

**Wildfire Management in Los Angeles' Wildland-Urban Interface:**  
Identifying Better Strategies for Reconciling Wildfires with LA's Communities

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**Aug. 29, 1:54 a.m.:** Flames leap across Angeles Crest Highway Saturday. The road runs through the heart of the area charred by the Station fire. (Wally Skalj / Los Angeles Times)

“Protecting lives and property from wildland fire can be a relatively easy task, with little education and planning.”

–Jon Van de Grift,  
naïve Natural Hazard investigator, NaturalHazards.org

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## **Executive Summary**

The Greater Los Angeles Area is faced with many serious environmental challenges. Perhaps the most imminent and frightening of these challenges is the region's geological, topographical, and environmental propensity towards the occurrence of natural hazards. One of the most frequent and destructive natural hazards seen by the region is the famous California wildfire. Because of high populations, widespread human sprawl, and an array of unique environmental conditions, every year countless homes in the greater Los Angeles area are damaged or destroyed by wildfires. Sometimes, human lives are lost. This harsh reality, in combination with new scientific data about wildfires in the region, is causing a slow but very real paradigm shift in fire management strategies. Now, people are realizing that fire is not only an important part of the natural ecosystem, but that it is also largely unstoppable.

Unfortunately, it is very difficult to find concise, consistent, and current information about how to adequately protect the communities in and around Los Angeles from large-scale wildfires. A frighteningly small amount of the literature describing optimum wildfire management strategies is consistent with current scientific data. It can even be difficult to find information that is consistent between different fire management-related sources. Because of the discrepancies between scientific data, current zoning and policy, and firefighting practices, LA's communities have been left largely defenseless in such a volatile natural environment. Clearly, there is a need to reevaluate current fire management paradigms as well as the way policymakers, planners, scientists, and firefighters inform each other and the public of what they know.

This paper examines previous fire management practices, scientific data about wildfires in the region, and current practices and strategies for coping with wildfires. By combining textual evidence with case study analysis and first-hand interviews with experts in the field, I have isolated three key themes of wildfire management in the Los Angeles area: zoning and policy-based strategies, managing the built environment, and protecting the natural environment and native species of the region. In addition to these three sectors of wildfire management, I have concluded that there is a need for improved communication between active organizations, individual homeowners, and governmental groups, as well as a need for the improved education of all people affected by wildfires in the region.

This study, therefore, proposes:

- The creation and utilization of a comprehensive, state-wide Fire Severity Zone mapping system
- The facilitation of increased information sharing between and within agencies involved in fire management, using web-based information hubs as well as regular conferences to encourage the realignment of all fire management strategies with cutting edge information
- The implementation of concrete and irreversible policies making any further human development on WUI wildlands impossible
- Furthering the education of the public about making homes on the WUI safe
- Making the regulation of new building codes on the WUI more strict and efficient
- Using policy to encourage the re-integration of native species and the reduction of invasive weed species in the region
- Legally protecting California Chaparral, California's native landscape

## *Chapter 1: Introduction—Wildfires*

In August of 2006 I left my home in Washington, DC to attend college in Los Angeles, California. While it might seem obvious to most people that a 3,000-mile distance between cities would indicate a vast array of societal and environmental changes, I was wholly unprepared for my new home and all it had to offer. I found that Los Angeles was home to a rich array of languages, foods, religions, and landscapes. However, as interesting and novel as these things were, their impact was less immediate and obvious than one key difference between Washington and LA: the very real presence of severe natural hazards. I admit that while applying to colleges I did not take Los Angeles' susceptibility to earthquakes, floods, debris flows, tsunamis, and wildfires into account.

I still vividly remember the moment I realized how vulnerable Los Angeles really was and how accustomed to natural hazards my California-born friends and classmates were. On May 8<sup>th</sup>, 2007—just eight months after I arrived in California—a brush fire broke out in Griffith Park, and quickly erupted into a full-scale wildfire. Griffith Park is only four miles away from Occidental College, and I remember gathering with other students at the highest point of the campus to watch the flames creep over the park's hillside toward us. The wildfire was so close that you could clearly see the wall of fire and its enormous flames chew apart the land. I was terrified—by the fire, but perhaps more by the calm expressions of delight and awe on the faces of the people around me. I wondered, why aren't they more afraid? And why hasn't the fire department taken care of this already—what are they waiting for?

After just two days, the Griffith Park fire had consumed over 800 acres of parkland. Mayor Villaraigosa declared the fire and its effects a local emergency, but as far as I could tell everyone went back to their daily lives and stopped talking about the fire. It was the most devastating fire I had ever witnessed, but it seemed to be a day-in-the-life of everyone else. The experience left me bamboozled. What kind of place had I just moved to? Eventually, my feelings of insecurity and confusion subsided, and I went on with my life just like everyone else. By the time another large-scale wildfire threatened the area I was not nearly as alarmed; in fact, I actually came to enjoy sitting on the deck of my old wooden house and watching the wiggling flames come closer and closer. The smoke was a bother, but what was the big deal?

That fire turned out to be the Station Fire—one of the biggest wildfires to burn in the region for decades. It was a *very* big deal, and it took the lives of two firefighters as well as countless wildlife and valuable native plant species. Many people lost their homes. As news about the Station Fire circulated in the media, my old feelings of bafflement returned. These wildfires seemed unstoppable, and they were clearly devastating. Why did Los Angeles and the rest of Southern California have to suffer such great loss so frequently, and why hadn't we figured out a better way to protect ourselves from the blaze? I wondered about where the next fire would burn, or if we would be faced with an earthquake, flood, or other disaster before the next set of fires got to us. It is a curious thing to live comfortably at the intersection of such life-threatening and seemingly unstoppable forces, and after the Station Fire I felt compelled to ask the basic question that many seemed to have ignored: why, exactly, do we choose to live here? Modern Americans famously settled in Southern California in part because of its riches in gold and its health benefits, but now the land and the air seem poised to lead us to our demise.



These thoughts motivated me to find out more about what systems our communities and governments had composed in order to cope with the dangers living in our region posed. After conducting weeks of research about fire management strategies in the region one thing became clear: the places I immediately went to for information, (like the U.S. Forest Service and the Los Angeles County Fire Department), had out-of-date information that conflicted with the scientific data I found from sources like the United States Geological Survey and small local nature conservancies. After talking to several experts in the field it became clear that my research skills were not the culprit for my confusion. Instead, my inability to find a straight and consistent answer from the main players in wildfire management turned out to be indicative of a greater problem. In recent years, scientific research about Southern California's unique environment has led to a new movement about how to best cope with wildfires on the Wildland-Urban Interface. In opposition to the concept that severe large-scale wildfires are unnatural and can be prevented by human interference, data now points to a different ideology.

## Background to the Wildland-Urban Interface Issue



The crux of the region’s wildfire issue—that LA’s communities are apparently at home amongst dangerous natural hazards—lies in what policymakers and scientists are now calling the Wildland-Urban Interface, also known as the WUI. The Wildland-Urban-Interface is defined as an area where urban development meets undeveloped wildlands—specifically referring to where homes burn due to wildfires. Essentially, any area or location where a wildland fire can potentially ignite homes is considered the WUI. In 1985, the problem of home destruction became officially known as the Wildland-Urban Interface fire problem.<sup>i</sup>

Los Angeles is famous for its expansiveness. Since it’s influx of human settlement in the mid-eighteen hundreds, Los Angeles has been gradually growing *outwards*—not upwards like many other urban metropolises. The sprawling qualities of Los Angeles have some positives. For example, open spaces, backyards, and a beautiful skyline are great things. Unfortunately, there

are also many negative aspects to the expansiveness of LA. A lack of adequate public transit, increased air pollution due to more cars, a lack of community are just a few of the noteworthy consequences of having a sprawling city. However, one of the most important results of LA's expansive development can be considered a positive and a negative simultaneously: the ever-growing city has met its geographic boundaries. What is unfortunate about this fact is that many of the people living in the greater Los Angeles area are building their homes in the wildland-urban interface, and thus putting their property and lives at greater risk.

John McPhee, author of The Control of Nature, puts Los Angeles in serious perspective when he describes its location on the brink of environmental disaster:

Los Angeles is overmatched on one side by the Pacific Ocean and on the other by very high mountains. With respect to these principal boundaries, Los Angeles is done sprawling. The San Gabriels, in their state of tectonic youth, are rising as rapidly as any range on earth. Their loose inimical slopes flout the tolerance of the angle of repose. Rising straight up out of the megalopolis, they stand ten thousand feet above the nearby sea, and they are not kidding with this city. Shedding, spalling, self-destructing, they are disintegrating at a rate that is also among the fastest in the world. The phalanxed communities of Los Angeles have pushed themselves hard against these mountains, an aggression that requires a deep defense budget to contend with the results. <sup>ii</sup>

Because "Los Angeles is a metropolis that exists in a semidesert, imports water three hundred miles, has inveterate flash floods, is at the grinding edges of two tectonic plates, and has a microclimate tenacious of noxious oxides"<sup>iii</sup> it is not surprising that the presence of natural hazards has become so casually accepted as a part of everyday life. It is also not (entirely) surprising that people have the tendency to overlook the very real danger of natural hazards when making the decision of where and how to build their new home. The Wildland-Urban Interface exists because people naturally migrate to undeveloped, beautiful areas. Who wouldn't want to be surrounded by wildlife, beautiful views, and often better air to breathe? Unfortunately

though, this mentality, mixed with a healthy dose of denial and misinformation about wildfire risk, has led to the WUI Problem.

### **Old Perceptions of Wildfires In Southern California**

I have identified three different paradigm shifts in fire management over the last one hundred years or so. Fire has been an important part of the Southern California ecosystem and the lives of its inhabitants for thousands of years. In fact, fires were commonly set by Native Californians in order “to enhance the following year’s crop of seeds or to force game from thickets into a hunter’s path.” Areas burned by fire “attracted deer to feed on the tender sprouting plants,” and minimized risk to young children from snakes.<sup>iv</sup> Additionally, fires became an early “form of insect control.”<sup>v</sup> Frequent “fires set by early residents or lightning provided a more open forest.”<sup>vi</sup> Before European settlement in Southern California, Native Californians used fire to “modify the environment in a way that best suited survival needs.”<sup>vii</sup> However, according to California State Parks, during the mid-1900s fire and land management agencies believed that all wildland fires, human- or nature-caused, should be extinguished as quickly as possible.<sup>viii</sup> This first phase of fire management was one of few fire prevention strategies, and little understanding of the role fire plays in the natural environment. More recently however, as the role of fire in the natural environment became better understood, people began to realize that fires might not always need to be extinguished.

This led to the belief that, as a result of “years of fire suppression, many areas of California that had experienced wildfires regularly for thousands of years” had not burned for decades. Wildlands had what seemed like unnaturally high levels of trees, shrubs and dead material.<sup>ix</sup> Under these conditions, “a lightning bolt or a careless person’s match, cigarette or campfire is all that is needed to create a large, destructive wildfire.”<sup>x</sup> It was believed that fire suppression activities had actually contributed to the fire problem, and wildfires could be avoided by reducing plant cover and brush. Scientists now know that chaparral naturally burns infrequently and does not need to be overly cleared, but in the late 70s and 80s fire and land management agencies began practicing extreme ‘fuel reduction’ in an attempt to prevent fires and keep communities safe.<sup>xi</sup> Instead of waiting for wildfires to ignite the accumulated brush, policymakers and firefighters felt that it would be best to clear excess fuel from the landscapes of Southern California.

Prescribed fire is one form of fuel management used in California, and is defined as the “confined application of fire to a pre-selected area of land in order to minimize the amount of fuel in the area.”<sup>xii</sup> Prescribed burns “are carried out only under specific weather and fuel conditions” and are “used to mimic nature’s own process of regeneration.”<sup>xiii</sup> Thankfully, because of limitations imposed by the air quality board and the potential litigation if prescribed fires escape and burn homes, prescribed burning of ‘excess’ fuel is uncommon.<sup>xiv</sup> Another more commonly used method of fuel reduction is mechanical brush removal. Currently, the USFS is “undertaking a massive program of mechanical crushing of brush in large patches across the landscape.”<sup>xv</sup> According to Jon E. Keeley from the USGS, this type of fuel reduction has serious implications for the environment. Unfortunately, in 2004 Congress passed the Healthy Forest Restoration Act under the Bush Administration, which stated that fuel treatments pose no

environmental threat “and therefore are granted categorical exclusion.”—despite the fact that the federal government is and has been funding research to determine if such treatments pose any environmental threat.<sup>xvi</sup> Fuel reduction practices are frequently followed by the seemingly helpful act of hydroseeding—the rapid replanting of a large area using high-powered hoses and a slurry of seeds and water—but unfortunately, hydroseeding does not help protect the scarred landscape after a fire. Hydroseeding actually leaves hillsides and burned land still vulnerable to weeds, and disrupts the natural process of fire recovery.

Unfortunately, because of fuel reduction practices, countless acres of California chaparral have been destroyed, exposing the landscape to very flammable non-native weeds, eliminating natural ember barriers, and increasing the risk of debris flow and other types of erosion. In the last decade, scientists specializing in the region’s wildfires have collected practically irrefutable evidence indicating that large-scale and very destructive wildfires have been occurring at regular intervals for thousands of years. In other words, science indicates that no matter what precautions people take to avoid them, wildfires will (and should) occur in the region. Unfortunately, much of the policy and fire-safe recommendations made by municipal, state, and federal governments as well as other entities involved in fire management do not always take current concrete scientific evidence into account. Current paradigms surrounding fire management revolve around the notion that with proper planning and action, large-scale and destructive wildfires can be prevented. However, this is incorrect. Urban planning, disaster preparedness, home building, landscaping, and preservation (among other things) should always operate under the assumption that very big wildfires will happen, no matter what. Unfortunately, people continue to build their homes in areas at high risk of being affected by wildland fires.

Based on scientific and historical data, there is one key paradigm shift that must be made in order to improve wildfire safety: the public and policymakers alike must understand that large-scale destructive wildfires in Southern California are *inevitable* and dangerous. No amount of fuel reduction or emergency preparedness will change the fact that large-scale fires have been naturally occurring in the region for as long as we can trace back. If people continue to develop in at-risk areas—the Wildland-Urban Interface—then they will continue to see property destroyed by fire.

This outlook might seem ominous and disheartening, but in reality accepting wildfires as inevitable—as people already do of California’s earthquakes— can make room for positive changes that have been squelched by other ineffective strategies in the past. If we come to terms with the reality of large-scale fires then we can shift our focus away from strategies that involve brush clearance, fuel reduction, and unnatural hydroseeding to strategies that focus on the most effective ways of thriving in our natural environment. According to Richard Halsey, the director of the California Chaparral Institute, many misconceptions were promoted about wildfires and fire management during the devastating 2009 fire in Los Angeles County known as the Station Fire. Many news articles and “editorial commentary have suggested that the US Forest Service is partially responsible for the Station Fire” because it failed to proactively clear underbrush in the Angeles National Forest.<sup>xvii</sup> Although fuel reduction is still performed in Southern California and the greater Los Angeles area, recently there has been a movement to eradicate these blanket fuel reduction practices. This shift marks the controversial transition from fire management practices involving human intervention to fire management practices that take cues from natural occurrences and native species—and the beginning of a new fire management paradigm.

## *Chapter 2: The Impact of Natural Hazards On Our Everyday Lives*

### **The Reality of Natural Hazards Around the World**

The fact that human populations live in hazard-prone areas is not a phenomenon unique to California. When considering the concept that wildfires, and many other natural hazards, are inevitable and ultimately destructive to human development and safety, it seems obvious that we should avoid living in hazard-prone areas. However, the reality is that as human populations are growing exponentially, (and as far as we can tell, they will continue to do so), the amount of land the human race inhabits will grow as well. This means that our options for human development are narrowing, and many people are being forced to live in unsafe areas. According to NaturalHazards.org, each year on average about 150,000 people are killed worldwide by natural hazards.<sup>xviii</sup> Losses from natural hazards are increasing—“mostly due to the rapid increase in human population.”<sup>xix</sup>

Unfortunately, as human populations increase and take up more space, the frequency and severity of natural hazards have increased as well. According to a report released by the United Nations, there has been a “fourfold increase in the number of recorded natural disasters” in the world since 1975.<sup>xx</sup> Although it is difficult to pinpoint the cause of this increase, many say that climate change is to blame. Whatever the reason, these statistics are affecting people directly, and devastatingly. According to Holli Riebeek from NASA’s Earth Observatory, as “recently as the 1950s, the average cost of catastrophic events was a mere \$3.9 billion per year.”<sup>xxi</sup> However,



between 1996 and 2005, natural disasters accounted for over US\$667 billion in material loss globally. Although an economic statistic, this high cost is also indicative of the great loss of human life and homes. When looking at recent catastrophic natural events like the 2004 Tsunami in the Indian Ocean, Hurricane Katrina, or Haiti's 2010 earthquake, it is easy to see how natural hazards are at odds with the world's human population.

In the aforementioned United Nations report on human development and natural hazards, Under-Secretary-General of the United Nations and Executive Director of the United Nations Human Settlements Programme, Anna Tibaijuka, astutely points out that “there is now a realization that, in many parts of the world, urban planning systems have changed very little and are often contributors to urban problems rather than functioning as tools for human and environmental improvement.”<sup>xxii</sup> Our global populations are increasing, and so are the numbers of natural hazards. Therefore, urban planning and policy need to be seriously reevaluated for the sake of our future. Somewhere in the equation where human lives meet natural disasters, these two entities must be reconciled.

### **Natural Hazards in the United States**

What Anna Tibaijuka touches on—that the way we use our land and build our communities can impact how we cope with the very real threat of natural disasters—is most definitely applicable in the United States. According to the United States Geological Survey, “in the United States each year, natural hazards cause hundreds of deaths and cost tens of billions of dollars in disaster aid, disruption of commerce, and destruction of homes and critical infrastructure.”<sup>xxiii</sup> Many different kinds of natural hazards impact the entire United States and

can have catastrophic endings. As of 2007, over 75 percent of declared Federal disasters are related to floods, and landslides affect all 50 states—causing over \$3.5 billion dollars annually in property and land damages, and between 25 and 50 deaths.<sup>xxiv</sup> As if these statistics weren't frightening enough, "the United States faces significant tsunami threats to the West Coast, Hawaii, Alaska, and island territories in the Caribbean and the Pacific." There are 169 active volcanoes capable "producing a wide range of hazards that threaten people and infrastructure on the ground as well as aircraft in flight."<sup>xxv</sup> One of the most widespread and destructive natural hazards in the United States is, of course, the wildfire—in 2004 alone, "wildfires burned more than 8 million acres in 40 states."<sup>xxvi</sup>

According to a 2007 analysis by the International Journal of Emergency Management, although disasters in the US are getting worse, our governments are not prepared. The "federal government's preparedness has been limited to helping after a disaster has occurred."<sup>xxvii</sup> Unfortunately, at the same time "local organizations often do not have the resources or the training to effectively react."<sup>xxviii</sup> Unfortunately, in the words of Dennis Mileti, leader of the five-year study *Disasters by Design: A Reassessment of Natural Hazards in the United States*, "many of the accepted methods for coping with hazards have been based on the idea that people can use technology to control nature to make them safe."<sup>xxix</sup> Clearly, this mentality is not working to keep people safe—in fact, the numbers of human and economic casualties of natural hazards is only increasing under it. Mileti believes that in order to create a sustainable relationship between humans and the natural world, "we need to change the culture to think about designing communities for our great grandchildren's children's children."<sup>xxx</sup>

## **California and Natural Hazards: Like Peanut Butter and Jelly**

Clearly, the paradigms for minimizing the negative impacts of natural hazards in the United States must be reevaluated and changed to better protect all of the people living in disaster-prone regions. This paper focuses on fire impacts in the Los Angeles area because within the United States, California is one of the most at-risk regions for natural hazards, and suffers the most damage annually—making it one of the most urgent regions to improve within the county. And within the State of California, Los Angeles County is the most populous region with approximately 10,393,185 people living within only 4,061 square miles of land.<sup>xxxii</sup> According to the United States Geological Survey (USGS), “Southern California has one of the Nation’s highest potentials for extreme catastrophic losses due to natural hazards.”<sup>xxxiii</sup>

It is estimated that the expected losses from natural hazards in eight counties of Southern California exceed \$3 billion per year.<sup>xxxiii</sup> Within Southern California, located so close to the San Andreas Fault and four different mountain ranges, and having very unique weather patterns, Los Angeles and its people are at high risk of natural hazards. While all of California is technically at high risk of being negatively effected by natural hazards, Los Angeles is a perfect case study for how to reconcile the needs of a rapidly growing population with the rapidly changing (and moving) natural environment. Residents of Los Angeles must live at all times with the threat of wildfire, floods, debris flows, earthquakes, and tsunamis, while going about their lives in an urban metropolis—clearly, these two themes are difficult to bring together.

## **California and Wildfires**

One of the more frequent and destructive natural hazards in California is fire. As of November 2006, since 1970, “12 of the nation’s 15 most destructive wildfires have occurred in California, costing the insurance industry \$4.88 billion.”<sup>xxxiv</sup> Since the late 1880s, “Southern California has experiences nine megafires over 100,000 acres”, and over half of them have occurred in the last 6 years.”<sup>xxxv</sup> Fire “frequency has been steadily increasing in coastal regions of California due to ignitions at the growing wildland-urban interface.”<sup>xxxvi</sup> The wildland-urban interface, also known as the wildland-urban intermix, refers to “an area or location where a wildland fire can potentially ignite homes.”<sup>xxxvii</sup>

According to USGS research scientist and expert on wildfires, Dr. Jon Keeley, “that California leads the nation in fire losses is not surprising.”<sup>xxxviii</sup> This is because “with more than 33 million people, California has a fire regime that is dominated by human ignitions. This anthropogenic fire regime, coupled with rapid population growth, has resulted in many people at risk to natural high-intensity wildfires, which have characterized this landscape long before human occupation.”<sup>xxxix</sup> The “threat of life and property losses related to wildfires is a significant issue for federal, state, and local fire and planning agencies who consider the mix of residential areas and wildlands” in California.<sup>xl</sup> Right now, the threat of wildland fires on human development and homes “influences fire management and protection policies at national and local levels.”<sup>xli</sup> Between 2000 and 2005, on average, 711,060 acres burned in the state of California per year. 2009, despite the presence of such destructive fires as The Station Fire, was a year of relatively few wildfires. Altogether, 402,181 acres burned in 2009—and while that

might sound like a lot, it is less than one third of the record 1.3 million acres that burned in the previous year.<sup>xlii</sup> Southern California in particular is at high risk of wildfires because of its especially dry climate, topography, and Santa Ana Winds.

### *Chapter 3: Wildland Fires in the Los Angeles Area*

#### **Los Angeles: A Watershed**

Wildfires do not only impact the areas they burn. In fact, they impact the entire ecosystem. The greater system of wildfire ignition, burning, extinguishing, and recovery takes place in all area of what scientists and many others refer to as a watershed. This means that any and all strategies surrounding fire management must consider the impact they may have on all other aspects of the natural environment in the greater watershed. It should be noted that in this paper, when referring to the Los Angeles Area, I am not referring to the territorial boundaries established for the sake of jurisdictional limits. I am actually referring to the Los Angeles and San Gabriel Rivers Watersheds, particularly the foothills and mountainsides within them. In general, I believe that this is a beneficial way of considering the spatial boundaries of wildfire management. Clearly, the fact that effective fire management cannot take place within neat concrete jurisdictional boundaries makes policy change difficult—but let’s be honest, wildfires don’t care!

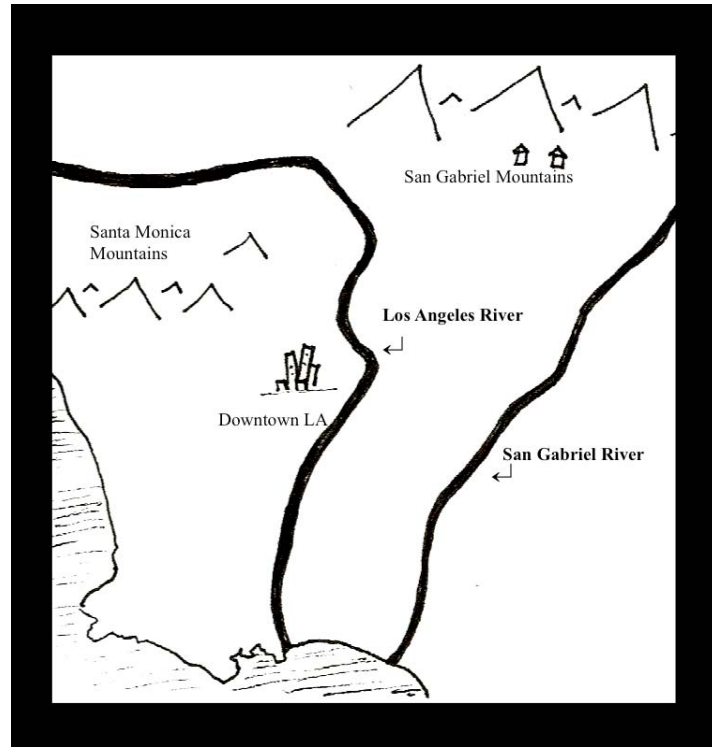
A watershed is defined by the US Environmental Protection Agency as “the area of land where all of the water that is under it or drains off of it goes into the same place.”<sup>xliii</sup> Watersheds “come in all shapes and sizes. They cross county, state, and national boundaries,”<sup>xliv</sup> and in the continental US alone there are 2,110 watersheds in existence.<sup>xlv</sup> The water in a watershed “moves through a network of drainage pathways, both underground and on the surface (streams),

that converge into progressively larger bodies of water as the water moves on downstream, eventually reaching the ocean.”<sup>xlvi</sup>

Perhaps John Wesley Powell, scientist geographer, put it best when he described a watershed as,

that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community.<sup>xlvi</sup>

In fact, there can be many small watersheds within a larger single watershed, and every individual stream, tributary, or river that exists has an associated watershed.<sup>xlvi</sup> A good example of how our watersheds are all connected is the famous continental divide located along the Rocky Mountains. The continental divide “forms the watershed division between eastward-flowing and westward-flowing streams, which drain into the Pacific Ocean. Within the westward-flowing watershed, there are hundreds of smaller watersheds, including the Los Angeles and San Gabriel River watersheds”—the watersheds most affected by wildland fires in the region.<sup>xlix</sup>



According to the Los Angeles County Department of Public Works, the Los Angeles River Watershed covers a land area of over 834 square miles “from the eastern portions of Santa Monica Mountains, and Simi Hills, and Santa Susana Mountains to the San Gabriel Mountains in the west.”<sup>1</sup> The watershed “encompasses and is shaped by the path of the Los Angeles River, which flows from its headwaters in the mountains eastward to the northern corner of Griffith Park,” where the water channel turns towards the south through the Glendale Narrows before it “flows across the coastal plain and into San Pedro Bay near Long Beach.”<sup>li</sup> The land use of the Los Angeles River Watershed is diverse. The upper portion of the watershed, spanning about 360 square miles, “is covered by forest or open space, while the remaining watershed,” approximately 474 square miles, “is highly developed with commercial industrial, or residential uses.”<sup>lii</sup> The Los Angeles River is “hydraulically connected to the San Gabriel River through the Whittier Narrows Reservoir, although this occurs primarily during large storm events.”<sup>liii</sup>



The San Gabriel River Watershed is located in the eastern portion of Los Angeles County. The watershed is “bound by the San Gabriel Mountains to the north, most of San Bernardino/Orange County to the east, the division of the Los Angeles River from the San Gabriel River to the west, and the Pacific Ocean to the south.”<sup>liv</sup> It spans approximately 640 square miles, across over 3 cities. About 26% of the watershed’s total area is developed.<sup>lv</sup> The San Gabriel watershed “drains into the San Gabriel River from the San Gabriel Mountains flowing 58 miles south until its confluence with the Pacific Ocean.”<sup>lvi</sup> The Los Angeles and San Gabriel Watersheds together cover over 1500 square miles, extending “from the Santa Susanna Mountains in the west to the San Bernardino/Orange County in the east.” In total, they also reach “from the San Gabriel Mountains in the north to the Pacific Ocean in the south.”<sup>lvii</sup> When considering the affect of fire on the region, it is helpful to think of how each area connects to other areas in the greater watershed zone.

### **What is a Wildland Fire?**

Like “floods in stream systems, wildland fire is a natural occurrence in many ecosystems.”<sup>lviii</sup> In fact, fire often plays an important role in maintaining the health of some ecosystems, such as prairies, oak savannas, and chaparral. However, “when fire threatens human life or property, it is considered a natural hazard.”<sup>lix</sup> A wildland fire is defined as a large-scale fire that often covers many square miles in a relatively short period of time. Wildland fires can burn for many days at a time, and are most frequently “ignited by lightning and sometimes by human activities, such as cigarette smoking and campfires.”<sup>lx</sup> Wildland fires can generate

“hurricane-force” winds, and can climb up steep terrain (like mountain slopes) incredibly quickly. In fact, “the steeper the slopes, the faster a fire is likely to burn.”<sup>lxii</sup> Wildland fires have even been known to leap across highways, and fly through the air in the form of burning embers or flaming lightweight plant material (like the top of a tall palm tree). Besides the obvious “threat of hot flames causing materials to burn, fire can also send vast amounts of ash into the atmosphere, which can inhibit plant growth, reduce visibility, and interfere with the breathing of people and other animals.”<sup>lxiii</sup> Sometimes, because wildland fires destroy vegetation, leaving burned slopes vulnerable to heavy rain, they can also “set the stage” for slope failures, flooding, and debris flows. Annually, the U.S. government spends hundreds of millions of dollars to control wildland fires.<sup>lxiii</sup>

Although this paper focuses almost exclusively on the direct affects of wildfires, it is important to acknowledge the indirect affects of fires as well. After a wildfire, the landscape is left sparse and black. All organic matter is burned away, and gives way to dry dirt. Formerly, plants and root systems protected the loose earth from moving around, but after a highly destructive fire, the earth is vulnerable to even the slightest disruption. As if the fire itself weren’t enough, many large-scale wildfires give way to dangerous debris flows. Debris flows are defined by the US Geological Survey as “fast moving landslides that occur in a wide variety of environments throughout the world.”<sup>lxiv</sup> They are “particularly dangerous to life and property because they move quickly, destroy objects in their paths, and often strike without warning.”<sup>lxv</sup> Debris flows “amass in stream valleys and more or less resemble fresh concrete.” Debris flows start on steep slopes –“steep enough to make walking difficult”—however once they get started, debris flows can “travel even over gently sloping ground”.<sup>lxvi</sup> They consist “of water mixed with

a good deal of solid material, most of which is above sand size.” Unfortunately, “some of it is Chevrolet sized.”<sup>lxvii</sup>

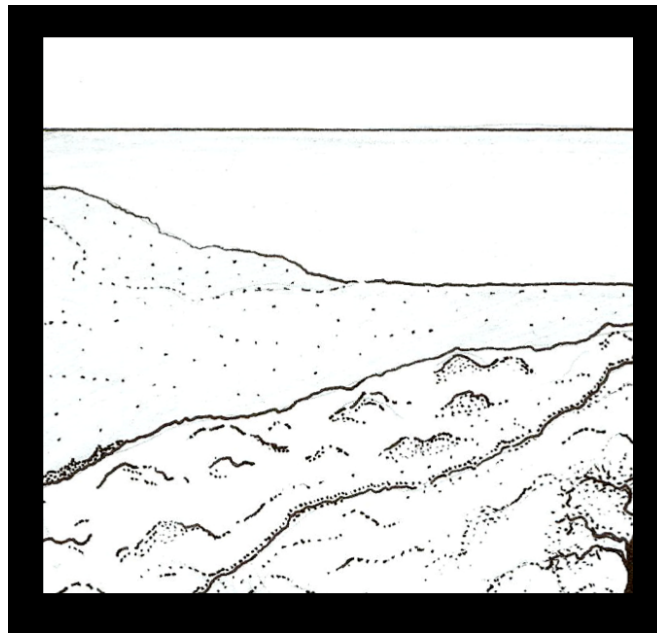
The “most hazardous areas are canyon bottoms, stream channels, areas near the outlets of canyons” and “slopes excavated for buildings and roads.”<sup>lxviii</sup> Areas “throughout Southern California are frequently beset by debris-flow problems, and public agencies have expended vast resources on massive debris-protection systems for more than 65 years.”<sup>lxix</sup> In fact, strung out “along the San Gabriel front are at least a hundred and twenty bowl-shaped excavations that resemble football stadiums and are often as large.”<sup>lxx</sup> These Debris Basins have been dug out in order to catch the debris flowing down mountainsides before it reaches areas populated by people. Often times they help, but they are not foolproof. In Southern California, there is almost always large-scale destruction from debris flows during rainfall preceded by a wildland fire.

### **The Santa Ana Winds**

The Santa Ana Winds is a fascinating phenomenon that is unique to Southern California. Many people believe that the winds have mystical qualities—and that strange things can happen when they blow across the City of Angels. Whether or not the winds are mystical, they certainly bring one scary thing: fire. The mountain ranges within Los Angeles County run from east to west, and the main canyon drainages flow north and south. This “natural topography has created airflow patterns linking the desert area with the Pacific Ocean.”<sup>lxxi</sup> During periods of high meteorological pressure zones over the deserts east of Los Angeles, hot, dry, northerly winds – the Santa Anas—follow these paths.<sup>lxxii</sup> Although they have been known any time between

September and March, they are most famous for occurring during October, the end of the driest seasons in LA and the beginning of fire season.<sup>lxxiii</sup> Because of the dry heat that comes with the desert winds, the regions graced by the Santa Ana Winds have a high frequency of fires. These areas have earned them the name fire corridors. Prominent fire corridors in LA County include Malibu, Arroyo Seco, and San Gabriel Canyons.<sup>lxxiv</sup>

### **California Chaparral**



According to the California Chaparral Institute, chaparral is California’s most extensive native plant community. It is present on most of the watersheds in the Los Angeles County.<sup>lxxv</sup> It is also the state’s “most characteristic wilderness, dominating foothills and mountain slopes from the Rogue River Valley in southern Oregon to the San Pedro Martir in Baja California.”<sup>lxxvi</sup> Chaparral is made of “a semi-arid, shrub dominated association of *sclerophyllous*, woody plants

shaped by summer drought, mild, wet winters, and infrequent fires (with natural intervals between fires being 30 to 150 years plus).<sup>lxxvii</sup> Meaning ‘hard-leaved’ in Greek, “*sclerophyllous* leaves are advantageous in a semi-arid climate because they reduce evaporation through a variety of traits” that include “waxy coatings, thicker cell layers, and recessed *stomata*, the pores in leaves permitting evaporation and the exchange of oxygen and carbon dioxide.”<sup>lxxviii</sup> Generally, chaparral is a California phenomenon, although a variation referred to as “mock chaparral” can be found in parts of Arizona, the central Rocky Mountains and Northeastern Mexico.<sup>lxxix</sup>

According to the County of Los Angeles Fire Department, evergreen and drought deciduous shrubs and ranges from 1 to 15 feet tall dominate chaparral.<sup>lxxx</sup> Most “of these plants are recognized by their tough, leathery leaves that reduce water loss in the dry climate.”<sup>lxxxi</sup>

Common examples of chaparral plant include various species of Ceanothus, Sage, Sumac, Toyon, Manzanita, and Chamise. Chaparral “ecosystems are very efficient at controlling erosion and protecting watersheds”—the “deep root systems of these plants help to stabilize slopes and allow them to thrive in the dry Mediterranean climate of Southern California.”<sup>lxxxii</sup>

Unfortunately, excessive fuel reduction practices are destroying California’s chaparral.

One of the biggest themes in the debates regarding fire management in Southern California is what to do about California Chaparral. As I mentioned before, because large amounts of chaparral tend to burn during wildland fires in the region, it has been commonly thought of as a fire risk. This belief has led to the creation of many fuel reduction plans created with the intention of clearing chaparral completely in order to avoid ignition. More recently, there has been a backlash to the demonization of California chaparral. In fact, the California Chaparral Institute was created with the sole purpose of reversing misconceptions and stigmas created about the plant community, and preserving what is left in the region. According to the

California Chaparral Institute, Chaparral not only provides California with much of its natural aesthetic, but it also “provides essential protection against erosion, allows underground water supplies to recharge, moderates local climates, provides important habitat for an interesting assortment of animals”, and offers people “unique opportunities to remain connected to nature on a local level.”<sup>lxxxiii</sup>

Although chaparral experts at the California Chaparral Institute believe that “chaparral provides a way for Californians to remember the value of wilderness,” unfortunately “some consider old-growth chaparral ‘trashy’ and unable to sustain a healthy ecosystem after 30 years or so of growth.”<sup>lxxxiv</sup> Unfortunately, because chaparral can pose wildfire risk, it has been labeled as a fire risk that must be controlled.<sup>lxxxv</sup> Those who categorize chaparral as purely a fire risk tend to believe that it must be burned or physically removed on a regular basis in order to prevent its accumulation. According to the Chaparral Institute, these “*value statements*” (as opposed to scientifically-based conclusions), are “harmful ideas because they promote actions that will eliminate the last remaining stands of old-growth chaparral and can lead to the conversion of younger chaparral to weedy grasslands” through “inappropriate vegetation ‘treatment’ activities such as prescribed burning and ‘mastication’ (grinding up chaparral with huge mowers).<sup>lxxxvi</sup>

There is “no question chaparral provides the perfect fuel for wildfires.”<sup>lxxxvii</sup> It is “hell to cut a line through; whitethorn ceanothus jabs our skin, the shrubs continually resprout, and the deadwood we push aside provides excellent kindling.”<sup>lxxxviii</sup> It seems understandable that “some view chaparral as only a fire hazard and would prefer to see the stuff cleared down to mineral soil.”<sup>lxxxix</sup> However, clearing old-growth chaparral is not how today’s experts recommend handling the increasing threat of wildfires on California’s Wildland-Urban Interface. According to the Institute, Old-growth chaparral “in excess of 100 years old is not ‘trash.’ It remains a

productive, dynamic ecosystem.”<sup>xc</sup> The idea “that ‘chaparral-choked areas’”—unfortunately a commonly used phrase used to describe fire-prone areas—“are responsible for causing large fires is related to one of the most repeated misconceptions regarding the system: past fire suppression efforts have allowed an ‘unnatural’ accumulation of brush.”<sup>xci</sup> While it is true that methods for suppressing fires have advanced in recent years, the accumulation of natural growth in California is not the culprit for increased wildfires and property damage due to fire on the wildland-urban interface.

According to Richard Halsey, director of the California Chaparral Institute, “the first thing to consider is that the amount of acreage burned per decade in our region has remained relatively unchanged over the past century despite the heroic efforts of our region’s firefighters.”<sup>xcii</sup> The main catalyst for large fires is extreme weather. Southern California’s weather consists of high temperatures, low humidity, and strong Santa Ana winds. Wildland fires under such conditions “are impossible to stop and can burn through nearly every vegetation type, regardless of age.”<sup>xciii</sup> In reality, invasive plant species (like some eucalyptus trees and palm trees) are more dangerous in the event of a wildfire than chaparral. Maintaining the native plant palette in the Los Angeles area is crucial to protecting the region’s ecosystem, and in the effort to manage wildfires.

### **Who Actually Fights Wildland Fires on the Front Line?**

There are several steps taken by fire management agencies in the event of a wildfire. When a wildfire starts, the first people to act are fire managers. Fire managers analyze the

specific fire situation to determine the best course of action.<sup>xciv</sup> Once fire managers have considered all of the most critical elements of the wildfire and developed a “suppression strategy” they determine what “kind of firefighters and equipment they will need to implement it.”<sup>xcv</sup> When the fire is started by natural causes, the fire manager and a team of experts may decide to allow the fire to burn. Obviously, this decision is made depending on the safety risk to humans the fire poses, as well as how intervention might “degrade water quality, wildlife habitat, or other resources.”<sup>xcvi</sup>

There are several groups that are created to fight wildland fires: handcrews, hotshot crews, helitack crews, smokejumpers, and engine crews. Handcrews generally consist of 20 people, and their main responsibility is to construct a “fireline” around the wildfire. A Fireline is a strip of land cleared of flammable materials meant to contain the fire.<sup>xcvii</sup> Incident Management Teams are the strategists. These teams consist of fire experts whose primary responsibility is to develop and implement strategies to suppress wildfires. Members of an Incident Management Team are in charge of providing food, equipment, transportation, and other goods and services to wildland firefighters.

### **Past Policy-Based Efforts to Protect the Wildland-Urban Interface from Wildfire**

Fire management on the WUI has been on federal, state, and municipal political agendas for years, and is becoming increasingly important as wildland fires are causing more and more destruction. Here are some of the most important past policy-based efforts intended to improve the WUI problem.



## Federal Government

Because the threat to the Wildland-Urban Interface impacts residential areas, political attention to wildland fires on the WUI has risen during the last several decades. In general, it is safe to say that because of the direct impact fires on the WUI have on people's lives, Federal fire policy and "suppression operations reflect the socio-political attention to protecting homes from burning during wildland fires."<sup>xcviii</sup> In 1979, the Vegetation Management Program was created – and still exists today through CAL FIRE (the California Department of Forestry & Fire Protection, a federally funded agency) in order to "develop strategies for responding to the growing fire hazard problem."<sup>xcix</sup> According to CAL FIRE, the Vegetation Management Program is a cost share program that allows public and private landowners to participate in wildland fuel reduction projects. The primary tool used by the Program is prescribed fire, although "in more recent years CAL FIRE has used the program for mechanical treatments of vegetation as well."<sup>c</sup> The Vegetation Management Program operates under Senate Bill 1704, legislation created in July of 1980. This legislation "provided CAL FIRE authorization to contract with private and public landowners for the purpose of fuel hazard reduction, vegetation management, and the improvement of wildlife, range, and forest resources."<sup>ci</sup> The VMP was "preceded by the Range Improvement Program that was used aggressively by CAL FIRE to remove undesired woody vegetation and increase forage production for domestic stock and wildlife." Early records show us that "range improvement burns" –or prescribed burns—were conducted by CAL FIRE as early as 1945.<sup>cii</sup>

The USDA Forest Service and the National Fire Protection Association created the National Wildland-Urban Interface Initiative in response to the high level of residential fire

destruction that followed the 1985 fire season. The initial “fire management response to the WUI fire problem, principally organized by the U.S. Forest Service and the National Fire Protection Association,” resulted in the Wildfire Strikes Home conference held in 1986.<sup>ciii</sup> From this initiative came the current “nationally supported Firewise program.”<sup>civ</sup> Since 2000, “federal and state wildland fire management policy has recognized the WUI fire problem as a principal issue in a number of documents,” including the National Fire Plan of 2000, the Federal Wildland Fire Management Policy of 2001, the ten-year Comprehensive Strategy of 2001, and the Healthy Forests Restoration Act of 2003.<sup>cv</sup>

One of the most notable efforts of the federal government to improve WUI safety was the creation of the U.S. Fire Administration within the U.S. Department of Homeland Security’s Federal Emergency Management Agency. The mission of the U.S. Fire Administration (USFA) is “to provide national leadership to foster a solid foundation for our fire and emergency services stakeholders in prevention, preparedness, and response.”<sup>cvi</sup> Through the allocation of grants, training, assistance with data analysis, and technology, the USFA essentially provides support for what is typically a regional or local effort.

However, despite an obvious interest in improving fire management, and the fact that the Federal government has been funding research to determine the effectiveness and safety of fuel reduction practices, there are still large gaps between scientific research and fire management policy. For example, the Healthy Forests Restoration Act of 2003 states that fuel reduction does not cause harm to forests or other fire-prone ecosystems. The Act passed despite the fact that the federal government clearly still has an interest in finding out whether or not these practices truly work, and the fact that most of the research being done currently points to fuel reduction practices as detrimental to the environment. Additionally, the Vegetation Management Program,

one of the most significant policies implemented in California wildfire management, is largely scientifically obsolete yet still exists. This hypocrisy within federally funded fire management and fire-related research is discouraging.

One of the most notable recent attempts to bring new fire-safe strategies and science into policy on the federal level was the introduction of S. 2390, the Fire-Safe Communities Act in 2008. The bill proposed the appropriation of federal funds for programs to create fire-safe communities (“municipalities that adopt fire ordinances consistent with a federal model developed by the National Institute of Standards and Technology”) as well as the promotion of “responsible development”.<sup>cvi</sup> The proposed Act contained no intergovernmental or private sector mandates, and would not have imposed any cost on state, local, or tribal governments. Most of the money proposed in the bill would have gone towards grants to fund smaller organizations, research, and fire assessment. Unfortunately, Congress overwhelmingly rejected the Fire-Safe Communities Act. Only 9% of representatives voted in favor of the bill.

### State Government

California as a state has recently been taking action to incorporate the WUI problem into policy. In 2005, the Office of the State Fire Marshal amended the California Code of Regulations in order to make them more conducive to fire protection on the WUI. The amendments to the California Building Code included the differentiation between Fire Hazard Severity Zones, and detailed guidelines for “new buildings located in any Fire Hazard Severity Zone within State Responsibility Areas,” any “Local Agency Very-High Fire Hazard Severity Zone,” and “any

Wildland-Urban Interface Fire Area designated by the enforcing agency for which an application for a building permit is submitted.”<sup>cviii</sup> According to CAL FIRE,

The broad objective of the Wildland-Urban Interface Area Building Standards is to establish minimum standards for materials and material assemblies and provide a reasonable level of exterior wildfire exposure protection for buildings in Wildland-Urban Interface Fire Areas. The use of ignition resistant materials and design to resist the intrusion of flame or burning embers projected by a vegetation fire (wildfire exposure) will prove to be the most prudent effort California has made to try and mitigate the losses resulting from our repeating cycle of interface fire disasters.<sup>cix</sup>

The Building Code focuses on enforcing the use of specific fire-safe materials and architectural strategies (like exterior wall openings and decking). The California Public Resources Code enforces the creation and maintenance of 100 feet of defensible space around a structure. These amended code requirements went into effect in the beginning of 2008. For residential buildings including one and two family dwellings, the building official or the fire authority enforces building standards for R-3 occupancies.<sup>1</sup>

### Local Government

The most significant policy-based strategy local governments use to help promote fire safety in Los Angeles is the regulation of buildings through codes, inspections, and the controlled allocation of permits. In the County of Los Angeles, there is system of Municipal codes put in place in an effort to prevent homes from catching fire in the event of a wildland fire.

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<sup>1</sup> [Details about the Los Angeles County Municipal Code fire regulations can be found in SEC.91.7201. and the sections immediately following]

[Links to the specific language used in California’s Wildland-Urban Interface Code can be found at [http://www.fire.ca.gov/fire\\_prevention/fire\\_prevention\\_wildland\\_codes.php](http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_codes.php)]

Within the Los Angeles Housing Code, (a portion of the Los Angeles Municipal Code), it is “found and declared that the existence of such substandard buildings and dwellings”—building not ‘up to code’—“threatens the physical, social and economic stability of sound residential buildings and areas, and of their supporting neighborhood facilities and institutions.”<sup>cx</sup>

While this statement is in reference to all buildings that are not up to code, it is especially true of homes on the wildland-urban interface that are at risk of catching fire—and of spreading fire to neighboring homes and buildings. According to the Code, no building or structure “shall be erected, constructed, enlarged, altered, repaired, moved, improved, removed, converted or demolished” unless a permit for the building has first been obtained from the Department of Building and Safety.<sup>cx</sup> Buildings located within a fire district must comply with provisions found in Division 72 of the Code. Some of these requirements include restrictions on utilities (that can combust easily), vehicles (that can block fire trucks and hydrants), attic openings (that can allow embers to enter the home, roofing (that can easily catch fire), and the implementation of sprinkler systems. Now, in combination with the amendments to the California Code, zoning policy in the Los Angeles Area is better equipped to keep homes safe.

#### *Chapter 4: Examining Past Large-Scale Wildfires in the Region*

To fully understand the impact that good and bad fire management policy can have, it is important to examine real-world examples. As part of my research, I evaluated four recent large-scale fires that took place in the Southern California area. Obviously, every large-scale wildfire poses innumerable challenges to a region, and there are countless lessons to be learned from every event. However, it would be impossible to detail all of the important parts of fire management that took place in each fire. For this reason, I have chosen to describe the details of each fire that I found most informative to fire management improvement.



## **San Diego: Devastated by Wildfire in 2003**

### General:

During the week of October 26, 2003, three wildfires (including the Cedar and Paradise fires) burned through San Diego County. The fires killed 16 people, and burned down 3,241 homes and businesses.<sup>cxii</sup> A total of \$43,230,826 had been spent on fire suppression by the end of the fire siege.<sup>cxiii</sup>

### Why the Fire Started:

The fires started on October 25<sup>th</sup> and 26<sup>th</sup>. Because of extremely high winds, dry conditions, and erratic fire behavior, the fires spread very quickly and were difficult to contain.

### Notable Strategies:

According to an evaluation by the Fire Safety Review, despite the loss of life and buildings, the “effective evacuation and protection actions on the part of emergency personnel, with cooperation by the public, saved thousands of lives.”<sup>cxiv</sup> Considering “the circumstances of these fires, injury rates were surprisingly low.”<sup>cxv</sup> However, a lack of formal operational agreements and consistent pre-season (fire season) interagency coordination, integrated planning, and training within the County “caused a degree of disorganization in the management” of the fires.<sup>cxvi</sup> According to the Fire Safety Review, “inconsistent or outdated policies among agencies also affected the overall efficiency of incident management.”<sup>cxvii</sup> In general, while many fire

management efforts went well, communication between and within all fire-related agencies could have been improved.

### Restoration Efforts:

After the 2003 fires, one of the most notable recovery efforts made was by a group concerned people who created an online networking system called the San Diego Fire Recovery Network (SDFRN). In an effort to “address the widespread ecosystem changes in San Diego County caused by the historic fires,” a network of community organizations, government agencies, and concerned citizens came together and created the Recovery Network.<sup>cxviii</sup> The website serves as a centralized database that offers geo-referenced data, metadata, maps, other website links, and other related information that could help “decision-makers, planners, researchers, and anyone interested in the 2003 fires.”<sup>cxix</sup> This network is such a positive thing because it facilitates communication between community organizations, government agencies, and citizens, as well as offering easy-to-access information to anyone who needs it.

### Shifts in Planning and Policy:

According to Jon E. Keeley, “Santa Ana winds and drought, not the build-up of sage scrub and chaparral vegetation fuels, were primary causes that turned natural and human-induced fires into ravaging disasters” in Southern California, including San Diego.<sup>cxx</sup> When testifying in a November 27, 2007 Senate Interior Appropriation field hearing in San Diego, “Keeley told Senators Dianne Feinstein (D-CA) and Wayne Allard (R-CO) and Congressmen Bob Filner (D-CA) and Elton Gallegly (R-CA)” that the “application of wildfire science” regarding fuel build-



up in forested areas is not relevant to curbing the fires in the San Diego (and greater Southern California region).<sup>cxxi</sup> The regions destroyed by the massive fires were not home to forests, but instead coastal sage and chaparral shrublands.<sup>cxxii</sup>

Forest-based scientific studies led to massive fuel reduction in the region—an ineffective attempt to prevent burning. Keeley noted that “large portions of areas burned in 2003 re-burned in 2007, illustrating that these relatively-sparse, young fuels were incapable of stopping wind-driven fires.”<sup>cxxiii</sup> Keeley believes that this demonstrates the ineffectiveness of fuel and vegetation reduction projects in protecting people and development from catastrophic fuels. However, it was emphasized that the “reduction of vegetation fuels around home sites was essential for the safety of first responders and homeowners.”<sup>cxxiv</sup> Although it is discouraging that these misconceptions were so prevalent during management practices and planning, it is encouraging to know that scientific data has been entered into the equation.

### **Santa Barbara’s 2007 Zaca Fire**

#### **General:**

On July 4<sup>th</sup>, 2007, the Zaca Fire ignited on private property. The Zaca Fire burned a total of 240,046 acres, 25% of the Sisquoc Watershed where it was partially located, before it was declared contained in late October. Many residential areas were evacuated during the fire, however only one building was destroyed. The building belonged to the Forest Service.

#### **Why the Fire Started:**

The wildfire ignited accidentally on private land near the Los Padres National Forest. The blaze spread very quickly, mostly because of the extremely dry conditions.<sup>cxxv</sup> In fact, when the fire started, Southern California was in the throes of a serious drought.

#### Notable Strategies:

During the Zaca Fire there were over 400 miles of firebreaks bulldozed in the Los Padres National Forest. The vast majority of these artificially created firebreaks had little to no impact in altering the course of the fire. Instead, they created a vast stretch of landscape that was easily invaded by alien plant species.<sup>cxxvi</sup> Santa Barbara County Fire Chief John Scherrei made an interesting analogy when describing how to combat the fire. On July 17<sup>th</sup>, 2007 to the Board of Supervisors, Scherrei said:

In a nutshell, this is a very dangerous fire . . . The country back there is like a bucketful of shark's teeth. It is very difficult to operate; very difficult terrain to fight a fire. It's like a mattress fire; it just keeps on smoldering then bursts back to life. With a mattress you've got to cut it up into little pieces and soak it good with water if your want to get it out.<sup>cxxvii</sup>

Essentially, Scherrei is describing the difficulty of throwing water onto a wildfire like the Zaca Fire. He, and many other decision makers, believed that "if you have a significant ridge you need to hold and have dozer lines, engine crews, hotshots and overhead support from air attack available in abundance, more than likely you can hold the main ridges."<sup>cxxviii</sup> Sadly, we know that this strategy did not work the way people anticipated it would.

In addition to bulldozing ineffective firebreaks, the USFS ignited a single backfire during the wildfire that burned 100,000 acres.<sup>cxxix</sup> Presumably, the backfire was started in order to reduce the age of the fuel in the Los Padres wilderness. Unfortunately however, that forest now

has a total of about 400,000 acres of recently burned chaparral. Chaparral in Southern California is adapted to fire at regular intervals, but is not adapted to frequent fire. This means that if, in the next fifteen years or so, a repeat fire occurs in the burned areas, many native species will be annihilated and will most likely be replaced by invasive plants species. Invasive plant species are not only harmful to the natural environment, but can also be more prone to igniting in the event of a fire.

### **Los Angeles' 2007 Griffith Park Fire**

#### **General:**

On May 8, 2007 “a brush fire broke out in Griffith Park, and over the course of the next two days, consumed over 800 acres of park land.”<sup>cxv</sup> Wind-driven flames took little time to sweep through the area, “forcing hasty evacuations and threatening numerous famous landmarks and tourist spots, such as the Los Angeles Zoo and the Hollywood Sign.”<sup>cxvii</sup> The fire tore through the park, causing significant damage to the canyons and peaks north and east of Mount Hollywood.

Luckily no one was injured in the fire, but many hiking trails, overlooks, and view stands were destroyed. Sadly, the “majority of Mixed Chaparral and Mixed Shrub plant communities in the burn areas were destroyed with significant damage to the oaks, sycamores, and other woodland communities.”<sup>cxviii</sup> Mayor Antonio Villaraigosa declared the fire and its effects a local emergency.

## Restoration Efforts:

After the fire was contained, the Department of Recreation and Parks staff met with the Department of Public Works Bureau of Engineering (BOE) staff, advisors and specialists from the UC Cooperative Extension program, and other agency representatives to “devise a Preliminary Fire Recovery Plan”.<sup>cxxxiii</sup> The Plan was issued on May 11, 2007, and had three phases:

Phase 1: Assessments/Emergency Debris Removal/Erosion Control Design

Phase 2: Erosion and Debris Flow Control/Restoration Design

Phase 3: Restoration

Fortunately for Griffith Park and everyone who enjoys it, the post-fire recovery planning became a collective effort—with many organizations and experts giving input on how to best promote the most natural and sustainable re-growth. To enact the plan, the Department of Recreation and Parks “contacted technical experts in a variety of fields” for assistance, experts from “a variety of federal, state, and local government agencies and from local community groups convened to discuss the Fire Recovery Plan, and to offer aid, and share resources and expert advice.”<sup>cxxxiv</sup> It was determined “during the first meeting that the goal of the Team was to develop a fire recovery plan that is science- and data-based.” It was “also determined that the first step was to gather data before the evidence disappeared.”<sup>cxxxv</sup> From there, several specialized multi-agency groups were formed, and the recovery became a well-planned, collective effort. Today, the Department of Recreation and Parks focuses its efforts on restoration, recovery monitoring, and public outreach. I believe that this model for post-fire

recovery is exemplary, and should be strived for after every large-scale destructive fire. In part, this type of cooperation-based strategy plan was possible because the fire occurred mostly on parklands, not privately owned property, but with careful planning I believe it can be replicated on other types of regions as well.

### **Los Angeles' Most Recent Large-Scale Wildfire: The Station Fire**

#### General:

On August 26, 2009 a fire started in Los Angeles County, north of the city of Los Angeles. The blaze ignited off Angeles Crest Highway just north of La Canada Flintridge, and because of high winds and dry conditions, traveled quickly to surrounding areas—including much of the Angeles National Park. The Station Fire burned over 160,550 acres of land, and cost over \$83 million to fight.<sup>cxxxvi</sup> Even worse, two firefighters lost their lives while fighting the blaze. Flames as “tall as 80 feet” were not uncommon to the fire, and mandatory evacuations were put into effect in many developed locations.<sup>cxxxvii</sup>

The Station Fire was fully contained by Friday, October 16<sup>th</sup> at 7:00 pm. After moderate rain had fallen in the San Gabriels the week before, fire crews were able to “hike in and contain the remaining portion of the fire.”<sup>cxxxviii</sup> Unfortunately, like many wildfires in the Southern California area (and many other regions) the Station Fire left the scorched San Gabriel Mountains at very high risk of flooding and debris flow. In an Emergency Assessment of Postfire Debris-Flow Hazards after the Station Fire, tributary “basins that drain into Pacoima Canyon,

Big Tujunga Canyon, Arroyo Seco, West Fork of the San Gabriel River, and Devils Canyon were identified as having” high probabilities of debris-flow.<sup>cxxxix</sup>

#### Why the Fire Started:

Sadly, the Station Fire was caused by arson. Due to “a lack of recent fires” as well as “drought conditions in the area” there was plenty of fuel to feed the Station Fire.<sup>cxl</sup> The terrain in the affected areas also tended to be “steep and relatively inaccessible, making fighting the fire from the ground difficult.”<sup>cxli</sup>

#### Notable Strategies:

According to the County of Los Angeles Fire Department, the establishment of a “strategic fuel break” by the community of The Meadows, (located on the WUI) saved hundreds of homes during the Station Fire.<sup>cxlii</sup> The community, located “on a secluded ridge of the Angeles National Forest just north of Altadena” has only one access road.<sup>cxliii</sup> Additionally, the area is “subjected to high-intensity down-slope winds, particularly in the fall and early winter months when life fuel moisture is at or near its lowest level.”<sup>cxliv</sup> The area also experiences Santa Ana wind speeds of up to 80 miles per hour. For most of the year, The Meadows is considered hazardous “due to its precarious location” and severe conditions.<sup>cxlv</sup>

In 2004, a “handful of homeowners decided to form a local Fire Safe Council (FSC) supported by the California Fire Alliance, a group of Federal, State, and local fire agency directors.”<sup>cxlvi</sup> LACoFD Deputy Forester J. Lopez coached residents in forming the group,

“planning fire hazard reduction projects, and developing a California FSC grant application.” The efforts of the community members and Lopez “resulted in a 2006 grant, and the Forestry Division Fire Plan Unit used Lopez’s guidance to propose an integrated fire hazard reduction project that addressed fuel reduction and emphasized continuing education.”<sup>cxlvii</sup>

The project specifically targeted hazardous vegetation on private land, access to the lone evacuation corridor, and minimizing the possibility of fire transfer.<sup>cxlviii</sup> The Fire Safe Council’s project was accomplished in several phases. The first phase of the project was “the reduction of overgrown, over mature and flammable ornamental vegetation adjacent to homes and streets located within the project area.” The second phase was “critical fuel reduction achieved by thinning the vegetation of steep vacant lots using recommended chemical treatment.” Treatment techniques included “Shaded Fuel Break,” a strategy of selectively thinning and removing more flammable understory vegetation while leaving the majority of larger, more fire-tolerant plant species in place. Another technique used was “Lop-and-Scatter,” a “hand method of removing upward-extending branches and then leaving the cut branches and leaves on the ground to prevent new growth.”<sup>cxlix</sup>

When the Station Fire approached the project area in 2009 “the flame lengths and fire behavior were severely reduced.”<sup>cl</sup> The team of firefighters—the “strike team”—assigned to local structure protection took advantage in the lull of fire activity and extinguished the reduced flames. After the fire ended, “winter rains that severely affected adjacent communities did little to no damage.”<sup>cli</sup>

## Restoration Efforts:

The U.S. Forest Service took charge of the Station Fire Post-Fire rehabilitation. According to a press release by the Incident Information System, there are three phases of rehabilitation that take place following wildfires on federal lands.<sup>clii</sup> The Angeles National Forest Station Fire recovery plan followed the three phases. The phases are: Fire Suppression Repair, Burned Area Emergency Response, and Long-term Recovery. Fire Suppression Repair is a series of immediate post-fire actions taken to repair damages and minimize environmental impacts resulting from fire suppression activities and “is usually initiated after a fire is contained and before the demobilization of an Incident Management Team.”<sup>cliii</sup> This “work rehabilitates the firelines, roads, trails, staging areas, safety zones, and drop points used during fire suppression efforts.”<sup>cliv</sup>

The Burned Area Emergency Response (BAER) program is “a rapid assessment of burned watersheds by BAER teams” to identify “unacceptable post-fire threats and implement emergency treatments to reduce unacceptable risks before the first major storm or damaging event.”<sup>clv</sup> Because wildfires can result in loss of vegetation, exposure of soil to erosion, and increased water runoff that may lead to flooding and increased sediment or debris flows, BAER treatments are important. Some of BAER treatments include the installation of: “erosion and runoff water control devices,” temporary “barriers to protect recovering areas,” warning signs, and drainage features for “increased flow.”<sup>clvi</sup> BAER work “may also replace safety related facilities; remove safety hazards; prevent permanent loss of habitat for threatened and endangered species; and prevent the spread of noxious weeds.”<sup>clvii</sup>



After the U.S. Forest Service began its recovery plan, (which included creating bulldozer lines on the burnt hillsides and covering them with cut vegetation), some residents of the affected areas complained that the hillsides were being left “unkempt”. In the past, fire lines cleared after wildfires. Fortunately, the Forest Service now recognizes that the total clearance of vegetation is “detrimental to the recovery of the landscape.” As the City of Monrovia’s website puts it: “simply put, covering bulldozer lines with cut vegetation, rather than clearing it away, is consistent with good environmental stewardship of the land and speeds its recovery.”<sup>clviii</sup>

### Shifts in Planning and Policy

According to Richard Halsey, the director of the California Chaparral Institute, many misconceptions were promoted about wildfires and fire management during the devastating 2009 fire in Los Angeles County known as the Station Fire. Many news articles and “editorial commentary have suggested that the US Forest Service is partially responsible for the Station Fire” because it failed to proactively clear underbrush in the Angeles National Forest.<sup>clix</sup> Many fire specialists were distressed by the misinformation that was widely distributed after the Station Fire was ignited. To “state that the Station Fire could have been prevented if the Forest Service had only completed its planned ‘underbrush’ clearance operations or prescribed burns” in the Angeles National Forest “indicates a profound misunderstanding of our region’s fire-prone environment.”<sup>clx</sup> In reality, there is no ‘underbrush’ located where the Station Fire was started. The Station Fire took place in chaparral environments, and the entire ecosystem is composed of native shrubs—not forest or brush. In fact, almost all of the land-cover on the San Gabriel Mountain Range is chaparral, not forest.

However, as the occurrences in The Meadows indicate, strategic fuel reduction in residential areas that preserved native plant communities and protected the ground from invasive growth was largely effective in preventing the spread of fire to homes. Although it is unfortunate that it took the initiative of homeowners—not the encouragement of local governments—to take precautionary measures, it is an optimistic sign that communities are working to better understand the natural environment and how to work with it—without stripping the land of chaparral and important root systems that prevent erosion debris flows.

## *Chapter 5: Different Agencies Involved in Los Angeles Wildfire Management*

There are many different types of organizations that work to plan for, manage, and recover from wildland fires in Southern California. Here is a list of some of the most notable organizations that work to improve wildfire management in the region.

### **The Forest Service**

The Forest Service Fire and Aviation Management Program is one of the most powerful agencies in fire management. It is a national program under the United States Department of Agriculture that, in the new millennium, has become “the premier leader in wildland fire management, operations, and research.”<sup>clxi</sup> The Forest Service Fire and Aviation Management fights wildfires across the United States using modern aviation technology, computer simulated fire management programs, and sophisticated resource tracking systems.<sup>clxii</sup>

According to the Forest Service, “neither wildland firefighting agencies or local fire departments can adequately protect the growing number of structures” on the wildland-urban interface.<sup>clxiii</sup> The Forest Service believes that “it is critical that private landowners take steps on their own to protect their property,” such as using fire-resistant building materials, landscaping techniques, and evacuation procedures.<sup>clxiv</sup> Interestingly, the US Forest Service co-sponsors the ad campaign of Smokey the Bear. The campaign is centered on the slogan “Only You Can Prevent Wildfires”—and clearly implies that not only can wildfires can be prevented entirely by

human actions, they can be prevented by simply not disposing of a cigarette in the forest or by properly extinguishing a campfire.<sup>clxv</sup> Obviously the campaign makes an important point—that people should be responsible for their actions and work to keep the forests safe—but it still perpetuates the concept that wildfires are not inevitable. Fortunately, when looking into the campaign more deeply, you can find some information about the benefits of wildfires in the region and the value of the natural ecosystem.

## **CAL FIRE**

CAL FIRE, also known as the California Department of Forestry and Fire Protection, is a section of the State of California’s federally funded Resources Agency. CAL FIRE provides emergency services to State Responsibility Areas and Local Responsibility Areas, and is therefore “dedicated to the fire protection and stewardship of over 31 million acres of California’s privately-owned wildlands,” and provides emergency services to local governments via contract.<sup>clxvi</sup> In fact, the Department provides different emergency services in 36 of California’s 58 counties through contracts with local governments.<sup>clxvii</sup> On average, the Department’s “firefighters, fire engines, and aircraft respond to an average of more than 5,600 wildland fires each year.” Those fires “burn more than 172,000 acres annually.”<sup>clxviii</sup> According to the CAL FIRE website, the Department’s mission is to “protect life and property through fire prevention engineering programs, law and code enforcement and education.”<sup>clxix</sup> The Office of the State Fire Marshal (or OSFM) has been part of CAL FIRE’s ‘team’ since 1995, and “provides for fire prevention by enforcing fire-related laws in state-owned or operated buildings, investigating arson fires in California, licensing those who inspect and service fire protection

systems,” approving fireworks, “regulating the use of chemical flame retardants,” evaluating “building materials against fire safety standards,” regulating hazardous liquid pipelines, and “tracking incident statistics for local and state government emergency response agencies.”<sup>clxx</sup>

### **The Los Angeles County Fire Department**

Municipal Fire Departments obviously play a huge part in wildfire management. The Los Angeles County Fire Department works all year to promote the safety of the County’s residents—and not just regarding fire protection. Because the LA County Fire Department works to promote safety in so many areas, (for example, educating the public about carbon monoxide poisoning, coping with potential terrorist attacks, preventing negative health impacts that come from heat waves, coping with floods, etc.), aside from front-line firefighting, its fire-safe strategies tend to work on the surface of wildfire management. Currently, under CAL FIRE’s Vegetation Management Program, the County of Los Angeles Fire Department is using five different methods to manage “over-aged chaparral stands”.<sup>clxxi</sup> These include:

- Prescribed Fire**

- Mechanical Brush Removal:** The use of mechanical equipment (like a bulldozer) to reduce vegetation

- Chemical Application:** The application of growth inhibitors, defoliators, or killers to “reduce highly flammable herbaceous or poisonous plants such as annual grasses or poison oak”

- Biological Control:** The reduction of plant volume using grazing or browsing animals (like goats) to minimize growth and maintain low fuel volume

and,

•**Hand Clearing:** The use of manual labor to remove brush with an assortment of tools – like the hand axe, or chain saw—to modify vegetation. This is the most common method used by property owners to meet Fire Code requirements<sup>clxxii</sup>

These fuel reduction practices are unfortunate because they have not been proven effective in the Los Angeles area, and pose a great risk on the native species of the region. Still, the LA County Fire Department is using its public outreach ability to accomplish something great: educating the public about how to create a defensible space around their home. This year the Fire Department started a program called *Ready! Set! Go!* that works to make it easier for the general public to use fire-safe strategies.<sup>clxxiii</sup> The Fire Department published a report under the *Ready! Set! Go!* program that functions as a “personal wildfire action plan” available to all county residents. The plan details the advantages of creating a defensible space (not clearing all vegetation) around the home in an easy-to-understand manner, and includes a checklist for preparing your family for the event of a fire. Public government funded organizations like the LA County Fire Department have a great opportunity to use their funding and their ability to reach large numbers easily, to educate the public about *correct* fire-safe practices that perpetuate the concept that wildfires are natural, inevitable, and must be carefully planned for.

### **The Los Angeles Fire Department (LAFD)**

On a more local level than the LA County Fire Department is the LAFD—the Los Angeles Fire Department. City of Los Angeles’ Fire Department considers itself a “full-spectrum life safety agency” that protects the more than four million people who live, work, and play “in America’s second largest City.”<sup>clxxiv</sup> The LAFD is comprised of 3,586 uniformed personnel and

353 non-sworn professional support personnel.<sup>clxxv</sup> A total of 1,104 uniformed Firefighters and Firefighter/Paramedics are always on duty at Fire Department facilities across the city, including 106 Neighborhood Fire Stations strategically located across the LAFD's 471 square-mile jurisdiction.<sup>clxxvi</sup> Additionally, the LAFD's Bureau of Fire Prevention and Public Safety is in charge of regulating and offering guidance for Fire Safety Systems and building codes and regulations.<sup>clxxvii</sup> This is a very important part of fire management, especially considering the potential impact new amendments to the California Code could have on the safety of the WUI.

### **City of Los Angeles Department of Recreation and Parks**

Wildfires in the Los Angeles Area often affect parklands. For example, the 2007 Griffith Park Fire took place exclusively on city-owned parklands. Because of this, and the fact that the preservation of native species is so important to fire management, the City of Los Angeles Department of Recreation and Parks clearly plays an important role in LA fire management. The Department of Recreation and Parks maintains and operates more than 390 sites of public, open space for recreational use. The Department "establishes, operates and maintains" parks, swimming pools, public golf courses, recreation centers, museums, child care centers, youth camps, tennis courts, sports programs, and senior citizen programs.<sup>clxxviii</sup> The Department also supervises the construction of new facilities, as well as the improvement of existing ones. The Department of Recreation and Parks administers more than 15,600 acres of parkland, including 4,217 acres in Griffith Park—the location of the 2007 Griffith Park wildfire.<sup>clxxix</sup>

Some of the programs overseen by the Department include the reforestation of LA city parks, as well as the maintenance of plant and tree species throughout the city. When a pest or fungus attacks a certain species of plant or tree in the area, the Department intervenes. For example, in 1998, eucalyptus trees in Southern California fell victim to a new pest in California. By the end of May the next year, the Department of Recreation and Parks had released 1.5 million Ladybird Beetles (ladybugs) into the San Fernando Valley to kill the pests and protect the trees. The Department was also in charge of taking down certain dead trees that posed safety risks.<sup>clxxx</sup>

More recently, the Department of Recreation and Parks has become involved in promoting the existence of native plant species as well as the slow reduction of non-native plants. In 2004 the Department began a tree inventory using a system “that will provide detailed information on tree species and the value of its characteristics” in relation to active and passive recreation, cooling and shading effects, as well as ecological and financial benefits.<sup>clxxxi</sup> The Department has evaluated all of its park sites for the opportunity to plant young trees. As part of this process, the “existing tree species palette” was analyzed and it was determined that many of the current non-native tree species will not be replaced until they die, but “rather another species will be introduced which has proven to be more successful or is better suited to the native plant palette or the watershed where that park is situated.”<sup>clxxxii</sup> Essentially, the Department of Recreation and Parks has a great opportunity to positively impact fire management by preserving the chaparral ecosystems of the region, and by improving the vegetation and root systems that top burning embers, and prevent debris flows and landslides. Like it has been doing after the Griffith Park fire, the Department can also play a critical role in responsible post-fire recovery efforts.



## **The Role of Nature Conservancies: Using Land Trusts to Protect Wildlands**

Because there has been a recent influx of scientific data suggesting that wildfires in the region are inevitable and should not be contended with, some organizations have begun using land trusts to purchase wildland in an effort to prevent its commercial or residential development.

### **The Arroyos & Foothills Conservancy (AFC)**

One of the organizations making efforts to prevent the development of LA's fire-prone regions is the Arroyos & Foothills Conservancy. The "primary purpose of the Arroyos & Foothills Conservancy (AFC) is land conservation, focusing on the natural foothills, streams, and arroyos" that "provide buffer between developed residential neighborhoods and the rugged San Gabriel Mountains and associated watersheds in Southern California."<sup>clxxxiii</sup> The Conservancy focuses its work in the foothills and arroyos of "the San Gabriel Mountains extending from the environs of Eaton Canyon on the east to the western Verdugo Mountains" –encompassing the communities of Altadena, Glendale, La Canada Flintridge, La Crescenta, Pasadena and South Pasadena.<sup>clxxxiv</sup>

In 2009, the AFC successfully acquired 20 acres of undeveloped land in the historic Rubio Canyon. According to the AFC, "this key parcel secures public trail access and ensures that Rubio Creek and surrounding chaparral and oak woodland right up to the Angeles National

Forest will be preserved for all time.”<sup>clxxxv</sup> By securing donations from community members and other organizations interested in conserving the chaparral wildlands, the AFC was able to prevent the parcel from being developed. This strategy—to buy WUI land before it can be developed—is becoming increasingly popular as a tool to not only conserve the natural environment, but also prevent any potentially dangerous development that would be in the path of wildfire.

### The Santa Monica Mountains Conservancy

Another Conservancy involved in purchasing land parcels in order to protect them from development is the Santa Monica Conservancy. The Santa Monica Conservancy is unique, however, in the fact that it receives federal and state funds to facilitate conservation, and can distribute funds to any project that needs it most. It was established by the California State Legislature in 1980, and has since helped to preserve over 60,000 acres of parkland in both wilderness and urban settings.<sup>clxxxvi</sup> The Conservancy credits its success and effectiveness to its partnerships with local government, joint powers entities, landowners, State and Federal agencies, and community-based organizations “to secure and develop parkland.” Through “a strategic planning process” that includes “substantial community participation and input,” the Santa Monica Mountains Conservancy’s “projects and priorities are continually updated to reflect the changing dynamics of the region.”<sup>clxxxvii</sup>

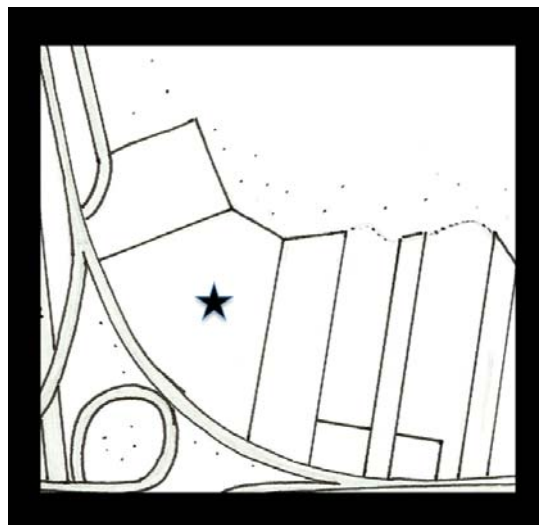
While using money from state-funded organizations to purchase fire-prone regions is a good way of preventing dangerous development on the Wildland Urban-Interface, it requires many steps and can be very complicated. According to Nancy Steele, president of the Arroyos

and Foothills Conservancy and Executive Director of the Los Angeles and San Gabriel Rivers Watershed Council, this strategy is not perfect, and it would be better if these wildlands were protected through concrete zoning and policy.<sup>clxxxviii</sup>

### **Neighborhood Organizations: Taking Action to Protect Local Wildlands**

Land Trusts are not just used by conservancies to protect the WUI. Some neighborhood associations have also moved to take control of their undeveloped wildlands to prevent them from being unsafely developed.

#### The Eagle Rock Ridge



The Eagle Rock Association (also known as TERA) is spearheading a movement to protect the 25.7 acres of open land known as the Eagle Rock Ridge from being developed for

commercial use. The land, located near the intersection of the 134 and 2 freeways, is “part of a key ecological connection between the San Rafael Hills core habitat and the Mt. Washington area.”<sup>clxxxix</sup> According to Frank Parrello, an Eagle Rock resident who is very active in the fight to protect the ridge, most people think that the ridgeline of undeveloped land above the 134 Freeway publicly owned and protected from development. Unfortunately, this is not true. Although it is zoned as Agriculture and Open Space, the “large swath” of open space is actually privately owned.

According to TERA the ridge remains “a critical corridor for open space with scenic mountain, city, and ocean views.”<sup>cx</sup> In addition to being a beautiful natural corridor in Los Angeles, something that is becoming increasingly rare, the Eagle Rock Ridge is also at high risk of being burned by a wildfire. Therefore, it is part of the WUI. Developing the property would not only mean putting any buildings at risk of burning in the event of a wildfire, it would also mean disturbing the natural old-growth chaparral located on the ridge, and exposing it to non-native species—making the land more vulnerable. The area hasn’t been developed before because it is difficult to access and does not have the necessary road infrastructure. However, its views of the Santa Monica Mountains and the Pacific Ocean have attracted attention from developers as of late.

A portion of the ridge is currently for sale for a total of \$2.4 million dollars, divided into nine individual parcels. In order to prevent the sale of the land to a developer, and its subsequent development, TERA wants the land to “be acquired by a public agency or land trust.” Recently, a developer made a proposition to the current owner that would have changed its zoning from agricultural to commercial. The developer wanted to build a restaurant and banquet facility that would have created access roads into the ridgeline from Mt. Carmel Drive in Glendale. If these

access roads had been built, access to all of the other privately owned parcels of land along the Eagle Rock Ridge would have been granted. Fortunately for TERA, communities in both Eagle Rock and Glendale opposed the proposed development, and it was not completed. Now the Ridge is on the market. For \$2.4 million, 25.7 acres could be acquired—potentially protecting several hundred acres of open space along the entire Eagle Rock Ridge. Hopefully, with help from community members and other invested organizations, the ridge can be protected.

### **Insurance Companies**

Insurance companies play an important role in the protection of the WUI. Insurance “is a means to share or transfer the risk of loss.” Thus, it improves an individual’s level of protection from incurring financial loss. Historically, “fire was the major peril for property owners.” In the words of Andre Lemaitre, author of the report, *The role of the insurance industry in piloting private sector security and prevention policy*,

“insurance companies have always been directly concerned in risk reduction, and the driving force behind a specific aspect, prevention design. So, if for a long time the only remedy for the ineffectiveness of the inhabitants and city officials faced with expanding fire was to ‘cut their losses’, that is to create a gap around a building on fire by demolishing other buildings, it very rapidly became apparent that city development called for other solutions.”<sup>cxci</sup>

Lemaitre is referencing the role of insurance companies in regulating building materials and practices in Europe, but still, his assertions are very relevant to Southern California fire management. Traditional ways of coping with fires don’t seem to be enough, particularly in regulating the actions of private homeowners.

One of the biggest turning points in fire management happened in London, UK in 1666—during the famous fire. The fire destroyed so much because the city lacked trained fire brigades, adequate water supplies, proper storage of flammable materials, and many other basic things used to prevent fires today. As a result of the fire, and the subsequent realization that something must be changed about fire management, “a method of sharing the losses arising from fire among a large group of investors or ‘insurers’ was developed,” in order to “protect owners and businesses against the financial consequences of such a disaster.”<sup>cxcii</sup> This led to the creation of one of the first property insurance firms, known as “The Fire Office”.<sup>cxci</sup>

Since then, insurance companies all over the world have made coping with disaster more manageable for those affected. Because insurance companies are always concerned about fire risk reduction, and because private homeowners must have insurance on their property, insurance companies have the potential to play a big role in the improvement of wildfire management and the perpetuation of smart fire-safe strategies and practices. It is important to enter insurance companies into the equation when planning for wildfires and facilitating multi-agency communication. They potentially have a lot of power in encouraging proper practices, and making sure that structures and land are properly built and maintained.

### **Individual Property Owners**

Because there is no way to prevent large-scale fires from happening in Southern California and Chaparral regions, and it is highly unlikely that the Wildland-Urban Interface will be eradicated of human development, it is important for developers, landscapers, and individuals

to protect their built environment—homes and surrounding property— from fire, heat, and embers as well as possible. While simply keeping a space up-to-code can help with fire protection, it is important that every property owner is well educated about fire-safe practices and the ways they can protect themselves and their communities from wildfires. Several agencies have made a push to educate homeowners on the WUI about fire-safe practices, and have published multiple guides to keeping a fire-safe property. Here is a list of the main ways property owners can improve fire safety on the WUI.

### Creating a Defensible Space

While total annihilation of any organic matter around a property is both extreme and ineffective, the careful and strategic clearance of vegetation around a home is an important step in protecting it from a wildfire. It is fortunate that the law now enforces creating a defensible space. According to the California Chaparral Institute, to create a defensible space “dense and flammable vegetation needs to be removed from the area immediately around a home in order to reduce the risk of structural ignition during a wildfire.”<sup>cxciv</sup>

Within thirty feet of a home, flammable materials such as fire-prone vegetation, wood stacks, wood decking, and patio furniture should be removed. For structures near wildland open space (the wildland urban-interface), “an additional 70 feet of space should be modified” to remove dead wood from shrubbery, to thin and trim trees and shrubs (removing lower limbs),

and to prevent the growth of weedy grasses.<sup>cxcv</sup> Maintaining “a modified canopy of vegetation to shade the ground is important to reduce weed growth.”<sup>cxcvi</sup> <sup>2</sup>

### Making the Actual Structure of a Building Less Susceptible to Fire:

Obviously, the most important thing to fire proof when protecting your home is the actual house. The very structure of a house can either cause it to burn to a crisp in the event of a fire, or protect it from fire and embers. Fortunately, the recent amendments to the California Code require all of these things, (including some landscaping requirements), however these changes are only required to be implemented in new homes or homes that have undergone a recent large-scale renovation. All homeowners would greatly benefit from making these changes.

Fortunately, fire-safe materials are easy to find in the area.

### The Natural Environment:

One facilitator of large-scale and environmentally destructive fires is the presence of non-native, invasive plant species. One of the best ways to burn your house down is to eliminate native species, and make way for fast growing, (and fast burning), weeds in the area around the home. By planting the correct native species around your home in a strategic manner, and mulching correctly, a homeowner can not only help stop fires, but can also prevent debris flow, soil loss, and flooding after a fire.

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<sup>2</sup> More information about maintaining a defensible space can be found at <http://takeresponsibility.cafirealliance.com/wildland.php>.



## **The California Fire Alliance**

The California Fire Alliance is, as its name suggests, an organization that promotes the alliance between fire management agencies. The mission of the Alliance is to reach “successful interagency/public collaboration that protects and enhances the quality of fire threatened by wildfire.”<sup>cxvii</sup> Its member agencies include CAL FIRE, the USDA Forest Service, the California Fire Safety Council, the Bureau of Indian Affairs, the Bureau of Land Management, the California Emergency Management Agency, the Los Angeles County Fire Department, the National Park Service, and the US Fish and Wildlife Service.<sup>cxviii</sup>

In addition to facilitating multi-agency communication between fire management agencies, the California Fire Alliance works to promote fire-safe practices by encouraging individual homeowners to protect their homes through the creation of a well-planned 100 feet of defensible space.<sup>cxix</sup> The Alliance does this by making resources and educational tools available to the public, and by partnering with other organizations interested in fire safety. The California Fire Alliance has created comprehensive guides to creating a defensible space around properties and made these resources available in public-friendly places like the organization’s easy-to-use website, Twitter, and Facebook. Because so many of the inconsistencies that occur in fire management exist because finding comprehensive and easy-to-understand information is so difficult, putting fire-safe strategies on social networking forums and well-designed websites is especially important. The Alliance’s website includes easy-to-read instructions on how to create a defensible space, a Tip Card, an Online Video, radio segments, legal information, and links to CalFire’s safety tips. Fortunately, the California Fire Alliance does not promote overzealous fuel reduction, and uses modern scientific data to create realistic fire protection strategies.<sup>cc</sup>

One of the most valuable things to California Fire Alliance does is promote and sponsor Fire Safe Councils within communities located on the WUI. Like the aforementioned The Meadows community, citizens interested in organizing themselves to make their neighborhoods more fire-safe can contact the California Fire Alliance to receive resources and instruction.

### **National Fire Protection Agency: Firewise**

There are an increasing number of agencies dedicated to facilitating communication and cooperation between different entities involved in fire management. The National Wildfire Coordinating Group, a consortium of wildland fire organizations and federal agencies responsible for wildland fire management in the US, is now sponsored and directed by the Wildland/Urban Interface Working Team (WUIWT).<sup>cci</sup> The WUIWT included the USDA Forest Service, USDI Bureau of Indian Affairs, USDI Bureau of Land Management, USDI Fish and Wildlife Service, USDI National Park Service, Federal Emergency Management Agency, US Fire Administration, International Association of Fire Chiefs, National Association of State Fire Marshals, National Association of State Foresters, National Emergency Management Association, and the National Fire Protection Association. The WUIWT created a program called Firewise Communities in an effort to further promote fire safety. The national Firewise Communities program is

a multi-agency effort designed to reach beyond the fire service by involving homeowners, community leaders, planners, developers, and others in the effort to protect people, property, and natural resources from the risk of wildland fire—before fire starts.<sup>ccii</sup>

The Firewise Communities approach put particular emphasis on the responsibility of communities in planning the design of a safe community, emergency response, and safer home construction and design.

### **S.A.F.E. Landscapes**

S.A.F.E. Landscapes, or Sustainable And Fire Safe Landscapes, is a collaboration between the University of California Cooperative Extension, Los Angeles and Ventura Counties, the Los Angeles and San Gabriel Rivers Watershed Council, the Los Angeles County Fire Department, the Ventura County Fire Department, the National Park Service, and numerous governmental, non-profit, and business organizations. S.A.F.E Landscapes “provides guidelines for creating and maintaining fire-safe, environmentally friendly landscapes in the wildland-urban interface.”<sup>cciii</sup> There are several programs created within S.A.F.E. Landscapes to help educate agencies and homeowners about proper fire safe strategies, including the *Climate, Fire, and Habitat in Southern California* program, the *Invasive Plants and Wildland Health* program, the *Defensible space, fire safe landscaping, and fire hazard reduction* program, and the *Fire resistant buildings* program. This collaboration of different organizations involved in fire management, coupled with an easy-to-access online medium, is a great step towards improving the future of comprehensive fire management.

## **The Los Angeles and San Gabriel Rivers Watershed Council: Facilitating Communication**

One organization has a unique strategy for encouraging fire-safe strategies: creating coalitions and facilitating communication between other entities at a watershed level. The Los Angeles and San Gabriel Rivers Watershed Council (LASGRWC) is a multi-faceted organization created around one goal: “to facilitate an inclusive consensus process to preserve, restore, and enhance the economic, social, and ecological health of the Los Angeles and San Gabriel Rivers Watershed through education, research, and planning.”<sup>cciv</sup> The Watershed Council has three overarching goals<sup>ccv</sup>:

- Reduce greater Los Angeles’s reliance on imported water by improving the quality and reliability of local water resources and increasing conservation;
- Create and nurture a landscape ethic (a sense of place) in the region, thus preserving the native landscape and increasing the amount of habitat for native fauna and flora;
- Facilitating the collaboration of watershed assessment, planning, management, science, policy, and economics –while taking into consideration community and government needs and constraints

All of these goals, particularly the latter two, are integral steps in the process we must take to improve the region’s fire management. By creating and nurturing a landscape ethic, and thus preserving the native landscape, we can reduce the number of fire-prone invasive weeds in our local ecosystem and promote the survival of California’s chaparral ecosystem. By protecting our native root systems, we can also help to preserve our hillsides from excessive erosion.

Additionally, by looking at wildfire management as a part to a greater whole—in other words, by looking at fire as a part of our watershed’s larger natural system—we gain a better understanding of how all things truly impact the region, and encourage people to reach for a better understanding of the natural environment. By facilitating the collaboration of watershed assessment, planning, management, science, policy, and economics, we can help to make fire management more effective and efficient, and minimize the lag between scientific data and current fire management policy and fire-safe practices.

#### History of the LASGRWC:

The LASGRWC was founded on July 19<sup>th</sup>, 1996 with the purpose of forming an organized cooperative effort to bring together all groups of people invested in the health of the Los Angeles and San Gabriel Rivers watersheds.<sup>ccvi</sup> Dorothy Green and Mark Gold of Heal the Bay and Don Smith of Montgomery Watson Engineers began discussing the inadequate communication between government agencies invested in the health of the watershed. At the time, Green, Gold, and Smith realized that there were five different kinds of water agencies in existence that were not exchanging information with the public, or between themselves. From these conversations came a decision to “bring representatives of all of these watershed agencies,” regulatory agencies, citizen groups, and consultants together to try and figure out “how best to remedy this situation.”<sup>ccvii</sup>

A diverse group of representatives from various agencies began meeting. Because they “acknowledged that agencies have traditionally been established to accomplish single purpose goals” and that “the agencies’ authorizing legislation does not require communication or

coordination with others working in similar areas of responsibility,” it was agreed that a conference would be held with a broader group of people to determine the best ways to improve communications and make comprehensive watershed management planning work well.<sup>ccviii</sup> This conference was the “Making Watersheds Work” conference held in 1995 in Burbank, California. Four local watersheds were examined. All of the watersheds had some type of organized cooperative effort working to ensure its health, with the exception of one: the Los Angeles and San Gabriel Rivers Watershed, the “very heart” of Los Angeles County.<sup>ccix</sup> After this realization, action was quickly taken to organize all interested parties into a council. Issues were brainstormed, a mission statement was drafted, a legal structure outlined, and a system of by-laws and was adopted. Thus was formed the Los Angeles and San Gabriel Rivers Watershed Council.

#### The Watershed Council’s Strategies in Fire Management:

Although a large portion of the Watershed Council’s focus is on the health of the region’s water system, the Council is also involved in minimizing the negative impact fire has on the health of the natural environment and the population. Within the context of the aforementioned three goals, the Watershed Council has four “Key Result Areas”, or strategies, that they work to implement and improve: education and outreach, research and monitoring, integrated planning and management, and sustaining the organization.<sup>ccx</sup> As part of my research I interviewed three different people from the Watershed Council: the Executive Director Nancy L.C. Steele, the Sustainable Landscapes Program Watershed Coordinator Drew Ready, and the Staff Geographer Mike Antos. Not only did these interviews provide me with a well-rounded sense of how the

Watershed Council works and operates, they also showed me that it is possible to create an organization that combines a rich knowledge of up-to-date scientific data on the local natural environment with a deep understanding about environmental policy and disaster management in Los Angeles.

One important thing that the LASGRWC does is publishing a quarterly magazine called *WatershedWise*. The magazine is “designed to further facilitate better communication and understanding about the watershed approach to planning and management.”<sup>ccxi</sup> Because *WatershedWise* is published four times a year, in print and web format, the magazine is able to inform over 2,500 readers “about major issues and activities in the watershed.”<sup>ccxii</sup> The magazine also profiles important agencies and community groups “doing the work.”<sup>ccxiii</sup> Publishing the magazine enables the watershed to get their message to their stakeholders in a clear and timely fashion.<sup>ccxiv</sup>

Recently, articles in *WatershedWise* “have been drawn from key stakeholders who participate in the Watershed Council’s Watershed Symposia series.”<sup>ccxv</sup> Symposia held by the council are also quarterly, and provide an interactive forum “for discussion and greater understanding of issues related to the intersection of land use planning and watershed management.”<sup>ccxvi</sup> Because the magazine is directly related to issues that concern its stakeholders, recent issues of *WatershedWise* have featured articles and discussions by expert contributors on the topics of best management practices for the urban LA environment, post-fire recovery efforts in the wake of the Griffith Park fire, and a follow-up issue on brush management and fuel modification after the Fall 2007 wildfires.

This combination of magazine distribution with face-to-face information sharing and collaboration has the potential to turn around fire management policy. The larger problem in Los

Angeles Area fire management is that there needs to be a successful paradigm shift in how people consider wildfires in the first place. The best way to accomplish this shift is to educate fire management agencies as well as individual homeowners about how the natural environment interacts with the built environment. Therefore, the Watershed Council's push to collect cutting-edge knowledge and to then distribute it to a widespread audience should be a very effective strategy at improving the state of modern fire management in the area.

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## *Chapter 6: Findings*

Because it is important to begin operating under the assumption that large-scale wildfires are inevitable, we must evaluate in what ways we should shift our policies and planning to live in balance with the inevitability of wildfires. To evaluate how fire management in the Los Angeles area can be improved, I have first categorized my findings into six categories.

### **Connecting the Dots Between Scientific Data and Fire Management**

First and foremost, it is clear that there is a significant lag between cutting edge scientific research about how fires behave in the region, and action taken to protect our communities from those fires. As I mentioned, the federal government is funding research to determine the affects of fuel reduction and other strategies on wildfires across the United States. This would generally imply that scientific data was integral in the creation of fire-safe strategies. Somehow though, potentially catastrophic practices, like the mechanical fuel reduction in areas of Old Growth chaparral, are still being used—despite the cries of scientists and nature conservancies to prevent them. More than that, they seem to be partially used as a way of comforting the fearful public. It is as if, in some cases, strategic and well-researched plans take a back seat to rash but seemingly helpful action.

There is no argument that taking action in the event of a large-scale wildfire cannot be delayed. Firefighters and decision-makers must act quickly to protect people's lives and property. After all, wildfires are time sensitive. However, as I've demonstrated in my case

studies, time and time again action is taken that is not aligned with what scientists and many conservationists know about fire and the chaparral ecosystem. In the best-case scenario of this, fire fighting is sub-optimal. In the worst-case scenario, like in the San Diego fires and the Zaca fires, wildfires do damage that could have been prevented. Often, the ecosystem is also irreversibly damaged. Every individual parcel of land in the Los Angeles area is unique. It is important to understand that what worked once in one region might not work—or worse, could be detrimental—to a different region. Because of this, all fire management practices must be compared to current research and information that is specific to the region affected. If data relating to the region's topography, human development, native species, airflow, and history are considered during planning and management, our communities will be safer and healthier. We must not sacrifice careful and responsible strategy for the sake of action.

### **Wildfires in the Los Angeles Area are *NOT* Forest Fires**

Many of the strategies used to promote fire safety in the region operate under the assumption that these wildland fires are forest fires, when in fact they are chaparral fires. This way of thinking has led policymakers and other organizations to use data collected in forest-regions and apply it to chaparral ecosystems. It is important that this mentality is eradicated because it is destroying the important chaparral systems in the area. Fuel reduction plans generally originate from forest fire experience—not from scientific research based on the region the fires are actually occurring. It is easy to understand why, in the face of a destructive wildfire, agencies are quick to use prevention and suppression strategies that have worked before in

different places. But this fact could potentially make the region *much* more dangerous and prone to frequent large-scale wildfires. Fire-safe planning must operate under the understanding that these fires are occurring in the very unique native California landscape that is California chaparral.

### **Fuel Reduction Practices are Band-aid Solutions to a Huge Problem**

Regardless of whether or not fuel reduction practices are effective at minimizing the impacts of wildfires, one thing is certain: fuel reduction practices are at most small band-aid solutions to a greater issue. Wildfires in developed areas must be suppressed in order to protect people's lives, and actions must be taken to protect the built and natural environments. However, nothing changes the fact that large-scale wildland fires are inevitable. Currently, regions such as Santa Barbara and San Diego are receiving massive influxes of funds to wipe out large amounts of their landscape "in the name of fire hazard reduction."<sup>ccxvii</sup> In a small number of cases this might be justifiable as a short-term solution, but there is a growing database of information that says these fuel reduction treatments will not solve the wildfire problem.<sup>ccxviii</sup>

### **Considering Who Really Bears the Cost of WUI Fires**

It is important that we do not forget who is bearing the cost of fires on the Wildland-Urban Interface. The economic cost alone of all natural hazards is enormous, and is one of the

biggest reasons California as a state is in enormous debt. As we know, wildfires are enormously expensive, and the costs related to preparing for, fighting, and recovering from them are unimaginably high. In 2009, the government spent more than half its annual firefighting budget just two months into the fiscal year.<sup>ccxix</sup> To make this statistic worse, that money was spent about six months before the traditional fire season even began.<sup>ccxx</sup> Every person paying taxes—income taxes, corporation taxes, sales taxes, or otherwise— is putting a significant percentage of their income towards fire management. Of course, fire management is a public service, but it is unfortunate that poor planning and improper prevention tactics can lead to the removal of other important services from the state’s budget. In 2008, after California spent a record-breaking amount of money on wildfires the year before, Governor Schwarzenegger proposed slashing all Medicaid dental coverage for adults—a cost that roughly equals the cost overruns incurred in 2007 from wildfire fighting.<sup>ccxxi</sup>

In general, the communities that build their homes on the WUI are very affluent, and while they are paying higher insurance rates due to their high risk location, everyone who pays taxes in Los Angeles County—regardless of socio-economic status or specific home location—is paying for the fighting and recovery of large-scale fires. Additionally, the impact large-scale fires have on the physical and aesthetic health of affected public parks, the temperature, and the quality of Los Angeles’ air is vast. According to an evaluation on the wildfire budget by The Christian Science Monitor, a consensus is emerging that “if California is to continue to protect fire-prone homes, owners must pay more fees and local officials must pay more heed to fire danger.”<sup>ccxxii</sup> Whether these fees include tax increases for homes located in specific fire severity zones or state fire jurisdictions, or are simply an annual fee paid to a local fire management agency, the distribution of payment for large-scale fires on the WUI needs to be changed.

Theoretically, if some of the state, federal, and municipal tax money currently spent on protecting the WUI from fire was redistributed to other public services, the benefits could be vast.

### **The Private Homeowner Plays an Important Role in Wildfire Management**

By nature, the WUI problem is directly connected to the safety of the built environment. Because private homes are most often the buildings destroyed by wildland fires, owners of these properties play an important role in fire management strategy and policy. In fact, the built environment is almost entirely dictated by the will of private homeowners. Although concerned community members have organized themselves around fire management efforts and education on occasion—like in the case of The Meadows community before the Station Fire— oftentimes private home- and landowners on the WUI are not adequately prepared to handle a massive fire. Scientist and wildland-urban interface expert Jack D. Cohen is a proponent of the establishment and recognition of “the home ignition zone” as a way of “principally determining home ignition potential.”<sup>ccxxiii</sup> He believes that “the home ignition zone provides the scientific basis for developing actions that will prevent residential fire disasters.” Cohen believes that “communities at risk of burning must be assessed and thereby identified based on the condition of the home ignition zones.” For the same reason, “mitigating home ignition potential during extreme wildland fires must focus activities within and immediate to the residential area, i.e. the home ignition zone.”

In reality, the home ignition zone largely corresponds to private property. This means that, “with minor exception, the authority for effectively reducing the home ignition potential belongs to homeowners.”<sup>ccxxiv</sup> Cohen emphasizes that:

Public land management agencies can facilitate homeowner mitigations and these agencies may be able to reduce fire intensities and the extent of burning around communities. But these agencies cannot accomplish the necessary and sufficient actions necessary to prevent residential fire disasters during extreme fire conditions by treating beyond the home ignition zone.<sup>ccxxv</sup>

It is thus important to keep in mind the power private homeowners have in fire management. There needs to be a more strategic and uniform way of evaluating how to best treat and regulate private property management on the WUI in order to protect the greater Los Angeles population, as well as flora and fauna, from fire. Luckily, recent changes to the California Code have greatly improved the future of the WUI by holding homeowners on the WUI accountable for their building safety and defensible space. Still, it is important to keep encouraging fire-safe education, the strict regulation of new building codes, and the maintenance of defensible space. Ideally, sometime in the future private landscaping will be regulated to promote the planting of native species, and discourage the spread of invasives. The reality of the situation is that regulating private property is complicated because private property rights must be upheld. For this reason, education of these homeowners is of utmost importance.

## **Multi-agency and Inter-agency Communication is Key in Effective Wildfire Management**

If this paper accomplishes anything, I hope it indicates how complicated fire management is. So many important things must be considered when developing prevention, suppression, and recovery plans. It is impossible for one agency using one strategy to approach a large-scale fire in an effective and environmentally responsible way. Therefore, it is crucial that organizations like the LASGRWC exist to facilitate multi- and inter-agency cooperation and communication.

## *Chapter 7: Lessons for LA*

“The test of a first-rate intelligence is the ability to hold two opposed ideas in the mind at the same time, and still retain the ability to function.” –F. Scott Fitzgerald

It is no secret that the Los Angeles area is a ticking time bomb of natural hazards, and the fuse of that bomb is much shorter when considering wildfires. As the data in this paper indicates, wildfires will happen whether homeowners or policymakers want them to or not. But why, when it seems obvious that the region is at high risk, do people continue to build and rebuild on the Wildland-Urban Interface? Why do California’s defense strategies revolve around band-aid solutions that are largely ineffective? Why doesn’t our scientific data match up with our policies? *The Onion*’s satirical newscast about Orange County’s annual “tradition of being shocked as wildfires burn their mansions to the ground” exemplifies the absurdity of the cyclical nature of natural hazard management.<sup>ccxxvi</sup> The comical broadcast describes how “strong Santa Ana Winds and warm weather combine to make a perfect place for wealthy Orange County residents” to not only “build and rebuild” their homes, but also to gather as a community and joyfully watch as they lose everything.

Although it is difficult to pinpoint the causes of such deeply engrained paradigms, I believe that the harsh reality of the natural environment, a deep affection for the region, and a healthy dose of denial account for the ineffective strategies intended to protect people. Perhaps Timothy Egan, New York Times columnist, put it best when he described the West Coast’s precarious position, writing:



the real triumph of hope over experience is not a second marriage, as the saying goes, but the fact that millions of us continue to live atop some of the most fragile ground on the planet, knowing full well it could crack, shatter, splinter and heave at any moment... we Ring of Fire inhabitants must keep such thoughts at bay, the willful act of daily denial that is our existence on an unstable surface.<sup>ccxxvii</sup>

It is difficult to reconcile something as terrifying as an earthquake or fire with something as idealistic as a bright future in sunny Southern California. Perhaps it should not be surprising that so many people are willing to overlook the very real and dangerous consequences of living in a high-risk fire zone when they get the opportunity to build their homes close to nature and above the dense layer of fog that settles on Los Angeles. These people are hopeful and idealistic in the face of inevitable danger.

In reality, the wildlands on the WUI should be protected by policy. Educating individuals and homeowners about fire safe practices is incredibly important, but should be upheld and insured by concrete regulations and zoning, not vague obstacles and recovery plans. It is unrealistic to eradicate homes on the WUI, (and, if you eliminate those homes then the WUI will simply exist in a new location), so those who chose to live there must be held accountable for the potential resources they can sap from the greater tax base and community.

Ideally, some sort of harmony can be reached between the very powerful natural environment, and the hopeful residents that reside on its irritable surface. Several fire management tactics, especially fuel reduction and hydroseeding, stray so far from what real scientific data would recommend because, regardless of their effectiveness, they make people feel more secure. In the same way that flight attendants ask travelers to turn off their electronics in order to instill in passengers a sense of participation and security, firefighters and policymakers are clearing chaparral and exposing the earth to invasive species because it *seems* to be helping. In reality, if someone left their cell phone on while flying in a plane, the plane

would not be affected, but it does make everyone feel safer to actively turn off a gadget. In reality, clearing 300 yards of land around your home and turning it into an arid dirt field does not increase a person's fire security—it just *seems* safer. Although a personal sense of security is important, real safety and environmental responsibility are much more important. Let's not turn off our cell phones just to watch the plane-crash. Instead, let's build a better plane.

## *Chapter 8: Policy Recommendations*

In recent years there has been a push to reconcile scientific data with policy change in the effort to make Los Angeles (and Southern California) more fire safe. There has also been a slow shift in the understanding that fires play an important and unstoppable role in the region's ecosystems. In general, there have been widespread improvements in the realm of wildfire management. However, as the Los Angeles and San Gabriel Rivers Watershed Council and other fire management agencies that are facilitating multi-agency cooperation recognize, there is an urgent need for a comprehensive strategy: one that combines effective fire-safe zoning and policy change and enforcement with safer buildings and the preservation of native species.

Currently, policy surrounding the wildland-urban interface problem is somewhat mottled. Concrete political action has been taken in some areas, like the specific building requirements for new and newly renovated buildings on the WUI, but is missing in other equally important areas, like the uneven distribution fire fighting costs and the protection of wildlands on or near the WUI. Because so much of the developed land located in high-risk areas is privately owned, and because the rights of private homeowners are upheld in the Los Angeles area, imposing regulations to these areas can prove challenging. Additionally, and perhaps more significantly, issues of who should carry more of the fire management burden and why are very complicated. The issue of bearing the cost of wildfires on the WUI brings up what community organizers would call a clash of WITT and YOYO ideologies. WITT—We're In This Together—would imply that because everyone is affected by wildland fires on the WUI, and because everyone

chose to live in a state and region that is prone to natural hazards, we must bear the cost collectively. However, this ideology also implies that action taken by residents of the WUI affects all residents of the greater region. YOYO—You're On Your Own—implies that the costs incurred on all citizens of the greater Los Angeles Area are theirs to cope with. However, this also implies that residents of the WUI would be forced to bear the majority of costs a large-scale wildfire poses on them—costs that are now covered largely by the government.

So how do we reconcile these two ideologies, and evaluate the true role of government in wildfire management policy? Clearly, the actions of few are negatively affecting many. But is it fair to impose greater costs on homeowners of the WUI when the government allows them to build their homes there in the first place? Legally, they have done nothing wrong. This question becomes more complicated when evaluating the concept of imposing fees on communities located in state fire jurisdictions—a less specific area than a new type of residential zone would impose. For example, La Crescenta/Montrose is an unincorporated area of Los Angeles County. Both La Crescenta and Montrose are grouped together because of their close proximity to one another. However, La Crescenta was greatly affected by wildfires during the 2009 Station Fire, and Montrose was not. Now, in the event of a wildfire, the neighboring cities of Glendale and Pasadena would take over firefighting and recovery.

Assuming the two communities would be grouped together if state fire jurisdiction fees were imposed, Montrose residents would likely be very angry at the idea of bearing equal cost as La Crescenta. But would residents of Montrose be correct? After all, both live in the same general area, and both benefit from many of the same qualities living on the WUI bring—for example, proximity to nature, quieter streets, and beautiful views. I believe that policy-makers must carefully consider how to balance firm and necessary policy change with the reality of

these WITT and YOYO challenges. Generally, I recommend that educating the public—particularly residents on the WUI—about the risks and expenses living in high-risk areas poses to everyone, will make the implementation of more intense fire management policy go more smoothly.

These are the policy changes I have recommended to bring the Los Angeles area closer to this ideal. I have categorized my recommendations into the four realms of fire management that I believe are most integral to creating a comprehensive fire management strategy.

### **Navigating Wildfire Management**

Wildfire Management in the region is largely convoluted, disorganized, and difficult to navigate. Because there are such large discrepancies between current fire management practices and the science- and data-based information we have about the region's natural environment, there must be a serious push to bring different stakeholders together. Firefighters, botanists, geologists, urban planners, community organizers, homeowners, policymakers and more have a wealth of knowledge to share with each other, and their overall impact would be greatly improved if their collective knowledge was used during all aspects of fire management. I believe that following the Los Angeles and San Gabriel Rivers Watershed Council's model for information sharing and communication is the best way to bridge the gap between these different stakeholders. By putting the discussion of fire management issues into print alongside tips and recommendations from experts, and making sure that prevalent topics in fire management inform

the contents of the magazine, the LASGRWC has created a way for the greater population to access good information.

In addition, by connecting *WatershedWise* magazine's content to the symposia held quarterly by the Watershed Council, the Council has made sure that the information they are publishing is current, applicable, and matters to the watershed's stakeholders. In doing this, they also facilitate much needed inter- and multi-agency communication in the watershed. If this model can be adapted to focus more regularly on wildfire management in the context of the greater Los Angeles and San Gabriel Rivers Watershed, and distributed to a larger number of people—2,500 is an admirable number of readers, but not nearly large enough to reach all of the people involved in LA's fire management— I believe it can have the potential to be the spoke in the wheel of wildfire management in the region.

Perhaps this model can be adapted by a major organization that has a broad reach, like CAL FIRE or the USDA Forest Service. However, regardless of who spearheads the endeavor, any new commitment to reconcile science, policy, and education in the form of a magazine and/or series of symposia should attempt to make it the foremost source that individuals and fire management agencies look to for information. Currently, entities are getting their information from many different sources. Clearly the results of this have led to inconsistent and inefficient fire management practices. If all fire management agencies were getting up-to-date scientific information, and then sharing their experiences and opinions with each other, fire management would be greatly improved.

## **Zoning and Policy**

There are two types of land on the WUI that must be reevaluated as soon as possible to prevent unnecessary destruction and loss: private residential property, and undeveloped wildlands that are either privately owned or owned by the County. I believe that there needs to be a shift in policy to legally protect both of these types of land.

First, a system of determining which homes on LA's WUI pose the greatest potential fire risk is needed. If there is an agreed upon system of categorizing fire risk, then determining any potential tax increases for residents of the WUI, as well as the imposition of new building and landscaping requirements, will become easier. One of the best ways of categorizing fire risk is to establish a mapping system that details zones of varying fire hazard severity across the state. Starting in 2008, the California Department of Forestry and Fire Protection (CAL FIRE) began to draft maps for Very High Fire Hazard Severity Zones (VHFHSZ) in Local Responsibility Areas, by county. A Local Responsibility Areas include incorporated cities, cultivated agricultural lands, and portions of the desert.<sup>ccxxviii</sup> So far, these maps are intended for use as guidance tools for homeowners, firefighters, and local municipalities. However, I suggest that the mapping of VHFHSZs should be adopted by the State of California and integrated in the California Code. Very High Severity Zones should be management differently than other fire severity zones, and there is no good reason why this differentiation has not influenced zoning and policy in concrete ways.

According to a report on WUI costs by Headwater Economics, “mapping high wildfire risk areas and the WUI is both a pragmatic policy tool and powerful visual educational tool.”<sup>ccxxix</sup> The “idea is to identify and map fire-prone areas, including those places where existing structures are at risk,” new “home development would pose a risk to property and human life, and where the cost of protecting homes from wildfire would be a substantial burden to on the taxpayer.”<sup>ccxxx</sup> By mapping these zones, the Wildland-Urban Interface can be further acknowledged in current policy, and homes currently located in these zones can be subjected to stronger fire-safe requirements and educational tools. The increasing awareness of the cost and safety issues surrounding wildfires on the WUI, combined with the availability of more detailed and affordable mapping technologies, has resulted in a variety of fire risk maps at the private, local, state and federal levels.<sup>ccxxxi</sup>

By creating adequate and consistent criteria used for identifying areas of high fire hazard severity risk, and extending the use of one comprehensive mapping system to the entire state, policy-makers could make an important first step towards better fire management policy. I believe that implementing a statewide mapping system is integral in the reevaluation of the two aforementioned types of land on the WUI that most need to be protected: private residential property and undeveloped wildlands. Additionally, the implementation of a comprehensive mapping system could lead to a more seamless integration of tax increases or fees imposed on homes built on the WUI. Because there is such a deficit in California’s budget, and because wildfire is a huge cause of this, eventually the distribution of firefighting costs will have to be shifted. If a small annual fee is going to added on to current homeowner fees and taxes, creating concrete fire severity zone differentiation could help to ease tensions associated with WITT and YOYO challenges.



First and foremost, it is in the best interest of *everyone* if currently undeveloped wildland on the WUI is zoned to prevent any further development. Currently, it is generally recognized that undeveloped wildlands (like the Eagle Rock Ridge) should be preserved because they pose a high fire risk. Currently, when a developer wants to buy land, the County or some other government entity sets up a series of permit-based ‘hoops’ to jump through, making development next to impossible. Still, sometimes large-scale commercial and residential developers get through all of the obstacles, and build in high-risk areas. This is particularly frightening when considering the fact that most developers are not invested in the long-term safety of a parcel of land, but that most people tend to assume an area is safe if it was developed in the first place. The County (and hopefully eventually the state) needs to recognize the wildland-urban interface as a place that should not be developed any further, and should set up a system of zoning and policies that make development impossible, forever. These areas will burn eventually no matter what—and Los Angeles’ citizens should be protected from the risks development on the WUI poses.

Second, integrating severity zone mapping has the potential to positively affect the safety and impact of privately owned homes on the WUI. I have outlined some of the changes that should be made in my description of policy-change on the Built Environment:

### **The Built Environment**

Private homes on the WUI must be equipped with smart defense mechanisms in the face of a large-scale wildland fire. Through zoning and education, the built environment on the WUI

can be greatly improved. There are two main parts of the built environment that should be assessed: the defensible space located around a building, and the building itself. Fortunately, the proper design strategies used in both of these areas have been integrated into current building codes, as I have mentioned earlier in the paper. In many cases, for a private home on the WUI to be insured, proper fire-safe structural features are also required. However, although these strategies have been incorporated into current building codes and other building requirements, during my research and interview process it became clear to me that the regulation of these new rules is not always perfect. Not only are these building and landscaping requirements not enforced on preexisting structures, they are also not always adequately enforced. One very well informed conservationist who resides on the WUI told me that, when someone came to inspect her home to make sure it was up to code, they were very lenient and ignored many of the fire hazards located around the home. This indicates to me that the acknowledgement of the WUI fire problem and its integration into the building code have not been properly integrated into people's everyday lives. Codes should apply to every building on the WUI, regulation should be stricter, and the public (especially the public living in high-risk areas) must be better educated about the WUI issues so that a paradigm shift can be reached.

### **The Natural Environment**

Although it is easy to forget about other things affected by wildfire when human lives are at stake, it is important to remember the important role that native plants play in protecting our environment and our lives. I suggest that the California Code integrate policies about using non-

native species into their existing rules and regulations. The re-integration of native species into the landscape, as well as our backyards, should be encouraged, and the planting of invasive species should be strongly discouraged. To date, the City of Los Angeles Department of Recreation and Parks has been gradually working to do this in public spaces and parklands, which is a good first step.

In addition to encouraging the proliferation of native plant species, I believe that it is crucial for a system of determining the most responsible fire-safe fuel management strategies to be created. Currently, governments and firefighters are using many fuel reduction methods that would never be recommended by scientists. If fuel reduction strategies are to be used, there must be some sort of system that makes sure any potentially drastic fuel reduction is first cleared by a board of environmental specialists. The survival of California chaparral is crucial to the health of the ecosystem, and should be protected by law—not destroyed by it. Ideally, there should be language in California’s State Legislation that requires the protection of California Chaparral, with only very few exceptions for science- and data-based wildfire protection.

### **What to Look Out For Next:**

According to Jon E. Keeley of the USGS, we currently lack a completely clear understanding of the relative value of altering conditions on the landscape (i.e. fuel treatments), in comparison to altering land planning and urban growth patterns, in comparison to changing building structure and landscaping. What we do know is that all of these three fire management strategies are important and must be carefully evaluated in accordance to their specific location and ecosystem. The USGS is currently working on a project called the Multi Hazards

Demonstration Project that is researching how different approaches in these three areas will affect future losses from wildfires.<sup>ccxxxii</sup> Hopefully after the project is completed, scientists, policymakers, and homeowners alike will be better informed and better equipped to deal with the huge responsibility development on the WUI poses. Additionally, all residents of the Los Angeles Area should keep their eyes and ears peeled for further work done by collaborative programs such as the S.A.F.E. Landscapes program and the LASGRWC. This is where cutting edge fire management change is being made, and they should be looked to for any advice about building, protecting, or buying a home around or in the WUI.

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