

THE 2003 SAN DIEGO COUNTY FIRE SIEGE FIRE SAFETY REVIEW

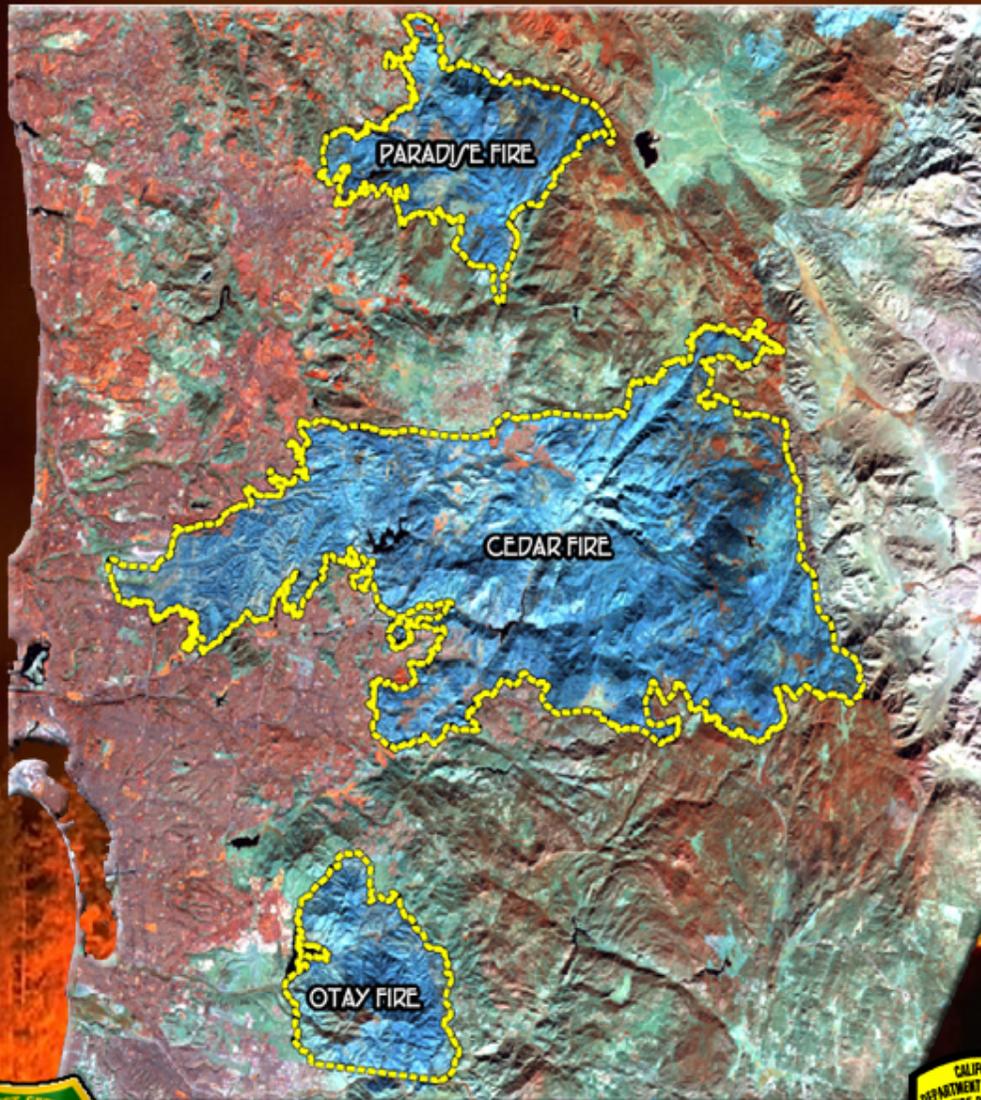


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I. Purpose

In late October of 2003, three major fires burned in San Diego County. Between October 25th and October 27th, 16 people lost their lives; 3241 structures¹ were destroyed, and suppression costs topped \$43,000,000. The Cedar fire alone, at 273,246 acres, was the largest fire in California history.

The California Department of Forestry and Fire Protection, the Regional Forester, Pacific Southwest Region, United States Forest Service, and the Forest Supervisor, Cleveland National Forest authorized an interagency team of wildland fire experts to conduct a review of the management of the Cedar, Paradise, and Otay fires.

The following report was researched and written in mid-November through December 2003. Information for this assessment was derived from over 121 interviews with firefighters and support personnel from the Otay, Paradise, and Cedar fires, and incident documentation and reports, photos, maps, and other references.

This report documents issues, findings and recommendations from a stakeholder workshop held on November 20, 2003. The workshop was conducted to provide an interactive forum for all agencies and groups that took part in response actions related to the San Diego County incidents. Participants included personnel from city, County, State and Federal firefighting agencies, law enforcement personnel, CALTRANS, FEMA, and the United State Marine Corps. Discussions focused on interagency relationships, communications, aviation and ground safety, preparedness, community protection, and wildland fire resource issues. Discussion groups focused on what worked well within these areas, needed improvements, and recommendations for the future. Full documentation of the workshop may be found in Appendix A.

¹ This figure represents all structures including primary residences, commercial structures, and outbuildings.

II. Executive Summary

During the 2003 Southern California fire siege, the Cedar, Paradise and Otay fires burned 376,237 acres or over 13 percent of San Diego County's total land mass. When the fires were finally suppressed, 16 people had died, 3241 structures² were destroyed, and \$43,230,826 had been spent for suppression in San Diego County.

Multiple high-acreage, high-hazard fires occurred within the Southern California area between October 21st and October 26th, 2003, straining local fire response resources and incident management coordination. During this period, 14 fires burned in six southern California counties, initiating one of the largest mobilizations of firefighting resources in State history.

The Cedar, Paradise and Otay fires started on October 25th and 26th. Extremely dry fuels, high winds, extreme erratic fire behavior and other factors made initial attack of these fires difficult and dangerous. Effective evacuation and protection actions on the part of emergency personnel, with cooperation by the public, saved thousands of lives. Loss of life and serious injuries did occur. However, in considering the circumstances of these fires, injury rates were surprisingly low. No aviation accidents occurred. Improved safety training and equipment is needed, particularly for law enforcement and other non-fire support personnel.

In initial and extended attack operations of the Cedar and Paradise fires, evacuation, suppression and aviation operations were conducted within a command system that was fractured due to difficulties with radio communications, the fast spread of fire through different jurisdictions, and rapidly changing operational priorities and tasks. Operational groups were sometimes isolated and this interfered with the implementation of the Incident Command System, but activities effectively focused on the primary operational goal of the protection of life.

A lack of formal operational agreements and consistent pre-season interagency coordination, integrated planning, and training within San Diego County caused a degree of disorganization in the management of the fires. Inconsistent or outdated policies among agencies also affected the overall efficiency of incident management, particularly in the area of aviation operations.

Interagency relationships, while cordial, lacked coordination, so information and intelligence did not flow effectively. Planning and logistics were in disarray for the first few operational periods, due in part to administrative difficulties with resource ordering systems, and to competing regional demands for fire suppression and support resources.

² This figure represents all structures including primary residences, commercial structures, and outbuildings.

The Incident Command System was effectively implemented on the fires, but more training on its functioning and use is needed, especially for agencies that do not routinely use the system for large-scale applications in concert with other cooperators.

Environmental, biological and social factors contributed to the fire's severity and effects, and both these categories require closer study. Fuels management in open space areas is needed. Comprehensive, consistent planning, building and zoning codes are necessary to mitigate hazards to communities in wildland-urban interface areas. Education of residents and support of community-based fire prevention and emergency planning efforts is essential. Unified interagency coordination with local media outlets will assist the efficient and accurate flow of information to the public.

III. Incident Events and Operations

“The 1970 fire disaster was unique in modern times, primarily in terms of the geographical area involved, total acreage burned, the wildland-urban nature of the fires, the large number of homes completely destroyed, and the large number of agencies, people, and equipment involved” -Excerpt, “Recommendations To Solve California’s Wildland Fire Problem”, Task Force on California’s Wildland Fire Problem, 1972.

The San Diego County Fires

The Cedar incident was reported to the Monte Vista ECC at 1737 hours on October 25th, 2003. Thirteen civilians and one firefighter were killed. Ninety-one people were injured. Over 2,200 residences were destroyed.

The Paradise fire was reported October 26th at 0130 PST. Two persons were killed in this incident and seventeen people were injured. The fire consumed 56,700 acres, and destroyed 176 residences.

The Otay fire was reported on October 26th at 1300 hrs. This incident burned a significant area, with a final total of 46,291 acres. The fire was controlled fairly quickly, with no loss of life. One residence was destroyed, and one firefighter was injured.

The complexity of managing multiple, high-acreage, and high-hazard fires within a focused urban geographic area tested local fire and emergency response resources. It also showcased the talent, tenacity, initiative and unmatched firefighting and emergency operations savvy of the personnel involved with the management of these incidents.

Although just over 2,200 residences were lost, 13,000 homes were saved within the Cedar fire perimeter, and over 25,000 residences were saved within the secondary perimeter. This number of “saves” is significant in considering the Cedar fire was estimated to have consumed 5,000 acres per hour within a 40-hour period. (Cedar Fire Damage Inspection Narrative Draft)

Fire Weather and Climate Trends

The years between 1998 and 2003 had been unusually dry in Southern California. The region had received only 50-75% of normal rainfall in 2003, as averaged since 1895. No summer season storms occurred, and 2003 ranked in the bottom of the 5th percentile for rainfall over a 108 - year period. Autumn began with seasonably warm temperatures.

As in past years, seasonally occurring pressure gradients between the Great Basin to the east and the cool Pacific Ocean to the west initiated “Foehn” or Santa Ana wind conditions. The National Weather Service issued a Red Flag Warning for extreme southwestern California, forecasting sustained low relative

humidity persisting at less than 10%, for strong, persistent gusty Santa Ana winds, and poor evening humidity recovery through Monday afternoon, October 27th. When the east winds surfaced on late on October 25th, relative humidity plummeted to four percent at the Descanso remote automated weather station (RAWS), which is located on the Cleveland National Forest.

Fuel Conditions

Within the predominant vegetation types of the region – coastal sage scrub, chaparral, oak woodland and oak forest, and at higher elevations, pine forest, in higher elevations – live and dead fuels were critically dry.

Samples of chaparral taken on Poser Mountain, San Diego County, California, on October 7, 2003 measured at averages of 49 - 55% moistures for old and new growth, respectively. Nighttime fine dead fuel moisture declined to 4 percent, and was even lower during the daytime hours.

The severity of the fire potential was indicated by the National Fire Danger Rating System (NFDRS) indices such as Burning Index, Energy Release Component, and 1000 Hour Fuel Moisture levels. Definitions of these indices can be found in the Glossary.

- During the week of fires, the Burning Index (BI) for the Descanso Fire Weather Station was 250, setting a new historical maximum reading. This reading indicated potential flame lengths of approximately 25 feet in brush.
- The Energy Release Component (ERC) for the Descanso Fire Weather Station was over 120, also setting a new record high for this measure of fire hazard.
- The 1000-Hour dead fuel moisture was at eight percent, hovering at the historical driest level as measured at the Descanso RAWS.

Fire Activity in Southern California

Beginning 10/21/03, a series of large fires occurring in close geographic and chronological proximity critically stretched initial and extended attack resources and logistical support systems in Southern California.

A comprehensive timeline for the 2003 California Fire Siege can be referenced in *The California Fire Siege 2003, The Story* (California Department of Forestry; United States Forest Service, Pacific Southwest Region, 2003). The following discussion provides a summary of these regional incidents.

Between 10/21 at 1200 hrs and 10/25 0001, a total of 5 fires in San Bernardino, Los Angeles, and Ventura counties had burned at least 145, 279 acres, and the management of these incidents required a significant commitment of emergency

response resources: 6,305 firefighters, 535 engine companies, 196 hand crews, 37 helicopters, 66 bulldozers, 70 water tenders and 784 overhead personnel.

On 10/21, at 1201, the Roblar 2 fire was reported near the community of De Luz, in San Diego County. Many Federal, State and local government firefighting resources from northern San Diego County were assigned to the Roblar 2 fire, since they were the “closest resources.”

A Red Flag warning was issued for 10/25 for very low humidity and Santa Ana winds in the southern California region.

On 10/25 at 0917, the Old fire began on the San Bernardino National Forest, threatening the communities of Crestline, Lake Arrowhead, and Running Springs and San Bernardino City. Later that day, at 1415 hours, the Simi incident, Ventura County, began.

The Cedar fire started on the Cleveland National Forest (CNF) on October 25th, at approximately 1737 hours

The Paradise fire started at approximately 0100 hours on October 26th.

The Otay fire started on October 26th.

The Cedar Fire

“Controlling a fire that starts in a wind affected area during the initial phase of a Santa Ana is an enormously difficult task...It is not unusual for a fully developed fire in chaparral to enlarge at the rate of 4 to 6 square miles per hour during the initial phase of a Santa Ana...Spot fires are numerous, sometimes up to a mile ahead of the main fire and occasionally as much as 4 miles.” Excerpt- Can Southern California Wildland Conflagrations Be Stopped? 1970. USDA Technical Report PSW-7/1974.

Cedar Fire Initial Attack Chronology

October 25th

The Cedar fire started on the Cleveland National Forest (CNF) on October 25th prior to 1737 hours, the time it was first reported to Monte Vista Interagency Emergency Communications Center (ECC). It has been reported in the media that a lost hunter started the fire as a means to signal for help.

The Monte Vista ECC dispatched Cleveland National Forest (CNF) resources to the fire. The initial dispatch was CNF Division 3, CNF Battalion 33, 9 engines, 1 hand crew and two water tenders. It was followed immediately by the dispatch at 1740 hours, of Monte Vista Unit CDF resources to the same location: CDF Battalion 3312, CDF Battalion 3314, 5 engines, 2 hand crews, and 1 dozer.

Air attack 330, air tankers 70 and 71, and helicopter 406 were dispatched as well, but they could not respond to initial attack, since 1736 hours was aircraft “cutoff” – the point at which it is too late to dispatch aircraft due to impending nightfall, in accordance with Federal and State aviation policies.

At 1819 hours, CNF Division 3 requested an additional 15 crews, 2 Type 2 water tenders, and 1 Type 3 engine strike team.

Initial suppression efforts for the Cedar Fire were hampered by terrain, limited access, time of day and extreme fire behavior. The fire started on a knob in 30-year old chaparral in a remote area of the forest. The location of the fire origin is illustrated in Figure 1.

The exact location of the fire was not initially clear to the Incident Commander (IC), or the Operations Section Chief (OSC), who remotely scouted the fire from two different locations. A CDF Division Chief who viewed the area was located at the east end of San Diego Country Estates. The IC was located on the opposite side of the San Diego River at Boulder Creek Road. Both individuals surveying the fire could see smoke, but neither vantage point offered a direct view of the fire.

It was evident the fire was located in rugged, heavily vegetated terrain, with no roads in close proximity. Access to the origin of the fire was difficult, as the fire was located between the roads in the vicinity of the Cedar Creek drainage. There were no primary Forest Service roads in the area. Boulder Creek and Eagle Peak Roads are maintained by San Diego County, Cedar Creek Spur is a Forest Service fire road, and is rarely maintained. The only other roads in the vicinity were jeep trails on private lands, none of which could bring firefighters within one mile of the fire.

Fire personnel attempted to gain access to the fire from the south. Many of the roads were overgrown with vegetation, eroded, or too narrow to accommodate efficient and safe travel of fire apparatus. Attempting to navigate these roads put engines and crews in a precarious position, in the event that Santa Ana winds surfaced on the fire. After a few hours of attempting to gain access on these roads, it was determined too risky to continue with darkness falling and gusty winds imminent. All resources were ordered back to the initial attack Incident Command Post (ICP) by the OSC.

It was soon determined any travel to the fire would have to be made on foot. Rugged terrain, darkness and heavy fuels would make cross-country foot travel slow and hazardous. High winds were forecasted for the coming hours, and personnel did not know precisely where the fire was and could only reasonably guess its direction of travel and rate of spread. Spotting was likely, and crews could be trapped by fire with no safety zones. Weighing these factors, the IC

decided that attempting to access the fire by foot would pose an unacceptable level of risk to firefighters.

Within 90 minutes, Santa Ana winds pushed fire through the area firefighters would have hiked into had the decision been made to access the area on foot. Likewise, the narrow, steep roads firefighters had attempted to navigate had also burned over.

Fire Spread and Behavior Chronology

To estimate the Cedar fire's rate of spread, a number of sources help document how fast the fire moved, and the direction and shape of its forward and lateral spread. Figure 2 is a map showing the points and locations referred to in the narrative. A more detailed discussion of fire behavior is found in Appendix B.

Communication logs from CDF, the San Diego County Sheriff's Office (SDSO), and USFS were analyzed. There are few detailed entries in the dispatch logs that connect a location and a time to the fire's movement and provide a meaningful temporal and spatial connection.

The City of San Diego estimated fire event times by interviewing firefighters who were working at various locations on the fire. The City then created a map with points featuring this spatial information. These data were combined with the radio log points to estimate rates of spread.

Using satellite imagery, it is estimated the Cedar fire burned with a wind speed of over 15 miles an hour. The fire made a 29 mile run from approximately midnight of October 25th until 10:00 hours October 26th moving approximately three miles per hour.

The fire moved slowly from 17:37 to 23:00 hours. At 17:51 it was estimated by the San Diego Sheriff's Department helicopter pilot as 50 yards square (1/2 acre). It was described by a CDF Battalion Chief, located at the east end of the San Diego Country Estates, as approximately five acres. The Initial Attack IC, staged at Boulder Creek Road on the opposite side of the San Diego River, estimated the fire at 20-25 acres in size. Terrain and darkness influenced what each saw from their respective vantage point, so their initial estimates of the fire's size differed.

Excerpts from dispatch logs help link time and observed weather and fire behavior. At approximately 21:46 hours, Monte Vista ECC dispatchers received a report, "Winds are variable north, northeast, and east at nine to 26 miles per hour. The temperature is at 68. Relative humidity is at 11 percent. The dew point at 11 degrees. And also the fire just made a run to the top of the ridge."

Winds increased significantly in short order. At approximately 22:20 hours, winds were "... Out of north, northeast and east at 18 to 27, gusty to 37 miles per hour."

At 22:50 hours the OSC reported “the fire has crossed Eagle Peak Road.” The fire began its spread into the San Diego River Drainage. The fire had moved 1.6 miles to the west-southwest.

The first reference to extreme fire behavior occurred at 23:18, when a CDF Battalion Chief described the fire from the east end of the San Diego Country Estates, “...I'm watchin' what I think are probably 75-foot flames right now just rollin' and we had probably about a 60 or 80 acre area ignition goin' about five minutes ago.... 100-foot flames now.”

Evacuation and ordering of structure protection resources through the OES Fire and Rescue Mutual Aid System (by 2100 on 10/25) proceeded promptly. This rapid response was important in saving lives and structures in the San Diego Country Estates, once the fire crossed the San Diego River.

The Forest Service and CDF initiated unified command at 2356 hours, October 25th, when the Cedar fire burned into the State Responsibility Area.

October 26th

At 00:09 hours, CNF Division 4 states, “Fire activity has increased...long range spotting and it has crossed the San Diego River.” The fire had moved almost a mile in forward spread.

Fire and law enforcement personnel underestimated the potential size and rate of spread of the Cedar Fire. Several communities (the Mussey Road area, Muth Valley and Barona Mesa Estates) received no notice of the approach of the fire. In many other cases citizens were evacuated on very short notice.

Many of the entries on the dispatch logs have no time stamp. The only time documented is when the tape that records conversations is changed. As the tape ended at 00:27 hours, a report is made “I got a spot fire now. It's less than a half-mile away.... speed to these structures is increasing. We've got a pretty good fire activity now and it's not laying down as much as before.”

Numerous spot fires, observed at over one-half mile ahead of the main fire, combined with erratic winds during the first night, caused extensive, unpredictable fire spread. These factors also contributed to entrapment of civilians and firefighters.

Prior to 0113 the Structure Branch Director stated, “This thing is progressing around the Ramona Oaks area quite rapidly. It's starting to head from..., Barona Mesa, I'm moving some resources in there now.”

The fire moved through the Barona Indian Reservation. Firefighters established a roadblock at the top of Wildcat Canyon road to stop the flow of traffic into what was becoming an extremely hazardous area.

There were 1,000 people were in the Barona Valley Ranch Casino and 722 guests registered at the resort and hotel. Two hundred employees were on duty. The golf course provided a greenbelt which helped protect the structures and other property on the resort grounds. Guests were advised to remain at the resort, and this likely saved many lives. Security personnel at the Resort assisted fire and law enforcement personnel with protecting patrons sheltering in the Casino. Had resort patrons attempted to evacuate the area by car, many would likely have been trapped by fire on Wildcat Canyon Road.

At 0116 CNF Dispatch received a report of a Sheriff Officer trapped in a burning building on Matlin Road. The fire had traveled west another two miles from the San Diego River bottom to Matlin Road in approximately one hour.

Wind speeds and erratic gusts continued to increase. Prior to 01:30 hours, an unknown voice, probably a lookout, reported to CNF Dispatch, "Winds still out of the northeast to east, northeast at, but they're up 25 to 40 miles per hours with 53 miles per hour. Temperature is at 66. Humidity is at 11 percent. Dew point is at nine degrees."

At 01:45 hours, the sheriff's dispatch log states the fire had jumped Rancho Barona Road. The fire had moved over 1 mile to the west-southwest in 30 minutes.

At 02:25 hours, the CNF dispatch log states that an elderly couple was trapped at on Albana St. The fire had grown another 1.3 miles, predominantly to the north, indicating the fire's lateral growth.

The Cedar Fire reached the Lakeside jurisdiction at 0300 on October 26th.

At 0309 hours, there was a report from the sheriff's office of four people trapped on Wildcat Canyon Road. The fire spread about 4.4 miles in 44 minutes.

The fire reached Poway at 0500, and burned 54 homes and 16 businesses.

The fire moved to the west 3.7 miles, reaching Highway 67. The fire hit Scripps Ranch at approximately 08:30. It continued to spread to the west, reaching Highway 15 at approximately 10:00 hours. The fire reached Tierrasante by 13:00.

The CNF dispatch log states that units were trapped on Mussey Grade at 1404 hours. At 1416 hours, a house was burning on Gem Lane, which is just south of Ramona. At 14:32, there was a "½ mile fire heading towards Harbison Canyon." By 14:50 it was "hitting Alpine heavy."

October 27th

The first sign of diminishing Santa Ana winds came during the late afternoon. On October 27th at 2000 hours the Julian RAWS recorded winds with a westerly

component blowing from the south-southwest at 1-2 mph. At the Descanso RAWS, the wind blew from the west-southwest at 18:30 hours at 0 mph with gusts recorded at 7 mph.

October 28th

The Cedar fire first entered the community of Julian on October 28th.

October 28th was a day of transitional winds. Winds were westerly at 4-8 mph with gusts at 10-12 mph from the Descanso RAWS. Throughout the day, the fire continued to burn to the east, into higher elevation conifer stands. Groves of insect-killed pines burned with high intensities and lofted embers further east. With the westerly winds, the fire aligned toward North and Middle Peaks, making upslope runs and spotting during the early morning hours. Prior to 09:00³ hours, the fire was backing down the eastern slopes of North, Middle and Cuyamaca Peaks.

By sundown, the fire destroyed several structures in the community of Cuyamaca. By 20:39 hours, the fire destroyed structures in the Harrison Park area, temporarily trapping a structure protection group. The fire had crossed the Sunrise Highway by 21:00 hours, and was moving towards the La Cima Conservation Camp.

October 29th

The fire continued movement to the east. By 0317 on October 29th the fire was spotting into the community of Kentwood-in-the-Pines, southeast of Julian. As the fire spread east of Kentwood-in-the-Pines, it burned into the edge of the July 2002 Pines fire, where fuels were greatly reduced. Most of the eastern edge of the Cedar fire joins the western edge of the Pines fire.

A strong westerly wind flowed over and through the San Diego River Drainage throughout the day. The winds funneled up the river and the fire spread into the community of Wynola. The Julian RAWS recorded winds at 9-17 mph with gusts at 16-30 mph between 0610 and 1210 hours. The fire spread to the northeast, killing a firefighter and destroying more structures. By 1610 hours, humidity increased to 50 percent, by 1810 to 80 percent, and by 2110 hours, it reached total saturation of 100 percent.

October 30th-November 4th

The air remained saturated with measurable rain falling by 0610 hours on November 1st at the Julian RAWS.

The maximum number of engines committed to the Cedar Fire was 722 November 1st-4th.

³ Temporal and spatial fire location relationships extracted from Division Chief Randy Lyle's narrative.

Command and Operations on the Cedar Fire

As the Cedar fire quickly escalated from a wildland fire to a wildland–urban interface fire, assigned leadership roles overlapped and were adjusted by necessity.

The OSC on the Cedar fire was assigned to develop plans for fire suppression actions on the east side of the San Diego River Drainage on October 25th. He coordinated forces that worked to secure the east side of the fire as fully as possible before the off-shore Santa Ana winds diminished and the on-shore winds began. Timing was particularly critical, since on-shore winds would likely push the fire north and east, into the areas between Julian, Pine Hills and Cuyamaca Lake.

As the fire began to expand with a high rate of spread and pushed down the San Diego Drainage and across the San Vicente Drainage, it entered multiple jurisdictions, adding further complexity to the incident. The Structure Branch Director (SBD), who normally has the responsibility to plan the protection of structures, was assigned duties for supervision and coordination of structure groups.

The decision to use the OSC on the east side of the San Diego River placed a heavier burden on the ICs and the Structure Branch Director. It further complicated the job of the Unified Commanders, as they took on the responsibility for developing suppression actions and contingency plans, along with their respective command responsibilities. Even though the firefighters on the ground were well coordinated at the Branch and the Division/Group level, it had an impact on the overall command and control of the incident for about 36 hours.

In the first 36 hours of the fire, suppression and evacuation efforts were heavily dependent on local knowledge. Local Chief fire officers are essential to effective initial attack, since they have knowledge of the local area and available firefighting resources. CNF Chief fire officers were reassigned to other fires in the Southern California region during this critical time. Both the Cedar fire IC and Division Chief (both CNF employees) are members of a Federal Incident Management Team. The Division Chief was IC for the team. In the late hours of October 25th, the Federal Cedar fire IC and a Division Chief were advised their team was mobilizing to manage the Old Fire. Other CNF Chief Officers had already been assigned to the numerous other fires in progress throughout the region. CNF and the GACC filled the order for the two team members, even in light of difficult local circumstances.

Later, as teams transitioned in other areas, some CNF Chief Officers were released or demobilized and became either assigned or engaged as structure groups on the incident within their own jurisdictional areas. CNF did not go below established “drawdown” levels prior to the start of the Cedar fire.

Firefighting resources functioned well independently, but fractured groups of resources impacted the effectiveness of overall command. As the incident's complexity grew, resources focused on individual area-specific tasks, which reflect protection of life as the highest priority. Communications did not flow between functional groups as they normally would have due to the rapidly evolving nature of the events.

As the fire progressed into additional jurisdictions, fire departments responded to the approaching fire front, increasing the fragmentation of operations. Some jurisdictions, including Miramar and San Diego City, initiated scouting and field observers. With the fast spread rate of the fire, other jurisdictions had little or no advance warning the fire was approaching.

The commitment of resources to structure protection and evacuation actions limited firefighting resources for perimeter control. Although perimeter control operations were sometimes uncoordinated, they were effective in many areas. For example, line was constructed and held in Poway and Julian, among other successes. Burnout operations were not always coordinated with adjoining forces because of radio communications problems.

Some structures were lost as a result of secondary ignition. Structures do not always ignite as the main fire passes, because its duration is relatively short and not always of sufficient intensity to initiate combustion. Often, airborne glowing embers accumulate on combustible areas of the structure, such as a wood shake roof, or on adjacent fences or furniture. Sustained heat from the glowing embers ignites these surfaces and spreads fire to the building. Firefighters were not always patrolling previously burned areas for secondary ignitions, as they often can do in other situations, as they were involved with urgent evacuation operations.

As the fire moved beyond the scope of incident command and control and progressed through multiple jurisdictions, assignments of local fire departments were tasked as organizational components (Branches and Structure Groups).

Radio communications problems exacerbated fragmentation of suppression operations efforts. Specific discussion on radio communications can be found in the radio communications section.

Two teams, one State Incident Command Team (CDF ICT 5) and the Federal Pacific Northwest Incident Management Team 2 (IMT 2), were assigned to the Cedar fire. CDF Team 5 transitioned in on October 26th and received a transition briefing from CDF Chiefs Maner and Barta at 1700. They assumed command of the Cedar Fire on October 27th at 0700 hours.

IMT 2 transitioned in on October 28th at 1400 with a briefing presented by Chief Hawkins and Forest Supervisor Fege. IMT 2 assumed command of Cedar East on October 30th at 0700 hours after the fire was zoned into Cedar East and Cedar West. The two IC's on the Cedar incident coordinated effectively and held twice-daily meetings. Planning proceeded well, with plans issued by operational period #2.

Planning and Logistics on the Cedar Fire

Planning, intelligence, logistics were in disarray for the first 72 hours of the Cedar Incident.

- Many resources on the Cedar Fire were unaware of the location of the Incident Command Post (ICP).
- Many resources on the Cedar Fire did not receive briefings from the team for the first 2 operational periods.
- When Incident Action Plans (IAPs) arrived at the line, they had little relationship to operations or distribution of resources on the ground. Resources did not always check in to the Incident Command Post and instead proceeded directly to the line, so their whereabouts were not known or documented on the IAP. Resources working within quickly evolving circumstances often changed their locations and activities based on immediate needs and changing priorities.
- Many resources on the Cedar fire did not receive relief or logistical support for the first 72 hours of the incident (food, fuel and supplies were acquired on their own or were provided by local citizens, departments, agencies, groups or vendors).
- The first IAP was produced on the morning of October 27th. However, many resources, assisting agencies and dispatch centers on the Cedar Fire went without an Incident Action Plan for 72 hours.
- During the initial stages (36-48 hours) of the Cedar Fire, in absence of organized operational briefings safety messages/briefings occurred between units at the Division/Group level down. In some cases, this information was provided over the radio.
- Once the first team was assigned to the Cedar Fire, the initial communication plan was not disseminated to ground resources.

Evacuation on the Cedar Fire

The Cedar fire quickly evolved into a wildland-urban interface conflagration. In a short time neighborhoods were threatened, and loss of human life went from a possibility to a reality. Operational priorities shifted to the protection of civilian lives and absorbed all available firefighting and law enforcement resources.

Evacuation notification to residents was issued primarily by door-to-door contact, or via loudspeakers on emergency vehicles. San Diego County utilizes the emergency broadcast system, but it was not activated as its use was deemed impractical at that time. The television notification system accommodates only a

limited number of characters. Since the fire was moving quickly, it was not possible to compose a message that would be applicable to all areas affected by the fire at the time. Messages would be inaccurate or untimely in a brief period, perhaps by the time the message was actually displayed. Given the late hour, after 0001 hours, it was likely few people were watching television.

Non-fire cooperators played an essential support role in evacuations. The American Red Cross did an outstanding job in their support function with 5,029 volunteers providing shelter support and assistance to displaced residents. The Red Cross established 12 shelters to aid residents during the incident. Four shelters had to be relocated when they were threatened by approaching fire.

A coordinated effort by San Diego County Animal Control staff and trained volunteers rescued over 3500 horses and 500 domestic animals. Animal rescues occurred during active firefighting, evacuation and civilian rescue operations and were coordinated through the Sheriff's Department. Animal rescuers set up their own shelters and utilized the 800 MHZ system for communications.

American Medical Response mobilized additional ambulances from outside the San Diego area. This relieved fire apparatus from EMS responsibilities and enabled them to resume firefighting operations.

The Paradise Fire

Initial Attack Chronology

October 26th

Initial attack resources were first dispatched to the Paradise fire at 0130 hours on October 26th. According to dispatch logs, a resident may have reported the fire prior to 2330 hours. Dispatchers believed this caller was viewing the Cedar fire, not reporting a new fire.

Another caller advised the fire was just south of the Harrah's casino on the Rincon Indian Reservation, within State Direct Protection Area (DPA). The first alarm dispatched closest resources including seven engines, a truck company, a medic unit, a local government Fire Chief, and one CDF Battalion Chief.

The recorded temperature at 0100 hours was 78 degrees. Relative humidity was under 10%. East winds blew at 35 miles per hour, with gusts to 45.

The first unit on scene, CDF Engine 3377 (E-3377), reported fire on both sides of Valley Center Road. The fire was burning on a mild slope just off Valley Center Road.

E3377 also reported that two houses were on fire, and that ten to fifteen acres were burning westward up a 30% slope toward Yellow Brick Road. E-3377 ordered an immediate need, closest resource strike team of engines. The five

engines still en route to the initial dispatch were diverted to the Yellow Brick Road area.

Battalion Chief 3317 (B3317) arrived at 0210 hours and assumed Incident Command. He ordered additional overhead, engines, crews and dozers. Because of limited resource availability, Monte Vista ECC could only provide two Type III engine strike teams, one Type I hand crew, and one Division Supervisor. Obtaining additional resources would require a request for assistance outside the local area.

The fire continued to move west with spotting of up to one-quarter mile ahead of the main fire. By 0230 hours, the fire was over 500 acres and growing rapidly.

The IC identified evacuation and rescue as the top priority, and perimeter control as second. The fire was to be kept east of Cole Grade Road, south of Pauma Heights Road, north of Fruitvale Road, and west of the Paradise Creek Drainage and the slope of Rodriguez Mountain.

At 0300, the IC conferred with CDF D3307 and CDF C3301. They ordered an additional 8 strike teams of Type III engines, 6 strike teams of hand crews, 4 strike teams of dozers, and 12 overhead positions.

The Paradise fire had serious potential. Based on the acreage of the first few hours, they estimated the fire would burn 10,000 acres within the first operational period. If the prevailing winds continued, it was expected the fire would move west into the Keys Creek Drainage, with spread to Hellhole Canyon and Rodriguez Mountain, also all within the first operational period. They ordered an Incident Command Team.

As on the Cedar fire, fuels were extremely dry. Heavy accumulations of drought and insect-killed brush and trees covered open areas. Major watershed areas and valuable agricultural resources including expansive citrus and avocado groves were at risk. Two major casinos in the area were crowded with patrons and guests, making evacuations difficult.

Predominantly, homes in the area were located on lots an acre or more in size. Over half the homes and associated outbuildings had less than the required 30 feet of vegetation clearance around their perimeters. Liquid pressurized gas (LPG) tanks were exposed.

After 0300, perimeter control efforts were initiated on the northeast section of the fire, and crews were able to provide a holding line from Valley Center Road to Rim of the Valley Road. Progressive hose lays and firing activities were employed successfully at the reservoir near the Miller Road extension between Paso Robles Road and Villa Sierra Road, and the forward spread of the fire was stopped temporarily.

Fire funneled through narrow drainages, pushed by the gusting winds, and structure losses continued. The engine companies were then directed to initiate direct suppression as the priority operation.

Fire Spread and Behavior Chronology

At 0600, conditions worsened as winds increased dramatically. The Operations Sections Chief redirected four engines to attempt to hold the fire from entering the Paradise Creek Drainage and moving upslope to the south. The units were in place and direct suppression efforts underway when the fire extended into the San Luis Rey Drainage, moving upslope to Rodriguez Mountain. Fire behavior was extreme, and surface fire flame lengths of up to 50 feet were observed. In brush stands where fuel was 20 to 30 feet high, flame lengths reached 100 feet or more.

A firestorm developed and moved south as 70 mph winds surfaced. The four engines evacuated the area and proceeded back to Valley Center Road and the North Lake Wohlford Road area. Sixty citizens were trapped by fire as they evacuated in vehicles. Engines provided protection as the fire passed. The firestorm progressed for nearly 20 minutes, cutting visibility to only a few feet. All resources were directed to North Lake Wohlford Road to rescue and protect people in that area. Spot fires developed over one mile ahead of the main fire.

Fire had spread in the upper Hell Creek area, the base of Paradise Mountain, Canal Road, and Bear Ridge, south of Woods Valley. Spot fires were reported on Guejito Road near Lake Wohlford, and in the vicinity of the Lake Wohlford Resort.

Suppression and Evacuation Operations

Several strike teams of engines arrived in the early morning hours and were directed to the Paradise Mountain area. Sunrise brought major runs to the south, up the main drainages.

Structure protection groups were assembled: the Cool Valley Group, Paradise Mountain Group, Woods Valley Groups, Fruitvale Group, Guejito Group, Hellhole Group, North Wohlford Group, and the Wohlford Resort Group. The fire moved faster than evacuations could be conducted for a few hours. Structure protection and evacuation activities continued throughout the day. Reduced wind speed combined with previously burned areas of lighter fuels may have helped limit fire spread and aided firefighting efforts.

CDF Team one assumed command of the Paradise fire on October 26th at 1400 hours. Twenty-four hour operational periods were established, and this staffing schedule worked very well.

The Santa Ana winds subsided on the evening of October 26.

October 27th

The first IAP (Incident Action Plan) was issued on October 27th. The IAP contained objectives reflecting the overall incident strategy and specific control objectives for the next operational period.

Evacuation operations were well-organized for Mt., Palomar, as evacuation plans had been pre-established for Palomar Mountain.

Significant damage to agricultural resources occurred, with losses estimated at 24 million dollars.

Direct mobilization of Fire and Law Enforcement resources from the Roblar 2 Fire to Paradise fire was a very important factor in gaining control of the incident, as was pre-staging of Incident Command Teams. The Operation Area Coordinator moved fire resources within the operational area to meet emergency needs.

The Otay Fire

The Otay fire started on October 26. Its cause is under investigation. The Otay fire was managed by a CDF Type III IC with supporting firefighters and equipment.

According to Mexican authorities (CONAFOR, Proteccion Civil de Baja California) on October 26, 2003, the Otay fire crossed the border sometime between 11:00 and 14:00 and burned 1822 acres in Mexico.

The fire burned in medium to heavy chaparral. A successful burnout operation was conducted from a fuel break completed 30 days before the fire along Proctor Valley Road. This fuel break was funded by a National Fire Plan Grant, administered by the US Fish and Wildlife Service (USFWS), and constructed by the San Diego Rural Fire Department and the USFWS.

No communities were evacuated during the Otay fire. One residence and five structures were lost. Several outbuildings were destroyed in Mexico. One hundred thirty-eight firefighters were assigned at the peak of fire operations, but the fire was successfully contained and most resources were released by October 28th.

IV. Incident Safety

“In November, 1966 the Loop fire started near the City of Los Angeles and spread over 2,028 acres of valuable watershed area in 32 hours; in just one minute of that period, the fire flashed up a narrow canyon and killed 12 experienced firefighters.” Excerpt - ***“Recommendations to Solve California’s Wildland Fire Problem”, Task Force on California’s Wildland Fire Problem, 1972.***

While post-incident review of matters such as operations, strategy, coordination, planning and policy are valuable, assessment of incident safety is absolutely essential. The safety and well-being of the public, firefighters, law enforcement, medical personnel and all others involved in emergency operations is, and always will be, of foremost importance. Accordingly, this discussion is presented first.

Summary

After 34 wildland firefighters lost their lives during the 1994 fire season, the five Federal wildland fire agencies critically reviewed Federal fire management policies and programs. Chief among their findings: the first priority in wildland fire management is the protection of life.

Accident and injury rates were surprisingly low for all personnel involved with the San Diego County fires, given the extreme fire behavior, complexity of the incidents, exceedingly long work hours, and sometimes fragmented nature of the operations structure. This is attributable to many factors, but it is primarily because safety is an integral, repetitive, and systematic part of regular training and daily fire service operations. At least two dozen civilians sustained injuries, but again, considering the scope and severity of the fires, these numbers are relatively modest.

In no way should these statements be construed to diminish the tragic loss of life and serious injury that occurred. Specific discussion of civilian and firefighter fatalities related to the Paradise and Cedar incidents is outside of the scope of this report. Investigation and review of those incidents is being conducted separately. It is important to establish, however, that due to quick and effective actions on the part of emergency personnel, and a high degree of public cooperation, thousands of lives were saved.

Potentially, more injuries and fatalities could have occurred. Evacuations and fire suppression operations were conducted under extremely difficult circumstances. While operations were generally safe, some responders did not have adequate safety equipment or training for incidents of this type. Communications and coordination difficulties compromised safety.

Safety Findings

Accident and injury rates were exceedingly low for all personnel, given the extreme fire behavior and complexity of the incidents. The skill, experience and management capabilities of personnel at the Division / Group level were significant factors in the prevention of mishaps.

Training and Qualifications

Non-fire personnel, including law enforcement, San Diego County Animal Control, the American Red Cross, and CALTRANS were instrumental in the success of incident operations. They were sometimes exposed to unsafe conditions for which they were not fully equipped or trained. Some did not have enough experience with large-scale wildfire operations to perceive the high level of risk associated with operations under the extreme fire conditions prevalent on the San Diego fires.

- Some deputies proceeded into areas that fire personnel had chosen to withdraw from, because conditions were deemed as unsafe.
- Law enforcement personnel and citizens drove through actively burning fire areas to reach evacuation centers.
- Law enforcement personnel implemented evacuations and road closures without adequate fire line safety training or essential personal protective equipment.

When the fire situation exceeded experience and training levels of structural companies and strike team leaders, they disengaged as a safety measure. Wildland firefighting and structure firefighting are distinct professional specialties. Federal wildland fire agencies receive intensive training in wildland and wildland-urban interface fire suppression, since such operations comprise the bulk of their duties. Local fire departments are primarily trained in structure suppression. CDF receives training in both areas. Each specialty has its own techniques, equipment and associated hazards. Consequently, local structure firefighters may not have a thorough understanding of wildland fire suppression tactics or safety; Federal wildland firefighters are not thoroughly versed in structure operations.

In North County, wildland fire training conducted prior to fire season for local government fire departments proved to be valuable. Firefighters learned important structure protection skills for use in wildland fire scenarios. The Camp Pendleton Fire School provided useful instruction and drills. Local training with simulations for the Hwy 67 Corridor was also well received. Joint training with Federal, State and local departments, hosted by the Lakeside fire department, proved to be useful as well.

There are differences between helibase management qualifications and certifications in CDF and the Forest Service. This caused issues related to the qualifications of contracted helibase managers.

Evacuations

Law enforcement personnel were valuable players in emergency response operations in the face a crushing workload, rapidly shifting priorities, and dangerous, stressful circumstances. Staffing shortages occurred at SDO substation.

In effecting evacuations, firefighters and law enforcement personnel conveyed potential life threatening consequences in an honest and effective way to residents. Rural residents who had experienced fires in the past took the initiative to evacuate the area, and took time to notify and assist their neighbors in evacuating. Others sheltered in place, and successfully defended their homes, often at great personal risk.

Incomplete or inconsistent communications between the Incident Command Post (ICP), law enforcement and firefighters caused uncertainty over evacuation areas and priorities. Officers were uncertain as to which areas had been evacuated, or those which needed to be either evacuated or closed. They did not always know the locations of shelters.

- In some cases, Fire or Law Enforcement personnel initiated evacuations at the Group level, rather than at the Branch level or above. In the fast-paced evacuation operation necessitated by the extreme conditions, these local independent actions saved lives. Real-time information regarding ongoing evacuation was not always communicated appropriately up through the chain-of-command, however, which caused some confusion.
- A similar lack of coordination and communication caused significant misunderstandings specific to road closures, area access restrictions, and authorizations for re-entry.
- No criteria for re-opening of roads or evacuated areas were issued.

Address numbers of many homes, particularly in rural areas, were either absent, not readily visible, or not adequate in size to be easily recognized by emergency response personnel. Identifying the access points to homes was also difficult in many situations, because the address marker was not always placed near the actual access point for the residence.

No pre-planned protocols or standards were established for flagging use or structure triage. Flagging is used by firefighters and law enforcement personnel to mark particular areas. Different flagging colors convey signals to other personnel (structure searched, not searched, civilians remaining, foam treated, fatalities, and evidence). Firefighters developed individual structure triage and flagging procedures during fire operations because of lack of preplanned protocols.

Emergency services personnel do not carry a comprehensive set of maps that cover unincorporated areas of the County. The maps that are used do not always

include all existing roads, particularly in the rural portions of the County or newer developments.

Radio Communications

Radio systems used by Federal and State agencies are incompatible with radio systems used by local fire departments, law enforcement agencies and animal control units. Incompatible communications systems caused a lack of coordination and poor information exchange. Response to real-time critical situations, coordination of evacuation operations, and timely filling of resource orders were all adversely affected.

Radio communications on the Cedar, Paradise and Otay fires were adversely affected by a number of factors:

- Traffic from international non-fire frequency users interfered with incident operations use.
- Federal and State agencies utilize Very High Frequency (VHF) frequency radio systems. Local fire and law enforcement agencies increasingly utilize 800 megahertz (MHZ) radio systems. Heavy use of the 800 MHZ system causes “busy outs”, effectively shutting the system down temporarily.
- Extended use of the Forest net as the Command Net on the Cedar Fire (8 days) adversely impacted both the ECC and communication capacity of the incident.
- Some repeaters on the CNF Forest Net had no fireproofing or vaults and were burned over. The CNF radio system infrastructure was in marginal repair before the fires started. Some repeaters had either not been installed or were not operational.

Effective management of emergency incidents depends heavily on functional radio communications. The “California Fire Assistance Agreement” States that each Strike Team/ Task Force Leader must be equipped with a VHF radio with a minimum of 32 channels. (Statewide Frequency Plan as published in ICS 420-1, Fire Service Field Operations Guide).

It is the responsibility of the jurisdiction sending apparatus to ensure that they have common communications capability with the Strike Team/Task Force Leader, but often apparatus were not equipped with compatible communications.

Local ground units entering into another agency jurisdiction were unable to reprogram radios (mobiles, handhelds and units from the cache) on the fire ground during initial attack. Recent changes in State policy have eliminated options for CDF resources to re-program radios.

In some cases poor radio communications with structure engines and strike teams impeded the ability of the wildland agency resources to coordinate

structure protection actions. When available and appropriate, “runners” were used as a substitute for radio communication.

Personnel utilized cellular phones to augment the poorly functioning radio system. Heavy levels of cellular phone use by both emergency personnel and the public overloaded the system, causing outages.

Several significant events highlight aviation communications deficiencies, including problems specific to breaches of the “virtual fence” between Cedar east and Cedar west; intrusion into the Presidential TFR by aircraft not compliant with pre-specified procedures; and termination of the incident TFR for Cedar east, Cedar west, and Paradise without coordination and adequate notification among the respective Air Operations Branch Directors (AOBD’s).

The initial attack pre-assigned air- to- air FM frequency was clear and effective. However, the new frequencies that were assigned for extended attack had numerous problems with interference from other non-fire frequency users, including international entities.

Thirty Mile Abatement Plan

Not all requirements of the “Thirty Mile Abatement” Plan could be implemented during the fires in San Diego County due to the imminent threat to life and property and the rate of fire spread. The Thirty Mile Abatement Plan was developed as a result of the safety review of the fatalities and injuries that occurred in July, 2001 on a wildland fire in Eastern Washington State. The requirements include such elements as fire entrapment training, the issuance of pocket cards, and stringent work/rest guidelines. The US Forest Service is the only California fire agency to fully adopt these requirements thus far. Their implementation has proved difficult on fires managed under unified command or within multiple jurisdictions where resources are committed from different agencies.

Work / Rest Ratios

Work hours among firefighters were excessive, particularly during the first 72 hours of the Cedar fire. Because civilian lives had been lost early in the incident, the Cedar IC directed firefighters to continue assisting the San Diego County Sheriff’s office with evacuation operations. Most firefighters on the Cedar fire worked 60-72 hours straight between October 26th and October 28th. By the morning of October 28th, sufficient resources had arrived to relieve firefighters, and evacuation operations were largely completed. At that time, firefighters were relieved of their duties for rest.

In spite of the long shifts, personnel managed fatigue in an effective manner. They monitored themselves and their co-workers for signs of fatigue, and implemented rest periods and breaks.

Weather Forecasts

National Weather Service forecasts and predictive services products were very accurate. Very few spot weather forecasts were requested. A fire weather meteorologist was requested by the team and arrived October 29th.

Airspace Management

Airspace was generally managed safely and efficiently. Management of air space over fire incidents in close proximity is complex. Monitoring and coordination of these aviation resources within the congested southern California airspace, particularly within the region of major airports and military facilities, requires a high level of technical skill and experience. Air space coordination was generally very good, with dedicated airspace coordinators and FAA representatives on scene. A few significant problems did occur, however.

“Virtual Fence” violations occurred repeatedly on the Cedar fire. The Cedar fire was zoned into two parts: Cedar east and Cedar west. Zoning is a fairly routine strategy implemented by the Forest Service to divide a large fire up into smaller, separately managed areas. A “virtual fence”, or landmark, was established to separate the two airspaces. This boundary between the zones improves aviation safety and permits the two areas to perform independently managed aviation operations.

The virtual fence between Paradise and Cedar was Highway 78, which worked well by most accounts. The virtual fence between Cedar East and Cedar west (the San Diego River Canyon) did not function as well, with numerous intrusions. In some cases, pilots may not have been fully briefed. In other cases, procedures for entry into the adjoining air space were not implemented or observed.

Presidential visits did not hamper fire operations. However, the Presidential TFR (temporary flight restriction) was violated. When the President of the United States travels, a corresponding TFR moves with him as a security measure. This TFR restricts all aircraft from flying within a 30 mile radius of the President. As the President moves, so, too, does the TFR.

In anticipation of the Presidential visit, the airspace coordination group established procedures for suppression aircraft flying within the TFR in coordination with the Secret Service and the FAA. Incident aircraft were permitted to continue suppression operations within the TFR, provided they utilized a specially assigned transponder code and communicated their movements on a specially assigned frequency.

During the President’s visit to the Cedar fire, multiple incident aircraft flew in violation of the TFR. Established TFR procedures, and the serious consequences of non-compliance, were not adequately communicated by key personnel at the Paradise and Cedar East and West Incidents. As a result, several aircraft entered the airspace and could not be identified by the FAA

personnel monitoring the TFR. This caused serious Presidential security concerns.

Airbase Security

Security at the Ramona Airbase Facility was not in compliance with current State or Federal standards. Security of aviation-related facilities and resources is of special concern in light of national security threats such as terrorism. Enhanced monitoring, access restrictions and other requirements are now in place at aviation facilities, as directed by the FAA and the Department of Homeland Security. Lack of adequate security at the Ramona airbase facility raised concerns about meeting new departmental aviation security policies. Egress and ingress to aircraft at the facility was not effectively monitored. Vandalism, theft, and unauthorized access to aircraft, airbase and runway areas were of significant concern. Although no security-related incidents were reported, new stringent security requirements must be met at all times.

Safety Recommendations

Training and Qualifications

- Develop and implement a wildland fire operations and safety training program for all agencies and departments that support fire incidents, such as SDSO, animal control, Red Cross, and CALTRANS. All emergency personnel should participate in regularly scheduled joint incident simulation exercises and drills. Disaster and evacuation planning, and accompanying simulations and interagency exercises, are needed at a variety of scales.
- Continue and expand training to target crew cohesion, situational awareness and risk assessment management for personnel who respond to wildland fire incidents.
- Develop a wildland fire-training program for all agencies/department that will be operating within or adjacent to the wildland fire incident. This program should provide initial and continuing training to those individuals responding to or in support of wildland fire incidents.
- Improve training and simulation exercises on wildland urban interface fire operations for local departments.
- Interagency training and simulation exercises like the North County, Camp Pendleton and the Highway 67 Corridor should continue on a regular basis. In some cases, interagency training/simulations would need to expand in scope and context.
- Agencies need to standardize qualification and certification requirements for aviation positions, at the state level.

Evacuations

- Personal protective equipment and other essential safety items should be furnished to and used by all emergency workers engaged in wildland fire activities.
- Develop a comprehensive plan for structure triage and protection standards to include identification protocols, such as flagging.
- Provide evacuation information in both English and Spanish.

Communications

- Explore options to utilize funding opportunities such as Rural Fire Assistance (RFA), Volunteer Fire Assistance (VFA) and FEMA Assistance to Firefighters grants to upgrade and standardize VHF radio systems for smaller local fire departments. Excess Federal and State VHF radios may be available to local fire and police departments.
- Rehabilitate and maintain the radio network on the Cleveland National Forest.
- Establish at least one cache in San Diego County for radios and related equipment.
- Continue to explore resolutions to excessive international non-fire radio frequency traffic.
- Develop a list of pre-tested extended attack FM frequencies for both air and ground operations that are clear from interference.
- Develop an aviation communications plan to address identified air-to-ground communications deficiencies.

Airspace Management

- Once virtual fences are established, boundaries must be carefully observed; procedures for entry must be thoroughly briefed to all pilots, and appropriately documented on form ICS 220.
- Establish standardized procedures for implementation of and compliance with Presidential TFR's. All aviation operations personnel must be adequately briefed. Air operations managers need to understand and appreciate the gravity of non-compliance and the serious consequences (including revocation of licenses) for pilots who are in non-compliance.
- Review conditions at the Ramona airbase facility to determine security deficiencies and needed improvements and fortifications.

V. Focused Areas of Review

“Wildland fires continue to take an intolerably heavy toll of life and property in California despite advances in technology and firefighting effectiveness. Much of the destruction by wildfire occurs within a few critical days each year when air temperature soars, relative humidity drops to near zero, and wind velocity increases to 50 miles per hour and more” - Excerpt, “Recommendations To Solve California’s Wildland Fire Problem”, Task Force on California’s Wildland Fire Problem, 1972.

The 2003 San Diego County Fire Review team was directed by the Regional Forester, Pacific Southwest Region, US Forest Service, Forest Supervisor, Cleveland National Forest, and the CDF San Diego Unit Chief to review a number of specific areas pertaining to the management of the Cedar, Paradise and Otay fires. The areas of assessment are:

- Wildland fire coordination policies and procedures such as the use of interagency aviation operations, qualifications, training, and certification procedures of the agencies involved
- Procedures, system and coordination with other organizations such as (but not limited to) South Zone Coordination Center, Riverside California, and the Southern California Multi-Agency Coordination Group
- Organizational management, leadership and the use of the Incident Management System model to address firefighter and public safety
- Pre-incident preparedness, including plans and agreements
- Environmental and social conditions which may have contributed to the severity and effects of the fires.
- Possible interagency strategies to reduce the probability and consequences of future catastrophic fires

The remaining sections of this report present findings and recommendations based on over 120 interviews with fire service personnel involved in the incidents, input from the stakeholder workshop held in November, 2003, and observations of wildland fire experts on the review team.

A. Wildland fire coordination policies and procedures such as the use of interagency aviation operations, qualifications, training, and certification procedures of the agencies involved

Summary

A large-scale, complex aviation operation was initiated for the Cedar, Paradise and Otay incidents. Aircraft resources were critical to suppression efforts.

No aviation-related accidents or injuries occurred. In considering the scope of the incidents, within the context of an extremely congested air space, sometimes hazardous weather conditions, poor visibility, and the dangers inherent in any aviation operation, aviation staff on the fires deserve recognition for their operational skills and attention to safety. A number of significant operational challenges were evident, however.

Inconsistent or outdated agency policies, lack of formal interagency agreements and training, and limited local, State and Federal coordination and planning are significant issues that should be addressed. Communications and coordination difficulties compromised safety to a degree.

Findings

Aviation Cutoff and Shutdown Policy

Aviation policies are inconsistent across agencies. Existing policies relating to aircraft “cutoff” and “shutdown” times between State, Federal, and local agencies are not consistent. State and Federal policies are each applied to different categories of aircraft. Local governments implement their own separate policy in regards to authorized hours of aircraft use. These inconsistencies may cause problems in interpretation in an interagency incident management setting. The distinction between “cutoff” and “shutdown” has been identified as an issue in need of clarification.

California State policy cutoff (in the context of an initial aircraft dispatch, with no air attack or helicopter coordinator already on scene) States that aircraft (planes or helicopters) may not be dispatched so as to arrive at an incident no later than 30 minutes before sunset. Cutoff is determined by referencing a standard table that provides these times according to the week within the year and the corresponding calculated time of official sunset.

Federal cutoff policy is consistent with State policy, except that it references only air tankers, and does not specifically address helicopter use. Air tanker dispatching procedures on the initial attack of the Cedar fire complied with current policy prohibiting dispatch after cutoff.” Air tanker cutoff, as articulated in Federal policy, relates to restrictions on the dispatching of air tankers in low ambient light conditions. Specifically, air tankers cannot be dispatched to arrive

at an incident earlier than 30 minutes after official sunrise, nor later than 30 minutes before official sunset, unless approved aerial supervision is on scene.

“Shutdown” is when all low-level aviation and single engine aircraft operations are shut down for the night. This is normally 30 minutes after sunset. Federal policy does not permit nighttime aviation fire suppression operations, nor does the State.

The Cedar fire was reported at 5:37 pm on October 25th. This was 3 minutes after aircraft cutoff. Accordingly, no aircraft resources were dispatched to the Cedar fire at that time, but instead were ordered for immediate use the following morning. San Diego County Sheriff’s office contacted Monte Vista ECC and offered the use of their helicopter for use for the incident, but the offer was declined due to interpretation of the “cutoff” policy.

County and City jurisdictions resources with fire suppression aviation resources sometimes implement other policies that permit nighttime aviation operations. These policies are not addressed in Federal or State mobilization guides. Because no agreements or standard operations are in place for the use of local aircraft on interagency incidents in San Diego County, policies for the use of these resources, including the hours of permitted operation, are not widely understood.

“No Divert” Policy

Implementation of the “No Divert” policy caused difficulties with aircraft use. State policy allows for an IC to request a “No Divert” on a specified number of aircraft if he or she “recognizes critical problems, such as safety of personnel, structures, or high values at risk, and has an urgent need for continued air support...” At that time, the specified aircraft will not be reassigned until the IC chooses to release them. The “No Divert” policy, as written, does not make a distinction between airborne aircraft or those resources held on the ground.

Aircraft under a “No Divert” were held on the ground for use in structure protection needs anticipated on another fire in the region. However, weather and visibility conditions prohibited safe operation on that fire, so aircraft sat idle on the ground. Other incidents with high need for aerial support, including the Cedar, Paradise and Otay fires had conditions conducive to aircraft use, but since the aircraft were on “No Divert” status, there was a delay in reassignment.

Use of Military Aviation Assets

Military resources are stationed nearby, and their use was advocated early on in the incidents. The US military has various aviation and other resources that are suitable for fire suppression operations. In San Diego County, Camp Pendleton maintains CH-46 helicopters with buckets, Miramar Marine Corps Air Station has CH-53 helicopters with buckets, and North Island Naval station has H-3 helicopters.

These heavy-lift helicopters work well for water-drop operations, but there are several constraints on their participation in wildland fire suppression operations. The Economy Act of 1932 limits the utilization of military assets prior to the complete use of all available civilian resources. Military aircraft utilize different communications that sometimes are not compatible with Federal, State and local fire agency communications systems.

Military pilots do not routinely receive specialized wildland fire suppression training that wildland fire aviators receive. This training includes wildfire suppression safety, strategy and tactics, and ground and airspace operations. However, military pilots usually receive some military training in the use of aerial buckets.

Additionally, in the case of Miramar specifically, personnel turnover due to deployments and transfers are somewhat prohibitive to the establishment of dedicated personnel trained specifically for wildland operations. These factors restrict immediate deployment of military assets to assist in wildland fire suppression activities.

There was considerable pressure and interest from elected officials and members of the public regarding use of military aviation assets from local bases. Military and USFS officials in Washington eventually authorized the use of military aircraft. At that time, mandatory training of pilots and crews was initiated.

Miramar aircraft were used on the Paradise fire late in the incident. After a two-day abbreviated tactical and safety training provided by fire agencies, they made 53 bucket drops on the fire. A dedicated helicopter coordinator was assigned to supervise the activities of the military helicopters

Helicopter pilots from North Island Naval station received abbreviated training from San Diego City and were available within San Diego City's jurisdiction, provided no interagency aircraft came into the city's airspace. However, these military aircraft did not engage in any suppression activities.

CH-53 flight crews advised the helicopter coordinator assigned to them was extremely helpful. However, military pilots are highly skilled in general aviation operations, and they expressed the training was too remedial with respect to pilot and general aircraft operations. They requested more specificity with regard to tactics, techniques and airspace coordination for future training.

The communications packages in the CH-53 and the H-3's military helicopters were compatible with wildland agencies communications systems.

Sharing of Aviation Resources Among Incidents

Coordination between air attack and lead plane was positive and effective to coordinate the sharing of aviation resources between the Cedar fire and the Paradise fire.

Recommendations

- Develop a consistent, easily understood aviation resource use policy for State and Federal agencies to address all categories of aircraft use under low-light ambient conditions.
- The current “no divert” policy, and guidelines for implementation need to be assessed. Any revisions would ideally make appropriate distinctions between airborne, actively working resources and those held on the ground, and provide guidance for multiple-incident scenarios.
- If the County chooses to pursue the option of using military resources, necessary pre-season preparations include:
 - Agreements
 - Training, including comprehensive classroom and field training. Existing California National Guard military helicopter training program is one suggested template.
 - Communications retrofit / augmentation, as indicated, for military aircraft
- Examine ways to improve operations and organization at shared helibases, specific to pilot briefings and preparation of daily assignments.

B. Procedures, system and coordination with other organizations such as (but not limited to) South Zone Coordination Center, Riverside California, and the Southern California Multi-Agency Coordination Group

Summary

There are 62 fire departments in San Diego County, but there is no countywide fire department. Twenty-seven percent of these departments are volunteer organizations. Overwhelmingly, local, State and Federal personnel stated that interagency relationships are congenial, positive and cohesive. However, these relationships are not always formalized with structured agreements. Inconsistent participation in interagency pre-season meetings, and inconsistency in the implementation of established policy and procedures hamper overall interagency coordination and effectiveness.

Management of these fires depended on the coordination between a number of entities. The Monte Vista Interagency ECC functioned well as a unified ordering point and expanded dispatch. The County EOC is formed only intermittently in times of emergencies and so its role was not clearly understood, by the wildland fire agencies. The Office of Emergency Services coordinates the Statewide mutual aid system for the office of the Governor and was invaluable in the procurement of resources from across the state. However, daily briefings with the OES Fire and Rescue Coordinator and local fire departments did not take place. Local departments did not have all the intelligence information needed about the incident status, available resources, or progress made towards its control

During initial and extended attack, resource ordering systems were overwhelmed. Resource ordering was cumbersome and sometimes delayed due to operational problems within and between MIRPS and ROSS.

Findings

Interagency Coordination in San Diego County

Interagency Relationships

Pre-fire interagency relationships were good across the County, but not always formalized with agreements.

Preseason Meetings and Exercises

Interagency pre-season meetings take place, but not always on a consistent basis, and are not attended by all cooperators. Preseason operations meetings have been effective locally and are a valuable forum for proactive discussion and planning prior to the season's start. They have been well-received on a local basis, with the Forest Service, CDF and some local government in attendance, but not all agencies have been represented or invited to attend meetings, and they are not consistently scheduled. The Forest Service and the CDF Unit Chief met this year for their annual operations meeting, but this coordination has not been consistent in the past. Meetings between the FS/CDF at the Division / Battalion chief level have been occurring on a regular basis.

Dispatch Procedures

The Monte Vista ECC functioned well as a unified ordering point and expanded dispatch. CDF, USFS and the OES Fire and Rescue Operational Area are located at this center. Orders for Forest Service or California Department of Forestry were made through the center and local government resources were ordered through the OES Operational area.

The "closest resource" dispatch protocol is not consistently applied in San Diego County by the Monte Vista ECC with all four zone dispatch centers that dispatch local government resources. The "closest resource" protocol directs that regardless of agency jurisdiction for an incident, the appropriate resource closest to the fire is dispatched to respond for initial attack.

Failure to implement the closest resource concept is particularly evident as it relates to the tribal fire department, paid on-call local firefighters, and volunteer departments. One primary reason is that the availability of these resources is inconsistent, and initiating their response to an incident is sometimes protracted with delays on page responses, etc. In cases where immediate incident response is critical, dispatchers will utilize resources that, although they are not truly the “closest resource”, are readily available to respond to a call.

Some agencies held on to resources operating within their own jurisdictions and continued to use them outside normal incident management control. This action limited the Incident Management Teams’ ability to manage the overall incident and provide support, briefings and direction.

There continues to be reluctance to order/assemble/receive operational resources in “task force” configuration. A “strike team” is an established number of resources of the same type – crews, engines, or dozers - with common communications and a leader. A “task force” is a set of mixed resources in any configuration, such as a crew, a dozer, and an engine, assembled for a specific purpose, with common communications and a leader. County agencies are not accustomed to using resources configured as a “task force.”

Drawdown Levels

All San Diego unit CDF engines were in San Diego County when the Cedar and Paradise Fires started. Engine resource levels for the US Forest did not go below drawdown prior to the start of the Cedar Fire.

Briefings

Daily briefings with the OES Coordinator and local fire departments did not take place. Local departments did not have all the intelligence information needed about the incident status, available resources, or progress made towards its control. The Office of Emergency Services coordinates the Statewide mutual aid system for the office of the Governor. The role of the OES Fire and Rescue Coordinator, who is elected by County fire chiefs, is significant in that it provides an important communications link to local fire departments.

County Emergency Operations Center

The County EOC (Emergency Operations Center) is established as a temporary operating facility in times of major disaster. It is a tremendous resource that was not fully utilized during these fires. It is organized, staffed and maintained by interagency personnel to coordinate strategic management decisions for the overall incident at the County level. Intelligence gathering and dissemination is a primary function of the County EOC. The County EOC coordinates with jurisdictions within the County to provide logistic support as requests come in.

The County EOC did not initiate sufficient intelligence gathering actions. They did not have all the information needed for proactive or anticipatory logistical support.

The role of the County EOC was not clearly understood, especially by the wildland fire agencies. During this series of fires, most fire departments were not represented at the EOC, with the exception of CDF, which had a representative present for a few days. One difficulty with the County EOC concept is that this unit is formed only intermittently in times of emergencies. Roles, responsibilities, and overall functioning may not be well understood or routinely practiced. Recent Countywide drills had been useful in familiarizing staff with EOC functioning, however.

Interagency Coordination between San Diego County and South Zone Coordination Center and the Southern California MACS

The fires in San Diego County started late in the Southern California 2003 fire siege and the timing influenced incident management team response, mutual aid responses and the availability of local personnel.

Mutual Aid

Firefighting resources from outside jurisdictions began to arrive in San Diego County on October 26 at 0004 hours. By 0410, OES had supplied 12 strike teams of engines from outside San Diego County. OES also requested 100 engines from Arizona and Nevada for use in San Diego County.

The San Diego County area is sometimes referred to as the California “Cul-de-sac.” Resources are often staged first for incidents in and around the Los Angeles Basin, because Santa Ana wind events usually start in the Santa Clarita and Cajon Pass areas, and then move south. Resources can be (and often are) depleted by the time San Diego County requests them. There was a concern that adequate resources would not be moved up to support the County in a timely manner.

Resource Ordering Systems

During initial and extended attack, resource ordering systems were quickly overwhelmed, and in many cases resources were obtained by bypassing dispatch, and in some cases, contacting needed resources directly. This worked effectively when resources were urgently needed. However, tracking, coordination and control of resources was impacted on the overall incident. Payment, reimbursement, and other issues were further complicated.

Some agencies expressed that resource ordering was cumbersome and sometimes delayed due to operational problems within and between MIRPS and ROSS. The Multi-agency Incident Resource Processing System (MIRPS) is automated resource ordering software designed through collaboration between CDF and Region 5 of USFS.

MIRPS is used throughout the CDF command & control infrastructure and USFS Dispatch Systems in California. MIRPS provides for notifications, resource status displays, resource ordering, and database reporting.

ROSS was established in 1997 and automates resource ordering, status tracking, reporting, and notification processes on a nationwide basis in near real-time. The development of ROSS is ongoing with some enhancements yet to be incorporated.

The National Interagency Coordination Center (NICC) and all of the Geographic Area Coordination Center (GACCs) began use of ROSS in spring of 2003. California GACCs utilized ROSS to interface with NICC for out-of-state resources, but maintained MIRPS as the official system for use in California. As a result, it was necessary for personnel at the GACC to manually transfer information between MIRPS and ROSS. Eventually, ROSS and MIRPS will be integrated to function seamlessly. During the 2003 fire season, however, the systems were not fully integrated.

These separate ordering systems caused delays as systems became overloaded. Procuring goods and services for essential support, such as food, sanitation facilities, and water, became difficult.

Area Coordination

The USFS and CDF established a 5-person Area Coordination Team to assist the County with resource coordination, effective the evening of October 29th. This team also participated in twice-daily MAC calls held by the OCC in Riverside.

Recommendations

- The Operational Area Fire and Rescue Group Coordinator should provide a daily resource availability status summary to all four zone dispatch centers.
- All involved agencies should provide a standing representative to the County EOC during major wildland fires that affect multiple jurisdictions.
- Continue early pre-staging of resources during periods of high fire danger.
- Streamline procedures for use of local contracts to procure resources such as sanitation facilities, caterers, water tenders, and other essential services that are readily available. Develop local incident support capabilities.
- Create a local MACS Coordination Group for the greater San Diego County area, established by the OES Fire and Rescue Coordinator. The MAC group would represent all departments and agencies with fires burning within their jurisdictions. Operational plans would establish triggers for activation of the MAC based on fire activity and current resource drawdown levels.

C. Organizational management, leadership and the use of the Incident Management System model to address firefighter and public safety

Summary

Some agencies get more practice than others in the application of the Incident Command System during large scale, multi-jurisdictional incidents. Large wildland fire agencies that routinely respond to large interagency incidents on a regular basis are well-versed on the workings of ICS. Smaller or more localized fire agencies use ICS for smaller-scale incidents, so they are less accustomed to its use on a large scale and over extended periods. Law enforcement and support agencies were also less familiar with the functioning of ICS.

Wildland firefighting responsibility is apportioned through a Statewide agreement into Federal, State, and local areas of responsibility. In cases where lands are intermingled, these lands are divided into practical Direct Protection Areas. These areas are delineated by boundaries regardless of statutory responsibility, and this protection is assumed by either the Federal or the State firefighting agencies. As fires moved through different responsibility areas, command structures were fragmented. As with other areas of review, communications difficulties diluted the effectiveness of the command structure.

Findings

ICS Implementation

Poor communications and a lack of leadership hindered full ICS implementation. There was no incident wide command structure in place until 0700 on August 27th, when CDF Incident Management Team #5 assumed command of the incident. During the initial phase, when the command structure was fractured, functional groups in localized areas functioned independently, conducting operations as prioritized locally. ICS, albeit on a smaller scale, was well implemented.

Some personnel (including law enforcement and support personnel) did not fully understand the functioning of unified command and corresponding roles within the ICS organization. There are some differences in the way that law enforcement interprets and implements ICS, and differences in system terminology caused some misunderstandings at the field level.

“Zoning”

Zoning the Cedar fire resulted in roles and responsibilities that were unfamiliar to personnel on the incident. Zoning fires is a practice that is sometimes used by Federal agencies, but CDF is not universally comfortable with this strategy and it is not a recognized ICS practice. Creating zones within the Cedar Fire exacerbated communications difficulties, since a fire that was once managed as one unit was now being managed as two discrete units, with distinct boundaries,

communications frequencies, and command structures. Zoning addresses difficult span of control issues, theoretically making the fire more manageable as two separate and smaller units, but it also effects a rapid organizational change.

Air Operations

Verbal communications among the three Air Operations Branch Directors (Paradise, Cedar east and west) were not fully effective, and critical information was not shared in a timely manner. In this increasingly complex fire suppression aviation operation, personnel task assignments, geographic locations, and chain of command changed rapidly. The means to effectively communicate these changes, using a communications system that was already strained and in some degree of disarray, was further compromised.

The Cedar west fire shared a helibase with the Paradise incident. The Paradise fire helicopter operations were co-located with Cedar west because this incident was not utilizing a large number of aviation assets and suitable base locations were at a premium. This arrangement also seemed logical since the Paradise fire was intermittently borrowing helicopters from the Cedar west fire.

Co-locating helibases offers certain logistical advantages when large incidents occur in close proximity, but this strategy posed problems with regards to pilot briefings and important communications. Briefings for both incidents were held jointly. Pilots received both sets of daily briefing documents simultaneously. Assignments were not always made immediately. Sometimes pilots were assigned to the Paradise fire, sometimes to Cedar west. Because both fires were large and complex, assimilating all tactical and safety information, making needed adjustments on communications equipment, and ensuring critical information and details were incorporated into operations was difficult and gave rise to several communications problems.

Recommendations

- San Diego County agencies and departments should operate under the FIRESCOPE Incident Command System as the single incident management system. Specific needs and concerns of agencies and departments would be addressed through regular coordination and operations meetings.
- In preseason meetings, formalize the use of multiple ICS Branches (using local jurisdictional agency as the Branch Director) when developing the incident organization for rapidly spreading wildland fires through multi-jurisdictional environments. Use pre-determined agency/department contacts under unified command. All agencies and departments should participate.
- When possible, co-locate the Incident Command Post and base camps established for law enforcement coordination. Catalog their locations.

- Local, State, Tribal and Federal agencies along with cooperators, should meet minimum CICCIS (California Incident Command Certifications System) standards for wildland fire operations. Appropriate training for local government resources through CIICS should include S290, Intermediate Fire Behavior and S205, Fire in the Interface.
- Training is needed for all participating emergency management agencies on ICS qualifications and certifications.
- Develop written clarification of aviation roles, responsibilities and procedures when incidents are divided into zones
- Take advantage of all agencies' capabilities and implement the ICS organization (at the Command and General Staff) during either complex or rapidly expanding incidents as staffing qualifications and skills allow.

D. Pre-incident preparedness, including plans and agreements.

Summary

Preparation for large-scale civil disasters of any kind requires a high degree of interagency planning and coordination. Administrative and operational agreements, policies and procedures must be established and understood by all cooperators. Roles and responsibilities require definition and concurrence. This effort requires dedicated time for interagency meetings, training and briefings. Effective pre-incident planning requires an equitable and consistent level of commitment and participation on the part of all cooperators. Many jurisdictions and organizations play roles in emergency response operations in San Diego County. Cohesive, well-organized multi-agency pre-incident planning and coordination is critical to the success of future emergency response efforts.

Several Statewide interagency agreements are in place relating to wildland fire emergency response. Three of these agreements were of particular significance during the Cedar and Paradise fires. The Cooperative Fire Protection agreement and the California Fire Assistance Agreement, and the Master Mutual Aid Agreement are of particular significance as the primary statewide agreements that govern interagency wildland fire operations.

At the local level, the Mutual Aid Agreement for San Diego County is current and is signed by all fire departments. This agreement provides for mutual aid within the County at no cost. The local operating plan, which implements the Cooperative Fire Protection Agreement was not updated and signed this year, but is understood by the affected agencies.

Findings

Aviation Hazard Maps

Aviation hazard maps were not readily available for the incidents. These maps aid pilots to identify hazards in a given area, particularly those for low-flying aircraft, such as power lines, towers, etc.

Agreements and Procedures

There are no current mutual aid agreements, standard operating procedures, or well-understood, consistently applied guidelines for use of local government aviation resources on interagency incidents. The San Diego City fire department leases a helicopter for search and rescue and fire-related missions. Under current internal operating guidelines, the helicopter is released each night and re-ordered for the following operational period. Additionally, it can be re-directed from a mission, as needed, for County-wide search and rescue. These and other operational guidelines are not fully understood by cooperators and dispatch centers and may have led to underutilization of this resource.

San Diego County Sheriff's Department (SDSO) has six helicopters that are primarily used for law enforcement and search and rescue. They are intermittently also used for fire suppression. Not all of the pilots are certified for fire missions. This resource may also be underutilized since there are no standing agreements for dispatching or use, and SDSO operational procedures are not fully understood by cooperators or local dispatch centers.

Reservation communities and adjacent fire departments are uncertain about the jurisdictional authority for evacuation nor do they have knowledge of any existing emergency response plans for those areas.

Planning

San Diego County has a comprehensive disaster plan, but lacks a coordinated, detailed evacuation plan. There is no coordinated emergency resource mobilization plan.

County Agencies have emergency operations plans that are not readily referenced, not sufficient in detail, nor widely reviewed or understood by personnel or citizens. These manuals are not convenient for use in field emergency situations. Information is not updated and does not contain sufficient detail for coordinated field operations.

Intelligence and Information Sharing

Emergency dispatch centers (managed by the State and Federal wildland fire agencies, local governments, and the San Diego County Emergency Operations Center) did not effectively share information and intelligence. Such intelligence includes accurate and timely information about fire movement, suppression and/or evacuation operations underway, resource status and location, and other categories of information pertinent to fire suppression and/or rescue operations.

Some excellent maps were developed by the County EOC, but these were not effectively utilized by the incidents.

Recommendations

- Current aviation hazard maps need to be jointly developed for San Diego County and be readily available. Multiple copies should be on hand.
- Develop cooperative agreements between wildland agencies and San Diego City and SDSO. Take steps to ensure respective operational guidelines are understood to facilitate full use of the resources when they are available.
- Ensure Tribal residents and adjoining fire departments assign responsibilities and pre-plan procedures for evacuation.
- Review and update the local operating plan. Assess the need for additional cooperative agreements to formalize local response to incidents.
- Develop a greater San Diego County area communication plan for emergency response that is consistent with the California Fire Assistance Agreement. Incorporate radio communications guidelines in the FIRESCOPE ICS-420-1 Field Operations Guide.
- Wildland fire agencies should work with the San Diego County Emergency Operations Center to development of a plan for timely distribution of intelligence information.
- Establish coordinated Countywide mobilization plans for emergency incident management and response. Plans should encompass all risk management and represent the needs of all agencies and departments.
- Expand the coordinated countywide evacuation plan to be administered by the Sheriff during emergency and disaster operations that includes all agencies/departments that engage in related direct incident response or secondary support activities. This plan should be specific and detailed, well organized, readily available and easily referenced to provide adequate direction to both staff and field personnel. Pre-incident review of and familiarity with evacuation plans should be encouraged. The evacuation plan ideally would be part of the comprehensive County disaster response plan. Elements of this plan could include:
 - All-Risk (Training for different kinds of disasters)
 - Communication
 - Early Alert Systems
 - Evacuation and Rescue
 - FIRESCOPE ICS
 - GIS/Mapping Products

- Joint Public Information
- Mobilization Guide
- Training
- Wildland Fire Response

E. Environmental, biological and social conditions which may have contributed to the severity and effects of the fires, as well as those which may have prevented / mitigated fire's effects.

“Adding to the complexity of the wildland fire problem are the many subdivisions, individual homes, and recreational developments located in the hills and mountains. People build homes there because it is more attractive than living in large urban areas. Unfortunately, despite recent efforts by State and local governments to impose fire safety regulations on such home sites, wildland residents rarely prepare for the inferno that can sweep through volatile brush and timber and destroy their homes in minutes”- Excerpt, “Recommendations To Solve California’s Wildland Fire Problem”, Task Force on California’s Wildland Fire Problem, 1972.

Summary

The overall environmental and biological factors that contributed to the 2003 San Diego County fires are easily identified: long-term drought, dry, extremely windy conditions and the accumulation of dense, drought and insect-killed fuels in open spaces and undeveloped areas adjacent to urban development.

Discussion and analysis of wildland-urban interface fire events must include investigation of social factors that influenced the final outcomes of the incidents. It is critical to assess the level to which the community and government recognized, acknowledged, and prepared for the event of wildfire. This includes consideration of urban development patterns, construction types, and level of awareness and preparation on the part of residents and local, Federal and State governments. In some areas, lack of appropriate planning and preparation contributed to poor outcomes. In other cases, social factors played a key role in limiting fire-related damage and saving lives.

Social conditions contributing to the fire's effects are not as easily summarized. Residential developments in San Diego's wildland-urban areas are generally rather high in density. Newer developments reflect contemporary building codes, and are constructed with less flammable materials such as tile roofs and fire resistant sidings. Older developments and homes in rural areas were built in accordance with older, less stringent codes, and are not generally as resistant to fire, although some homes have been retrofitted with fire-resistant materials.

There is a comprehensive awareness of the threat (and historic regular occurrence) of wildfires on the part of residents and local officials. However, fire-related considerations have not been well integrated into community planning,

general government and public preparedness, and the behaviors and lifestyles of residents.

Findings

Land Use and Development

Within San Diego County, there has been significant structural development in the past 20 years without an appropriate level of emphasis on wildland fire protection planning. This trend is similar in many other communities in the western United States, where urban areas are increasingly spreading outward to border, or expand into, wildland areas. Appendix B includes a comparison of the number of houses within the Laguna Fire imprint in 1970 and the current amount of development. This analysis is based on data provided by the County of San Diego. According to county records there was an increase of over 9217 residences within this perimeter, a fivefold increase in a 34 year period.

With regard to the planning and development of communities, general areas of concern include inappropriate construction materials, such as shake roofs and wood sidings; developments situated within topography that increases vulnerability to fire, decreases their defensibility, and makes evacuations difficult; insufficient egress and ingress for neighborhoods and communities in proportion to population density; lack of greenbelts or vegetation clearances; and the use of landscaping plants that are not suitable in a fire-prone environment, such as eucalyptus trees. An analysis of both the influence these factors is also included in Appendix B.

Flammable Landscaping

Eucalyptus trees contributed to fire spread. It is well documented that eucalyptus does contribute to long-range spotting in large fires. The composition and shape of eucalyptus leaves make them float aloft readily within a fire's convection column. They are caught by winds and flutter to the ground, while still smoldering, to cause spot fires. The shaggy, hanging bark shards on eucalyptus trees and excessive ground litter generated by this species also adds to fire spread. It was observed during the Cedar incident that where debris had been removed under younger stands of eucalyptus, fire did not move into the tree crowns.

It is difficult to eradicate eucalyptus trees once they have become established. Damaged or burned trees will re-sprout vigorously from the base of the trunk. After a widespread cold snap in the San Francisco Bay Area in the 1970's, thousands of frost-killed eucalyptus trees were cut down on the University of California, Berkeley campus. Because residual stumps were not treated with herbicides, most of these trees re-sprouted and have grown back to their former size.

Open Space Management

There are extensive undeveloped open space areas throughout San Diego County. These areas include Federal, State and private lands, as well as those

managed by the County. Because these areas are important plant and animal habitats, they are conserved in accordance with Federal, State and local laws. In addition, preserving these lands helps to protect cultural resources. There are over 10,000 recorded archaeological sites in San Diego County, more than any other County in California.

Open spaces and preserves also provide recreational opportunities and are visually pleasing to many in the community. However, these open space areas provided a significant source of fuel for the 2003 fires. Because these corridor areas often cut through or closely border urban developments, they carried fire into neighborhoods. There is a strong correlation between structures lost in relation to distance to open space. This analysis is contained in Appendix B. Vegetation management in these areas is critical.

Environmental Policy

When implementing certain actions that can affect the environment, State and Federal governments must comply with a number of regulations, including various environmental laws and their specified administrative procedures. This includes the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). These laws require varying degrees of project analysis and opportunities for public participation. These laws provide an important element of oversight to government activities, and provide for set procedures and timelines for analysis documentation, public comment, and appeals.

Depending on the type and location of the project, fuels management work is subject to the requirements of these laws. Environmental compliance laws are somewhat complex and sometimes delay the planning and implementation of hazardous fuels treatment projects within the County. Prescribed mitigation requirements, such as steps necessary to protect species or limit emissions into the air, sometimes limit the scope and effectiveness of prescribed fire and other fuels treatments.

Closure Policy

Closures of Southern California National Forests, Public Lands, and State and local parks and other recreation areas during extreme fire danger are one way to help prevent ignitions and protect the public. Closure guidelines among and between agencies are inconsistent and often plans and their protocols are difficult to understand or easily implement.

Forest closure and use restriction protocols have been established for the Cleveland National Forest. Closure implementation guidelines are based on two criteria: the burning index (BI) and live fuel moisture levels. Guidelines for BI and fuel moisture thresholds differ by fire management analysis zone (FMAZ). FMAZ's are administrative areas delineated within the Forest and are used for

fire management and planning purposes. The plan guidelines allow for closure of discrete FMAZ's, or for a full Forest-wide closure.

The closure plan also States the Forest Supervisor may exercise the discretion to declare a closure if Red Flag wind warnings are in effect (25 mph+ winds) and large, multiple fires off-Forest had depleted fire suppression forces substantially. Hunting, as a specific activity, is regulated exclusively by California Department of Fish and Game (CDF&G). The US Forest Service can and has closed the Forest to all users under the Fire Restriction and Closure Plan guidelines, but the agency does not have the authority to close the Forest only to hunters.

On occasion, during periods of extreme fire danger, public access to National Forests may be prohibited or restricted temporarily to prevent human-caused fires and to protect visitors. Generally, on most Federally-managed Forests, parks, and public lands, closure is implemented as a last-resort measure, and the CNF's Emergency Closure Plan reflects this overall philosophy. It states "...closures will be implemented as a last resort when there is no other option available to protect Forest resources and provide for public safety."

Recommendations

"The only alternative to planned and managed vegetation patterns in Southern California appears to be the acceptance of great economic damage, threat to human life, and the unpleasant aesthetic and environmental effects of unmanageable wildfire"- Excerpt. Can Southern California Wildland Conflagrations Be Stopped? USDA Forest Service General Technical Report PSW-7. 1974

- Adopt the vegetation management and the codes and ordinances recommendations from *Mitigation Strategies for Reducing Wildland Fire Risks*, a report presented to the San Diego County Board of Supervisors on August 13, 2003.
- Study the possible correlations between introduced plant species and wildland fire, including studies to determine the extent to which eucalyptus may contribute to fire propagation, spread, and structure loss. Develop vegetation layers for GIS analysis, including locations of eucalyptus trees, to further research in this area.
- Local scientists and researchers, land managers and fire management experts should explore methods to manage open space corridors and preserve areas adjacent to developments. The group would research optimal methods to manage vegetation while preserving view sheds, and sensitive species, habitats, and other resources set aside for conservation.

- Comprehensive fire and fuels planning must be integrated into preserve system management. Such plans should adequately consider periodic drought conditions and accompanying extensive mortality of native vegetation. Also, they would incorporate considerations for the dynamics of vegetation communities on the landscape-scale, including creation and maintenance of appropriate age classes and edges; and appropriate management of Forested areas. Additionally, vegetation management strategies must be formulated that prevent or minimize the proliferation and spread of non-native annual grasses, which can pose an even greater fire hazard than native vegetation.
- A broad suite of fuels management options should be assessed, including mechanical treatments, grazing, and prescribed fire treatments. The County Parks Department and the Department of Planning are currently drafting management plans for the Barnett Ranch and San Vincente preserve areas that include fire management as a central topic.
- Large-scale, cross jurisdictional fuels management is needed as part of a County-wide fuels management plan. Building and weed/brush abatement codes need to be standardized and uniformly enforced. Unmanaged open space areas need assessment and appropriate treatment.
- Develop consistent fire-hazard closure guidelines for Federal, State, and local open space areas and parks within the region. Make closure plans simple and straightforward, with guidelines that are based on easily measured thresholds. Accommodate a wide degree of managerial discretion in closure orders.

F. Possible interagency strategies to reduce the probability and consequences of future catastrophic fires

Summary

A number of interagency efforts are required to reduce the probability and effects of future large fires in San Diego County, and have been previously discussed throughout this report. These efforts require consistent communication, coordination and collaboration. Throughout interviews and research, the Review Team found that officials from all agencies characterize interagency relationships in San Diego County as cordial and productive. These positive relationships provide a solid foundation for the establishment of structured, cohesive interagency readiness and prevention efforts, including regular training, planning and coordination.

Interagency efforts must also focus on public information, perceptions, and education. Residents of the wildland-urban interface must be informed, involved, and proactive in the effort to prevent fires and to lessen their impacts when they do occur. The media is a primary source of information for most residents.

Interagency partnerships in the establishment of productive relationships and efficient systems of information transfer to local media outlets are essential.

Agencies must work together to continue to build on strong relationships with the communities they serve. This requires efforts to initiate regular, timely communications with the public. Existing positive relationships with the public serve as a strong foundation for joint efforts to find and implement strategies for wildfire readiness and prevention. Community-based efforts underway, including activities of FireSafe Councils, indicate the public's increasing understanding of the wildfire threat and their willingness to take proactive measures to protect their families, neighbors and homes. These community-based activities must be encouraged and supported.

Findings

Interagency Strategies

San Diego County lacks a Local Type II Team that can be assembled on short notice. Type II teams have been assembled in the past, but proved difficult to fully staff with qualified personnel, so teams were re-configured with A, B and C designators and are teams for the Cleveland, San Bernardino and Angeles National Forests. The ABC Teams are on rotation and can (and often are) dispatched to assignments to the Los Angeles or San Bernardino areas. Additionally, they are not as readily mobilized as compared to an established, local type II team.

Media

Local media, such as newspapers, TV and radio stations, are extremely important links to the community during large-scale disasters such as the Cedar and Paradise fires. Media coverage was extensive, particularly in local newspapers.

Many media reports were very positive, and information proved very useful to the community; others were very critical, and not based on accurate facts. In interviews with personnel on the fire, the review team found that inaccurate media reports hit especially hard and caused frustration. Inaccurate reports about firefighter fatalities were especially stressful for firefighters and damaging to morale.

Difficulty with communications and information within the fire command, staff, and dispatch and field operations structure has been highlighted. The media also had difficulty the obtaining accurate, timely information. A lack of consistent, coordinated and unified media relations hampered the flow of accurate, consistent, timely, and complete information to the media, and ultimately to the public. There was no unified response to, or coordination with media outlets.

Negative and inaccurate reporting indicates media representatives would benefit from appropriate training and education on fire operations.

Public Perceptions

In interviews with members of the public, the Review Team found that citizens directly impacted by the fire are skeptical about the fire departments' accounts of events during the fires relative to initial and extended attack suppression and rescue operations. They expressed that a lack of understanding behind the rationale for tactical decisions or the placement and deployment of resources. They posed many questions and raised concerns on a number of fronts relative to certain aspects of fire suppression operations. Some residents expressed that local fire departments did not convey realistic assessments about the survivability of their homes. They in turn perceived their homes were safer from fire than was actually the case.

The public's assistance to firefighters, such as providing meals and drinks, general cooperation, and other support, was significant.

Public Education

The Greater San Diego Fire Safe Council has great interest in participation in public education efforts, a larger number of public education officers and the development and funding of public service announcements.

The public does not fully understand which agency has the authority and responsibility for evacuation orders and operations. There is misunderstanding regarding "voluntary" evacuations versus those deemed "mandatory." Fire agencies were unsure of their authority, if any to implement "mandatory" evacuations.

Some homeowners chose to "shelter in place" – remaining at their residence to defend it and their belongings from fire. Many did not appear to have pre-planned defense actions, plans for contingency, or appropriate personal protective equipment. Their homes often did not have pre-existing defensible space and other fire-preventative features as promoted by FireSafe or FireWise.

Recommendations

Interagency Strategies

- Conduct multi-agency, County-wide disaster drills annually. Encourage wide participation from fire and law enforcement agencies, as well as agencies such as CALTRANS, animal control, Red Cross, and other support functions.
- Examine different methods for wide-scale community notifications systems, such as reverse 911.
- Continue local interagency meetings at the ECC, Engine Company, Battalion, Division and Command and Executive levels.
- Develop a local interagency Type 2 Incident Management Team (in short team configuration) for the greater San Diego County area for rapid response.
- Develop a comprehensive GIS- based Countywide mapping system available for all agencies and departments during emergency and disaster response and planning. Products would include large strategic planning capabilities and tactical maps.
- Establish a Countywide task force to evaluate San Diego County radio communications issues.

Media

- Coordinated pre-season informational seminars for the media could provide information on safety, operations, and contacts for media inquiries. Abbreviated seminars have been conducted annually in the past, but attendance by local press has been inconsistent.
- Establish a Joint Information Center for all incident management agencies in San Diego County, such as the system implemented by the San Bernardino Mountain Area Safety Task Force. Develop a media communications Operating Plan to serve all the stakeholders during emergency response activities.
- Review and develop opportunities to enhance intelligence-gathering capabilities, including new technologies that reduce exposure to risk, such as remote cameras, satellite information, enhanced aviation-based remote sensing, etc .

Public Perceptions

- Local fire service personnel should engage in post-fire outreach to the community to discuss the incident and answer to the public's questions and concerns.
- Fire departments should provide realistic assessments about home and community survivability and should continue to assist homeowners in finding and implementing strategies to make them more defensible.

Public Education

- Adopt the public education recommendations from *Mitigation Strategies For Reducing Wildland Fire Risks*, presented to the San Diego County Board of Supervisors, on August 13, 2003.
- Educate the public and media about opportunities for, and constraints on, using military resources in wildland fire operations.
- Continue efforts to educate the public about the need for defensible space around homes, and the flammability of local and exotic vegetation planted in open space and yards. Actively include public education resources such as the FireSafe councils in these efforts.
- Continue to seek ways to support the efforts of the Greater San Diego Fire Safe Councils, and their efforts to promote fire prevention education and assistance to residents. Foster support for the FireSafe program as well. Assist councils in obtaining funding and support, such as through National Fire Plan grants that are administered through State and Federal governments.

VI. Conclusion

“From September 22 to October 4 1970, fire raged through more than half a million acres of brush and Forest covered wildlands in California. These were 13 days of uncontrolled flames which killed people; consumed hundreds of homes built in or on the edge of the wildlands, and damaged thousands of other structures.” – **Excerpt, “Recommendations to Solve California’s Wildland Fire Problem”, Task Force on California’s Wildland Fire Problem, 1972.**

In the fall of 1970, hot temperatures, dry fuels and a dry east wind ushered in a disastrous 13-day fire siege. Southern California experienced a devastating fire season, with astounding loss of life and property. California’s Secretary for Resources formed a task force in 1972 to assess California’s wildland fire problem and to recommend legislative or administrative actions to be implemented. Ronald Reagan was the State’s Governor. Investigations were initiated. Findings were documented. Recommendations were made.

A decade later, in 1980, 325 homes were lost in a San Bernardino wildfire; in 1990, 641 structures were destroyed in the Painted Cave fire. In 1993 Southern California saw another hot and windy October bring wildfire and four people perished. Four hundred homes were lost in the Laguna fire alone, 1200 structures in total. Tragic human loss from wildfires had been seen in years past. In November, 1956, the Inaja fire burned 11 firefighters to death in a steep San Diego County Canyon. In November, 1966 the Loop fire killed 12 firefighters.

Many of the findings published in 1972 reflect circumstances and issues that still exist today. These include the need for building codes, urban planning, and zoning practices that integrate considerations for wildfire; wide-scale cross-jurisdictional fuels management, comprehensive pre-incident planning, improved interagency coordination, and public education. In many cases, findings and recommendations in this report parallel the 1972 report.

The 1972 report emphasized legislative, administrative, and government-focused, operational remedies to prevent and control wildfires. The plan did not address what is now recognized as a critical part of an overall strategy: the participation of wildland-urban interface residents, working in tandem with local, State and Federal governments to find and implement solutions. There are significant human and social considerations that come into play in the wildland-urban interface fire problem, and they must be fully acknowledged and addressed.

Circumstances surrounding the Cedar, Paradise and Otay incidents- dry fuels, high temperatures and hot winds; high-density urban areas in close proximity to wildlands; simultaneous, large incidents, and dwindling suppression resources –

were extreme. But these conditions were not without precedent. These circumstances occur regularly in Southern California and cannot be characterized as unexpected anomalies. With the use of contemporary forecasting technologies and long-term trend analysis techniques, the likelihood and severity of these events are fairly predictable.

Large wildland-urban interface fires, such as those seen in the fall of 2003, are becoming no less frequent. Fatalities, injuries, and loss of homes in these types of fires continue to occur as they have in the past, despite repeated review, analysis and recommendations that seem to always follow on the heels of such “unprecedented, worst-case scenarios.”

Governments must begin to prepare, in earnest, for the worst-case scenario. This includes comprehensive disaster planning, improved multi-agency coordination and interagency training on the part of emergency response agencies. Fire-related considerations must be integrated into zoning, building codes, and large scale planning in southern California, just as other regions consider the likelihood of disasters such as hurricanes and floods in their overall municipal administration and planning programs.

Just as significantly, a meaningful preparedness effort requires a high level of proactive participation and engagement on the part of residents in the wildland-urban interface, including the establishment and maintenance of defensible space around homes and neighborhoods, and personal and community pre-incident planning.

APPENDICES

Appendix A: Interagency Workshops

Appendix B: Fire Behavior

Appendix C: Review Team

Appendix D: Glossary