Dr. Matt Rahn

Director of Research and Education at SDSU’s Field Stations Programs. He has been working in ecology, environmental sciences and sustainability for over 15 years. In 1993, he began his career at the University of Nevada Reno, working on his B.S. and M.S. degrees in biology, while also working for the Nevada Biodiversity Initiative, and Biological Resources Research Center. This experience provided Dr. Rahn with a broad foundation in ecology and conservation throughout the western United States. He has received training and expertise in a wide range of wildlife monitoring and survey techniques across multiple taxonomic groups; with particular emphasis on mammals, insects, herptofauna, aquatic organisms, and fish. He has designed and implemented large-scale research projects including behavioral, ecological, disturbance, and dispersal studies, with a strong foundation in research design and statistical analysis.

Terence McHale

Joined Aaron Read & Associates after serving as Director of the California Fire Foundation and Consultant to the California State Assembly Committee on Fire, Police and Emergency Services. Terry has worked with a wide variety of clients to write and lobby legislation on a spectrum of issues ranging from the creation of the California Firefighter’s Memorial to the line of consanguinity for heirs. In 2009, he was awarded with the Director’s Achievement Award on behalf of CALFIRE.

During his time at Aaron Read & Associates, Terry has interviewed and written stories about such interesting Californians as Clint Eastwood, Kareem Abdul Jabbar, Gary Condit, Governor’s Pete Wilson and Gray Davis and the great skier, Spider Sabich. Terry was made an honorary firefighter in 2002 for his work in public safety, and has also been awarded the President’s Award from the California Dental Hygienist’s Association (CDHA) and the Special Award from the California Athletic Trainer’s Association (CATA).

Terry has maintained an integral role in managing both paid and free media messages of campaigns.
On June 16 & 17, 2014 – CAL FIRE Local 2881 hosted their first California Wildfires and Statewide Challenges Symposium in Sacramento, California.

Community experts from the federal, state and local levels accepted invitations to attend the symposium. Topics ranged from environmental change to land management to firefighter staffing and safety.

The format was individual presentations followed by roundtable discussions. No one arrived at the symposium with a pre-set agenda or a preconceived notion of what the ultimate outcomes would be.

The idea was simple enough – allow the experts to honestly view the California landscape as it relates to wild land fires and encourage common sense conclusions.

The robust discussions were insightful.

A universal conclusion was that urbanization has profoundly changed the California wild land environment, forever, and that we are a generation behind urban strategies for fire suppression and response when dealing with wild land fires. A concomitant view is that the risks are multiplying as the urban/wild land interface is abrogated by increased development and natural factors such as drought and global warming contribute to multiple, inevitable fires that singularly would once have been viewed as cataclysmic.

Costs attributed to wildland fires are staggering. An economic study of wildfires in San Diego County alone in 2003 and 2007 estimated costs at $4.5 billion, and that does not include incalculable, indirect costs, such as lost workdays, business shutdowns, watershed losses or decreased tourism. The economic costs far exceed the cost of fighting fires.

*Bill Craven, the longtime and highly respected consultant to the State Senate Natural Resources Committee, said, “Wildfires cost $3 billion a year at the federal level, which is half of the Forest Service budget now being spent on suppression. It used to be 15 percent in the 1990s. The economic losses are now five times what they were in the 1980s.”*

As more resources are being directed toward fighting and cleaning up after wildfires, fewer may be available for research and prevention efforts.

A failure to develop a strategy for wild fires that includes cooperation between stakeholders, budget prioritizations, the impact of political vagaries, and social and business structuring is an invitation to disasters that will be devastating. Homes, businesses and public lands will be lost. Lives will be profoundly disrupted, and tragic impacts will be felt by public safety regardless and the general public.
Numerous wildfires continue to burn out of control throughout California. Many of these fires were ignited in late June by dry lightning and made worse by parched conditions and a lack of rainfall.”
NASA July 1, 2008

Governor Arnold Schwarzenegger declared a state of emergency...as Santa Ana winds continued to whip the fires in unpredictable ways ...the flames burst open, and the hillside looked like a volcano had just erupted ....looked like a river of fire. Fire was literally flowing down the hill.
SFGATE November 16, 2008

Residents Evacuate as Hundreds of Firefighters Battle California Wildfires. California Flames Scorch Dry Earth.
CNN August 13, 2012

Rim Fire Hits Yosemite and Explodes into One of California’s Largest Wildfires
The Tuolumne County fire nearly doubled in size overnight and stretched over 125,620 acres, or 196 square miles – larger than the size of San Jose.
San Jose Mercury News August 23, 2013

Unprecedented Wildfires in California
The January predictions of this year possibly being the worst fire season have come true ... “I’ve been doing this for twenty years,” said San Diego County Supervisor, Bill Horn. “This is the worst I have seen.”
CNN, May 16 2014

Wildfires Eat Up Forest Service Budget, Hampering Prevention
The cost of fighting wildfires in California in California, and the western United States has skyrocketed ... fire suppression and other firefighting expenses have increased from 16% of the Forest Service Budget in 1995 to 42% in 2014 ....

“Since 1985 the number of large wildfires in the western United States increased fourfold relative to the previous fifteen years.”
Research Meteorologist Dan Cayan of UC San Diego’s Scripps Institution of Oceanography.

“I have personally witnessed 45 fire seasons in the West and I worry that we are getting to the tipping point. We have a billion burnable acres in the United States and 250 million of those acres are at risk. 15 million homes are at risk. Wildland fires are a wicked problem that will not rise to other issues like budget and defense, but it is a bad problem getting worse.”
Tom Harbour, US Forest service

“This is not just a fire problem. It’s a development problem, a land-use problem and an ecological problem.”
Kevin O’Connor, International Association of Fire Fighters

“18% of the country’s wildlands are developed and the movement into areas once open and wild will never be reversed. Our goal is a consolidated effort between all levels of government as we implement preventive and suppression measures to protect the lives and property increasingly at risk. Failure to act responsibly will result is economic ruin for communities and a tragic loss of life.”
Mike Lopez, President, Cal Fire Local 2881
Mike Lopez, President CAL FIRE Local 2881: “When Rick Swan and I sat down to plan the Symposium, our goal was simple – we wanted to get beyond the posturing and hyperbole to begin developing a realistic wild land fire plan for California and the Country.”

Ken Pimlott, director of CAL FIRE: “We keep going down the paradigm of let’s throw more stuff at it. But when you look at the cost of rebuilding, it doesn’t matter how much you throw at it, you’re still going to lose all those things… Go to the Oakland-Berkeley Hills. They rebuilt exactly the way it was. The roads aren’t wider, and the vegetation is twice what it was.”

Kevin O’ Connor, International Association of Fire Fighters (IAFF) governmental affairs assistant to the general president: “Any firefighter west of the Mississippi and south of central North Carolina is going to be a wild land firefighter at some point in their career. Even New York City last year had some significant events.”

Karon Green, chief consultant to the Assembly PERS Committee, answering a question about encouraging the Legislature to enact policies: “I look at it as how do you get it proposed for funding? The more research you have to back up your asks, the more weight it carries.”
Rex Frazier, Personal Insurance Federation of California (PIFC):
“The Insurance industry is looking to fire fighters for assistance as we begin to assess a future with fires no one would have predicted possible a decade ago.”

William “Bill” Craven, chief consultant of the California Senate Natural Resources Committee: “A couple of numbers jumped out at me. One is that in California so far, we’ve had 1,100 fires of various sizes, two times the yearly average. The second is a statistic from NASA... 30 to 60 percent higher projections for fire numbers by the end of the century...Seventeen percent of the California WUI is developed with housing. As population pressures increase, the rest of that WUI is going to be subject to potential development. That is going to make things very dicey in terms of fire policy.”

Tom Harbour, director of Fire and Aviation Management for the U.S. Forest Service: “We don’t think far enough down the road about how we are going to get out ahead of this wild land fire problem. We can’t cut our way out of it and we can’t one-more-air tanker our way out of it. It’s too big. Choices are going to have to be made. If we don’t make them, folks outside of us are going to make them for us... .25-year-old staffers on the Hill are going to be making decisions... unless folks like us get together and say, ‘We have some ideas.’”

Deputy Chief (Ret.) Rick Swan, former member of the CAL FIRE Personal Protective Clothing Committee: “This whole issue of wild land firefighter PPE (personal protective equipment) and heat stress and smoke and particulates are in such an infant stage of what we should know. Until we can find out what we are breathing and what is affecting us, how that comes back into our bodies – we know what’s going on in structural stuff ...we don’t know that necessarily outside. What about the intermittent CO2 exposure? We don’t know what that does or how that affects us. We flat out don’t know it.”
Nelson P. Bryner, chemical engineer leader for the National Institute of Standards and Technology (NIST): “I think the fact that WUI is a problem has not received much attention until recently. ‘America Burning’ started us down a path that we are still on with 40 years of science. We don’t have 40 years of science for the WUI side.”

President Chris Mahon, president of Ventura County Professional Firefighters Association: “Ventura County has had an aggressive prevention program for 30 years, We’ve been working with property owners for a long time. It was difficult, but culturally it is ingrained in our department now. It didn’t start out that way. But now we get great compliance. New people are often skeptical until they experience their first wild fire. Once they have lived through one, they are the first ones out there saying, ‘Hey, can you come tell us what to do?’

Dan Cayan, Scripps Institution of Oceanography (SIO): “We cannot escape the relationship between a more volatile fire environment and climate changes must be addressed. The impact on fire safety is significant.”

Dan Silver, CEO of the Endangered Habitats League: “Fire departments, from my perspective, facilitate the continued expansion of the WUI by checking boxes. ‘You build it and we’ll defend it.’ Somehow that chain needs to be broken.”

George Broyles, Fire Test Leader, U.S. Forest Service: “The landscape in the west has changed quickly and become more susceptible to the conditions which lead to wild land fires.”
CHANGING NOMENCLATURE OF CALIFORNIA FIRES

**Fire Season:** An antiquated term that refers to annual discrete periods where patterns of temperature, precipitation, and humidity facilitate conditions for wildfires; modern trends indicate that the nomenclature be changed to “Fire Year”

**EHL:** Endangered Habitats League

**IAFF:** International Association of Fire Fighters

**LRA, SRA, FRA:** Local-, State-, Federal Responsibility Area

**NIST:** National Institute of Standards and Technology

**PIFC:** Personal Insurance Federation of California

**POTUS:**

**USFS:** United States Forest Service

**Wildland Fires:** This term has become a misnomer. Fire is no longer isolated to wildland areas; Fires now impact highways, houses, businesses, etc. collectively referred to as a wildland urban interface fire (WUI)

**WUI:** Wildland Urban Interface
Since the 1970s, our nation has witnessed an increase from three million to an overwhelming seven million acres burned each year – with further increases projected.\(^2\)

The Oakland Hills fire in 1993 placed an orange glow in the sky that was unfamiliar and, at least momentarily, frightening for Californians. Firefighters who responded have said since then that we “dodged a bullet” as the fire nearly escaped into total catastrophe. This singular event exposed inefficiencies that we have allowed to continue in the subsequent two decades. Recent fires have finally begun to strain the great trust that our firefighters, the best trained and educated in the world, and certainly not short on courage, will be able to put out all the fires.

Given the complexity of our communities and land use, most firefighters will, at some point in their career, respond to a fire in the Wildland Urban Interface (WUI). In the conterminous US, the WUI covers 277,668 square miles and has approximately 45 million housing units.\(^4\) The WUI is widespread in the eastern US, reaching a maximum of 72% of land area in Connecticut, while in the west, California has the highest number of WUI housing units of any state (5.1 million). Between 2007-2011, local fire departments responded to over 330,000 wildfires each year.\(^13\) With over 1.1 million firefighters and 30,100 fire departments in the US.\(^3\) Conservatively, if roughly 9% of the US is part of the WUI, then at least 100,000 firefighters are regularly involved in WUI and wildland incidents across 2,709 departments. Despite this, many of these firefighters do not generally consider themselves wildland firefighters.

The statistics are staggering. In California, only 4% of wildfires are natural events, meaning that well over 95% of our wildfires are the result of human activity. Of these events, one in six engulfs transportation infrastructure, and one in ten includes some type of structure (about 3,000 homes are lost each year in the US) - \(^5\) and, sadly, last year was a hit in the gut when 34 wildland firefighters lost their lives. As a result, emphasis
has shifted from “traditional wildland firefighting” to structure defense in the WUI where over 40% of our homes are now located.\textsuperscript{5}

If trends continue, and the woeful problems associated with drought and global warming suggest the trend is inexorable, it is conservatively predicted that large fires (defined as 500 acres or more) will increase nearly 35% by 2050, and an alarming 55% by the end of this century.\textsuperscript{7} Future decisions on development and management of the WUI are critical in determining future vulnerability and risks. The paradigm shift from wildland to WUI firefighting has transformed conventional risk. Traditionally, fire studies focused on the three broad categories: wildland, structure, and vehicle.

Each incident type comes with distinctive exposures, hazards, and risks with protocols, tactics, and PPE specific to each scenario. A WUI fire represents a dynamic and multifaceted incident where these incident types merge. Firefighters may respond to a wildland fire, but often focus on community defense where structures and vehicles can become involved. The evolution of modern wildfires and the complex matrix of land use and development suggest that this is not only a common scenario, but is a virtual certainty. As a result, we are experiencing a transition from a “traditional” wildland fire (where firefighters and communities may be reasonably prepared and protected) to an incident with diverse risks and consequences.

We need to change the way our society thinks about wildland fires.
The discussion during the Symposium focused some on the disconnect between the various levels of government. Immediately problematic is that the same mistakes keep being made. Much of this is ascribable to the curious fact that the federal government does not have an independent fire service with an autonomous, operational point person taking charge and assuming the demands of leadership. The federal responsibility for fighting fires is scattered through too many bureaucracies, and too many agencies.

As mentioned previously, only .05% (5 out of 1,000) firefighters consider themselves wildland firefighters. Consequently, the training for wildland firefighting can be marginalized both in terms of importance and budgeting. The situation can also be exacerbated by the distances perceived between a forester and a firefighter.

One of the participants said the fire service can sometimes be characterized as 100 years of tradition unencumbered by progress. For example, Ed Pulaski created the firefighting tool that carries his name, the Pulaski, more than 100 years ago. If Pulaski had been a soldier a century ago, he would not recognize the modern way we conduct war, but sadly his familiarity with firefighting strategies and tools would be immediate.

The internecine issues inherent with firefighting are problematic when helping policymakers construct a coherent firefighting blueprint. A politician can be expected to listen when firefighters provide a linear narrative, but a cacophony of ‘fire specialists providing conflicting images’ only adds to the problem. We could resolve many of the problems if we made laundry listed a series of ideas and as step toward establishing public policy.

At the end of this document, we will provide a series of ideas that will streamline wildland fire policy and result in more effective protection of property, greater security for our neighbors, and increased health and safety for our firefighters.

A couple of numbers jumped out at me. One is that in California so far, we’ve had 1,100 fires of various sizes, two times the yearly average. The second is a statistic from NASA ... 30 to 60 percent higher projections for fire numbers by the end of the century ... seventeen percent of California is WUI developed with housing. As population pressures increase, the rest of that WUI is going to be subject to potential development. That is going to make things very dicey in terms of fire policy. - William Craven, chief consultant of the California Natural resources Committee
The term “fire season” has become archaic in the public safety lexicon. The mission has changed due to environmental reasons and the widespread development in previously pristine areas. The idea of seasonal firefighters may be an idea whose time has passed. This is particularly true when we realize that the vast majority of our fires (over 95% in California alone) are the result of human causes rather than natural events. We should also be asking why firefighters fall under aegis the Department of the Interior, the Department of Agriculture, BLM and others in piecemeal approach to fighting fires at the federal level. The Fire Service as a professional partner is not there with the US Forestry, and while no one is accusing anyone of anything nefarious, the idea of benign neglect wading toward incompetency is mentioned.

Large-scale wildfires have significant, and overlooked economic impacts, often exceeding billions of dollars in losses. In the conterminous United States, there are over 45 million homes in 70,000 communities in the WUI², with the annual cost of fires exceeding $14 billion.⁴ Each fire has a unique personality and concomitant economic impacts. In California, the most alarming trend is that half of the twenty largest wildfires in California’s recorded history have occurred in only the past decade, with many of these events having an unprecedented physical and financial impact to the state. The economic, social and environmental costs of wildfires are often staggering.

For example, the 2003 wildfire event that consumed much of San Diego County became one of the most costly fire incidents in California’s history. With three co-occurring fires (Cedar, Paradise, and Otay), the fires consumed a total of 375, 917 acres, 3,241 homes were lost, and sadly 16 people lost their lives, including one firefighter. At the peak of the fires, 6,635 crew were fighting the blazes. The Cedar fire is still the largest recorded fire in California’s history (at over 280,000 acres).

In a comprehensive economic impact assessment, the total economic impact of the 2003 wildfires in San Diego County is estimated at over $2.45 billion.¹ This equates to a cost of over $6,500 per acre. Surprisingly, the total suppression costs amounted to less than 2 percent of the entire economic impact; a relatively negligible cost in contrast to the overall loss. Major categories of losses included utilities and other infrastructure ($147.3 million), ecosystems ($61.2 million), lost business and tourism ($365.5 million), unemployment insurance ($400 million), FEMA disaster loans ($170 million), FEMA grants

¹ Rahn 2009
($137.5), insurance claims ($1.2 billion), and increased medical costs (mainly respiratory/pulmonary cases - $10.7 million). In 2007, San Diego County experienced another large-scale wildfire siege, costing the region an additional $2 billion in economic losses.

More recently the Rim Fire from 2013 became the third largest fire in California’s history having burned over a quarter-million acres in the Sierra Nevada Mountains near Yosemite National Park. Over a year passed before the fire was officially declared “out” due to a lack of winter rains and several deep-interior inaccessible areas that continued to smolder. In comparison to other large-scale fires in California, the Rim Fire had relatively few structures lost (11 residences, 3 commercial buildings, and 98 outbuildings). Because of the significant timber resources and ecological value of the affected area, total economic losses neared $1 billion. In comparison with other fires in the state, suppression costs were staggering ($127 million or nearly 14% of the total economic loss). Had the Rim Fire reached the Hetch Hetchy reservoir (the main water supply for the Bay Area), economic losses could have made this one of the most financially devastating fires in the world (see below for further discussion on water resources).

While these case studies provide an interesting cross-section of recent, large-scale wildfires in California, actual economic and social impacts are not adequately addressed. Further, it does not account for the total losses inflicted on our state from all wildland/WUI fires (both large and small). Finally, not all of the economic impacts or losses are captured in these analyses. It is relatively easy to quantify economic losses in terms of property, buildings, infrastructure, goods, and suppression costs. It is more difficult to quantify the long-term costs to health and welfare (for both community members and firefighters), ecosystem services, watershed and water quality degradation, and air quality. Regardless, we now recognize that large-scale wildland/WUI fires have become commonplace, the frequency and intensity of these fires is increasing, and the resulting economic and societal impacts are significant.

Experts at the symposium highlighted that what we don’t know about wildland and WUI fires may exceed what we do understand. Nelson P. Bryner of NIST said they lack data on the WUI. For example, in urban fires we know kitchens are the number one location for ignition and most fatalities are caused by upholstered furniture. In the WUI we don’t know if its wood shingles that first ignite or the walls; and the lack of reliable information has a negative impact on how we plan to attack.

NIST studies provide some evidence that wooden decks are a main ignition point, yet we don’t know how many embers it takes to ignite a deck. NIST conducted some wind tunnel experiments and discovered if the embers are spread out, they blow away and won’t start a fire. As studies mature, the idea of how we build a deck will change.
Awareness of wildfires as an issue has never been greater in our country’s history than now. What were once generally considered issues of the west are now nationally recognized as an increasing threat to all of our communities and ecosystems. As a result, the term ‘wildland fire’ has become a bit of a misnomer. Large wildfires frequently threaten homes, businesses and lives, shifting the focus to structure defense. Further exacerbating the situation, a new paradigm is emerging: we are witnessing a dramatic shift in the frequency and intensity of wildfires due to a variety of factors, most of which are human-caused.

As our population grows, decisions on developing and managing the wildland-urban-interface (WUI) will determine our vulnerability and the risks imposed on our firefighters and communities. Throughout the United States, an ongoing debate is ensuing that questions the adequacy of modern firefighter staffing, resources, response protocols, and land management. Critical decisions are driven by such malleable and extrinsic factors as public perception, environmental concerns, or budgetary constraints. As a result, decisions can be made without adequate empirical support or understanding of the issues, resulting in serious consequences to wildfire/WUI response, community safety, attack effectiveness, and firefighter health and safety.

Although firefighting response and effectiveness has vastly improved, many of the most basic issues have not been researched and considerable uncertainty remains. As a result, wildland and WUI fires have not kept pace with the advancements seen in structure and high-rise fires. In 1973, the National Commission on Fire Prevention and Control published a report that was the result of nearly two years of work. Findings and recommendations from this report served as a catalyst for significant changes and advancements in our urban fire sector. The results are nothing short of miraculous, especially when you consider that the US population has increased by about 100 million people, with the concomitant increases in buildings and homes.

Table 1. Trends in fires, deaths, injuries, and dollar loss in the United States.

<table>
<thead>
<tr>
<th>Category</th>
<th>1971*</th>
<th>2012**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deaths</td>
<td>7,570</td>
<td>2,385</td>
</tr>
<tr>
<td>Property Loss (Adjusted for 2012 dollars)</td>
<td>$12.85 Billion</td>
<td>$7.10 Billion</td>
</tr>
<tr>
<td>Number of Fires (structure)</td>
<td>996,900</td>
<td>374,000</td>
</tr>
<tr>
<td>Injuries</td>
<td>Tens of Thousands (estimate)</td>
<td>13,050</td>
</tr>
</tbody>
</table>

*Data based on Appendix V, America Burning, the Report of the National Commission on Fire Prevention and Control (1973)
Unfortunately, consensus among participants at the symposium estimate that analogous advancements in wildland/WUI fires are easily decades behind structure fires. For example, we are only starting to understand how staffing influences initial attack effectiveness of wildland/WUI fires, yet we do not fully understand the potential risks that firefighters face, including exposure to carbon monoxide and hazardous air pollutants. Further, although there are a variety of programs in the fire sciences, they tend to focus on structure fires, fire administration, and fire technology. Wildfire science and education programs remain under represented in the fire services industry and our educational institutions.

The result of the America Burning report (1973) provided several broad recommendations, for which seems to ultimately have been a successful national program. It is worth highlighting these key points here, as they can easily be adapted to meet the wildland/WUI agenda, and coincidently follow closely with many of the recommendations that emerged from this symposium:

Table 2. America Burning (1973) key recommendations.

<table>
<thead>
<tr>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>There needs to be more emphasis on fire prevention</td>
</tr>
<tr>
<td>The fire services need better training and education</td>
</tr>
<tr>
<td>Americans must be educated about fire safety</td>
</tr>
<tr>
<td>In both design and materials, the environment in which Americans live and work presents unnecessary hazards</td>
</tr>
<tr>
<td>The fire protection features of buildings need to be improved</td>
</tr>
<tr>
<td>Important areas of research are being neglected</td>
</tr>
</tbody>
</table>

Again, the purpose of this symposium is to highlight critical areas of need and discussion for wildland and wildland-urban-interface fires in California (and the United States), and help advance public safety, community protection, and firefighter health and safety. We need to begin a statewide and national dialogue on wildland fire issues that receives the same attention, support, and implementation that resulted from America Burning (1973). Generating this dialogue and awareness of wildland fire issues could have a galvanizing affect across California and the United States, resulting in meaningful societal, economic, and environmental benefits.

Much like America Burning (1973), the recommendations herein are simple, straightforward, and timely. Our goal is to highlight critical needs (at a time when policymakers are focusing more carefully on costs), address long-term planning and land use change, and recognize our changing demographics. We need to answer the question of how we are going to continue protecting our families, communities, businesses and open lands in the future. The results of the symposium are provided below, organized into five areas: Climate and Environment, Land Management, Resources and Infrastructure, Firefighter Health and Safety, and Attack Effectiveness.
"Wildland fire service in the West is still based on what used to be a limited fire season." But climate change is expanding the "natural" season, and there is no season for human-cause fires.”

For thousands of years, the frequency and intensity of natural wildfires shaped the distribution and configuration of the forests and grasslands in many parts of the United States. Over time, many of our ecosystems became adapted to wildfires with some plant and animal species becoming dependent on fire as part of their natural history. However, modern catastrophic wildfires are significantly different from the historic fire regime in California. Today, only a fraction of the wildfires we experience in California are caused by natural events.

As described earlier, wildfires can have major economic consequences as both large-scale incidents and through aggregate annual losses of smaller fires. Much of that economic toll occurs in our ecosystems, where the services that they provide are lost or degraded. According to our panel of experts, the two areas of greatest concern are impacts to our watersheds and air quality. Other key areas include habitat losses, impacts to endangered and sensitive species, and the resulting increases in invasive species post fire.

**Status and Trends**

Specifically, scientists have linked climate change to the amount of carbon dioxide in the atmosphere. It used to be 280 parts per million of CO2 concentration pre-Industrial Revolution. Today it is around 400ppm. By the end of the century, it will be even higher, as explained by Meteorologist Cayan.

**Identifying Need for Action**

As more than one speaker noted, urban fires were a wicked problem in the 1970s when the fire death toll was averaging 9,000 a year. A federal blue-ribbon commission tackled the issue and produced the landmark “America Burning” Report. In the 40 years since, that report has shaped the fire service and led to better scientific understanding about fires in enclosed spaces, better safety gear for firefighters, more fire-resistant building codes and better prevention efforts and equipment. As a result, fire deaths in America have been cut by two-thirds, even as the population has expanded.
The relationship between our nation’s water resources and our wildland areas cannot be overlooked. According to Tom Harbour, probably one of the highest risks lies in watershed management and water quality. Economic assessments support this assertion, where majority of the funds allocated to our ecosystems tend to support watershed restoration programs. For example, after the 2003 Cedar Fire, FEMA provided over $47 million in watershed restoration funding and $14 million in hazard mitigation efforts. Portions of these funds were used to restore habitat and control the potential impact of erosion and floods in the following winter. It will never be clear how much funding private landowners, tribes, and municipal entities spent on erosion and flood control measures, but we know this was an extraordinary expenditure.

These impacts pale in comparison to the potential losses that could have occurred during the 2013 Rim Fire. Potential impacts to the Hetch Hetchy reservoir put at risk the main water supply for the San Francisco area, servicing over 85% of their water needs with over 2.6 million customers. As a precautionary measure, the San Francisco Public Utilities Commission diverted water from Hetch Hetchy to downstream reservoirs in San Mateo and Alameda Counties. However the Utilities Commission still paid over $116 million for supplemental water and electrical services as a result of the fires. The Utilities Commission estimated that if the Rim Fire had actually impacted their water infrastructure, economic losses would have been between $100 and 736 million. We rely on these pristine watersheds for a large part of our state and national water supply; we cannot afford to ignore this risk.

Finally, flooding after a wildfire is a very serious threat. There is a possibility that the fire created a hydrophobic layer beneath the surface, increasing the chance of a landslide in subsequent rain events. The lack of aboveground vegetation and compromised root structures can also lead to flood and landslide risk.

Second only to watershed impacts is the threat wildfires have to our air quality. The effects of smoke exposure on the body are diverse and cover a range of conditions including eye and respiratory tract irritation to more serious disorders, including reduced lung function, bronchitis, exacerbation of asthma, and premature death. Concrete data are not available for calculating total health impacts from wildfires, but it has been estimated at over $10 million in health care costs for a single large (500+ acres) incident. During the Cedar Fire in 2003 (California’s largest wildfire on record), hospitals experienced significantly higher than average numbers of complaints from local residents for illnesses plausibly associated with exposure to fire or smoke such as asthma, burns, and respiratory distress. There was also an increase in potentially related complaints such as altered neurological function, cardiac-related chest pain, and palpitations.

2 Rahn 2009.
3 County of San Diego HHSA, EMS QA Net MICN records, 2003
The physical effects associated with a fire are a result of the types of pollutants found in the smoke, which can be unpredictable and chaotic. The smoke from wildfires is a highly variable and complex mixture of CO$_2$, water vapor, CO, particulates, unburned fuel, polycyclic aromatic hydrocarbons (PAH), nitrogen oxides, trace minerals and diverse toxic constituents. Composition depends on variables such as fuel type, moisture content, temperature, and wind. Different types of wood and vegetation contain cellulose, lignin, tannins and other polyphenols, oils, fats, resins, waxes, and starches, which produce different compounds when burned, some of which are hazardous. When wildland fires become WUI fires, man-made materials (once ignited) release a variety of chemicals, many of which are considered carcinogenic and highly toxic. The composition of this chemical mixture is largely unknown during various stages of a wildfire, and hazard assessments and decision-making cannot adequately account for firefighter and community risk.

Climate change impacts are a growing concern, not just because of the potential increases and risks of wildfires, but also because wildfires may be a significant contributor to carbon emissions. For example, the estimated GHGs from the 2001-2007 wildfires in California was roughly 200% higher than the annual car emissions for those same years, or the equivalent of adding 50 million vehicles to the state. In fact, the amount of carbon released by the dead and decaying trees (post fire) may emit more carbon into the atmosphere than the actual fire event itself.

In an analysis of the western United States, wildfires have significantly increased since the mid 1980’s. Shifting climatic conditions and land use change have combined to produce more frequent and intense wildfires while also increasing the overall annual wildfire season. California is also considered a climate change hotspot likely to experience higher than average impacts when compared to the rest of the United States. Difficulty in managing the dramatic increases in fire frequency and intensity over the past decade suggests that historic management and response practices are inadequate.

Recent research suggests that regional temperatures in California may increase from 1.7 C to 5.8 C by 2100, depending on the climate model used and the emissions scenarios assumed. This of course leads to an increase in the number of days of high or extreme fire risk (as assessed by Cal Fire in their daily wildfire risk warning system). Ultimately the fire season may be longer in California, with predicted increases in the

---

number of Santa Ana wind days under future climate scenarios. In fact, recent research suggests that the fire seasons are already longer than they were historically.

There is more uncertainty about how California’s future precipitation patterns will be influenced by climate change. It is generally predicted that most precipitation will still occur during the winter months, with little or no predicted changes in the total annual precipitation. However, most studies suggest that there may be considerable changes in inter-annual and decadal fluctuations in precipitation. Future climate scenarios also predict decreases in snowfall with more of California’s annual precipitation coming from rainfall. As the climate warms, the snowpack in the mountains will melt faster, causing spring runoff to happen earlier in the year. This ultimately means that the availability of water for vegetation communities will be significantly reduced during the dry seasons (spring through fall) leading to decreased fuel moisture and increased fire risk.

Increased frequency of lightning may occur as a result of climate change. This of course has direct implications on the risk of wildfires that we may already be experiencing. In 2008, over 2,000 wildfires were started by over 6,000 dry-lightning strikes in Northern California. The record number of lightning strikes and extreme drought conditions created catastrophic conditions that burned nearly 1.2 million acres, destroyed over 500 structures, and killed 15 people.

10 id.
11 Cayan.
13 Westerling.
15 http://www.fire.ca.gov/index_incidents_overview.php
Biological invasions have been characterized as “self-regenerating pollution.”\(^1\) Whether intentional or accidental, this type of “pollution” can be thought of in much the same way as water or air pollution.\(^2\) Unfortunately, reducing or controlling invasive species requires a distinctly different strategy because of:

- The economic value, trade activities, and other activities that depend on, or involve invasive species
- The diverse entry points or pathways for introduction
- Poor understanding of native flora, making identification of invasive species difficult
- Problems knowing which species may become invasive
- Difficulty in determining which activities must be regulated to combat the problem. Like traditional types of pollution the approaches to deal with invasive species are similar. They include prevention, cost recovery (polluters pay a penalty), and prohibitive or regulatory legislation.\(^3\)

Wildfires may also augment the current spread of invasive species. This occurs when the normal disturbance regimes under which the native community evolved are altered. Throughout the western United States, we have witnessed the spread of invasive species, particularly grasses, which change the fire frequency and intensity and shorten the return interval of fires. This results in a feedback loop where wildfires advance the spread of invasive species, ultimately leading to a type-conversion of the habitat to a nonnative dominated ecosystem.\(^4,5\) Beyond non-native grasses and noxious weeds, additional threats may exist in increased infestations of certain beetle species and other insects or pathogens that can decrease ecosystem health and increase fire risk. While many of these pathways and relationships are still being investigated, one thing is clear: invasive species must be dealt with in our long-term wildland fire management strategy.

---


Native Habitat and Endangered Species

The impact to ecosystems is largely uncertain, however some changes are likely. For example, some insect species instigate high fire risk conditions. Vegetation mortality from insects and pathogens can become a significant contributor to wildfire risk.\textsuperscript{16} Further, insect infestations and pathogens are predicted to increase as a direct result of changing climate.\textsuperscript{17} This occurs because future climate scenarios may actually enhance the survivability and spread and by reducing overall health thereby making the biological community more susceptible to damage or disease.\textsuperscript{18} For example, increasing the winter temperatures in the Sierra Nevada Mountains could make conditions more suitable for pitch canker, resulting in increased disease and economic losses.\textsuperscript{19}

In many of the economic assessments on large-scale wildfires, ecosystem impacts and endangered species figure significantly into the loss estimates and recovery costs. Future wildfire management plans and response strategies must account for native habitat, endangered, and sensitive species.

Land use change and urbanization (including the increasing development into the wildland-urban-interface seems divorced from natural processes and ecosystems. Much like our historic development in the high-risk areas like flood plains, we continue to expand our homes, business, and infrastructure into the WUI without rigorous constraints or societal acknowledgement of the risk. There seems to be a disconnect between the risks created by our land use decisions and the ultimate costs incurred by local, state, or federal governments.

CAL FIRE is a world-renowned emergency response agency dedicated to protecting over 31 million acres of wildland in California. Today, their role has expanded to cover over 350,000 calls a year for non-fire related incidents, including medical aids, hazardous material spills, swift water rescues, search and rescue, floods, earthquakes and more.\textsuperscript{20} However, when budget reductions are proposed, the focus is typically on wildfires.

\textsuperscript{20} See generally: http://www.fire.ca.gov/about/about.php (last accessed November 20, 2011).
rather than other areas of CAL FIRE’s responsibility. In recent decades, our Governors, Legislature, and Legislative Analyst’s Office have suggested strategies for coping with the budget impact, focused on fire protection in the Wildland-Urban-Interface (WUI) and State Responsibility Area (SRA). Generally, these proposals emphasized the development of a new fee for properties located within the WUI/SRA. The original goal was to create an SRA fee program to offset the roughly $200 million cost of CAL FIRE’s annual wildfire protection/response budget. However, increases in major disasters and a failing economy led to a substantially different program. During the 2013-14 fiscal year, the newly implemented fire-prevention fee program collected $74,978,000, and spent $58,765,000 on prevention activities and $14,396,000 on administration. Admittedly, this program is still in the early stages and the long-term results have yet to be realized. However, the high cost of wildfires continues and there has been no significant reductions in the states operational budget.

RESOURCES & INFRASTRUCTURE

“Let’s review together the combined resources in place for prevention and suppressing.”

“There are huge inefficiencies that we allow to exist.”

“We have allowed benign neglect to become overall incompetence.”

FIREFIGHTER HEALTH AND SAFETY

“Because of budget problems and the vagaries of nature, firefighters are being asked to do more with less.”

Status and Trends

The ability to effectively combat wildfires is inextricably linked to community and firefighter health and safety. Again, the wildland/WUI fire industry significantly lags behind structural firefighting. For example, a considerable amount of research has addressed CO exposure and risk in structural fire incidents with aggressive outreach and education campaigns. However, analogous research programs on WUI and wildfire incidents are more limited. As a result, there is a serious deficiency in the current understanding of wildfire practices and firefighter health and safety. Fundamental uncertainties based on our fragmentary understanding of the relationships between resources, land management, and environmental conditions creates a situation in


22 See generally: http://www.thesilentkiller.net/index.html for information and resources on CO exposure and risk.
which sound and well-informed decision making is extremely challenging, if not impossible.

While smoke exposure at some wildfires and prescribed burns can be no more than a nuisance, on occasion it approaches or exceeds legal and recommended occupational exposure limits. As discussed in the section on Air Quality above, wildland and WUI fires create a highly hazardous, carcinogenic, and toxic environment for firefighters. As WUI fires become more commonplace, we are recognizing that many safeguards for structure and vehicle fires are not part of WUI standards. Customary protocols and personal protective equipment (PPE) may actually be incompatible in many situations. For example, extended duty on many wildland/WUI fires means that an SCBA could provide only a fraction of the protection needed during a 12-hour shift. This device is further limited simply due to the physical constraints it places on the firefighter in the field. Similarly, turnout gear for structure fires is designed to afford adequate protection for an interior attack, not the exterior attack more typical of WUI firefighting. The thick, heavy, urban gear induces serious heat stress for firefighters conducting exterior or vegetative fire suppression. Proper WUI safeguards are imperative.

The typical responsibilities of a firefighter are also a leading contributor to the health risks they face. Firefighters often go from a state of sleep to near 100 percent alertness and extreme physical exertion in a matter of minutes. When combined with the heavy equipment and gear they carry through extended periods of intense heat and brutal environmental conditions, wildland firefighters experience the limits of what the human body was meant to withstand. Repeated exposure to these conditions can lead to cardiac arrests, where the heart’s electrical impulses become rapid (ventricular tachycardia) or chaotic (ventricular fibrillation).

All of the studies from the 1970s to present look at vehicle fires, structure fires and wildland fires as though they are isolated incidents. But in California, you would be hard-pressed to find just a wildland fire, was a point made at the symposium by Dr. Matt Rahn, from California State University San Diego. The wildland firefighter goes in with standard gear and no SCBA and yet we don’t know the answer to the basic question, when you’re standing 20 feet from the burning vehicle, what are you being exposed to?

The number of wildland firefighters suffering from dehydration also appears to be on the rise, yet the reasons of not been delineated, studied, or reviewed at length. The reason may be so simple is the fact that firefighters are drinking sports drinks instead of water. NIST points out that we have not yet developed to test for hydration.

Studies are now being conducted on the long and short-term effects of exposure to carbon dioxide, but researchers are hampered by the inability to measure the exposure in real time, especially as a firefighter moves in and out of smoke. The roundtable discussion at the symposium triggered concern over the ramification of being exposed to CO2 and the subsequent ability of a firefighter to think clearly and act decisively. Potentially, a risk management decision is being undermined because people aren’t thinking clearly.
Identify Needs and Priorities

Advancements in technology and assessment methods can help us understand the relationship between the harmful effects of CO, particulates, and hazardous air pollutants (HAPs), and other threats that occur during a fire incident. We need to understand the actual exposure and risks our community and firefighters face during a wildland/WUI fire incident. We need to understand how the response, training, and protection protocols can be improved to enhance the health and safety of firefighters and our community. This not only helps protect the firefighters, but also contributes to improved initial attack and response effectiveness: a healthy firefighter is an effective firefighter.

“It is a tribute to firefighters that under such extreme conditions the vast majority of fires are controlled quickly”

Status and Trends

Emergency response effectiveness is driven by four factors: 1) land management practices, 2) existing environmental conditions, 3) equipment resources available to fight a fire, and 4) the number of firefighters dispatched to an incident. When one variable is unbalanced (e.g. extreme environmental conditions or insufficient staffing) the result is an inability to effectively contain wildfires.

The availability of adequate resources and staffing to combat wildfires also has a direct impact on meeting fire suppression goals. Suppression failures generally happen when the resources available for an initial attack response are ineffective or insufficient at controlling the fire. This can occur when firefighting resources throughout a region are spread too thin due to excessive activity or when adequate resources are not provided, particularly at the outset of a wildfire event.

Rahn (2010) conducted the first wildland fire staffing study to assess initial attack effectiveness under various staffing levels and environmental conditions. Basically, the results suggested that by increasing the number of firefighters on an engine, the efficiency, effectiveness and the overall ability to potentially control a wildland fire significantly increased, thus enhancing emergency response and the ability to protect California from...
modern wildfires. This preliminary study also has serious implications for firefighter health and safety. The most startling difference were the peak heart rates recorded by a 3-0 engine. During these trials, these firefighters traveled nearly ½ a mile longer than a 4-0 engine on the same 2,000-foot hoselay. Furthermore, adding a single firefighter to a 3-0 engine resulted in faster completion times that were up to 50 percent faster. Firefighters on a 3-0 engine also sustained peak heart rates of over 220 beats per minute, well beyond acceptable limits, increasing the risks of complications and tachycardia. It should be noted that this initial study was conducted under “ideal” conditions in southern California, lacking the intensity, heat, and stress that a wildfire creates.

Current research conducted by Rahn (2014) has demonstrated that real-world scenarios are far more serious. Monitoring of California firefighters during actual wildfire incidents has shown that firefighters regularly exceed safe physiological conditions. Many individuals sustained peak heart rates above 220 beats per minute, had core body temperatures well above 102 degrees Fahrenheit, demonstrated excessively rapid respiratory rates, and were exposed to CO levels well beyond occupational limits. Each factor could significantly impair attack effectiveness, let alone having firefighters experience all simultaneously.

Identify Needs and Priorities

It is imperative that we improve our understanding of how staffing, resources, tactics, and technology can improve attack effectiveness.

• We must increase programs that focus on prevention; improve education and awareness of homeowner responsibility in the WUI. These programs cannot continue in isolation of a more serious discussion on how we manage and expand into the WUI.

• We must create a comprehensive policy and management program that adaptively and scientifically informs when and how we suppress wildfires, allow fires to be a natural part of the landscape, allow for future development, design fire-safe resilient communities, and provide for ecosystem and watershed-level protection.

Next Steps and Recommendations
• Address the issue of inter- and intra-agency cooperation, including how best to navigate the LRA, SRA, and FRA. We need to address the diverse land management, land use, and fire response practices between and among agencies, the funding mechanisms for fire prevention and response, and the allocation of resources and firefighters at a local, state, and national level. This discussion should include the concept of a consolidated federal fire agency.

• There is a need to create a comprehensive wildfire/WUI education and training program that meets the diverse needs of urban and wildland fire agencies with an emphasis on providing new tools, technologies, and operational strategies to meet the evolving risks and demands.

• Develop a better understanding of future risks related to wildland/WUI fires and create proactive (rather than just reactive) programs to address key areas such as drought, flooding, Santa-Ana wind events, landslides, etc.

• A change in the frequency, intensity, and distribution of wildfires has, and will continue, to occur throughout California. It is imperative that we acknowledge this change and identify ways to avoid, minimize, and mitigate the risk and impacts.

• We need to develop a long-term firefighter health survey that addresses key factors associated with exposure and injuries and better understand the short- and long-term consequences.

• We need to improve funding for research, especially in key areas that can help improve situational awareness, environmental monitoring (e.g. exposure and risk), communications, and protective equipment.

• We need to help firefighters understand when they are experiencing compromised decision-making (related to factors such as stress, heat, CO exposure, dehydration, etc.).

• We need to ensure that policy and decision-making is informed by good science and information (striking a balance between theoretical, applied, and basic science).
• We need to address mental health issues and wildland firefighting, particularly in the areas related to post-traumatic stress disorders and suicide rates.

• We need to develop a better tool for hazard risk assessments for wildland/WUI fires and implement land management that prospectively protects and plans accordingly.

• We need to understand how the incident command and/or other remote operations can better serve firefighters and firefighting through enhanced monitoring, situational awareness, and biometrics.

• Identify opportunities where programs that address issues such as greenhouse gas emissions, climate change, ecosystem management, invasive species removal, watershed management, habitat conservation, and endangered species programs can align with and facilitate landscape level management for wildland/WUI fires.

• Improve communication and coordination between fire and insurance agencies.

• Ensure that current and future regulations and codes are supported by the best available science and understanding of the particular issue.

• Improve the communication and dissemination of research and technology to fire agencies and decision makers.

• Improve our understanding of how and where small scale proscribed burns can be a useful management tool and identify opportunities where this can assist in improving habitat and ecosystems.

• Work with the building, insurance, and development industry to help identify and implement the best practicable design and materials for construction within the WUI. Identify opportunities for retrofitting requirements for resale and/or reconstructed homes within the WUI that do not meet current standards.

• Identify potential opportunities for tax and/or insurance incentives for homeowner prevention and management programs within the WUI.

• We need to develop wildfire impact assessment tools that accurately captures the total loss as well as the “saves” that occur due to fire suppression activities.

• Develop a clearinghouse for information on wildfires and firefighter health/safety.

• Create a center or group that can provide independent expert analysis on policies, laws, and regulations related to fires and emergency response services and how they relate to fire response agencies and firefighters.

• Advocate for Blue Ribbon Commission on Wildland/WUI that follows in the spirit of the work done in 1973 – America is Still Burning
FEDERAL GOVERNMENT STRUGGLES WITH FIRE POLICY

“Currently, agencies like the Forest Service must borrow from non-fire accounts with fire suppression costs exceed the budget. ‘Fire Borrowing’ was intended to be an extraordinary measure, but as fire seasons have grown more destructive it has become common practice (8 of the last 10 years) - and has created a devastating cycle that prevents agencies from doing needed hazardous fuels removal or timber harvest, leading to worse fires. Until we reform the way we budget for wildfires, none of the actions we advocate can take place.” - Congressman Mike Simpson 2015

Considerations Presented:

- Changing Environment
- Fire fighter health and Safety
- Community Preparedness
- Fire fighter staffing and resources
- Navigating the protection and Management Landscape
- Dealing with Government Bureaucracy

Deliverables:

- IAFF White Paper
- Legislative/Regulatory Research and Safety Grants
- Blue Ribbon Commission
- Policy Budget Concerns
Audience/Forum issues: These can be broken down into major headings of

**FF Safety/Training/Government Prevention**

- Drought and Water Control
- Reimbursement from Forest Service (up to two years)
- Prevention (not enough people to enforce)
- Fire loads are too high
- Incentives for defensible space (insurance?)
- Zoning- inadequate zoning enforcement
- Home owners not willing to cooperate
- Dealing with multiple Agencies
- Pollution controls prevent fire load reduction (preventive/controlled burning)
- Portal to Portal- federal vs municipal fire fighters (variations in work shifts)
- Volunteers tapping into federal grants but do not respond
- Radio interoperability
- Training

There was a consensus among the group attending that additional funds are needed for continued scientific research into several areas of wildland firefighting.

- Effectiveness of building codes in WUI
- Educating home owners and the public on prevention- and defensible open spaces
- Unifying and improving effectiveness of response (agency co-operation and coordination)
- Initial response staffing effectiveness
- Fuels management
- Fire fighter safety, effectiveness of tactics, PPE, physiological impact of wildland firefighting on fire fighters


The Austin Local suggests engaging the NWCG in an attempt to recognize prior learning and experience.
As our Locals continue to expand into the wildland areas of firefighting this is a valid concern. Extensive periods of time can be required for municipal fire fighters to gain qualifications/certification in wildland firefighting. While much of this training is beneficial there are many redundancies in the wildland training that experienced fire fighters should be able to avoid if the programs recognized prior leaning and experience.

Committee needs to discuss/consider participation in the NWCG to attempt to address interagency cooperation and exchange of information to include municipal counterparts rather than just federal agencies. The NWCG currently consists of seven federal agencies and three non-federal entities. The non-federal entities are the State Foresters Association, Intertribal Timber Council and the IAFC. At the very least the IAFF should explore the role of and usefulness of the NWCG. IAFF members could possibly benefit from IAFF participation in the NWCG? NWCG sets some of the training standards that States follow regarding wildland firefighting. Involvement in the establishment and or revisions of these standards could be beneficial. Several forum participants mentioned the fact that as structural fire fighters transition into adopting additional roles in wildland firefighting that the NWCG standards for training do not give any recognition to prior learning. As such experienced fire fighters must begin training in wildland programs as if they are a new fire fighter with no experience. The NWCG may also be a viable avenue in supporting legislative revisions that the IAFF believes are necessary at the federal level.

Proposed IAFF Tasks

**IAFF White Paper on Wildland Fire Fighting**

- The Task Force members and forum participants agree that the development of an IAFF “White Paper” regarding wildland firefighting is a viable first step in identifying issues and priorities regarding wildland firefighting.

**Evaluation of Training Requirements**

- Training requirements across the spectrum regarding wildland firefighting should be evaluated by the IAFF Training Department and a database created. An evaluation of State and Federal requirements will allow the IAFF to address inconsistencies or concerns.

**Research Grants**

- The IAFF should engage stakeholders and identify priority needs regarding research and seek Federal grants to accomplish research into wildland fire topics of concern. Such research will directly benefit the IAFF members, their safety and the public.
Overview

There is an obvious frustration for IAFF members that deal with or engage in wildland firefighting due to inconsistencies across the Nation in dealing with other agencies and regulatory road blocks. Due to the expansion of urban areas many fire departments previously tasked with the primary roles of structural suppression and EMS are seeing an emphasis placed on wildland firefighting by local communities. Often this results in conflicts with federal agencies and federal priorities regarding suppression, prevention and the maintenance of lands adjacent to the communities.

As a member of the Training Program in NWCG the IAFF could help adjust the training curriculum to provide for Local’s concerns.

• The work should move towards nationwide surge ability with qualified Local members providing the staffing instead of the Privates.

Currently the Federal Govt deals with States on a nationwide process, State affiliates need to query their respective locals as to how their state needs to work with the Fed’s one size fits all process. Either educating the locals in the Fed process or moving to personalize the process for each state should be moved forward. This is where the increased citizen responsibility issues could be addressed.

The IAFF is being left behind in this diverse and growing skill set. Our members voices are not being heard on very important Training, Education, Staffing, Health and Safety issues at meetings which define what our members will be doing. If we are not at these events and meetings we can’t influence the outcome.

We need to leverage the NATIONAL ACTION PLAN An Implementation Framework for the National Cohesive Wildland Fire Management Strategy April 2014 to engage in the Implementation Planning Guidance

• Enhance wildfire response preparedness in areas more likely to experience large, long-duration wildfires that are unwanted or threaten communities and homes.
• Enhance wildfire response preparedness in areas experiencing high rates of structure loss per area burned.
• At the community level, emphasize both structure protection and wildfire prevention to enhance the effectiveness of initial response.

Regarding the deliverables discussed at the meeting, the list should be evaluated and prioritized setting goals in the areas where the most benefit for the members has a viable return. Considerations could be establishing the Blue Ribbon Commission and standardizing training or supporting the creation of qualification equivalencies. In addition the members would benefit greatly from improving interagency cooperation between federal and municipal agencies. A starting point to consider would be exploring the NWCG.

Additional considerations:

Federal and/or State legislative Actions

• Stricter enforcement of defensive zones/ordinances
• Waivers at the State and Federal level on pollution controls for controlled burning
• Legislative remedy for Forest Service reimbursements to municipalities
• Additional research funding
H.R. 167

To provide for adjustments to discretionary spending under section 251(b)(2) of the Balanced Budget and Emergency Deficit Control Act of 1985 to support wildfire suppression operations, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JANUARY 6, 2015

Mr. SIMPSON (for himself and Mr. SCHUMACHER) introduced the following bill; which was referred to the Committee on the Budget, and in addition to the Committees on Agriculture and Natural Resources, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned.

A BILL

To provide for adjustments to discretionary spending under section 251(b)(2) of the Balanced Budget and Emergency Deficit Control Act of 1985 to support wildfire suppression operations, and for other purposes.

1 Be it enacted by the Senate and House of Representa-
2 tives of the United States of America in Congress assembled,
3 SECTION 1. SHORT TITLE.
4 This Act may be cited as the “Wildfire Disaster
5 Funding Act”.
Pay for fighting wildfires like natural disasters

By the Editorial Board - 03/22/2015 5:00 PM

An out-of-control wildfire is just as much a natural disaster as a hurricane or flood. Just ask Californians who fled for their lives or saw their homes burn down in recent years.

But that’s not how wildfires are handled in the federal budget, and it’s taking money away from worthwhile programs in our national forests and parks.

This has to change.

The U.S. Forest Service, the White House, bipartisan supporters in Congress and conservation groups are on the right track. They’re trying to push through legislation (H.R. 167) so that the costs of fighting the few catastrophic wildfires would be paid from emergency funds, just as when other natural disasters strike. The Forest Service and Interior Department would continue to fund routine firefighting from their regular budgets.

The House and Senate are expected to start working this week on Forest Service appropriations. Under the current setup, money is set aside in its budget for wildfires at the 10-year average cost. But when costs go beyond that, the agency must borrow from non-firefighting programs.

That has happened in eight of the last 10 years, including $440 million in 2011-12 and $500 million in 2012-13. The Rim fire in 2013, which burned 400 square miles in Stanislaus National Forest and near Yosemite National Park, cost more than $127 million to control.

While these transfers are generally reimbursed, Forest Service officials make a strong case that they do real damage

In California in 2012-13, paying to fight wildfires prevented the agency from buying land along Leech Lake, in the Sierra and at Big Sur. The previous year, repairs on the Pacific Crest trail and in the Inyo and Los Padres national forests didn’t get done. A wastewater project in Lassen National Forest was delayed, and so was a key road in Angeles National Forest.

Some of the work that is put off such as removing brush and other fuel is designed to lessen wildfire damage. So taxpayers end up paying more in the long run.

During the past 30 years, the average wildfire season has grown some 70 days longer, and total acres burned have doubled to 7 million. Between 1995 and 2014, firefighting went from 16 percent of the Forest Service budget to 42 percent.

With climate change and more development near public land, the risk of costly wildfire damage will only increase. The way the federal government funds fighting big wildfires has to adapt with the times.
On July 17, 2014 Dr. Rahn and symposium representatives met with firefighter experts from across the United States, including representatives from Florida, Colorado, Texas, New Mexico, Arizona, Virginia, Washington, and others. The purpose was to discuss trends and the continuing crisis in California, which is being felt almost identically although with some differing local flavor across the country. The group echoed many of the same issues discussed at the California Symposium. It became clear that fire agencies throughout the US are battling many of the same wildland/WUI issues experienced in California. In particular, the following issues were highlighted during the meeting:

- Significant changes in the frequency and intensity of wildfires have been occurring throughout the rest of the US. Firefighter impacts are increasing as a result. We need to recognize that this impacts not just the traditional wildland firefighters, but also municipal agencies now.
- We need to develop advanced education and training programs focused on wildland and WUI firefighting that are accessible to career firefighters and diverse agencies throughout the US.
- Incentivizing homeowners to maintain defensible space and resolving conflicts with ecosystem and watershed management.
- We need to resolve the funding and reimbursement and cost recovery mechanisms between local and federal agencies.
- We need to improve coordination of land management practices across federal, state, and local lands.
- Land management hurdles must also be overcome, including environmental challenges, legal, regulatory, and policy hurdles associated with proscribed burns, brush clearing, or other practices. We need to identify streamlined procedures to address environmental clearances to provide timely and efficient wildland management; air quality clearances seems to be one of the more major hurdles.
- They emphasized the continued disconnect where local government is permitting rapid development in the WUI and shifting the burden to state and federal fire agencies.
- Further, federal fuel management places an increased risk on local communities and government resources.
- There is a disconnect between land management, policies, local land use, land management, and private property.
- There was significant interest in improving the science behind firefighting, especially in the areas of firefighter tracking, communications, and hazard/exposure identification.
- Minimum wage is being discussed as a living wage argument and the impact on entry-level firefighters is real, and concerns of salary compaction are daunting.