

***Ventura
County
Wildland
Fire Siege
October 2003***



Fire Chief Bob Roper

EXECUTIVE SUMMARY

Ventura County incurred the wrath of three major wildland fires (Piru, Verdale, and Simi) beginning on October 23, 2003. These three fires, coupled with the other major wildland fires in Southern California, tested prevention, suppression, and recovery efforts of every fire agency in Ventura County and California.

Weather conditions, combined with extreme fuel conditions experienced during this fire siege, heavily impacted the densely populated urban cities of Moorpark and Simi Valley as well as the Wildland Urban Interface (WUI) areas in Ventura County. During this time period, the Simi Incident (107,568 acres) was the largest wildland fire in Ventura County. The Simi fuel bed has never burned to that magnitude. The rapid fire spread can be directly attributed to extreme weather conditions and a fuel bed that was stressed and not properly managed.

Ventura County did not suffer the same proportionate losses as other jurisdictions, but any loss is too much. Our successes were based upon several factors:

1. Key strategy and tactics coupled with aggressive firefighting
2. Updated building and fire codes for construction in the wildland urban interface
3. An aggressive vegetation management program
4. Effective community education programs

This after-action report will address the historical perspective, issues that presented problems, the actions that worked well, and proposed recommendations for future study and corrective action.

It is apparent that tax dollars are not commensurate with providing a fire engine at every structure during these times and that the wildland urban interface problem is not going away anytime soon, in fact, it is expanding. As you read this report, you will see that the notable items are not new to the fire service and that it is paramount that government, businesses, and the public work together in order to prevent a recurrence of these fires and losses.

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HISTORICAL PERSPECTIVE

The Problem

The psychological, monetary, and physical losses from wildland fires are all too familiar to the public. As urban growth centers become less attractive because of higher costs, pollution, traffic, crime, etc., the wildland urban interface (WUI) area of our communities will be impacted by growth. This sprawl affects many facets of governmental responsibilities, fire protection being a primary concern. Four key factors contribute to this major problem:

1. Population Growth - As growth moves to these highly flammable fuel zones, defensible space and proper planning are paramount. Local government must create an environment where acceptable levels of risk are designed purposely.
2. Increased Fuels and Lack of Natural Fire - Continued wildland fuel loading occurs due to lack of recurring natural fires and drought conditions that stress fuels. Studies indicate that this problem is only just beginning as global warming issues develop.
3. Vegetation Management - To comply with environmental and regulatory agency requirements, fire professionals and land managers have increasing difficulty in conducting vegetation management programs. The primary issues involve balancing environmental and liability concerns, whether conducting a prescribed fire or simply hand cutting standing brush. In addition to these issues are the mixed policy conflicts between federal, state and local governments.
4. Increased Costs Associated with Fire Suppression - Catastrophic wildland fires cause an increasing demand on firefighting resources with associated suppression and damage costs.

The Organization

The Ventura County Fire Protection District (VNC) is a full service, career fire department. It serves the unincorporated county area and the six cities within Ventura County: Simi Valley, Thousand Oaks, Moorpark, Ojai, Camarillo, and Port Hueneme via 31 fire station delivery centers covering approximately 865 square miles.

VNC has a long-standing excellent working relationship with federal fire agencies (U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife, and National Park Service) and is under contract to provide wildland fire protection to the California Department of Forestry and Fire Protection's (CDF) State Responsibility Areas (SRA). VNC is one of the few local government fire departments to maintain a fleet of Type III wildland fire engines, wildland fire handcrews, and heavy equipment construction unit (bulldozers) for local and mutual aid assistance.

The Natural Fire Regime

Fire is a natural and beneficial part of Ventura County's "Mediterranean" type ecosystem that makes up its geography. Cool, wet winters and warm, dry summers preclude the rapid decomposition of organic material, common in other climates of the world.

Fires in the brushlands of Ventura County have been a recurring part of the ecosystem for thousands of years. Early inhabitants used fire for hunting, enhancing plant yields, and for insect control, as well as for cooking and warmth. Fires were commonly set by local Chumash Indians to enhance the following year's crop of seeds or to force game from thickets into a hunter's path. Burned areas attracted deer to feed on the tender sprouting plants and provided access for hunting. Fire cleared grounds around villages, minimizing the risk to young children from snakes and became an early form of insect control. Frequent fires set by early residents or lightning provided a natural mosaic of different ages of fuels/brush. The mosaic landscape tended to limit the size of fires because young brush is generally less dense and less likely to burn.

Fire Exclusion Practices

Early pioneers brought a contrasting view of fire to the region. They looked upon fire as destructive — a force to be prevented, controlled, and suppressed. Pioneers considered the burning of brushlands for improving seed production to be destructive to livestock feed.

By the early twentieth century, fire exclusion was the accepted practice. However, what was seen as a good policy to protect lives and property from fire began to have unexpected consequences. A fire regime of smaller, more frequent fires was being replaced by one of fewer, larger and more intense fires and with homes now in its path.

Wildland Fire Risk Factors

Wildland fire spread is influenced by three primary factors: weather, topography, and fuel. In addition, other factors complicate the issues, including the wildland urban interface, diversified responsibility for wildland vegetation management, destructive insects, and diseases.

Weather

Wind and drought are the major weather-related factors that increase wildland fire dangers. Every year, people try to predict whether the fire season is going to be busy or not due to rainfall. Studies have now shown that there is no direct correlation between rainfall and the intensity of the fire season. The typical "Santa Ana" east wind conditions develop as the fall jet stream drops over the Rocky Mountains. In Ventura County, over the past 20 years, these east winds are becoming shorter in duration and occur later in the fall season.

Topography

Topography, or the "lay of the land," greatly influences fire intensity and the direction of spread. Fires generally spread much faster uphill because convective heat rises, preheating the vegetation ahead. Aspect, or the direction that a slope faces, determines the type and moisture content of the vegetation. South-facing slopes are drier and, consequently, have lighter vegetation than north-facing slopes. Canyons and saddles funnel winds, increasing wind speed and, consequently, increasing fire spread. Consequently, homes built in steep, narrow canyons and at canyon rims face an increased risk from fires.

Fuel

During the last century, greater emphasis was placed on fire prevention, and professional firefighting forces continued to improve fire suppression methods. One side effect of those efforts was that the average age of wildland vegetation increased and, as it aged, it became increasingly dense. Recent reviews (Appendix 1) indicate that Ventura County wildlands currently have three to ten times the vegetation density that existed 100 years ago. The increase in fuel density adds to the problem of controlling fires because more fuel results in more intense wildfires.

Fuel moisture is a critical component of predicting the intensity of wildland fires. As the fall season approaches, fuels dry out and become more volatile in nature. This factor (Appendix 2) usually coincides with the occurrence of the Santa Ana winds and the media stories of devastating fires.

Pre-Fire Initiatives

The addition of hundreds of new houses each year to wildland urban interface (WUI) areas and pre-existing rural home sites add to the complexity of wildland

fire mitigation. These structures may limit the ability of fire managers to pick the most effective location to stop wildland fires and may require firefighters to limit perimeter control activities in order to concentrate on defending homes; therefore, VNC has undertaken a variety of pre-fire initiatives.

Defensible Space

The WUI situation is further complicated when homeowners have not maintained an area of reduced vegetation around their homes. This "defensible space" around structures allows firefighters a safe place to operate under the extreme fire conditions that accompany wildfires. It also protects the structures in the advent that there are not enough fire engines to be at every house.

Unfortunately, many homeowners ignore the need for defensible space because they misunderstand the "clearance" concept. They believe it to mean the complete removal of any vegetation on the land around their homes. Other homeowners do not want to touch any native vegetation for environmental or aesthetic reasons. Other homeowners do not have the time or money to remove and dispose of vegetation, which could involve costly tree trimming and landfill charges.

In Ventura County, all fire departments have adopted VNC's "Weed Abatement" program as a model and to maintain consistency. This program notifies property owners in April that they need to create 100-foot defensible space by June 1. If the property is not in compliance by the deadline, VNC will have an approved contractor abate the hazard, collect the contractor's costs plus an administrative charge from the property owner through a special property tax assessment. This program has been in effect since the 1970s, and its success in protecting homes and limiting structural damage is due to its program administration and support by the Ventura County Board of Supervisors.

Vegetation Management

Fuels management or vegetation management is probably the single most, cost-effective tool available to mitigate fires. Prescribed burning, chemical treatment, mechanical treatment, biological treatment, and fuel breaks are all forms of vegetation management.

Prescribed Burning - Prescribed or controlled burning is the intentional introduction of fire, under favorable weather and fuel conditions, in order to remove old vegetation (fuel) guided by an approved written plan. Some experts believe that prescribed burns, set under carefully monitored conditions, can safely remove old fuel and present a barrier to the spread of wildfire while minimizing erosion potential and improving habitat.

Proponents of prescribed fires observed that in areas with more frequent fires, especially forests and woodlands, vegetation tends to consist of fewer but larger trees, enhancing drought survival capabilities. In addition, some studies have shown that more frequent, smaller, and less intense fires favor animal populations by increasing plant and habitat diversity.

However, private landowners sometimes are reluctant to allow projects on their lands due to liability concerns. Therefore, some large beneficial projects are halted because one landowner refuses permission to allow his/her land to be burned.

Prescribed fires are the most cost-effective method to alter large fuel beds and the most controversial. Liability concerns, smoke management issues, biological/environmental studies must be performed, along with archaeological reviews, prior to conducting a burn. These concerns are compiled into a comprehensive written document that meets the California Environmental Quality Act (CEQA) requirements and approved prior to ignition. Compiling the CEQA paperwork usually take six to nine months.

VNC's prescribed fire projects are divided into two classifications: large-scale acreage and "cut and stack" burns. Both classifications require CEQA compliance with the large-scale acreage burns being much more cost effective. The "cut and stack" burns are used on smaller, more controversial projects (around homes) and are much costlier due to the amount of hand work/labor costs.

No matter the type of project, the biggest single factor in any prescribed burn is the liability factor. VNC, as a "Contract County" to CDF, can utilize CDF's liability coverage if VNC is in full compliance with all aspects in the burn plan. Otherwise VNC is liable. VNC also partners with the U.S. F.S. on joint projects, but liability concerns affect the daily decision of whether a burn can be implemented for all sponsors.

With media reports of escaped controlled burns, related liability issues, and the bureaucratic process, by default, this type of fuel management may not be a primary choice of action.

Chemical Treatments - Herbicides have been successfully used to convert some chaparral-covered areas to grasslands and to reduce the understory vegetation load in forests. They also have some use in maintaining clearance around structures and in reducing the cost of maintaining fuel breaks. However, the policies of many land management agencies and environmental groups preclude herbicide use in quantities large enough to have any significant impact on the overall fuel problem.

Mechanical Treatment - Mechanical methods of vegetation management include bulldozing, crushing, chaining, brush mowers, chipping, and hand clearing. Many of these methods rely on burning the accumulated brush in the winter during periods of damp weather. Hand cutting or "chipping," with the chips being reapplied to the site as biomass, is feasible for small areas, but becomes prohibitively expensive on large projects.

Biological Treatment – For years, goats, sheep, and cattle have been suggested as a means of reducing the fuel load, especially near developed areas. Cattle and sheep are an economical and effective method of reducing the annual grass crop, but they do not eat chaparral. A coordinated approach to range management to alter fuel beds/zones should be employed between landowners and fire management officials.

Fuel Breaks - Fuel breaks are generally strips of land many miles long and 200 to 400 feet across where the vegetation is greatly reduced and may not be completely removed. They are designed to be places where a fire's intensity will be greatly reduced, giving firefighters an opportunity to halt its progress. Fuel breaks can be helpful as locations to control prescribed burns or wildfire flanks. However, they have not proven particularly successful in directly stopping wind- or fuel-driven fires, since these fires spread by throwing embers in front of the flame front, starting new "spot" fires.

The fuel break system was envisioned as a grid so that fires would be limited in size by running into a break where they would be controlled. Fuel breaks proved helpful along the flanks of a fire but were not effective in stopping the frontal assault of a wildfire, where the fire-building effects of topography and prevailing winds overcame the limiting effects of the firebreaks. Fuel breaks require landowner permission to maintain, are subject to erosion/environmental concerns, and are labor intensive, therefore, expensive.

Codes and Ordinances

The wildland urban interface fire problem is a national, state, and local issue. Local regulatory agencies must meet state and federal mandates and standards for issues ranging from biological preserves to fire protection. However, the issues are different from area to area. To resolve the wildland fire problem, the regulatory codes and standards must address the issues for the specific areas where they are enforced.

These changes require an effective public education program and strong community support. The elected policy makers are instrumental in achieving this goal as certain policy decisions impact the building and real estate industry and their related costs.

Flammable roofing material is perhaps the most significant factor in the loss of homes in wildland-urban interface fires. Fortunately, building codes have been updated in recent years to prohibit the wood shingle roofs that caused so many homes to be lost in the past.

Public Education

Public education is one of the best tools in combating fire issues, yet least utilized or retained by the public. Fire departments have consistently tried to hammer out the message to the public about the effects of wildland fires and what they can do to prevent them and how to deal with them once they occur.

VNC has created numerous brochures ranging from vegetation management to how to safely evacuate your horse. Public apathy in pre-fire activities is a challenge as seen in Fire Safe Councils. These groups are formed by local neighbors to raise awareness of wildland fire safety. They are easily formed after a recent fire, but it is difficult to nurture them for on-going involvement.

It is difficult to spread the educational message if your jurisdiction is outside of a major media market, i. e. Los Angeles. Likewise, VNC tries to do public service announcements (PSA), but is limited to one local television channel with limited reception. Radio channels in Ventura County are better, and Ventura County is limited to only one newspaper that carries local stories.

ISSUES

The following issues were identified during this siege of wildfires contributing to prevention and suppression activities:

Extreme weather conditions coupled with abundant/uninterrupted fuels - An ample quantity of fuels that were almost at their critical fuel moisture levels were ignited under extreme (Red Flag) fire weather conditions. These factors with unrestricted topographic features allowed unheralded fire spread rates to occur. Several spot fires two miles ahead of the main body were documented along with fire spread rates of 10,000-acres/per hour.

Conflict between structure protection and perimeter control - There continues to be issues with the definition of structure protection and the ordering of resources. Without clear definitions, dispatch/ordering and command staff becomes embroiled in conflicts among resource requests.

Reimbursement concerns - Issues involving who is paying for needed resources continue to complicate the operation of extinguishing the fire.

Lack of training/certification of mutual aid resources - It appeared that not all incoming mutual aid fire engine crews were familiar with wildland urban

firefighting tactics and strategy. This included structural triage, burning out operations, and fire behavior. Engine crews appeared underutilized during structure protection situations where perimeter control could be a better assignment.

Evacuation directions were limited and sometimes issued without authorization - Some evacuation direction was given by unauthorized entities, sometimes miles from the fire activity. This caused confusion by affected residents and was further complicated by repeated media reports.

Public had little or no warning, or direction for evacuations - The public complained that there were little or no media reports specific to Ventura County for evacuations. This is true due to the limited direct media focus within Ventura County; the lack of front line timely information being disseminated to the media; the fire occurring on a weekend whereas local media was not staffed up immediately; and the lack of activating the Emergency Alert System (EAS) on local radio channels.

Evacuations were also impacted by varying definitions of the term, which confused the public. "Voluntary" evacuations were used, but who can issue them and what does it really mean? The media used "recommended" and "mandatory" evacuations. It appeared that some entities believe that they can legally impose mandatory evacuations and others legally can only impose recommended evacuations. Road closures were imposed, but the public and law enforcement entity often didn't know when the area was safe to reopen. Unneeded forced evacuations created traffic hazards for incoming resources as people fled their homes.

Misinformation regarding fire operations - During initial fire stage, before an established Information Section was established, rumors began about fire spread, fire suppression tactics, evacuations, etc. This was particularly true where rumors about firefighting burning-out operations were contributing to the advance of the fire flanks. An after-action investigation proved this rumor false.

Responding mutual aid resources do not have a common mapping system- VNC uses the "GEOLOCK" maps system that is synonymous with USGS quad maps scales. These maps are updated on a regular basis whereas standard Thomas Bros. maps are updated annually. This mapping system was a FIRESCOPE project begun in the 1980s, but never finished. Dissimilar maps between responding jurisdictions complicate commands and directions.

Lack of common radio frequencies - Like past wildland fires, mixed agencies arrived on scene unable to communicate directly with each other. These fires had agencies working on 150.000 -170.000, 400.000 and 800 MHz frequency ranges. At best, strike team leaders may have programmable radios to provide

communication in the interim before a radio cache arrives. Cellular telephone reception was also compromised at various times during the fires.

VNC lacked sufficient staff to represent department at multiple city and county Emergency Operation Centers (EOC) - Due to the number of concurrent fires and their dynamic nature, VNC staffing levels were stressed. A total recall of department personnel was implemented early on and had a tremendous response, but early personnel needs were difficult to fill. This impacted information dissemination and coordination among entities.

Dispatch call screening - Many citizens were concerned about the time it took for 911-call reception and lack of response. Dispatch staff had to screen pending requests for help from duplicate calls to actual new requests. The impact on a dispatch center during these times can sometimes create an unrealistic "terse" nature from the dispatcher to the caller. The dispatcher has to constantly move between callers and doesn't have time for duplicate information. Dispatchers also received calls from people reporting the fire as being next to their house when it may have been much farther away. After responding equipment verified the fire wasn't an immediate danger, the caller often called repeatedly soliciting help again. As the fire became more dynamic, sometimes resources would not be available to re-respond.

The lack of proper fuels management created enormous fuel beds/loads - VNC is responsible for recognizing the hazard and attempting to coordinate suggested projects with property owners. Open space areas managed by private and public entities lack the education and support for fuels management. Liability concerns and the bureaucratic approval process inhibit timely action once suggested projects are formulated.

Metal roof construction - VNC banned shake roofs years ago, but the building industry was successful in getting metal roofs (over existing shake roofs) approved in the county. During these high wind conditions, the lightweight metal roof panel raised high enough for flying embers to lodge underneath and ignite the shake roof. These alleged fire safe roof conversions extended normal extinguishment time and required additional firefighters.

Window failures - Several cases of window failure occurred where single-pane glass failed/cracked and allowed the fire environment to enter homes. This also occurred where vinyl window frames fatigued due to the heat.

Attic vents allowing entry of flying embers - Attic vents on gable roofs and mechanical wind-driven turbine vents were not screened or the screen mesh was too large, thus allowing flying embers to enter attic spaces.

Ornamental and agriculture vegetation transmitted fire spread to homes - Several losses have been documented where the wildfire was directly transmitted from

these ordinary, so-called safe green vegetation. During the Santa Barbara "Painted Cave" fire in 1989, that area experienced a severe drought and predictions of ornamental vegetation spreading wildfire came true. Prior to this fire siege, fire spread would not have been predicted through these plants because they were not stressed.

Poor development planning in past years - Prior to the 1970s, developments in Ventura County were not conditioned for the same type of fire safe design as they are today. These older developments presented many challenges compared to new developments. Crews were performing structure triage, deciding which homes could be saved and which could not. The older homes that suffered losses had inadequate water supply, narrow roads, ordinary construction, poor addressing, and were located in unsalvageable topographic locations.

Power outages affected access gates, alarms, and medical equipment - During the height of the fires, power outages began. These outages caused fire alarms and medical equipment to trigger false alarms, prompting 911 requests for service. Electric access gates to private developments are required to have battery back-up systems, but many of these were not maintained, thus trapping fleeing residents inside and delaying emergency responders.

WHAT WORKED WELL

Local, state and federal Incident Management Teams (IMT) – These teams, composed of local, state and federal staff, are available for immediate response for all types of emergencies. The synergy of their diverse backgrounds brings multiple viewpoints wherever the incident is located. During dynamic times, bringing in these outside resources relieves the initial attack command structure. Coupling local staff with these teams enhances the IMT's ability and provides local involvement. Due to the vast number of Southern California fires, IMTs were pre-deployed, which speeded their response into Ventura County. These teams were used on all three Ventura County fires.

Independent actions - Due to the erratic, fast pace of the initial wind-driven fire spread, many entities began independent actions within their authority. This ranged from evacuations to direction of resources with mixed results. During a catastrophic event such as these fires, independent action is somewhat warranted, but hopefully coordinated to ensure effectiveness of actions and safety.

4th person staffing on CDF Contract County fire engines – VNC contracts with CDF to protect SRA lands and must follow their direction for particular fire engines under the contract. For the second straight year, CDF allowed VNC to staff a 4th firefighter on their contracted fire engines and provided reimbursement.

This single additional firefighter greatly improved their production output and safety during this fire siege.

Strategy, tactics, and aggressive firefighting – VNC has been a long-time wildland fire agency. This wildland fire involvement created the experience and education to meet this fire siege’s challenge. This fire siege was different from most because the department’s key operational staff was available in county and not committed elsewhere in the state. Their background of local knowledge and wildland experience created the best possible command staff to combat these fires. This staff, combined with very aggressive firefighting by engines companies, undoubtedly saved numerous structures. Some people may say that VNC’s building codes and vegetation management contributed to our save rate, which is true, but these fires disregarded large open space areas (golf courses, freeways). Aggressive firefighting made the difference.

Sawyers on out of county strike teams – VNC contributed strike teams (five fire engines with a leader) to other Southern California fires. Due to the pre-planning efforts recognizing the danger of firefighting within the “bug-kill” forests, VNC assigned a fire control worker certified as a sawyer on each strike team. The sawyer’s responsibility was to create escape routes on roads if or when falling trees would block access. Reports indicated that this tactic was instrumental in assuring firefighter and public safety.

Temporary sharing of resources among local incidents – Due to the dynamic nature of new fire starts and fire spread, the incident commanders (IC) of the Verdale, Piru, and Simi fires remained in contact with each other. As a critical situation developed and essential resources were requested, the three ICs shared “immediate need” resources to streamline the ordering process. After the urgent resource need diminished, these resources were returned to their respective incident.

Forward observers – VNC employed the use of forward observers by car and helicopter to provide fire spread intelligence. The fire spread was so dynamic that VNC also used television and news radio reports as well as 911 calls.

Military Aircraft Fire Fighting (MAFF) capability – VNC enjoys hosting two of the C-130 MAFFs at Naval Base Ventura County - Point Mugu Air National Guard. Recognizing the politics in the MAFF’s activation, VNC received the confirmation that the MAFFs would be flying on the Simi incident Sunday morning (October 26). The MAFFs’ quick turn around was anticipated, but their actual effectiveness was delayed due to high wind conditions.

Satellite cell phones – During the most intense moments of the fire, communications on the radio channels became difficult, and cellular telephone circuits were busy. VNC deployed a couple of our own satellite telephones, and these proved to be instrumental during initial communications.

Knowledge of fire history and pre-position of resources – The Simi fires have jumped the 118 Freeway and run to the Pacific Ocean eight times in the past. With this knowledge, commanders pre-positioned resources in anticipation of the fire following the expected path. For the first time in recorded fire history, these resources were able to hold the fire as it jumped the freeway

Pre-fire planning, tactical maps and planning ops – VNC utilized established tactical maps that identified strategic tactics and were distributed to operations staff. As time transpired, a planning ops position developed advanced tactical maps to meet the changing fire conditions.

Recall of off-duty VNC personnel – As fire conditions developed, preparedness plans were put into effect, which dictated augmented staffing levels. Once the Simi incident began, field commanders communicated the dynamic nature of the fire, and a general recall of all off-duty firefighters and support personnel was implemented. This recall and its overwhelming response was key to staffing resources and overhead positions.

Coordinated public safety response among mixed disciplines – Due to the historical number of large-scale events in Ventura County, the Incident Command System (ICS) has been used for many years, even before the Standardized Emergency Management System (SEMS) was mandated upon California governments. ICS created an environment where everyone from law enforcement to Public Works knew their role and acted accordingly, ever focused on the goal. Under this decision-making model, unified command was established to uphold the role and authority among the primary decision makers at each incident.

Secondary demobilization sites – It became apparent that there weren't enough resources to timely respond to each fire in Southern California. To speed up this process when releasing resources, the Simi incident established a secondary demob site in Los Angeles County due to the geographic obstacles in returning to Moorpark Base Camp. Even though it required more overhead staff to accomplish demob, this model allowed quicker release of needed resources to the ordering system.

Multi-Agency Coordinating System (MACS) – MACS grew out of FIRESCOPE's initial work following the 1970s devastating wildfires in Southern California. This system brings together key agency decision makers to prioritize resource distribution during multiple fires and establish strategies.

Creative Emergency Medical Service (EMS) partnerships – Approximately 80% of VNC calls for service are for EMS calls. As the magnitude of these fires grew, VNC, the County EMS Agency, and American Medical Response (AMR) ambulance conferred. The EMS Agency waived response timelines, VNC

committed itself to maximum deployment, and AMR redeployed additional ambulances to handle the increased call volume. This operation was not covered under existing disaster plans, but it is a model for the future.

Communications among fire chiefs – Besides staff performing the MACS function, there was constant communication between neighboring fire chiefs. These communications proved essential in resolving, “log-jams” in ordering processes and allowed extra deployment of neighboring resources due to the request’s urgency and the threat to neighboring jurisdictions. For example, they were able to work out the sharing of air resources that would have been delayed by glitches in the ordering process.

Red Cross evacuation shelters – The Red Cross did an outstanding job in establishing several evacuation centers. Usually VNC directs the Red Cross to prepare for a certain number of evacuations and suggests a good location for the evacuation site. Due to the fires dynamics, the Red Cross took independent action and accomplished its mission.

Agricultural passes – In 1985, after VNC’s major wildland fires, there were vast acres of agricultural losses. It was identified that many property leasers and ranch workers couldn’t get through road closures because they didn’t have a valid ID showing that they had a need to enter a closed area. In working with the Ventura County Farm Bureau, VNC created an “Ag Pass” that allowed the registered property owner to issue these temporary ID cards. These ID cards allow someone to enter the restricted area to evacuate horses, move livestock, and perform limited agricultural firefighting.

Fire Communications Center (FCC) or dispatch – Each agency’s dispatch center is the heart and soul for the 911 system and deployment of resources. During the initial fire siege, dispatchers were working at 300% above their normal call rate while trying to screen duplicate calls and new requests for help. By breaking off the Verdale spot fire and making Simi a new incident, dispatchers were able to relay 911 information directly to field resources. Once extra staffing became available, dispatchers implemented “expanded dispatch” to track and process orders on the Simi incident.

Damage Assessment Teams (DAT) – DATs are a new resource typing within the ICS system. These teams were initiated within two days of the fire start to define damage losses. This information was critical for the disaster declaration and FEMA recovery process. VNC used staff from fire, building and safety, and assessor agencies for these teams.

Community support – The community support at base camps continued to be instrumental in keeping morale high as fatigue persisted. Signs thanking firefighters and home-baked foods added that extra support in keeping crews engaged.

Vegetation management projects – Staff maintained numerous fuel breaks and fire roads that provided access to the remote control points. VNC has long enjoyed a partnership with Southern California Edison. VNC maintains their tower access roads in conjunction with fire roads. VNC has also performed several vegetation management projects, primarily to improve grazing practices for ranchers. These projects have proved to be strategic control points during fires.

Planned developments and newer high hazard fire codes – Since the 1970s, VNC has been updating its fire codes and planning criteria for new developments. Our codes and ordinances for high hazard wildland areas continue to evolve as lessons are learned throughout the nation. These include criteria for access, firefighting water, addressing, greenbelt setbacks, construction types, etc. VNC designs these codes with the idea that these communities are fire safe and that fire engines will not be needed within for firefighting. The success of the evolving code changes lies with our fire prevention staff leading the change and the County Board of Supervisors, acting as our policy makers, supporting the changes.

“Weed Abatement” or Hazard Reduction Program – This program has been in effect since the 1970s. It is a mandated program and is highly supported by the County Board of Supervisors. For example, property owners have the right to appeal their clearance charges to the Board of Supervisors. The Board has not overturned a charge for over ten years. In fact, the Board upheld an appeal on a charge for more than \$50,000 on a property last year because of the process and the proven results that this program has had in defending and saving homes.

RECOMMENDATIONS

Establish basic training/certification requirement for all fire engine resources – wildland-urban interface training is essential to ensure continuity of operations and safety among entities. Training needs to focus on firing operations, structure triage, and fire behavior. These suggestions are not new. The Calabasas fire report suggested S-205 training class, “Fire Operations in the Urban Interface,” and development of minimum requirements for all firefighters responding to OES mutual aid.

Develop interoperable radio communications capability – With the mixed frequency ranges by diverse fire agencies, radio communication reliability is marginal. Much reliance is made on radio caches, but their availability is often delayed. Technology needs to be developed to bridge the mixed radio frequency gap.

Resolve the definition of structure protection versus perimeter control – This definition is long overdue for resolution because it is undermining the effectiveness of mutual aid agreements and ordering requests. Operations staff needs to focus on fire tactics and not the difference on interpretations. This is an immediate need item that is impacting reimbursement issues, often times affecting whether an entity will send resources.

Evacuations definitions – Create standard terminology for evacuation orders by law enforcement and educate the media and public regarding their use. Suggest “sheltering-in-place” rather than actual evacuations to limit traffic impacts on responding resources.

Coordinate evacuations with law enforcement and Red Cross – As law enforcement informs the public to evacuate, suggest that the public go to a Red Cross shelter as a check-in point for relatives.

Maintain adequate staffing of handcrews for perimeter control – The California mutual aid system can muster fire engines, but the need for handcrews is overwhelming. During the east wind fires, primary attention is usually given to structure protection using fire engines. Perimeter control is assigned to a combination of handcrews, bulldozers, and fire engines. Due to the number of Southern California fires and their terrain, handcrews were the resource of choice for perimeter control, yet few were available. This situation delayed perimeter control and early containment of several fires.

Require that IMTs cross train together – In the beginning, IMTs were single agency tools and now have invited outside agencies to participate. Cross training among local, state, and federal IMTs should ensure seamless transition on incidents.

Bring new technology into fire operations – New technology is needed to provide real time intelligence to field commanders for resource accountability and fire behavior.

Ensure that initial attack resources are self-sufficient for 36 hours – Lack of logistical support during the dynamic early hours dictated crews had to be self-sufficient and provide for fuel, food, and water. Crews also had to implement rest cycles whenever they could because relief was not available for the first 36 hours.

Develop future commanders and overhead staff through trainee positions – The general fire service is experiencing abnormal attrition levels. To combat the loss of field experience, trainee positions need to be made available at incidents.

Increase firefighter staffing and liaison positions – Clearly this fire siege shows that the additional 4th firefighter on fire engines increases productivity. It also

showed that there weren't enough firefighting personnel for all request types and begs the question how can taxpayer dollars meet the need for random disasters? A thorough review of operations should be completed to suggest additional firefighting staffing and/or methods during adverse conditions. VNC is the fire department for six cities and the County and must determine an alternate method for staffing all the EOCs when called upon simultaneously. Consideration should be given to an "area command EOC" concept as a method to minimize overhead demands for all agencies.

Commit funding to finish FIREScope products – FIREScope created the ICS and MACS products, which have proven themselves over time. State and federal funding to finish key projects was eliminated in the 1980's and many of these projects are still viable for today's fire operations, i.e. common mapping system.

Develop system to provide timely media updates for public notifications – Fire agencies must inform the public about road closures and evacuations via the media and/or the Emergency Alert System. The media and fire agencies must also develop a local public information tool in conjunction with the EAS to reach people who are not listening to the radio. Consider web page and television media updates.

Increase the 100-foot defensible space requirement commensurate to fuel type and slope – VNC's 100-foot defensible space requirement has truly proven its effectiveness over the years, but there are cases where the 100-foot space should be lengthened due to heavy fuel types and the degree of slope. Fuel types emit varying degree of British Thermal Units (BTUs) within the radiant heat and convection column. The slope of the property's topography greatly influences the convection column's pre-heating of uphill fuels. A model to calculate these two factors needs to be developed in order to substantiate defensible space increases beyond the existing 100-foot requirement.

Create buy-in and social responsibility of fire problem – Individual property owners and open space management agencies must acknowledge their role in working with fire management agencies toward the goal of fuels management. We all enjoy open space land, but long-term management of the fuels is paramount to ensure flora and fauna viability. The Native Americans' approach to burning areas to improve and control the land should be part of the open space ecosystem management. This philosophy also applies to the individual property owner, as fuel zones should be contiguous in modifications to create defensible zones.

Create alternative methods to reduce vegetation toward long-term fuel management – Consider adopting a partnership agreement with local cattle ranchers whereas they move fence lines and agree to graze these zones early in the spring for fire control purposes. In return, the fire agency conducts

prescribed fire burns to improve rangeland and water supplies. This creates a win-win situation for both parties.

Increase coordination and training among city/county planning staff, building and safety officials, fire marshals for wildland urban development – These three disciplines need to interact more closely in working to build fire safe communities.

Bring the insurance industry into the solution – The insurance industry is a key recipient in wildland fire safety, so why not make them part of the solution. Suggest having the insurance industry provide discounts if the homeowner creates defensible space, firefighting water supply, access, addressing, and high fire hazard construction modifications. This suggestion is similar to the insurance industry’s practice of providing discounts/incentives for fire sprinklers, deadbolts, fire extinguishers, and security alarms. This type of action places the burden of the WUI upon those who live within it and not the general public.

Public education – Educate those living in fire-prone areas of their personal responsibility before and during a fire. Besides regulatory enforcement programs, educate residents of the “ember environment” of a wildland fire and what they can do to minimize damage. Consider mandating full disclosure of the WUI issues during a real estate transaction and promote educational efforts to inform the public about forest and wildland health issues. Another topic is how to deal with power outages during fires and their secondary effects.

Establish Fire Safe Councils to create local buy-in of fire problem - Support public education efforts by citizen-based groups, such as the Fire Safe Councils, to increase the level of public and government understanding of the risks of living in the wildland urban interface and their responsibilities in protecting their property. Homeowners can also be instrumental in applying their own “barrier” type of foam.

Suggest fire and building code changes for high fire hazard areas – Work with local and State officials to review and propose changes for the new Urban-Wildland Interface code and local ordinances such as:

- shake roofs
- double pane windows
- access
- firefighting water supply
- vinyl windows
- metal over shake roofs
- attic vents screens
- addressing
- defensible space requirements
- fire shutters

Reduce bureaucratic process and liability issues on prescribed fire projects – The bureaucratic process on getting these projects approved needs to be streamlined so projects can be done timely. Liability issues need to be reduced so fire agencies can conduct burns and property owners feel secure buying into a

project. Consider the state and federal governments underwriting a low-cost liability insurance program.

Create standards for ornamental plantings and agricultural crops nearby structures – Certain types of ornamental and agricultural vegetation have clearly demonstrated their ability to transmit fire directly to structures. These plants need to be identified and restricted from nearby structures.

CONCLUSION

As people migrate from cities to rural areas, they bring with them expectations of city-type infrastructure and support services. Many do not realize the role of fire in the natural ecosystem around them and the increased need for personal responsibility relating to fire in wildland urban interface areas. They often do not understand that their homes and possibly their lives are at stake. The public needs to understand that creating survivable homes and protecting the environment in a wildland urban interface area is a partnership between fire agencies and owners, a partnership that requires not only homeowner participation but also financial commitment.

The issues identified in this paper and others after this fire siege are not new to the fire service, government officials, or the public. The question becomes what will it take to truly address and implement the wildland issue on a local, state, and federal basis or are we doomed to address these issues again in the near future?

After considering all the issues identified, it appears that there are many pre-existing conditions (narrow roads, types of housing construction, etc.) that may never be politically addressed on a scale large enough to make a significant difference. Hopefully, new developments will be regulated enough to provide fire safe communities. Therefore, only three distinct areas can bring timely pre-fire mitigation tactics to the wildland urban interface issues we encounter today:

1. Remove the barriers and become aggressive in conducting fuel management programs ranging from clearing of diseased vegetation to conducting prescribe fires.
2. Establish a 100-foot baseline defensible space program that has the ability to consider additional space requirements depending upon fuels and slope.
3. Engage the public in active wildland fire safety and outreach programs.

These three pre-fire steps will provide the best use of tax dollars in combating the challenges of wildland urban interface fires. These steps are not the final solution, but rather an effective approach to reality-based actions.

REFERENCES

- Biswell, Harold H., 1989. "Prescribed Burning in California Wildlands Vegetation Management," University of California Press.
- California Department of Forestry and Fire Protection. "Public Resources Code."
- California Department of Forestry and Fire Protection. 1989. "A Discussion of the County General Plan and the Role of Strategic Fire Planning."
- California, State of. "Utilization of Forest Biomass to Mitigate Wildfires."
- California, State of. "FIRESCOPE Origin & History Review."
- East Bay Hills Fire Operations review Group. 1992. "The East Bay Hills Fire, A Multi-Agency Review of the October 1991 Fire in the Oakland/Berkeley Hills," California Office of Emergency Services.
- FIRESCOPE. "Field Operations Guide (FOG) Manual."
- Guidance Group, and Mission-Centered Solutions. 2003. "Southern California Firestorm 2003," Lessons Learned.
- Hemenway, PhD, Kathleen. 2002. "Wildfire Risk Mitigation Reports."
- Keeley, Jon, E.A. Johnson and C.J. Fotheringham. "Prescribed Burning: Do We Really Know What We're Doing?"
- Morgan, Diane and Mashburn, Keith, 2003. "Simi Incident Damage Assessment Report," Ventura County Fire Protection District.
- San Diego County Wildland Fire Task Force. 2003. "Mitigation Strategies for Reducing Wildland Fire Risks," Report to the Board of Supervisors.
- United States Department of Agriculture. 1998. "Healthy Forests, An Initiative For Wildfire Prevention and Stronger Communities."
- United States Department of Interior. 2001. "Urban Wildland Interface Communities within the Vicinity of Federal Lands."

APPENDIX 1

VNC CONSOLIDATED FUEL BED SUMMARY

This is a summary of the history of major wildland fire activity on all ten fuel beds in Ventura County. Fifty years, from 1950 to 1999, were researched and narratives written on each major fire.

Two out of three major wildland fires were wind driven. The fuel bed with the highest percent of wind driven fires was the South Mountain fuel bed. The Simi fuel bed came in second highest. The Piru fuel bed had the highest number of topography driven fires.

WILDLAND FUEL BED HISTORY

FUEL BEDS	1950	1960	1970	1980	1990	TOTAL FIRES
SIMI	5	4	7	5	4	25
VENTURA	3	3	3	2	6	17
SOUTH MOUNTAIN	1	2	4	4	2	13
OAKRIDGE	6	3	6	4	2	21
BLACK MOUNTAIN	4	2	0	3	0	9
OJAI	0	0	2	2	3	7
PIRU	7	1	2	2	3	15
FILLMORE	3	4	2	3	3	15
THOUSAND OAKS	4	1	7	2	1	15
MALIBU	6	0	3	6	1	16
	39	20	36	33	25	153

WIND DRIVEN FIRES

FUEL BEDS	1950s	1960s	1970s	1980s	1990s	Wind Driven Fires	TOTAL FIRES
SIMI	4	3	6	4	2	19	25
VENTURA	2	3	2	2	3	12	17
SOUTH MOUNTAIN	1	2	4	4	1	12	13
OAKRIDGE	4	3	3	3	2	15	21
BLACK MOUNTAIN	2	2	0	2	0	6	9
OJAI	0	0	0	2	3	5	7
PIRU	2	1	1	0	1	5	15
FILLMORE	3	3	2	2	2	12	15
THOUSAND OAKS	3	1	6	2	1	13	15
MALIBU	6	0	2	3	1	12	16
	27	18	26	24	16	100	153

APPENDIX 2

LIVE FUEL MOISTURE 1999-2003 AVERAGE ALL AREAS - CHAMISE

