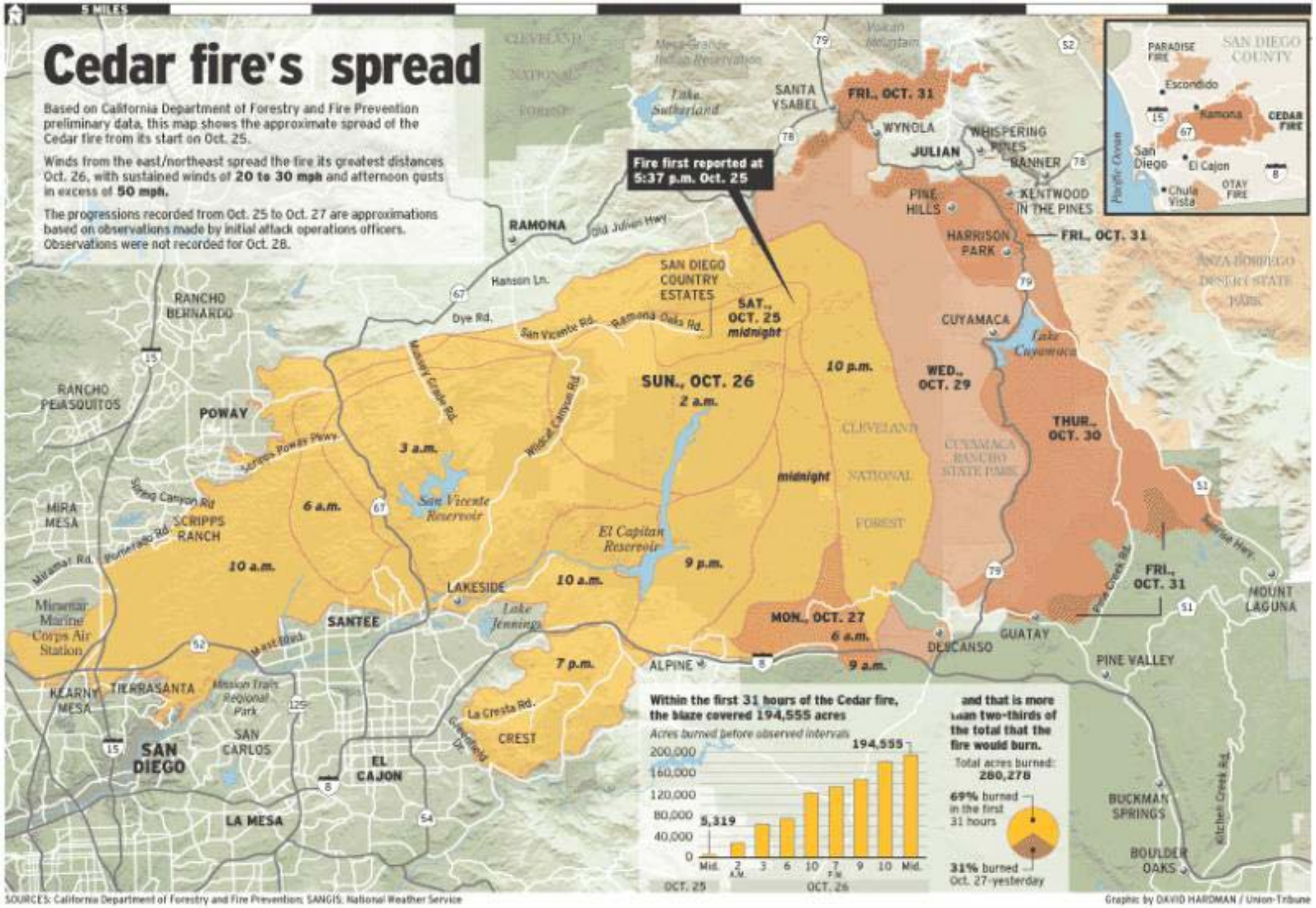
Cedar fire's spread
Based on California Department of Forestry and Fire Prevention preliminary data, this map shows the approximate spread of the Cedar fire from its start on Oct. 25.
Winds from the east/northeast spread the fire its greatest distances Oct. 26, with sustained winds of 20 to 30 mph and afternoon gusts in excess of 50 mph.
The progressions recorded from Oct. 25 to Oct. 27 are approximations based on observations made by initial attack operations officers. Observations were not recorded for Oct. 28.
Fire first reported at 5:37 p.m. Oct. 25
SAT., OCT. 25 midnight
SUN., OCT. 26 2 a.m.
3 a.m.
6 a.m.
9 a.m.
10 a.m.
midnight
10 p.m.
WED., OCT. 29
THUR., OCT. 30
FRI., OCT. 31
MON., OCT. 27 6 a.m.
7 p.m.
9 p.m.
RAMONA
SAN DIEGO COUNTRY ESTATES
RANCHO BERNARDO
RANCHO PENASQUITOS
POWAY
MIRA MESA
SCRIPPS RANCH
Miramar Marine Corps Air Station
SANTEE
LAKESIDE
EL CAJON
LA MESA
SAN DIEGO
KEARNY MESA
TIERRASANTA
SAN CARLOS
CREST
ALPINE
DESCANSO
GUATAY
PINE VALLEY
MOUNT LAGUNA
BUCKMAN SPRINGS
BOULDER OAKS
JULIAN
WYNOLA
SANTA YSABEL
WHISPERING PINES
BANNER
PINE HILLS
KENTWOOD IN THE PINES
HARRISON PARK
CUYAMACA
Lake Cuyamaca
CLEVELAND NATIONAL FOREST
CUYAMACA RANCHO STATE PARK
ANZA-BORREGO DESERT STATE PARK
San Vicente Reservoir
El Capitan Reservoir
Lake Jennings
Lake Sutherland
Mesa Grande Indian Reservation
Volcan Mountain
Hanson Ln.
Dye Rd.
San Vicente Rd.
Ramona Oaks Rd.
Mussey Grade Rd.
Wildcat Canyon Rd.
Scripps Poway Pkwy.
Spring Canyon Rd
Pomerado Rd.
Miramar Rd.
Mast Blvd.
Mission Trails Regional Park
La Cresta Rd.
Crestridge Dr.
Old Julian Hwy
Harris Hwy.
Pine Creek Rd.
Kitchen Creek Rd.
PARADISE FIRE
SAN DIEGO COUNTY
Escondido
Ramona
CEDAR FIRE
San Diego
El Cajon
Chula Vista
OTAY FIRE
Pacific Ocean
Within the first 31 hours of the Cedar fire, the blaze covered 194,555 acres
Acres burned before observed intervals
200,000
160,000
120,000
80,000
40,000
0
5,319
194,555
Mid. 2 A.M. 3 6 10 7 P.M. 9 10 Mid.
OCT. 25
OCT. 26
and that is more than two-thirds of the total that the fire would burn.
Total acres burned: 280,278
69% burned in the first 31 hours
31% burned Oct. 27-yesterday
SOURCES: California Department of Forestry and Fire Prevention; SANGIS; National Weather Service
Graphic by DAVID HARDMAN / Union-Tribune

Exhibit C

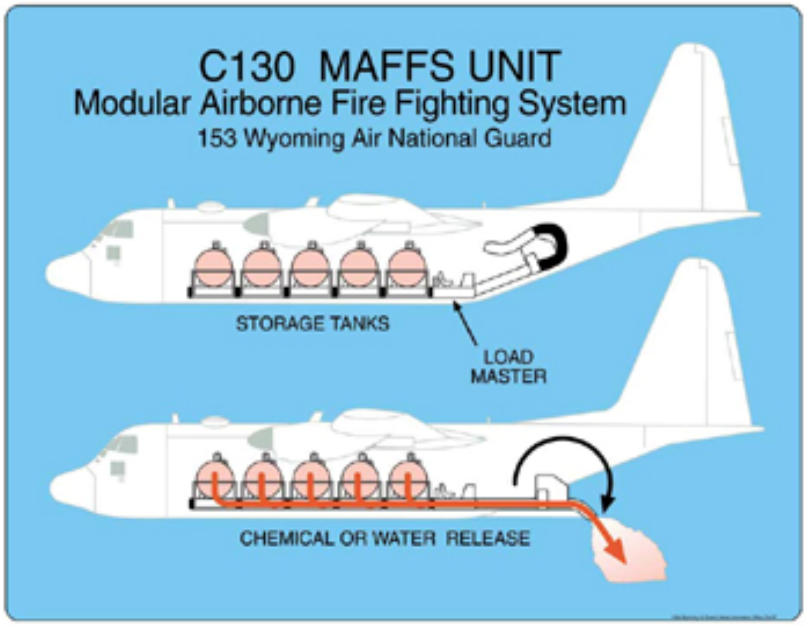
C130 MAFFS UNIT
Modular Airborne Fire Fighting System
153 Wyoming Air National Guard
STORAGE TANKS
LOAD MASTER
CHEMICAL OR WATER RELEASE

Exhibit D