Appendix A

California Chaparral Institute comment letters on previous VTP EIRs (2005 – 2018)

The California Chaparral Field Institute

…the voice of the chaparral

August 31, 2005

Mr. Jeff Stephens, Deputy Chief for Vegetation Management
California Department of Forestry and Fire Protection (CDF)
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Sacramento, CA 94244-2460

Dear Mr. Stephens,

We are submitting the following comments in reference to the CDF's Notice of Preparation (NOP) for the Vegetation Management Program (VMP) Draft Environmental Impact Report of 2005.

There are four important issues we would like to address that have relevance to the proposed VMP and the upcoming final Environmental Report:

1. The use of vegetation treatment methods to attempt to reduce the frequency and size of catastrophic fires.
2. The need for a critical and objective analysis of the costs vs. benefits of various fuel modification treatments available today.
3. The classification of old-growth chaparral as "decadent."
4. The recognition of chaparral as an important economic, recreational, and natural resource that needs to be managed as carefully and with as much focus as the state's forest systems.

Our comments focus primarily on wildfires relating to chaparral, California's most extensive and characteristic plant community; an ecosystem that is also associated with the most devastating wildfires in the state. These are important points to highlight because much of what is within the California Fire Plan tends to treat different types of fuels with the same broad brush, "one-size-fits-all" approach, failing not only to recognize the distinct differences between forest and chaparral, but also the important differences within chaparral types themselves. These differences have important fire management implications that need to be addressed. Not doing so will dramatically reduce the effectiveness of our state's fire management efforts.

1. The use of vegetation treatment methods to attempt to reduce the frequency and size of catastrophic fires.

It is a common perception that wildlands in California are unnaturally overgrown with a half-century's worth of highly combustible brush and small trees because of successful firefighting efforts since the 1950s. Such conditions are often blamed for allowing wildfires to become large and catastrophic. As a consequence, firefighting agencies are frequently held responsible for being the cause of our current wildfire crisis. This model is well supported in the coniferous belt of California, but the lower elevation chaparral is a completely different story. Support for this perception, especially in southern California, has come from studies relating to systems in Baja California (Minnich 1983, 1995) that are not particularly comparable to landscapes north of the border.

A suggested remedy to correct the “fuels problem” has been landscape level vegetation management projects that include prescribed burning and other treatments. According to this model, once a “mosaic” of mixed aged fuels is created, the size and frequency of large, catastrophic fires will be reduced dramatically in California. This is suggested in the NOP as well as the California Fire Plan (1995).

Recent scientific research, however, performed over the past ten years by numerous investigators and since the Fire Plan was written seriously challenges this assumption (Keeley et al. 1999, Moritz 2003, Wells et al. 2004, Moritz et al. 2004). In particular, studies have shown that fuel age does not significantly affect the probability of burning. Zedler and Seiger (2000) examined the same question through mathematical modeling and arrived at the same conclusion. Under extreme weather conditions, fire rapidly sweeps through all chaparral stands, regardless of age.

In addition, the fire suppression/fuel accumulation model does not agree with fire history trends in southern California over the past century; the number of acres burned per decade has remained relatively constant (Keeley and Fotheringham 2003) with fire frequency increasing in lock step with population growth. Please see Figures 1 and 2. Indeed, roughly a third of San Diego County burns every decade. At no time in the past would fires have burned more frequently than this because it is at the threshold of tolerance for most chaparral species.

Although fuel is obviously important, we know fires do not become catastrophic without corresponding extreme weather conditions (low humidity, high winds and temperatures). During such conditions, fire can be spread by burning through younger fuels or by spotting up to a mile away from the fire front. Both the 2003 Cedar and Otay fires in San Diego County burned through multiple numbers of large, young age-class mosaics less than eight years old. Please see Figure 3. Reducing fuel loads at strategically placed locations can provide anchor points and safety zones for firefighters, especially during non-wind driven events, but they have not proven effective in stopping the spread of wind-driven fires.

Contrary to conventional wisdom, large wildfires have always been part of the southern California experience, even before fire suppression. Relating to a huge fire in Orange County, L.A. Barrett wrote, "Nothing like it occurred in California since the National Forests have been administered. In fact, in my 33 years in the Service, I have never seen a forest or brush fire to equal it." Barrett wrote this in 1935 and was referring to one of several large wildfires that burned during the last week of September, 1889 that consumed an estimated 800,000 acres. This estimate represents a firestorm equivalent to the southern California event in October, 2003 that burned 750,000 acres.

2. The need for a critical and objective analysis of the costs vs. benefits of fuel modifications available today.

If landscape level fuel treatments are not effective in preventing large fires, how then do we reduce wildfire risk? Fuel treatments can be extremely expensive, pre-fire management funds are limited, and the windows available for prescribed burning projects are constrained by safety issues. When deciding what to do, our decisions should be based on a careful analysis of the costs and benefits of the various methods and strategies available to prevent loss of life and property. This sort of analysis is required before we can conclude with confidence how much modification to do and where to perform it.

As stated in the California Fire Plan,

> *"The typical vegetation management project in the past targeted large wildland areas without assessing all of the values protected. Citizen and firefighter safety and the creation of wildfire safety and protection zones are a major new focus of the new prefire management program. Now, increasing population and development in state responsibility areas often preclude the use of large prescribed fires…The vegetation management program will shift emphasis to smaller projects closer to the new developments, and to alternatives to fire, such as mechanical fuel treatment."*

We support the objective of shifting our fire management focus to the wildland/urban interface with smaller fuel modifications as suggested by the California Fire Plan. If a thorough analysis of the true costs of various fuel modification treatments is performed (one has never been done), we believe concentrating efforts directly where loss of life and property can occur will produce the greatest and most effective benefit.

Strategically placed prescribed burns near communities, reasonable defensible space requirements around structures (thinning within the 30-100 foot zone rather than clearing to bare soil), and well coordinated education efforts through community based Firewise and Fire Safe programs are all within CDF's mandate. And although difficult to implement, placing more emphasis on making structures more fire safe needs to be part of any long term fire planning process. Executing such a management plan will not only be the most efficient use of fire management dollars, but will also limit potential resource damage that can be caused by large, landscape level vegetation management projects in the backcountry.

> *"Given that department funds for prefire projects are limited, the department must carefully and systematically select the projects that provide the greatest benefit for a given investment."*
>
> -California Fire Plan

3. The classification of old-growth chaparral as "decadent."

We would like to propose the CDF eliminate the term "decadent" when describing older-growth chaparral stands. Although the characterization has significance to firefighters when describing stands that have accumulated dead material, it is has pejorative connotations and does not reflect our current understanding of the chaparral ecosystem.

Use of this term has unfortunately led credence to the assumption chaparral "needs" to burn every 20 to 30 years to in order to renew itself, suggesting the necessity of using prescribed burns as a resource management tool. Field research has failed to support this notion. Specifically,

- The continued ability of chaparral stands nearly a century old to maintain productive growth has been confirmed by multiple investigations (Hubbard 1986, Larigauderie et al. 1990),
- The accumulation of living material (biomass) steadily increases for at least 45 years in chamise chaparral (Specht 1969) and probably more than 100 years in other types, especially north facing stands, and
- Shrubs in older chaparral communities are not constrained by limited soil nutrient levels (Fenn et. al. 1993).

While it is true some individual specimens of certain ceanothus species will die as a stand reaches 20-40 years of age (Keeley 1975), others remain an important part of chaparral stands over 90 years old (Keeley 1973). All of these species have dormant seed banks that ensure their long term persistence in the ecosystem even if fires only occur every century or so. When spaces do appear in the chaparral, living plants quickly fill the void. For example, chamise shrubs that have not experienced fire for at least 80 years continually send up new stems from their base (Zedler and Zammit 1989).

Not only do mature shrubs continue growing over time, but seeds from the majority of species common to north facing, mesic chaparral stands require long fire-free environments before being able to germinate. Moisture protecting shrub cover and leaf litter are needed to nurse the seedlings along. Plants such as scrub oak (*Quercus berberidifolia*) and holly-leafed cherry (*Prunus ilicifolia*) fall into this category. So rather than being a "decadent" habitat of dying shrubbery, many mature chaparral stands are just beginning a new stage of growth after fifty years of age.

Although chaparral is a fire-adapted ecosystem and some types do accumulate significant amounts of dead wood, the system certainly does not need human caused ignitions to remain healthy especially in light of the increased number of fires occurring in southern California shrublands today. The idea chaparral needs to burn is related more to human perceptions than any ecological process.

The term decadence needs to be placed in the context of what we know about threats to healthy chaparral ecosystems. Senescence risk, which is the risk of loosing species if fires are too infrequent has never been demonstrated for any chaparral in any part of the state. In fact, studies show good ecosystem recovery even following 150 years without fire. Immaturity risk on the other hand, which is the risk of loosing species if fires are too frequent, has been repeatedly demonstrated in countless studies.

4. The recognition of chaparral as an important economic, recreational, and natural resource that needs to be managed as carefully and with as much focus as the state's forest systems.

Chaparral provides essential protection against erosion on our hillsides, allows the recharge of underground water supplies, provides recreational value, and offers unique opportunities for citizens to remain connected to nature on a local level. Yet the system remains relatively unknown and little understood by both the public and many land managers.

This misunderstanding has caused, as mentioned above, chaparral to be either ignored or lumped together with other vegetation systems. This leads to poor land management decisions and inaccurate conclusions. For example, while mentioning California's unique Mediterranean climate, the California Fire Plan misapplies research that is applicable to certain non-Mediterranean influenced forests, but not chaparral.

> "*Suppression of fire in California's Mediterranean climate has significantly altered the ecosystem and increased losses from major fires and fire protection costs. Historical fire suppression has increased periods between fires, volumes of fuel per acre, fire intensities, etc….*"

While this may be true for some of the conifer forests on the western slope of the Sierra and some other southwestern forests (Swetnam et al. 1996), it is definitely not true for southern California chaparral as explained earlier. An additional claim states that,

> *"Vegetation in California's Mediterranean climate was dominated by a complex succession ecology of more, smaller and less damaging wildfires before European settlement began."*

Again, this may applicable to certain forests in the state as shown by tree ring studies, but there is no such evidence supporting such a conclusion in chaparral dominated systems.

Applying the right knowledge with the appropriate ecosystem is crucial if we want to properly manage our state's wildlands. Since chaparral is California's most extensive plant community, it is prudent to make sure we understand both its particular fire regimes and its sensitivities to changes in those regimes.

There was a period in the last century when one of the primary objectives of the CDF was to increase and "improve" range land by eliminating chaparral through type-conversion through the use of increased fire frequency. With increasing population pressures, a generally fire illiterate public, and an expanding wildland/urban interface, the Department's mission is quickly changing. The CDF is not only a highly skilled resource manager trying to protect life and property from wildfire, but also one trying to balance the demands of competing interests in order to prevent the wholesale elimination of California's native landscapes.

Preventing unwanted type conversion of chaparral due to increased fire frequency should be added as one of the VMP's objectives and included in the final environmental report. One of the best ways to accomplish the "control of invasive and noxious weeds", a current program objective, is to maintain healthy chaparral plant communities by making sure the appropriate fire regimes are preserved (Keeley 2004). We don't really know what the natural fire return interval is for each type of chaparral, but we do know fires occurring closer than 15 – 20 years apart can threaten many of them (Zedler et al. 1983, Haidinger and Keeley 1993, Keeley 1995, Zedler 1995, Jacobson et al. 2004). There is a distinct possibility there can be local extinctions of certain species if some chaparral types are not allowed to exist past 50 years.

The California Fire Plan acknowledges that,

> *"California has a complex fire environment, with multiple climates, diverse topography and many complex vegetation communities. CDF data on assets at risk to damage from wildfire is incomplete."* And, *"unnaturally frequent patterns of fire can overwhelm the inherent ability of many fire adapted species of plants to sustain themselves."*

We feel it is crucial for the CDF's final environmental report reflect these observations in light of the data we have presented here.

Sincerely,

Richard W. Halsey
Director
Southern California Chaparral Field Institute

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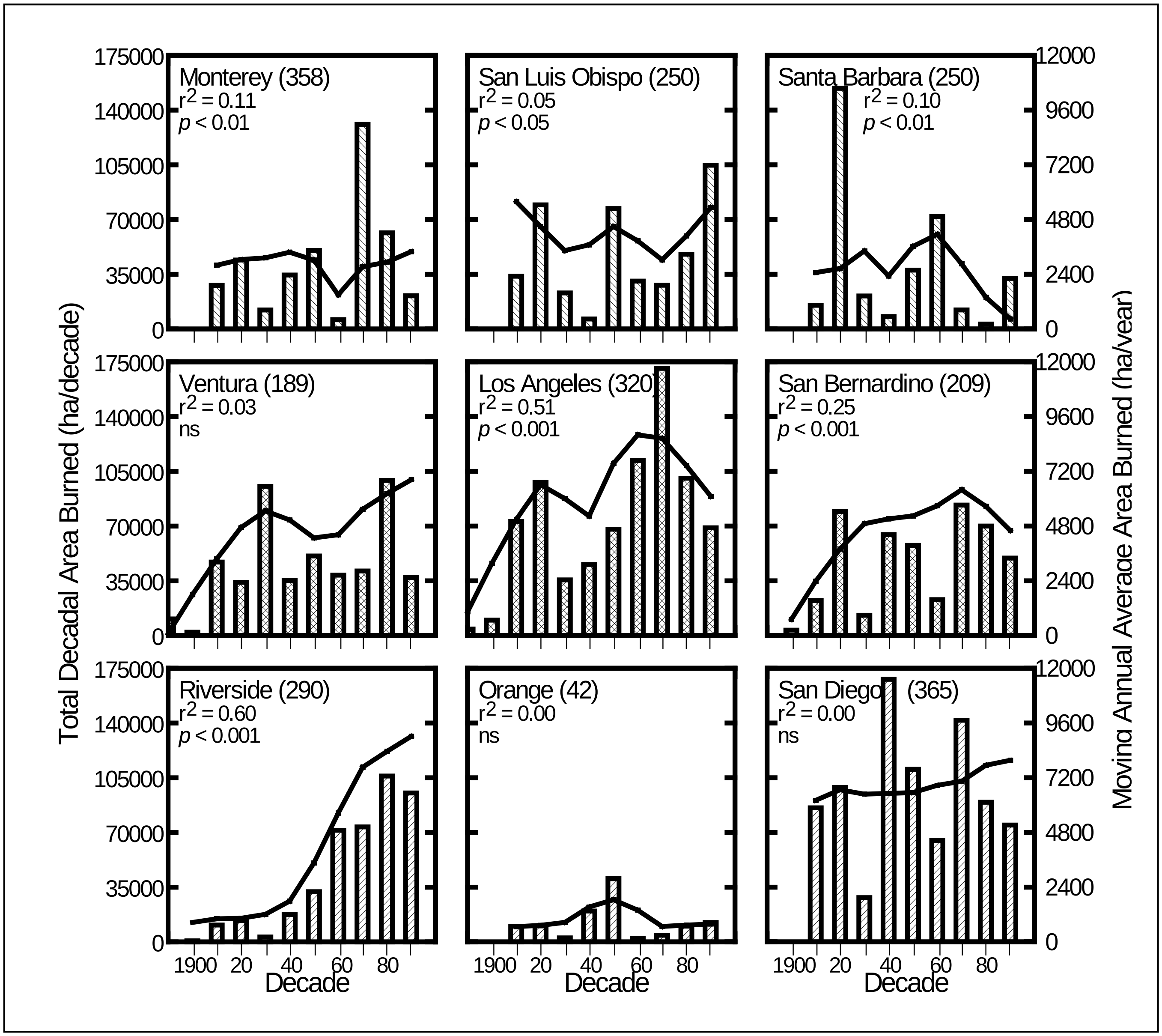

Fig. 1. Area burned per decade and 10-year running annual average during the 20th century for nine counties in central and southern California. Shrubland area in thousands of hectares shown in parentheses following the county name. 1 hectares equals 2.47 acres (adapted from Keeley and Fotheringham 2003).

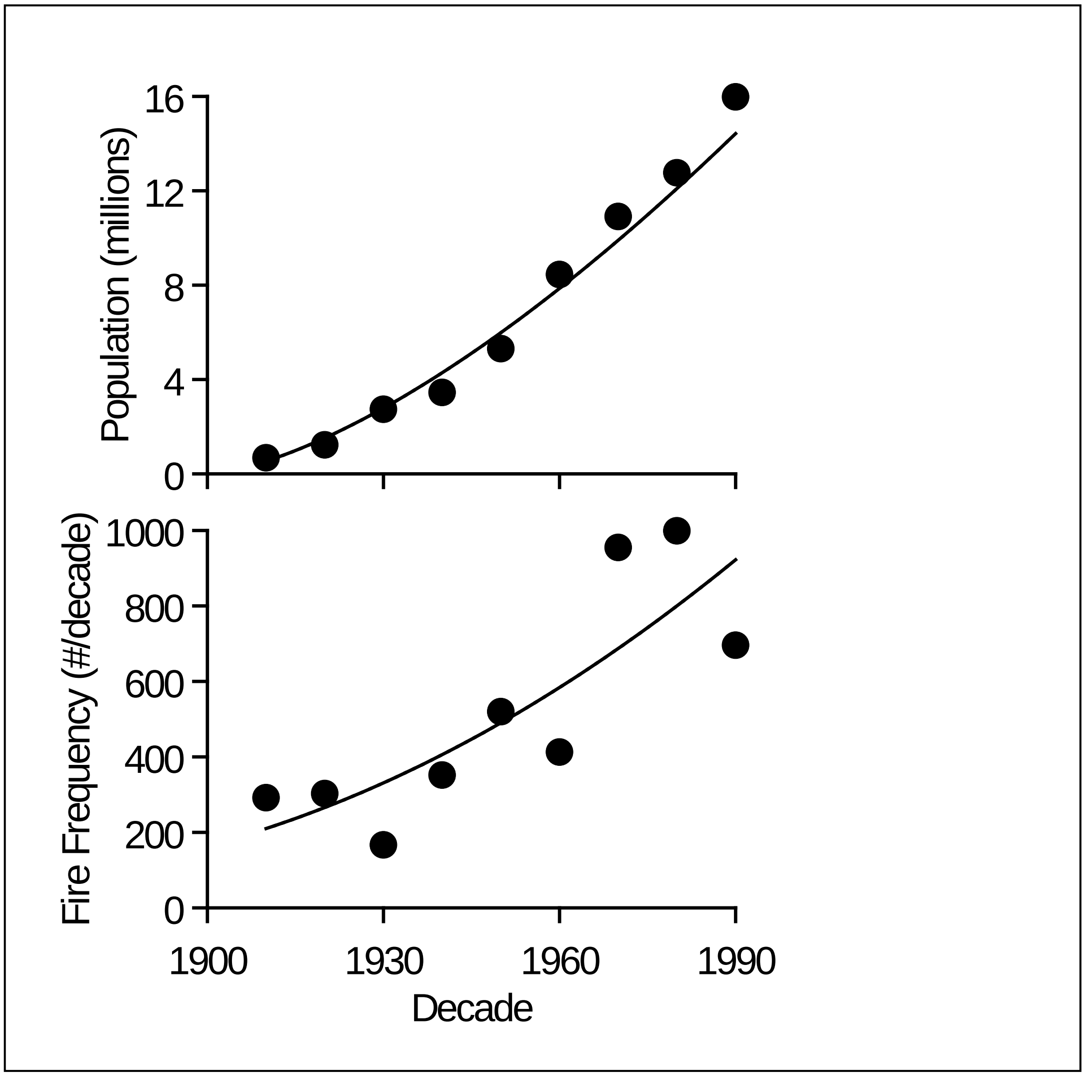

Fig. 2. Decadal changes in human population and fire frequency in southern California (from Keeley and Fotheringham 2003).

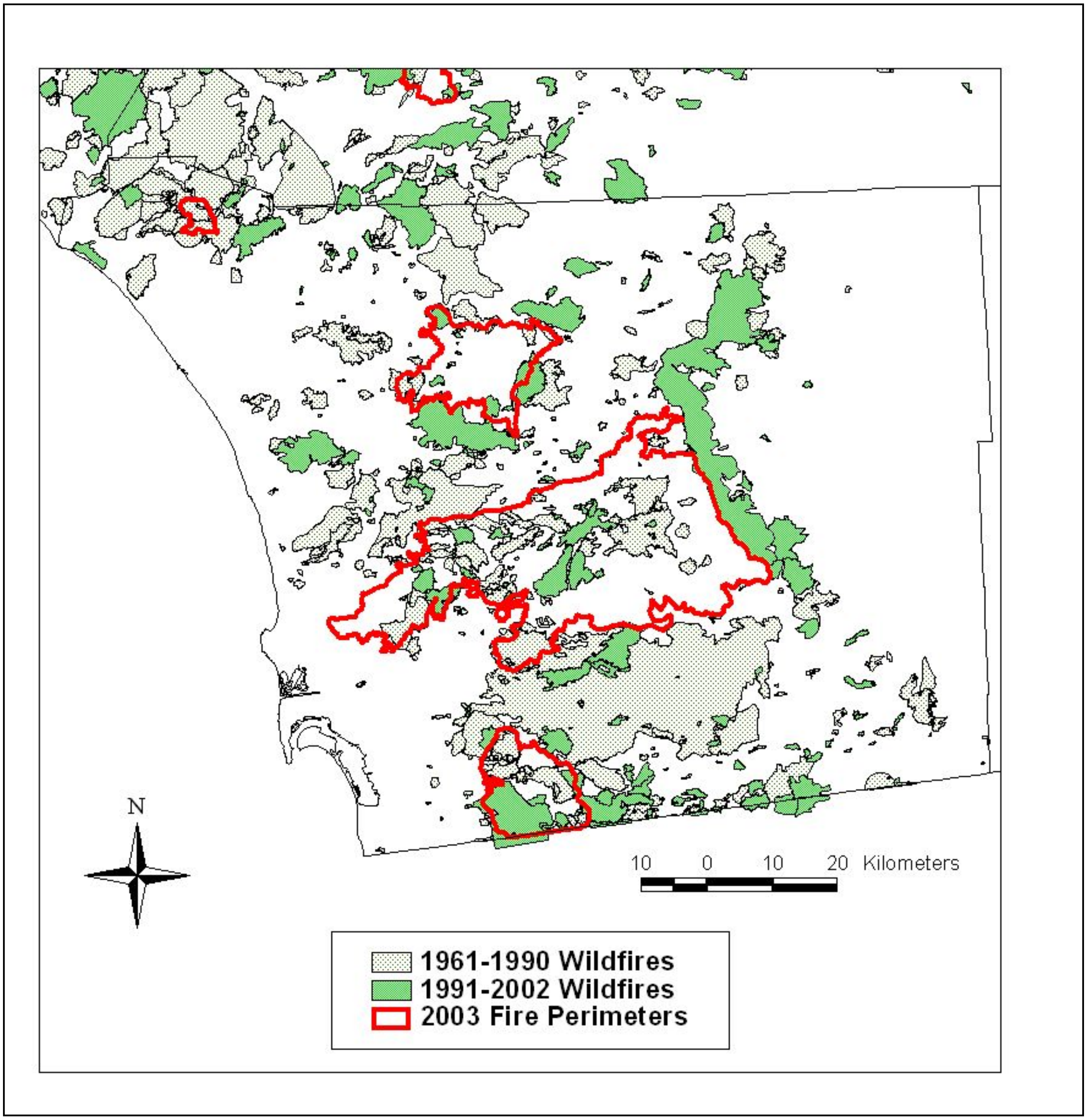

Figure 3. Historical Fire Perimeter Map of San Diego County. Both the Otay fire (lower middle dark outline) and the Cedar (central dark outline) burned through several large patches (mosaics) of young chaparral (Halsey 2005).

January 25, 2013

Board of Forestry and Fire Protection
Attn: George Gentry
Executive Officer
VegetationTreatment@fire.ca.gov
Sacramento, CA 94244-2460

Re: Draft Program EIR for the Vegetation Treatment Program

Dear Mr. Gentry and Board Members,

> **There are two types of fires; the ones we prepare for and the ones that do all the damage** (Fotheringham 2012).

Unfortunately, the Draft Program Environmental Impact Report for the Vegetation Treatment Program (PEIR) continues to ignore the fires that cause the most damage by focusing exclusively on habitat clearance projects.

This despite extensive scientific research that clearly indicates that the best way to effectively protect lives, property, and the natural environment from wildfire is through a **comprehensive approach** that focuses on *community and regional planning, ignitability of structures, and fuel modifications within and directly around communities at risk.*

> **Every decade we increase funding for fuel modifications and fire suppression activities, followed by a decade of even worse fire impacts** (Keeley 2009).

By stating that, "The proposed program is intended to lower the risk of catastrophic wildfires on nonfederal lands by reducing hazardous fuels," the PEIR perpetuates and expands the same approach that has failed to reduce cumulative wildfire loss and firefighting expenditures over the past century. **Consequently, the Board of Forestry is NOT addressing the main causes for loss of life and property from wildfire.**

Attempt to Exempt CalFire From CEQA

All projects within the 38 million acres of California (1/3rd of the state) the Board of Forestry (BoF) has targeted for habitat clearance by burning, grinding, grazing, or herbicide will only be evaluated by a vague, yet-to-be formulated checklist. They will not be reviewed through the California Environmental Quality Act (CEQA). This will prevent citizens and independent scientists from questioning a project under CEQA that they feel is environmentally damaging.

We find this attempt to exempt CalFire from the environmental protections of California's premiere environmental law disturbing, although not surprising. One of the objectives under Goal #5 of the 2010 California Fire Plan endorses efforts to "remove regulatory barriers that limit hazardous fuel reduction activities." As we stated in our comment letter on the Draft Fire Plan, we strongly disagree with this objective and believe it is inappropriate for a government entity to advocate such action.

Rather than seeking ways to circumvent proper scientific oversight and efforts to insure that scarce fire management resources are used in the most effective way, the BoF should recommend inclusive community processes that embrace environmental review and invite all stakeholders. While democracy can be inconvenient, and collecting information that may question a proposed project frustrating, it is the best way to create a successful fire risk reduction strategy.

Impossible to Properly Evaluate the PEIR

By creating an overly broad "program" EIR without explaining where projects will be done, the BoF is making it impossible for the public and the scientific community to properly evaluate its plan to clear more than two million acres of wildland in California per decade. This is not the intent of a program EIR.

A program EIR allows for a more "exhaustive consideration of effects and alternatives than would be practical in an EIR on an individual action" AND allows "the lead agency to consider broad policy alternatives and program wide mitigation measures at an early time when the agency has greater flexibility to deal with basic problems or cumulative impacts" (CEQA Tool Box).

The BoF should have taken this opportunity to truly consider the entire fire environment rather than merely duplicating and expanding a program of questionable efficacy, namely more habitat clearance. Instead, the BoF is proposing an unacceptably open-ended, hypothetical Program that amounts to a "blank check," preventing subsequent California Environmental Quality Act (CEQA) reviews of thousands of projects.

The only reference to where the projects will be is an approximate number of acres within broad, and incredibly diverse, bioregions. Only a vague, yet-to-be-determined checklist will be used to evaluate individual projects. If a project "passes" the checklist, it will be within the scope of the PEIR and exempt from subsequent CEQA review.

Over the past decade, our experience has shown that citizen and independent scientific oversight is essential evaluating habitat clearance operations. Local, state, and federal agencies have repeatedly demonstrated a willingness to ignore potentially significant environmental impacts in order to complete projects.

The best opportunity Californians have to ensure that projects are both necessary and do not cause significant environmental damage, is their ability to the challenge agency actions through CEQA. This Program PEIR is attempting to take that protection away.

Faulty Conclusions

We find the PEIR's conclusions that individual and cumulative impacts are all less than significant are not supportable. The conclusions are based on broad, inaccurate assumptions and incomplete research, especially in regard to shrubland ecosystems. In fact, when it comes to using the most relevant, up to date scientific data, the PEIR fails to satisfy some of the most important standards required by CEQA.

Our analysis indicates there will likely be significant environmental impacts that cannot be mitigated as the PEIR describes.

Therefore, this PEIR needs to be retracted. In its place, the BoF should create a **comprehensive program** reflecting specific, regional differences that will achieve the Program's key goal, "to prevent loss of lives, reduce fire suppression cost, reduce private property losses and protect natural resources from devastating wildfire." (PEIR 1-1)

We offer a summary of such a comprehensive approach in our **suggested alternative to the Program** as part of our comments below.

In brief, a comprehensive approach will:

Save more lives and property. Most homes burn and lives are lost because communities are not fire safe, not because of inadequate wildland vegetation treatments of the type this PEIR proposes.

Significantly reduce the amount of habitat clearance. As demonstrated by science and codified in PRC 4291, fire safe structures and communities require much less surrounding vegetation management. As set forth in PRC 4291, local agencies may exempt from the law's standards, "structures with exteriors constructed entirely of nonflammable materials, or conditioned upon the contents and composition of the structure, and *may vary the requirements respecting the management of fuels* surrounding the structures in those cases."

It's not the absence of clearing distant wildand vegetation that is responsible for the loss of homes. The losses are caused by the fuels under the front porch, the needles in the rain gutter, and the location of the home.

Save the state a significant amount of money. Instead of continually clearing and re-clearing wildland areas, year after year, the state should focus on long term fixes to recurring wildfire hazards such as directing the removal of flammable cultivars (palms, acacia, etc.) within communities, focusing on science-based defensible space zones, help communities find funding to retrofit unsafe structural problems (vents, roofing, etc.), and most importantly **continue to develop its analysis of fire hazard areas in order to provide guidance to land planning agencies.** The BoF can use its current regulatory authority to accomplish much of this.

Habitat clearance activities beyond defensible space zones of the type the PEIR describes creates a financial black hole. In addition, it is likely the currently envisioned Program will become embroiled in expensive litigation.

The Failings of the PEIR

1. Underlying Bias

The proposed Vegetation Treatment Program is based on a questionable, overly-broad assumption about a natural landscape that is recognized as one of the most diverse biological regions on the planet. As a consequence, the PEIR's proposed Program, conclusions, and mitigations fail to accomplish the document's stated goals and threaten California's natural environment.

The broad assumption that underlies the entire PEIR is presented in the Executive Summary:

> Past land and fire management practices have had the effect of increasing the intensity, rate of spread, as well as the annual acreage burned on these lands (BOF, 1996).
>
> Much of this change in threat can be attributed to fire exclusion policies instituted over the past 100 years (Bureau of Land Management, 2005). (PEIR ES ii)

While it is true some forested communities have missed fire cycles and may be burdened by increased vegetation due to past fire suppression efforts, this is not the case for a significant amount of the natural landscape in California. For example, in evaluating research over the past decade concerning southern California, leading fire scientists have concluded in a US Forest Service publication,

> The fire regime in this region is dominated by human-caused ignitions, and fire suppression has played a critical role in preventing the ever increasing anthropogenic ignitions from driving the system wildly outside the historical fire return interval. Because the net result has been relatively little change in overall

> fire regimes, **there has not been fuel accumulation in excess of the historical range of variability, and as a result, fuel accumulation or changes in fuel continuity do not explain wildfire patterns** (Keeley et al. 2009b).

Although there are incidental references in the PEIR that,

- most of the brush and chaparral systems are probably operating close to their natural range of variation in fire frequency (PEIR 4.2-9)
- plant communities being threatened by type conversion due to excessive fire frequency (as opposed to vegetation build up via past fire suppression)
- current forecast models indicate that there will be an increase in grasslands... (PEIR ES iii)

the PEIR did not incorporate this information into the Program, in limitations on the 38 million acres of landscape "available for treatment," or within suggested mitigations.

The influence of the overly-broad and incorrect assumption can be seen in the predominant type of literature cited. Despite the fact that native shrublands, primarily chaparral, represent the most extensive native plant community in California, most of the literature cited is primarily concerned with forested ecosystems (specifically, research that conforms to the PEIR's basic assumption).

We discuss the failure of the PEIR to discuss the main points of disagreement below, but the issue here is that these references do not reflect the incredibly diverse ecosystem types in California that the BoF intends to clear, nor do they "provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences." (Section 15151 Standard for Adequacy of an EIR, CEQA)

By making the inaccurate assumption that all vegetation communities are overgrown due to past fire suppression practices and need to be "treated," the BoF has designated about the third of the state of California to be included into its habitat clearance Program.

Syphard et al. (2006) summed up the problem well when they wrote,

> Despite overwhelming evidence that fire frequency is continuing to increase in coastal southern California (Keeley et al. 1999, Moritz et al. 2004, NPS 2004), the current fire-management program subscribes to the paradigm that fire suppression has led to fewer, larger fires, and that landscape-scale prescribed fire should be used to create a fine-scaled age mosaic. Considering the results of our simulations, we believe that adding more fire to the landscape through broad-scale prescribed burning may have negative ecological effects. Instead, our results are consistent with recent recommendations from the U.S. National Park Service to change the fire management program to focus fuel-reduction efforts and prescribed fire on strategic locations such as the wildland–urban interface (NPS 2004).

Unfortunately, one of the Program's main "treatments" is the very broad-scale burning project being rejected by a growing number of agencies (Fire Management Plan FEIS Santa Monica Mts 2005). In fact, the previous California Fire Plan (1996) rejected such an approach:

> The typical vegetation management project in the past targeted large wildland areas without assessing all of the values protected... The vegetation management program will shift emphasis to smaller projects closer to the new developments.

Specifically the PEIR states,

> Large Scale Wildland Treatment—These are areas up to the watershed scale, or even greater, that are treated to reduce highly flammable or dense fuels, including live brushy plants in some vegetation types (such as chaparral), a build up of decadent herbaceous vegetation or, dead woody vegetation. (PEIR 1-12)

The concept of "decadent herbaceous vegetation" has been used for years by fire management agencies to justify burning chaparral for resource reasons (Halsey 2011). There is no scientific justification for such burning (Montygierd-Loyba and Keeley 1985, Keeley et al. 1985, Keeley et al. 2005). The tendency for the PEIR to view native shrublands within a biased, pejorative context is a common theme:

> However, in the absence of periodic disturbance, the continued productivity of the state's rangelands is being *threatened by the encroachment of non-native invasive plants and native shrubs*. Vegetation treatments can help counter these *negative trends*, and improvement of rangeland condition is a primary objective of the VTP. (PEIR 1-5) *Emphasis added.*

The desire to modify the landscape to improve economic output is certainly a reasonable objective for a statewide management plan. However, allowing a systemic, negative bias against native ecosystems to influence policy management decisions is not. This bias appears to be one of the reasons the PEIR has failed to properly consider the cumulative effects on shrubland ecosystems (see below).

2. Inadequate Support for Program's Key Goal

While we agree that vegetation management can be an essential part of reducing wildland fire risks and can be effective in moderating wildfire behavior, the PEIR fails to provide an adequate level of support for its exclusive, broad brush approach: clearing habitat on a statewide basis. This failure to find adequate support is likely because, as Mell et al. 2010 wrote,

> a clear link has not been established between specific fuel treatments (e.g. reducing tree density or raising crown base height) and the resulting change in

> wildland fire behaviour, *especially over a range of environmental conditions*. (emphasis added)

Instead of reducing the *risks* of wildland fire, the factors that actually lead to the loss of life and property, the Program focuses exclusively on addressing the *hazard* of wildland fire, which is an unrealistic approach (hazard is anything that can cause harm, risk is the chance the hazard can cause harm to you). **The Program's exclusive approach is equivalent to trying to prevent earthquakes** (the hazard) instead of addressing the actual risks by earthquake-safe land planning and retrofitting buildings and structures to survive tremors.

The support the PEIR provides for this approach is inadequate not only because it broadly misapplies papers that are generally forest-based (as discussed above), but it exaggerates the fire management benefits of fuel treatments by ignoring the critical role played by community and home fire prevention. For example, the PEIR cites the success of fuel treatments during the 2007 Angora Fire:

> The Angora fire burned 3071 acres of forest and urban interface, destroying 254 homes and costing $160 million dollars. The fuel treatments generally worked as designed, significantly changing the fire behavior and subsequent fire effects to the vegetation (Safford, et. al., 2009). (PEIR 4.2-25)

While the Safford et al. paper is an excellent analysis of how fuel treatments can modify fire behavior and protect trees, the paper's conclusion that is most relevant to the PEIR's key goal to "reduce private property losses" is that,

> **Many homes burned in the Angora Fire in spite of the fuel treatment network;** government efforts to reduce fuels around urban areas and private lands do not absolve the public of the responsibility to reduce the flammability of their own property. (Safford et al. 2009)

Without an equal effort to address this issue, the BoF will be unnecessarily damaging the natural environment and wasting tax-payer dollars through its exclusive approach.

The PEIR then cites the Emergency California-Nevada Tahoe Basin Fire Commission Report (2008) by noting its 48 findings, "that serve as a plan to reduce said wildfires and negative impacts in the future."(PEIR 4.2-25)

Of the 48 findings, six are directly related to community and home fire prevention and six more deal with fire suppression. This was in recognition that it wasn't flaming trees that ignited the 254 homes that were lost, but other burning houses. While no single one cause could be blamed for the losses, flammable housing materials, wind blowing in alignment with streets, and the presence of logging slash from past commercial logging projects played important roles (Murphy et al. 2007).

The failure of fuel treatments to protect flammable communities is a frequent phenomena as demonstrated in the 2007 Grass Valley Fire (Cohen and Stratton 2008, Rogers et al. 2008), the 2003 Cedar Fire (Keeley et al. 2004), and the southern California 2007 firestorm (Keeley et al. 2009a). Such observations indicate a clear case for the need to conduct an objective cost/benefit analysis of fuel treatments (Keeley 2005).

When addressing fires driven by severe weather conditions (the ones that cause the most damage to life and property), the PEIR is generally dismissive of the ability to deal with them because these fires are "difficult to control even by the world's most comprehensive wildland protection system." (PEIR 4.2-10)

We find the failure to address wind driven fires as one of the major failures of the PEIR. Research is showing that with proper land planning, much of the risk presented by wind driven fires can be reduced significantly (Syphard et al. 2012, Moritz et al. 2010, Parisien and Moritz 2009).

3. Inadequate Disclosure of Expert Disagreements, Literature Cited

CEQA guidelines clearly state that,

> Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.

The PEIR has failed to meet this guideline.

For example, we found no reference to the ongoing controversy regarding the benefits of severe, stand replacing fires and associated treatments in forests (Bond et al. 2012, Bond et al. 2009).

Relating to an underlying assumption that is aligned with the forest/fuel accumulation bias noted above, the PEIR claims that short fire return intervals in "frequent fire adapted communities",

> ...maintained an open, park-like forest stand with a continuous ground cover of grasses, herbs, and shrubs beneath the forest canopy (Kaufmann and Catamount, [nd]; Parsons and DeBenedetti, 1979). (PEIR 4.2-1)

The Kaufmann reference is a non-scientific publication that has more to do with dry-ponderosa pine forests in the southwest than the mixed conifer systems that are common in California. The Parsons paper did not conclude that forests in California were "open, park-like" with a "continuous ground cover of grasses." What the paper actually said about the mixed-conifer zone of Sequoia and Kings Canyon National Parks was that,

> The varying intensities and frequencies of the fires that occurred in these forests under natural conditions would have created a mosaic of open and closed canopy conditions, as well as heavy to minimal ground fuels.

The hypothesis that a "continuous ground cover of grasses" in Sequoia has been rejected by more recent research (Evett et al. 2003).

There are also new studies the PEIR failed to note that raise questions concerning the impact past fire suppression practices have had on mixed conifer forests in California. Odion and Hanson (2008) and Odion et al. (2009) suggest that forested areas in California that have missed the most fire return intervals (i.e., the most fire suppressed) are burning mostly at low/moderate-intensity and may not be experiencing higher levels of high-intensity fire than areas that have missed relatively fewer fire return intervals.

The one-size-fits-all approach the PEIR takes regarding fire suppression is not scientifically supportable and raises serious questions about the PEIR's conclusions.

For shrubland ecosystems, which have completely different fire regimes and responses to management than forests, there were less than a dozen peer-reviewed papers referenced (out of nearly 1,000 literature citations) relating directly to fire. Most of those were more concerned with the spread of invasive species than fire management. **We find this absence inexcusable, especially considering the fact that the most expensive, devastating wildland fires in California are associated with these ecosystems.** We are especially perplexed because there has been a wealth of research concerning shrubland ecosystems conducted over the past decade indicating that:

- Unlike some forests, native shrublands have not become unnaturally dense with vegetation due to past fire suppression practices (Keeley et al. 2009b, Keeley et al.1999)

- Prescribed burning is unlikely to have much influence on fire regimes in southern California (Price et al. 2012)

- Large, severe, infrequent wildfires are the natural, historical pattern in central and southern California (Lombardo et al. 2009, Mensing and Bryne 1999, Keeley and Zedler 2009)

- The age of vegetation has very little to do with the size of fires (Moritz 2003, Moritz et al. 2004)

- Old-growth shrublands are healthy, dynamic ecosystems (Keeley et al. 2005)

All of these findings are contrary to the Program's rationale for conducting habitat clearance in central and southern California shrublands. For example,

> Well planned prescribed burning can be an effective means of reducing fuels that result from long periods of fire exclusion while moderating potential ecosystem damage (Knapp et al., 2005). (PEIR 1-4)

Here is what the cited Knapp et al. document actually said in reference to chaparral:

> Because of frequent human-caused ignitions and seasonal hot and dry winds, the fire regime remains similar today, despite fire-suppression efforts.
>
> The bottom line is that the potential for shifts in the plant community exists when the heat generated by prescribed burning is dissimilar to what would have been experienced with the fire regime that species evolved with.

The PEIR also continually refers to the creation of hydrophobic soils during severe fires as a justification for prescribed burns:

> Although the potential exists to create hydrophobic soils through prescribed burning, burning prescriptions typically are successful at keeping severity low enough to prevent formation of hydrophobic soils (DeBano, 1989). (PEIR 5.7-12)

Soils in chaparral are hydrophobic whether or not they are burned. There has not been any extensive study of quantitative effects of low, moderate and high severity burning on hydrophobicity and soil loss. Burning can cause the hydrophobic layer to sink in the soil and is thought to increase top soil erosion, but the field studies show that its effect disappears quickly after the first rains (Hubbert et al. 2006). More importantly, there have been quite a few studies of postfire erosion and debris flows and hydrophobicity is not typically a major component of these models as substrate type and slope incline are many times more deterministic in predicting soil loss (Cannon et al. 2009, Gartner et al. 2009).

It is clear the authors of the PEIR misunderstood the actual conclusions of some cited papers, did not conduct an adequate literature search, and appear to have ignored contrary evidence.

4. Questionable Citations

The two key references the PEIR provides to support its Program to conduct chaparral clearance projects in southern California are non-peer reviewed documents. One, San Diego County’s 2003 Wildland Task Force Report, was removed from circulation on August 24, 2004, after the scientists who were quoted within wrote strong letters to the San Diego County Board of Supervisors indicating their work had been misquoted and misrepresented by county staff. The PEIR stated,

> In its August 2003 report, the San Diego Wildland Task Force agreed that fuel or vegetation management is the single most effective tool available to mitigate

> fires. The build-up of fuel greatly affected the intensity and speed of the recent fires contributing to the loss of lives and property. (PEIR 4.2-8)

The scientists cited in this Task Force Report made it clear they **did not support this conclusion**. In fact the scientists wrote to the Board that they found the report "woefully inadequate and biased in its treatment of the available scientific information, and flawed in many of its assumptions, its treatment of published data, and its recommendations concerning vegetation management as part of a comprehensive fire-risk reduction strategy" (Spencer et al. 2004, Halsey 2012).

There appear to be questionable citations in other subject areas as well. The PEIR cites only one outside reference in its Wildfire Trends Introduction to support its contention that "... streams are being infiltrated by silt and debris following high severity fires, and unnaturally severe wildfires have destroyed vast areas of forest (Bonnicksen, 2003)." (PEIR 4.2-3)

This reference is the testimony to the Committee on Resources, U.S. House of Representatives by a controversial timber industry spokesperson whose credentials have been questioned by other scientists. In an open letter to the press the scientists wrote that, "not only do the views and statements of Dr. Bonnicksen fall far outside the mainstream of scientific opinion, but more importantly that Dr. Bonnicksen has misrepresented himself and his qualifications to speak to these issues" (Rundel et al. 2006).

The concept that severe wildfires have "destroyed" vast areas of forest in California is a subjective perspective that does not belong in a what should be a scientifically-based analysis. Regarding streams "being infiltrated by silt," the National Marine Fisheries Service (2005) has properly examined the matter and has concluded:

> Wildfires occurring within various locations throughout the action area indirectly contribute fine sediment to streams. Although effects of fires may degrade stream habitat in the short-term, recent theory suggests wildfire has a role for creating and maintaining landscape characteristics, habitat complexity, and species diversity (Brown 1990, Rieman and Clayton 1997, Gresswell 1999).

The lack of transparency in the PEIR's citations is a pervasive issue. Some citations can't be found (e.g. BOF 1996), it's frequently unclear what they are referring to (e.g. Sugihara et al., 2006), and many are not relevant to the statement being supported (as noted above).

5. Areas of "Treatment" Unknown

According to CEQA Guideline 15124(a): "The precise location and boundaries of the proposed project shall be shown on a detailed map, preferably topographic. The location of the project shall also appear on a regional map." No such maps are included in this PEIR.

The maps that are included are either of the entire state or of large, complex bioregions. These are not helpful since approximately *only* 1/3 of those areas are apparently affected by the Program. These areas are not identified.

Even if the maps provided by the PEIR are used to estimate where projects might occur, there are conflicts between what the maps indicate and what the PEIR states. For example, the document's Condition Class map (4.2-13) indicates that much of southern coastal California is either significantly or moderately altered from its historical fire regime condition class. Yet the PEIR text cites research showing that most chaparral, the dominant ecosystem in coastal southern California, is within its historic fire return interval. In fact, the US Forest Service research has shown that most of the chaparral in the four National Forests in southern California actually has a negative departure from historical fire patterns, meaning the native shrubland ecosystem is being threatened by too much fire as opposed to not enough (Safford and Schmidt 2008).

Since the PEIR does not specify which landowners are part of this Program, a landowner, a land manager, or the neighbor of a cleared parcel has no way of determining whether or not they are subject to this Program, or even of knowing whether they are affected by it. As a consequence, effected parties have no idea if they should be concerned with this PEIR or not. Therefore, the lack of specific location information makes it impossible for this document to meet CEQA's requirement of notification.

Unfortunately, since the PEIR does not include information documenting public notices for its review period, we have no way of determining whether the public was properly notified at all.

6. Impossible to Determine Significant Impacts

Because the PEIR is so vague and does not identify any of the project areas, it is impossible for citizens and independent scientists to properly evaluate the potential for significant environmental impacts. The only place this can be done is at the specific project level. However, such a review, as normally provided by CEQA, is precluded as per this PEIR.

Depending on a yet-to-be made general checklist to evaluate projects (as indicated in the PEIR) is not a reasonable approach to situations that can be extremely complicated. The California gnatcatcher *(Polioptila californica californica)*, an endangered species in the highly flammable south coast bioregion, provides one example. The species is mentioned only once in the PEIR:

> The California gnatcatcher (*Polioptila californica californica*) and Southern California rufous-crowned Sparrow (*Aimophila ruficeps canescens*) are permanent residents of semi-open sage scrub habitats. These birds avoid dense, overgrown shrublands and so may benefit from treatments that create a better-proportioned mosaic of shrub mixed with open areas. (PEIR 5.5-64)

The PEIR never defines what “dense, overgrown shrublands” are, nor does it cite any references to support this overly broad statement, but the PEIR’s suggestion that treatments “create a better-proportioned mosaic” suggests the intent of habitat manipulation which aligns with Goal 8 of the Program (altering vegetation structure to “improve” wildlife habitat).

If the PEIR had conducted an adequate review of the literature it would have found that, although gnatcatcher reproductive success is higher in younger coastal sage scrub, most gnatcatcher pairs live in coastal sage scrub stands greater than 20 years old (Atwood et al. 2002). The most important result of the research, however, was that population <u>persistence</u> (through a regional population crash) was highest in the oldest stands, which serve as important refugia.

Suggesting that the habitat for the gnatcatcher is potentially open for manipulation is contrary to accepted practice. For example, the USFS Forest Plan Criteria S39 states, “Avoid fuel treatments in coastal sage scrub within the range of the California gnatcatcher, except in Wildland/Urban Interface Defense Zones and on fuelbreaks. (Federal Code 36 CFR 219)

Since the PEIR does not explain where its “fuel treatments” or habitat manipulations will be conducted, we find it difficult how the authors conclude that the Program will cause no significant impacts to the gnatcatcher. More troubling, the PEIR follows up by actually suggesting the clearance of habitat will be a positive in a bioregion subject to more than 200,000 *unspecified* acres of clearing:

> In summary, indirect effects of the VTP in the South Coast Bioregion are likely to be positive for species that occur in open habitats where exotic pest species are unlikely to invade. (PEIR 5.5-65)

Coastal sage scrub habitat is indeed extremely vulnerable to exotic, invasive pest species when disturbed, in the form of non-native grasses (O’Leary 1995, Talluto and Sudling 2008). Ironically, this is something the PEIR recognizes:

> However, gnatcatcher populations are likely to decline if shrub removal treatments result in a conversion of sage scrub to exotic grassland. (PEIR 5.5-64)

Then the PEIR indicates that,

> Treatments shall not remove essential habitat elements of special status taxa know [sic] or likely to occur in the area (Mitigation Method PEIR 5.5.2-11)

How will the BoF determine what is “essential habitat” for the gnatcatcher? This is never indicated. Since coastal sage scrub is one of the dominant plant communities (“fuel” in the parlance of the PEIR) in the south coast bioregion, we don’t know how the BoF will meet the goals of the PEIR without impacting gnatcatcher habitat.

Although contradictory statements and questionable conclusions within the PEIR are a deep concern, the bigger issue addressed here is that in many instances the PEIR fails to acknowledge well known environmental problems. If they had, as in the case of the gnatcatcher, they would have realized and acknowledged the potential for the Program to cause significant impacts.

In a 1997 Memorandum of Understanding (MOU), the US Fish and Wildlife Service (USFWS) agreed to allow the clearance of coastal sage scrub (gnatcatcher habitat) within the 100 foot defensible space zone around structures without the need for a take permit in each instance. In exchange, fire agencies were to report the number of acres cleared annually. Under this agreement, as per section 4(d) of the Endangered Species Act, a maximum cumulative loss of 5% of total gnatcatcher habitat in the county (approx 220,000 acres), or about 745 acres, was allowed due to fire clearance activities. The terms were clarified in an Incidental Take Statement from the USFWS.

Unfortunately, although fire agencies continue to clear vegetation in and around San Diego County, we have found that neither the USFWS nor the various fire authorities have made any effort to comply with the terms set forth in the Incidental Take Statement. In 2009 we issued a Freedom of Information Act request to the USFWS for any documentation relating to the MOU or compliance therewith. The sparse documentation delivered did not include any annual acreage reports and, instead, mostly consisted of internal USFWS correspondence asking why nothing was being done with regard to MOU compliance.

Based on the Program as described in the PEIR, it appears the BoF is proposing clearance operations over and above a level that has likely already exceeded USFWS guidelines.

Since the PEIR does not make clear where fuel treatments will be conducted in the south coast bioregion, nor does it provide the necessary evidentiary documentation to support its assumptions, it’s conclusion that the Program will not cause significant impacts to the gnatcatcher and other sensitive species is highly questionable. We have found similar problems relating to other species throughout the document.

7. Minimized Negative Impacts of Prescribed Fire/Type Conversion

Although the PEIR acknowledges that chaparral can be type converted by too frequent fires, it fails to provide any mitigation to actually prevent it.

The use of prescribed fire during in chaparral, especially when conducted during the cool season, can lead to type conversion (Keeley 2006). It is not an appropriate management strategy for that reason. The suggested mitigation to properly “time” or adjust the “intensity” of a prescribe burn is unrealistic and is only in reference to special status plants, not plant communities.

> Mitigation Measure 5.5.3-1**.** For fire-adapted special status plants, the timing or intensity of prescribed burns shall be adjusted and incorporated into Burn Plan prescriptions to simulate the natural fire regime. The project will be burned in a pattern to create and maintain a mosaic of old and young growth chaparral with diverse habitat structures. (PEIR 5.5-109)

The proper ecological "time" for a fire in chaparral is during the height of the fire season. Chaparral fires are naturally "intense." Attempting to reduce intensity can cause significant negative impacts to the ecosystem, namely type conversion (Keeley and Brennan 2012, Keeley et al. 2011, Keeley et al. 2005).

Regarding the use of prescribed fire to control invasive species, actual experience has demonstrated that with herbaceous weeds, prescribed fire usually does not result in sustainable control unless the program involves repeated burning. For example, the East Bay Regional Parks finds it successful if they burn every year to control yellow star thistle. However, once those treatments are stopped, the target species potentially returns with a vengeance (Alexander and D'Antonio 2003). Some woody species such as brooms may be controlled with a particular fire frequency, but that frequency will be detrimental to many native woody species as well. As a general rule, **reducing fire and other disturbances is likely to do more to restore native systems** than increasing broad scale disturbance, at least in California.

Due to the growing spread of Sahara mustard (*Brassica tournefortii*) in desert regions, the proposed Program has the potential of causing significant negative impacts to thousands of acres in chaparral and transition zones adjacent to, and potentially within, both the Mojave Desert and Anza-Borrego Desert by prescribed fire as well as mastication and herbicide spraying. The resulting denuded and disturbed soils would be highly vulnerable to type conversion into a Sahara mustard monoculture where native habitats are currently at low risk of takeover by this aggressive weed species. Fields of Sahara mustard decimate biodiversity of both native flora and fauna; produce dry, fire-prone landscapes; and eliminate the wildflowers that attract visitors to desert communities. We could not find a reference to this incredibly invasive species in the PEIR.

In regards to impacts of prescribed fire on wildlife, the PEIR appears to dismiss the problem by claiming, "Most shrub-dwelling wildlife will be able to avoid direct mortality by flying away or taking shelter on or under the ground before the fire arrives." (5.5-23)

Most chaparral animals are extremely territorial. They may fly away to "avoid direct mortality," but with their specific territory eliminated and lack of unoccupied territories at the fire edge, it is not unreasonable to assume the expatriated animal will die.

8. Ignored Cumulative Impacts

Another approach the author's use throughout the PEIR to dismiss potentially significant impacts relates to the percentage of the bioregion being "treated."

> Since no more than 0.28% of any life form will be treated annually, bioregion-level effects are expected to be relatively minimal. (PEIR 5.5-65)

We find this kind of thinking not only naive, but disingenuous. It is irrelevant how much of the broad landscape is being treated on an annual basis when there are numerous vegetation communities and specialized habitats found throughout each bioregion that only occupy limited areas. The clearance of the only surviving patch of old-growth chaparral near the town of Pine Valley, as the US Forest Service intended to do in its current Mt. Laguna/Pine Valley HFRA Project in the Cleveland National Forest, cannot be dismissed as insignificant just because it only represents a fraction of the total chaparral in the entire bioregion.

Thinking on a percentage and annual basis also precludes seriously considering the cumulative impacts over time.

The PEIR only considers "treatment" programs conducted by other agencies and timber harvest activities. It does not include the impact of increased fire frequency on ecosystems, such as chaparral, already impacted by such a trend. Such an approach precludes a proper analysis of cumulative effects.

The PEIR's suggested mitigation measures regarding the spread of invasives that will result when native shrublands type-convert to non-native weedlands due to the Program's "treatments," fail to address resulting significant impacts of habitat loss. Cleaning the tires of clearance equipment, making sure the canopy cover of trees (where present) is at least 60% for shade, and informing local groups interested in noxious weed control (PEIR 5.5-112) to prevent the spread of invasives are not adequate.

The PEIR does recommend the "development of project level management measures and implementation methods are necessary to minimize likelihood of type conversion" (6-59), but this is in context of sagebrush steepe plant communities. It also is in alignment with the questionable assumption that underlies the PEIR. Namely, the "encroachment" of junipers due to fire suppression. While there is evidence that fire suppression may have allowed the spread of trees into the steepe, many of the management responses are extremely controversial, such as dragging massive chains across the steepe plant community to rip up junipers and sagebrush for range "improvement."

To defer a proper plan "to minimize the likelihood of type conversion" to the project level will prevent a proper analysis of the Program's cumulative effects.

To properly evaluate the cumulative impacts of the Program, the PEIR should have examined the *total* impact of all fire on the landscape, not dismiss such impacts by indicating, among other things, that the average size of its treatments (approx 260 acres) is not big enough to have significant impacts on the region.

For example, the PEIR seems to totally dismiss the potential impact on migratory birds when there is no indication in the proposed Program that clearance operations will not occur between February and September to protect bird nests.

> Significance criteria 1C. Interfere substantially with the movement of any native resident or migratory species or with established native resident or migratory species corridors, or impede the use of native species nursery areas; and permanently alter the habitat value of established wildlife corridors. (PEIR 6-60)
>
> Determination of Significance. *Based on average size of VTP prescribed burn project area (260 acres)*, frequency of occurrence, and expected spatial distribution, the cumulative impact of VTP with other related actions is considered less than significant with adopted implementation and mitigation measures when assessed at the scale of a bioregion. (PEIR 6-65) *Emphasis added.*

Mitigations for cumulative impacts? The standard response in the PEIR is “none required.” We find such findings in complete opposition to standard practices and in violation of the Migratory Bird Treaty Act and California State law. We provide an alternative mitigation measure in appendix I.

The first step in determining the cumulative impact of the proposed Program is to conduct a statewide evaluation of native shrublands and provide a reliable estimate of how many acres have been type converted historically, how much is currently threatened, and what impact the Program, development, increased fire frequency, and climate change may have on existing shrublands. Otherwise, any conclusions relating to the cumulative environmental impacts of a vegetation treatment program will be questionable.

The photo above demonstrates the impacts from one type of "fuel treatment" proposed in the PEIR. A rich, old-growth stand of chaparral in Santa Barbara County is being systematically compromised by clearance activities funded by a local FireSafe chapter. The foreground represents the impact of mastication showing significant soil disturbance. In the background, the longer-term impact of earlier treatments show the invasion and spread of highly flammable, non-native weeds and grasses. This process has increased the ignitability of this area with the addition of flashy fuels.

Additional pictorial examples of habitat clearance projects for the purpose of "treating fuels" can be found in the following albums:

Cuyamaca State Park:
https://plus.google.com/photos/111832478062101189732/albums/5794481180501585377

Cuyamaca State Park II:
https://plus.google.com/photos/111832478062101189732/albums/5795096192589480961

Clearance activities near and within the Los Padres National Forest:
https://plus.google.com/photos/111832478062101189732/albums/5512793492339288961

Clearance projects in the Cleveland National Forest:
https://plus.google.com/photos/111832478062101189732/albums/5444493002476885681

9. Inadequate Alternatives

As per CEQA (15126.6), "An EIR shall describe a range of reasonable alternatives to the project,... which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives."

The only alternatives provided in the PEIR are variations on the amounts and types of treatment types used. Also, we reject the conclusion that "no alternative would create a potential increase in wildfire extent/severity..." (PEIR 5.2-14). The spread of invasive grasses that will likely result when shrublands are subject to the Program's "treatments" has been shown not only to increase the potential for ignitions, but to lengthen the fire season (Brooks et al. 2004). The PEIR has not provided any evidence that such a change would not increase wildfire extent, let alone an increase in the number of fires.

To achieve the CEQA requirement, the BoF's primary goal to "enhance the protection of lives, property and natural resources from wildland fire," and to conform to the PEIR's purpose "to analyze the environmental effects of the VTP, to indicate ways to reduce or avoid potential environmental damage resulting from the program, and to identify alternatives to the proposed program," there needs to be a **Wildland-Urban Interface (WUI) alternative.** The WUI alternative would take a comprehensive approach that focuses on *community and regional planning, ignitability of structures, and fuel modifications directly within and around communities at risk.*

There is an abundant amount of scientific research indicating that focusing vegetation treatment, as this PEIR does, as the preferred method to protect lives, property, and the environment from wildland fire is a failed policy. This was made clear during the 2007 Witch Creek Fire, among many others, in which more than 1,100 homes were destroyed and two people were killed. According to a comprehensive study from the Institute for Business and Home Safety (2008), "Wind-blown embers, which can travel one mile or more, were the biggest threat to homes in the Witch Creek Wildfire. There were few, if any, reports of homes burned as a result of direct contact with flames" from wildland fuels.

A much broader study (Syphard et al. 2012) confirmed and expanded upon this finding by examining data on 700,000 addresses in the Santa Monica Mountains and part of San Diego County. The researchers mapped the structures that had burned in those areas between 2001 and 2010, a time of devastating wildfires in the region.

Buildings on steep slopes, in Santa Ana wind corridors, and in low-density developments intermingled with wild lands were the most likely to have burned. **Nearby vegetation was not a big factor in home destruction.**

Looking at vegetation growing within roughly half a mile of structures, the authors concluded that **the exotic grasses that often sprout in areas cleared of native habitat**

like chaparral could be more of a fire hazard than the shrubs. "We ironically found that homes that were surrounded mostly by grass actually ended up burning more than homes with higher fuel volumes like shrubs," Syphard said.

It is the houses themselves, their location, and the fuels within 120 feet of those houses (including litter in gutters, yard junk, cultivars like palms and acacia, wood piles, etc.), that determines whether the property is vulnerable to fire.

Dr. Jack Cohen (2000), a research scientist with the US Forest Service, has concluded after extensive investigations that home ignitions are not likely unless flames and firebrand ignitions occur within 120 feet of the structure. His findings have shown that,

> …effective fuel modification for reducing potential WUI (wildland/urban interface) fire losses need only occur within a few tens of meters from a home, not hundreds of meters or more from a home. This research indicates that home losses can be effectively reduced by focusing mitigation efforts on the structure and its immediate surroundings (Cohen 1999).

Cohen's work is consistent with the research on homes with nonflammable roofs conducted by other scientists. During WUI wildland fire events, Foote and Gilless (1996) at Berkeley found an 86 percent home survival rate for homes with a defensible space of 84 feet.

The lack of a WUI alternative is surprising, especially in light of discussions within the Board of Forestry and Fire Protection itself. During a 2005 meeting of the Range Management Advisory Committee (RMAC), participants discussed strategies focused on actual assets at risk rather than landscape level "fuel treatments" of the type the current PEIR is proposing. The following is taken from the minutes of that meeting:

> Jeff Stephens asked to speak to RMAC as the VMP (Vegetation Management Program) Manager versus that of the RMAC Executive Secretary. He outlined three points for consideration by RMAC:
>
> • First, the original goals developed when VMP was created were developed in a different political and environmental climate than what exists today. Rather than eliminate the program perhaps what is needed is a reevaluation of the goals given the politics and environmental concerns of today.
>
> • Second, the VMP has historically been a prescribed fire program. Perhaps what is needed is a program that is more diverse in the type treatments, vegetation types, and circumstances where it may be used. This is a goal of the VMP PEIR.
>
> • Third, when developing recommendations to the Board RMAC may wish to consider the views of some researchers like Jon Keeley, who maintain that the fires that occurred in the south during October 2003 would have occurred regardless of vegetative stand age or structure developed via fuel treatments. This

> is because these fires occur under extreme fire weather events associated with low fuel moisture. **Therefore it is not a good use of resources to perform large landscape fuel reduction projects; rather it is more useful to concentrate efforts near the values to be protected** (RMAC 2005).

We urge the Department of Forestry and CalFire to retract this PEIR and create a **comprehensive program** as referenced above reflecting specific, regional differences, actual assets at risk, and current science without an attempt to exempt its projects from CEQA. In only this way will the state achieve the Program's key goal of preventing loss of lives, reducing fire suppression cost, reducing private property losses and protecting natural resources from devastating wildfire.

As a final note, while the protection of life and property will always be the primary focus of any fire management program, all too often the natural environment is viewed only as a "fuel" that needs to be mitigated, especially shrubland ecosystems. This often leads to decisions on the fire line and during vegetation management activities that have seriously compromised the natural environment. **Valuable natural resources such as old-growth chaparral, intact habitat, and important wildlife corridors need to be seen for what they are, assets at risk.**

Sincerely,

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The California Chaparral Institute is a non-profit science and educational organization dedicated to promoting an understanding of and appreciation for California's shrubland ecosystems, helping the public and government agencies create sustainable, fire safe communities, and encouraging citizens to reconnect with and enjoy their local, natural environments. www.californiachaparral.org.

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APPENDIX I

Migratory birds are perhaps the most highly valued component of North America's biological diversity, with approximately 1,200 species representing nearly 15% of the world's known bird species. The seasonal movement of migratory birds is one of the most complex and compelling dramas in the natural world. Migratory birds embark twice each year on long-distance journeys between their breeding areas and their wintering grounds, which are sometimes separated by thousands of miles. State, federal, and international law all recognize the importance of protecting migratory bird species from harm.

Pursuant to the MBTA, it is unlawful "at any time, by any means or in any manner to . . . take [or] kill . . . any migratory birds, [and] any part, nest, or eggs of any such bird." 16 U.S.C. § 703(a). This prohibition applies to federal agencies and their employees and contractors who may not intend to kill migratory birds but nonetheless take actions that result in the death of protected birds or their nests. *Humane Soc'y of the United States v. Glickman*, 217 F. 3d 882 (D.C. Cir. 2000) (holding that federal agencies are required to obtain a take permit from FWS prior to implementing any project that will result in take of migratory birds); see also *Robertson v. Seattle Audubon Soc'y*, 503 U.S. 429, 437–38 (1992) (finding that federal agencies have obligations under the MBTA) and *Center for Biological Diversity v. Pirie* (191 F.Supp.2d 161 (D.D.C. 2002) (allowing injunctive relief against federal agencies for violations of the MBTA). The prohibition on "take" of migratory birds includes destruction of nests during breeding season. Specifically, "nest destruction that results in the unpermitted take of migratory birds or their eggs, is illegal and fully prosecutable under the MBTA." U.S. Fish and Wildlife Service, Migratory Bird Permit Memorandum, from Director Steve Williams dated April 15, 2003.

In a *Memorandum of Understanding Between the U.S. Department of Agriculture Forest Service and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds* ("MOU"), the agencies identified specific actions that, if implemented, would contribute to the conservation of migratory birds and their habitats. The MOU requires the Forest Service to alter the season of activities to minimize disturbances during the breeding season, to coordinate with the appropriate FWS Ecological Services office when planning projects that could affect migratory bird populations, and to follow all migratory bird permitting requirements. Importantly, the MOU "does not remove the Parties' legal requirements under the MBTA, BGEPA, or other statutes and does not authorize the take of migratory birds," (emphasis added).

Under the MBTA, "any person, association, partnership, or corporation" who violates the MBTA or regulations thereunder are subject to criminal and civil penalties. 16 U.S.C. §707. Violations of the MBTA are prosecuted as a misdemeanor, and upon conviction thereof, are subject to fines of up to $15,000 or imprisonment of up to six months, or both. *Id.*

Requirements of the California Fish & Game Code

In addition to the protections afforded by the federal MBTA and outlined above, several bird species within the project area are also protected under state law. Specifically, "[i]t is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird," and "it is unlawful to take or possess a migratory nongame bird." *See* Cal. Fish & Game Code §§ 3503, 3513.

To mitigate the potential take of migratory bird nests, we recommend that the following mitigation measure be implemented for all vegetation clearing projects:

Source: Southern California Association of Governments. 2012. Final Programmatic Environmental Impact Report for the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), Appendix G: Examples of Measures that Could Reduce Impacts from Planning, Development and Transportation Projects.

BIO/OS34: Project sponsors may ensure that suitable nesting sites for migratory nongame native bird species protected under the Federal Migratory Bird Treaty Act and/or trees with unoccupied raptor nests (large stick nests or cavities) may only be removed prior to February 1, or following the nesting season.

A survey to identify active raptor and other migratory nongame bird nests may be conducted by a qualified biologist at least two weeks before the start of construction at project sites from February 1st through August 31st. Any active non-raptor nests identified within the project area or within 300 feet of the project area may be marked with a 300-foot buffer, and the buffer area may need to be avoided by construction activities until a qualified biologist determines that the chicks have fledged. Active raptor nests within the project area or within 500 feet of the project area may be marked with a 500-foot buffer and the buffer avoided until a qualified biologist determines that the chicks have fledged. If the 300-foot buffer for non-raptor nests or 500-foot buffer for raptor nests cannot be avoided during construction of the project, the project sponsor may retain a qualified biologist to monitor the nests on a daily basis during construction to ensure that the nests do not fail as the result of noise generated by the construction. The biological monitor may be authorized to halt construction if the construction activities cause negative effects, such as the adults abandoning the nest or chicks falling from the nest.

- Beginning thirty days prior to the disturbance of suitable nesting habitat, the project sponsor may arrange for weekly bird surveys conducted by a qualified biologist with experience in conducting breeding bird surveys to detect protected native birds occurring in the habitat that is to be removed and any other such habitat within 300 feet of the construction work area (within 500 feet for raptors) as access to adjacent areas allows. The last survey may be conducted no more than 3 days prior to the initiation of clearance/construction work.

- If an active raptor nest is found within 500 feet of the project or nesting habitat for a protected native bird is found within 300 feet of the project a determination may be made by a qualified biologist in consultation with CDFG whether or not project construction work will impact the active nest or disrupt reproductive behavior.

- If it is determined that construction will not impact an active nest or disrupt breeding behavior, construction will proceed without any restriction or mitigation measure. If it is determined that construction will impact an active raptor nest or disrupt reproductive behavior then avoidance is the only mitigation available. Construction may be delayed within 300 feet of such a nest (within 500 feet for raptor nests), until August 31 or as determined by CDFG, until the adults and/or young of the year are no longer reliant on the nest site for survival and when there is no evidence of a second attempt at nesting as determined by a qualified biologist. Limits of construction to avoid a nest may be established in the field with flagging and stakes or construction fencing marking the protected area 300 feet (or 500 feet) from the nest. Construction personnel may be instructed on the sensitivity of the area.

- Documentation to record compliance with applicable State and Federal laws pertaining to the protection of native birds may be recorded.

February 25, 2013

Board of Forestry and Fire Protection
Attn: George Gentry
Executive Officer
VegetationTreatment@fire.ca.gov
Sacramento, CA 94244-2460

Re: ADDENDUM to our January 25, 2013 comment letter on the Draft Program EIR (PEIR) for the Vegetation Treatment Program

Dear Mr. Gentry and Board Members,

Type conversion of native shrublands, the purpose of a Program EIR, and land planning were issues we addressed in our original letter of January 25, 2013. We would like to expand on these matters here. In addition, we are submitting a large number of exhibits for the administrative record including:

1. A petition with 3,080 signatures and comments requesting that the Board of Forestry retract its PEIR and to work with the California Natural Resources Agency and the Senate Committee on Natural Resources and Water to create a Comprehensive Fire Protection Program**.**

2. Scientific papers cited in this and our January 25, 2013 letter.

3. Our 2005 comment letter to Cal Fire on the NOP regarding the Vegetation Management Program DEIR identifying the need to incorporate current science into its planning process and to avoid using forest-based models when managing other ecosystems.

Type Conversion

As stated in our January 25, 2013 letter, contrary to statements in the PEIR, US Forest Service research has shown that most shrubland ecosystems within the four National Forests in southern California have **negative** departures from historical fire patterns, meaning the native shrublands are being threatened by too much fire as opposed to not enough. Based on this analysis, it is a fair assumption that many other native shrublands in State Responsibility Areas are being threatened by too much fire as well, and hence type conversion. We have included US Forest Service research maps at the end of this letter showing these negative departures (In our previous letter we mistakenly termed negative departure as positive).

Program EIR: General

A regulation enacted under CEQA, Title 14 of Cal. Code of Regulations (CEQA Guidelines) § 15168 defines a "Program EIR," its uses, and whether a Program EIR can eliminate the need for further CEQA documents for site-specific projects (either "tiered EIRs" or "negative declarations") as follows:

> (a) **General**. *A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related either*:
>
> (1) *Geographically,*
>
> (2) *As logical parts in the chain of contemplated actions*,
>
> (3) *In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program*, or
>
> (4) *As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar way*s. (Italics added)

The PEIR fails to meet these criteria for a program EIR.

We find that since the 38 million acres targeted by the PEIR are neither geographically (1) nor ecologically similar, it is impossible for the Board to conclude as it does in the PEIR that *the individual activities carried out* under its authority in the Program will have *similar environmental effects* which *can be mitigated in similar ways* (4). This is especially true since the PEIR was dominated by forest-based research, some of which was misinterpreted and misquoted, and fails to address specific regional differences in ecosystem type, biodiversity, and wildland-urban interface issues.

We also find the huge, 500% expansion of Cal Fire's previous Vegetation Management that this PEIR proposes does not qualify as *a continuing program* (3). The massive area proposed for treatments requires an entirely different analysis as explained in our previous letter.

And finally, the projects the PEIR are proposing occur in so many different ecosystems with so many different variables, that considering them *as logical parts of contemplated actions* (2) is equivalent to classifying developments on flood plains, earthquake faults, and along the coastal zone as exempt from independent review because they all involve housing subdivisions.

In addition, the CEQA guidelines state,

> (5) A program EIR will be most helpful in dealing with subsequent activities if it *deals with the effects of the program as specifically and comprehensively as possible*. With a good and detailed analysis of the program, many subsequent activities could be found to be within the scope of the project described in the program EIR, and no further environmental documents would be required. (Italics added)

We find the PEIR fails to meet this standard of dealing *with the effects of the program as specifically and comprehensively as possible* as explained in our previous letter.

Program EIR: Details

A treatise on CEQA, Remy, Thomas, Moose & Manley, Guide To CEQA (11th ed. 2007) (Guide To CEQA), discusses Program EIRs. They state that Program EIRs can serve an important function by,

> "*. . . providing a single environmental document that can allow an agency to carry out an entire 'program' without having to prepare additional site-specific EIRs or negative declarations.* To effectively serve this second function, a program EIR must be very detailed; in other words, *it must include enough site-specific information to allow an agency to plausibly conclude that, in analyzing 'the big picture,' the document also addressed enough details to allow an agency to make informed site-specific decisions within the program*. (Guide To CEQA, pp. 637-638; italics added)

The Board's PEIR does not contain site-specific information, and hence has failed this standard. It appears then that the Board is depending on the second step of environmental analysis, that is, to go through a "written checklist" to determine if the significant environmental impacts of a site-specific project have been evaluated in the Program EIR. Since the PEIR has failed to do this, then the Board is required to prepare site-specific "tiered" EIRs or negative declarations (The factors that a lead agency must examine in the written checklist are set forth in Public Resources Code § 15162).

There are no checklists within the PEIR specific to each plant community and region the Program will be treating. Therefore, it is impossible to properly evaluate the Program's impacts.

In addition,

> . . . (*T*)*he authors believe that a lead agency should clearly inform the public whether future CEQA documentations are anticipated.* Such information will

> affect the manner in which people review and criticize the 'first tier' EIR . . ." (Guide To CEQA, p. 638; italics added)

The PEIR has not done this.

After setting forth the definition of a "program" set forth in CEQA Guidelines § 15168(a), the Remy et al Guide To CEQA provides

> . . . **What is a 'Program'?**
>
> . . . The use of a program EIR allows a lead agency 'to characterize the overall program as the project being approved at the time.' . . . (A) program EIR acts as an analytical superstructure for subsequent more detailed analysis. *The program EIR should identify those probable environmental effects that can be identified.* For those impacts that cannot be predicted without undue speculation or for which the deferral of specific analysis is appropriate, the agency can defer such analysis until later points in the program approval or implementation process. . . . Subsequent EIRs need only focus on new effects that have not been considered before. . . ." (Guide To CEQA, pp. 638-639; italics added)
>
> . . . (F)or a program EIR to allow an agency to dispense with additional EIRs or negative declarations for later site-specific projects, the program document must be at once both comprehensive and specific. It must concentrate on a project's long-term 'cumulative' impacts, but must also contain enough details to anticipate 'many subsequent activities within the scope of the project.' CEQA Guidelines, § 15168, subd. (c)(5). . . ." (Guide To CEQA at p. 639)

For the reasons stated in our previous letter, the PEIR has failed to properly *identify those probable environmental effects that can be identified.* Specifically, the PEIR's cursory treatment of shrubland type conversion that can certainly be identified, the cumulative impacts of such a change on ecosystem health and diversity that are ignored, and its flawed, forest-based analysis of the entire state, are all significant and fatal flaws in the PEIR.

Poor Preparation

List of Preparers and Individuals/Organizations consulted in preparation for the PEIR is almost exclusively dominated by northern California, forest-based consultants and Cal Fire staff. Only one outside agency scientist who has had significant involvement in fire research over the past decade involving Southern California was included (Geographer P.W. Wohlgemuth with the USFS Riverside Fire Lab). We find this especially odd since the Board is involved with the California Fire Science Consortium which is focused on exchanging and distributing knowledge concerning the most recent research in fire science.

As a consequence, we are asking the Board the following questions concerning the preparation of the PEIR:

1. How were consultants for the PEIR selected?

2. Why did the Board not include well known scientists familiar with shrubland-based ecosystems, especially those in southern California?

3. Why did the Board exclude important conservation groups who the Board knows have been extremely active in commenting on fire management issues in California (such as the California Native Plant Society and the California Chaparral Institute)?

4. How were the citations in the PEIR vetted to ensure they were relevant to the statements and conclusions made in the PEIR?

5. Why is there a lack of shrubland-based citations and applications in the PEIR when the majority of the most damaging fires in California have occurred in shrubland ecosystems?

6. Why did the Board only provide alternatives focused on vegetation treatment rather than more comprehensive approaches of the type suggested in our January 25, 2013 comment letter?

7. How does the Board intend to use the comments being submitted about the PEIR? We ask this question because while CEQA indicates that “an EIR should summarize the main points of disagreement among the experts,” we are hoping the Board will not merely attach submitted comments to satisfy this requirement. We are hoping the Board will actually *use* the submitted comments to develop a more comprehensive fire management program. Such use is true to the intent of CEQA.

Land Planning

We mention the importance of land planning in reducing wildand fire risk in our prior letter. We wanted to provide additional research that affirms the importance of providing a **Wildland-Urban Interface (WUI) alternative** to the Board’s proposed Program as we offered in our January 25, 2013 letter.

After examining housing that borders public forestlands in the West, Gude et al. (2008) concluded,

> Most importantly, national, state, and local policies that address **wildland fuels management need to be coupled with policies that address existing and future development in fire-prone private lands.** (Emphasis added).

In a follow-up, comprehensive examination of wildfire suppression costs in the Sierra Nevada area of California, Gude et al. (2013) concluded,

> In light of mounting evidence that increases in housing lead to increases in fire suppression costs, future policies aimed at addressing the rising costs should attempt to either reduce or cover the additional costs due to future home development. **To ignore homes in future wildfire policies is to ignore one of the few determinants of wildfire suppression cost that can be controlled.** For example, governments have limited ability to control factors such as weather and the terrain in which wildfires burn.
>
> **The most obvious means of reducing additional suppression costs due to future home development would be to limit future home development in wildfire prone areas.** Based on our findings, future savings may be achieved by a combination of policies that aim to keep undeveloped land undeveloped and encourage new development within existing urban growth boundaries and existing subdivisions. (Emphasis added)

Failure to Incorporate Comments

According to the PEIR,

> All scoping comments received by the Department in response to its earlier NOP have been incorporated by the Board as a part of the scoping for the Vegetation Treatment Program EIR proposed herein. (PEIR 9-1)

We are not sure what the Board means by "incorporated," but we have found that prior comments provided by us to the Board appear to have been generally ignored.

For example, in our 2005 comment letter concerning the NOP we wrote,

> ... much of what is within the California Fire Plan tends to treat different types of fuels with the same broad brush, "one-size-fits-all" approach, failing not only to recognize the distinct differences between forest and chaparral, but also the important differences within chaparral types themselves. These differences have important fire management implications that need to be addressed. Not doing so will dramatically reduce the effectiveness of our state's fire management efforts."

Our January 25, 2013 comment letter repeats the same point:

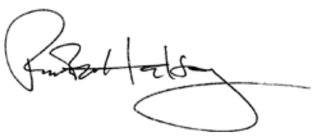
> The one-size-fits-all approach the PEIR takes regarding fire suppression is not scientifically supportable and raises serious questions about the PEIR's conclusions. For shrubland ecosystems, which have completely different fire regimes and responses to management than forests, there were less than a dozen

peer-reviewed papers referenced (out of nearly 1,000 literature citations) relating directly to fire.

The need to appropriately address and incorporate the different fire regimes of coniferous forest vs. chaparral and other ecosystems into the Program's vegetation treatment prescriptions is a substantial issue that was raised during the scoping process in 2005, and one that still remains inadequately addressed in the PEIR.

We urge the Board to take advantage of the the wealth of information available from independent scientists, conservation organizations, and private citizens who care deeply about California and use it to shape its future policy documents and fire management programs.

Sincerely,



Richard W. Halsey
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Justin Augustine
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Center for Biological Diversity

The California Chaparral Institute is a non-profit science and educational organization dedicated to promoting an understanding of and appreciation for California's shrubland ecosystems, helping the public and government agencies create sustainable, fire safe communities, and encouraging citizens to reconnect with and enjoy their local, natural environments. www.californiachaparral.org

The Center for Biological Diversity is a 501(c)3 nonprofit conservation organization with more than 450,000 members and online activists dedicated to the protection of endangered species and wild places. www.biologicaldiversity.org

New signatories to our letter:

Claudia Foster
Richard Foster
Board of Directors
Del Dios Volunteer Fire Department

Richard Foster
President
Del Dios Mutual Water Company

Terry Frewin
Chair
Sierra Club California/Nevada Desert Committee
Santa Barbara, CA

Las Virgenes Homeowners Federation
Kim Lamorie, president
Mary Ellen Strote, vice president
Kathy Berkowitz, secretary
Joan Yacovone, treasurer

Andrew J. Orahoske
Conservation Director
Environmental Protection Information Center
Arcata, CA 95521

Prior signatories

Kevin Barnard
President
The Escondido Creek Conservancy

Pat Barnes
Chairperson
Orange County Group Executive Committee
Sierra Club, Angeles Chapter

Monica Bond, Principal Scientist
Wild Nature Institute

Cindy Crawford
Environmental Writer
www.caopenspace.org

Michael J. Connor, Ph.D.
California Director
Western Watersheds Project

Penny Elia
Task Force Chair
Save Hobo Aliso Task Force
Sierra Club

David Garmon, President
Tubb Canyon Desert Conservancy

George Hague
Co-Chair
Santa Ana Mountains Task Force
Sierra Club, Angeles Chapter

Tom Hopkins, President
Ventana Wilderness Alliance
Santa Cruz, CA

Gordon Johnson
Director
California Wilderness Project

Eric Johnson, Chair
Puente-Chino Hills Task Force of the Sierra Club

Frank Landis, Ph.D.
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California Native Plant Society, San Diego Chapter

Travis Longcore, Ph.D.
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The Urban Wildands Group
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Ulrike Luderer
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Sierra Club, Angeles Chapter

Greg McMillian, Chair
Executive Committee
Santa Lucia Chapter, Sierra Club

Patricia S. Muir
Professor, Botany and Plant Pathology
Oregon State University

Tom O'Key
Southern California Desert Video Astronomers
www.scdva.org

Doug Paulson
President
Escondido Citizens' Ecology Committee

Claire Schlotterbeck
Executive Director
Hills for Everyone

Geoffrey D. Smith
Founder
Wilderness4All

Joel Robinson
Director
Naturalist For You

Michele Roman
Environmental Photographer

Terry Welsh
President
Banning Ranch Conservancy
Sierra Club Banning Ranch Park and Preserve Task Force

Fred Woods
Friends of Daley Ranch
Escondido, CA

George Wuerthner
Western Wildlands Council
Bend, Oregon

David Younkman
Vice President for Conservation
American Bird Conservancy

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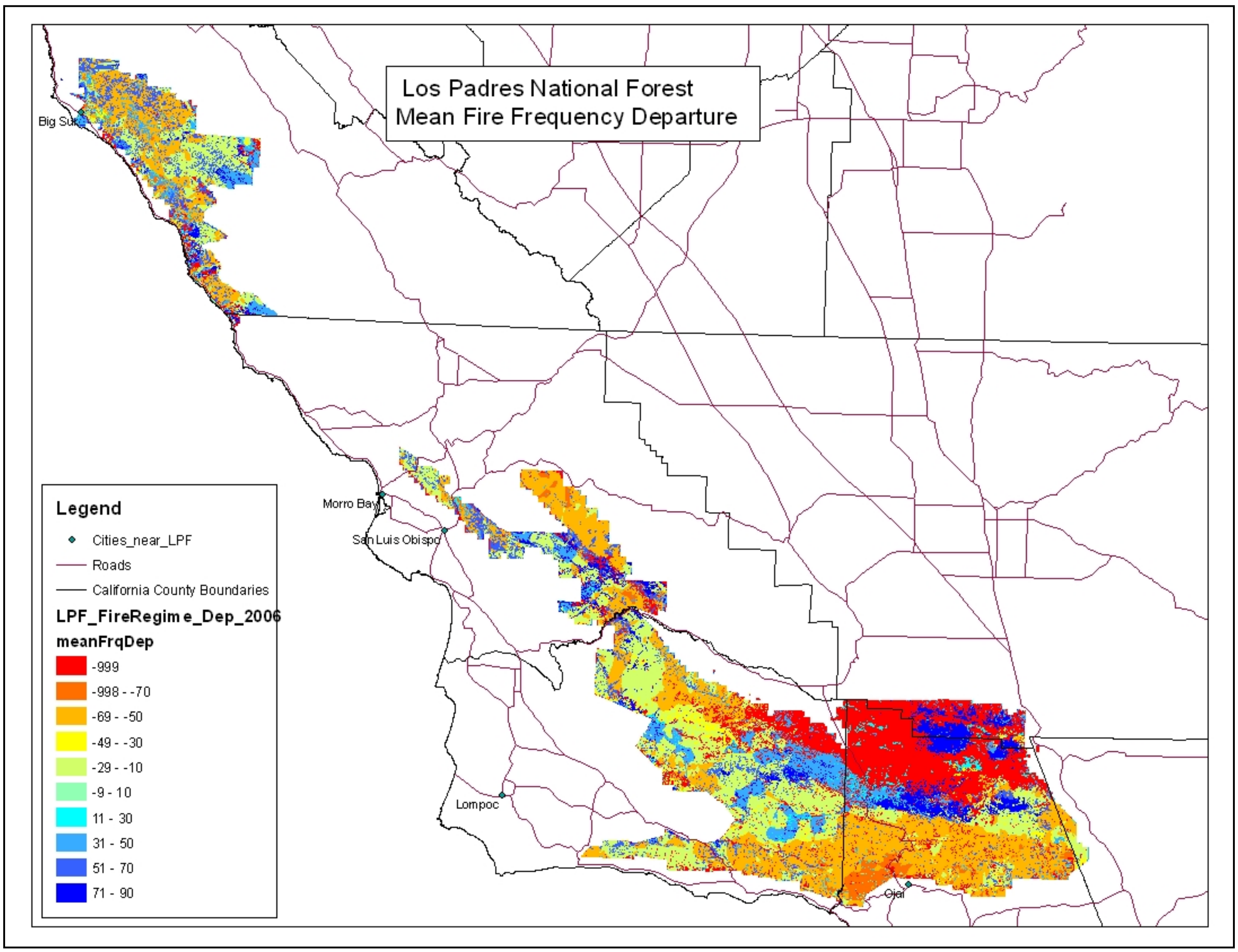
Gude, P.H., K. Jones, R. Rasker, M.C. Greenwood. 2013. Evidence for the effect of homes on wildfire suppression costs. International Journal of Wildland Fire - http://dx.doi.org/10.1071/WF11095

Gude, P., R. Rasker, J van den Noort. 2008. Potential for future development on fire-prone lands. Journal of Forestry, June: 198-205.

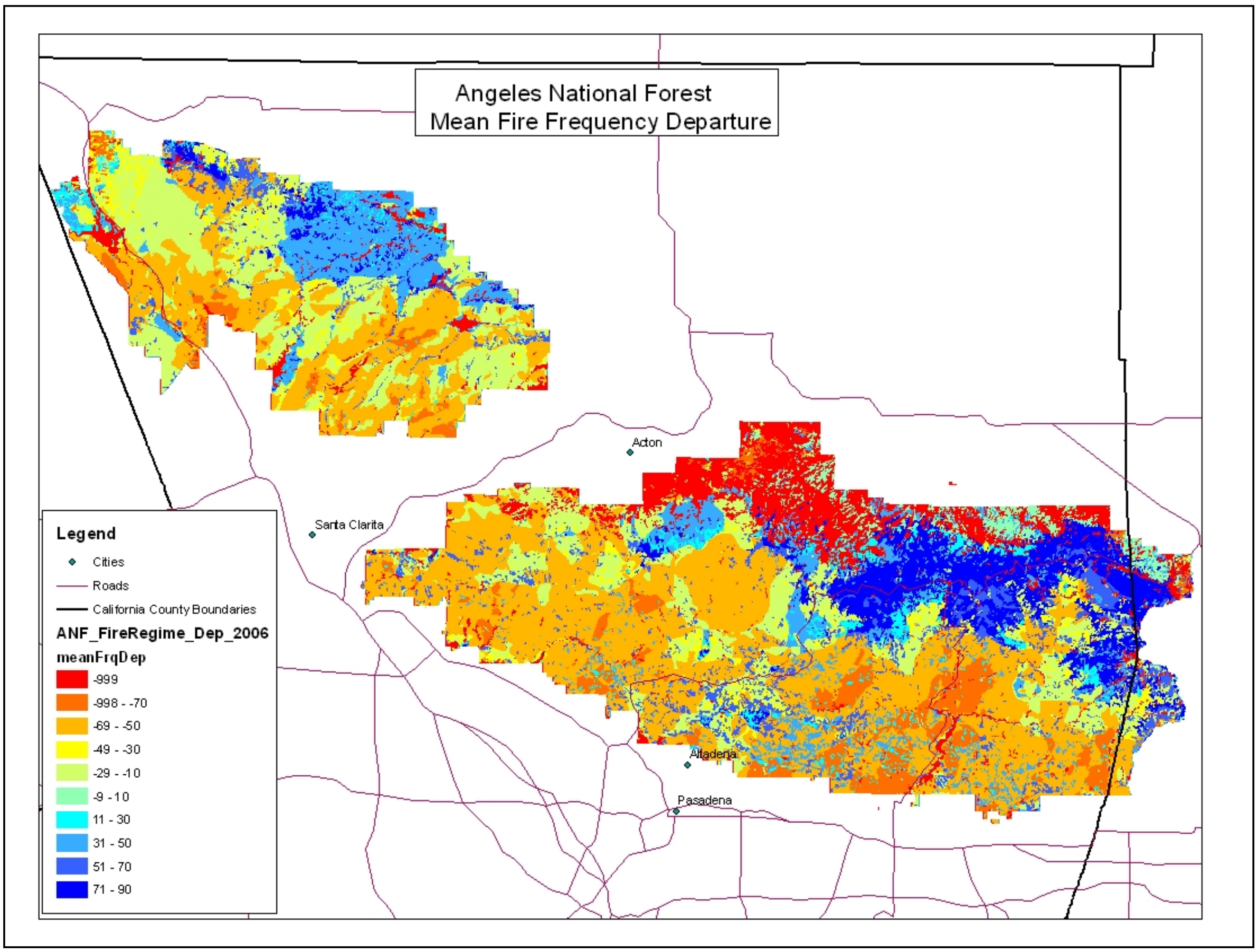
Los Padres National Forest Mean Fire Frequency Departure Map
Hot colors represent negative departures (more fire than historical)
Cool colors represent positive departures (less fire than historical)

From Safford, H. D. and D. Schmidt. 2008. Fire departure maps for southern California national forests. USDA Forest Service and The Nature Conservancy.



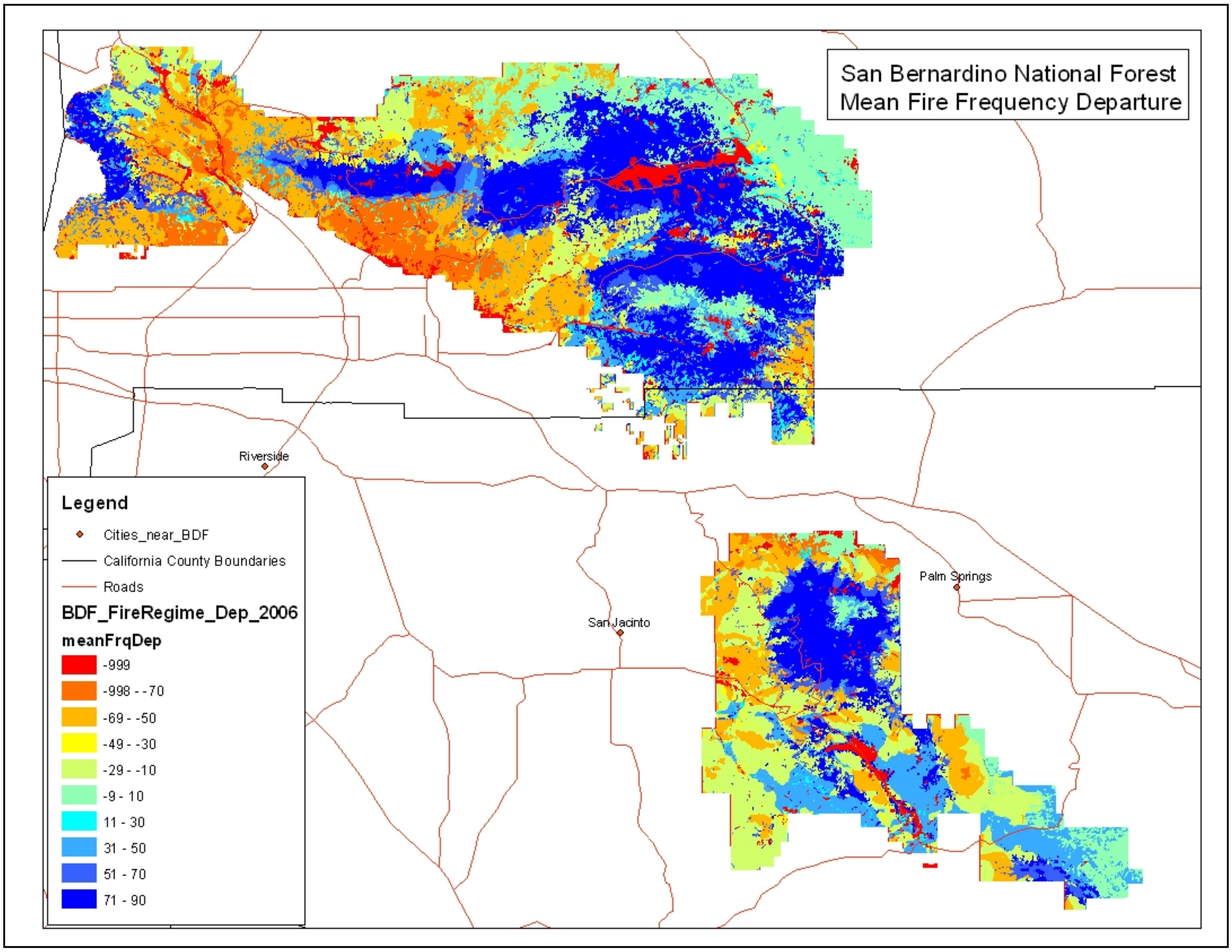
Angeles National Forest Mean Fire Frequency Departure Map
Hot colors represent negative departures (more fire than historical)
Cool colors represent positive departures (less fire than historical)

From Safford, H. D. and D. Schmidt. 2008. Fire departure maps for southern California national forests. USDA Forest Service and The Nature Conservancy.



San Bernardino National Forest Mean Fire Frequency Departure Map
Hot colors represent negative departures (more fire than historical)
Cool colors represent positive departures (less fire than historical)

From Safford, H. D. and D. Schmidt. 2008. Fire departure maps for southern California national forests. USDA Forest Service and The Nature Conservancy.



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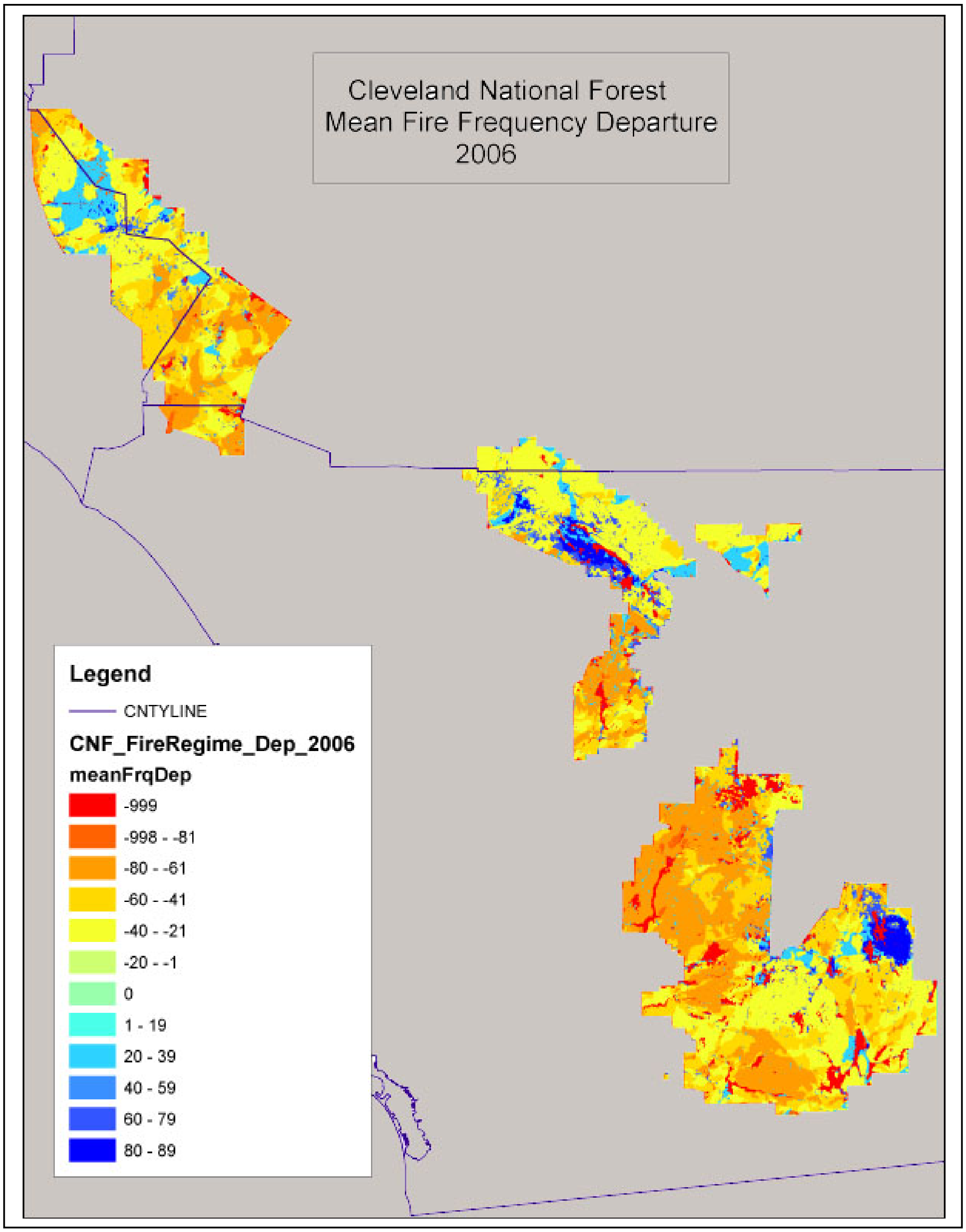


CALIFORNIA
CHAPARRAL
INSTITUTE
...the voice of the chaparral

April 8, 2013

Board of Forestry and Fire Protection
Attn: George Gentry
Executive Officer
VegetationTreatment@fire.ca.gov
Sacramento, CA 94244-2460

Re: CCI 3rd comment letter on the Draft Program EIR (PEIR) for the Vegetation Treatment Program

Dear Mr. Gentry and Board Members,

In this, our final comment letter on the PEIR, we would like to submit some questions relating to the PEIR document and the proposed Program.

A False Dichotomy

The primary question we have always asked about vegetation treatment projects in native shrubland ecosystems is why, if the science concerning the efficacy of such an approach is mixed at best, are vegetation treatments the default response to the threat of wildland fire?

This default response was illustrated in a San Diego Union-Tribune article on April 5, 2013, when it quoted Mr. Gentry as saying,

> *People have to expect one of two things. They're going to have to expect a large-scale fire that San Diego has already seen or they're going to have to accept some form of treatment to help mitigate those large-scale fires. That's the choices we're basically faced with.*

This is a false dichotomy. When the science has clearly shown that the best way to protect lives and property from wildland fire is through a combination of fire safe community planning, fire safe structures, and appropriate defensible space, the choices offered by the Board of Forestry and the PEIR do not reflect what we know. Spending millions of dollars on clearing habitat is not an effective use of fire management resources. The research is conclusive on the inadequacy of focusing exclusively on vegetation treatments:

> "Wind-blown embers, which can travel one mile or more, were the biggest threat to homes in the Witch Creek Wildfire. **There were few, if any, reports of homes burned as a result of direct contact with flames" from wildland fuels.**
> - Institute for Business and Home Safety 2008

and,

> Examining data on 700,000 addresses in southern California it was found that buildings on steep slopes, in Santa Ana wind corridors, and in low-density developments intermingled with wild lands, were the most likely to have burned between 2001 and 2010. **Nearby vegetation was not a big factor in home destruction. Exotic grasses that often sprout in areas cleared of native habitat like chaparral could be more of a fire hazard than the shrubs.**
> - Alexandra D. Syphard et al. 2012

and finally,

> …effective fuel modification for reducing potential WUI (wildland/urban interface) fire losses need only occur within a few tens of meters from a home, not hundreds of meters or more from a home. This research indicates that **home losses can be effectively reduced by focusing mitigation efforts on the structure and its immediate surroundings.**
> - Jack Cohen 1999

The Board's assumption appears to be that the *attempted mitigation* of large-scale wildland fires through vegetation treatment is the main goal in and of itself, rather than the actual protection of life and property. The one goal out of nine in the PEIR that does address protecting life and property is stated in a way that precludes any alternatives to vegetation treatment projects.

> *2. Modify wildland fire behavior to help reduce catastrophic losses to life and property consistent with public expectation for fire protection.*

Changing the Question

We suggest an alternative way of looking at the fire environment so that all the knowledge we have concerning wildland fire risk reduction is utilized. The Board of Forestry needs to ask itself,

How can we protect lives and property from wildland fire,
rather than,
How can we try to stop wildland fires?

In light of the two very different approaches these two questions can produce, we respectfully ask the Board to provide the public answers to the following as they apply to the PEIR:

1. Why has the Board of Forestry not taken a more comprehensive approach to fire risk reduction (by including all factors known to reduce the loss of lives and property during wildland fires), and instead focused exclusively on vegetation treatment in the PEIR?

2. Considering that the Board's mandate is focused on forests, forestry, and forest fires, that the majority of the Board's members are associated with forestry, that the PEIR is a forest-based document, and that the PEIR preparers' expertise is primarily in forested ecosystems, how did the Board adjust its approach in the PEIR to reducing the threat of wildand fire in non-forested ecosystems such as chaparral where most of the damaging fires occur?

3. The Board has claimed that there will be local input into the planning of individual vegetation treatment projects. However, if the PEIR is certified, the ability of citizens to challenge a project under the California Environmental Quality Act will be eliminated. If citizens believe a project approved by the Board and/or Cal Fire will cause significant environmental damage, what recourse will citizens have to challenge such a project?

4. In light of the data presented in the three studies cited above, Institute for Business and Home Safety (2008), Syphard et al. (2012), and Cohen (1999), what scientific rationale does the Board use to focus exclusively on vegetation treatment to reduce the loss of life and property from wildland fire, especially in southern California? We could find no such rationale in the PEIR.

5. What role, if any, did the economic incentive of federal grant dollars or other monies available for vegetation treatments play in the PEIR's exclusive focus on vegetation treatment?

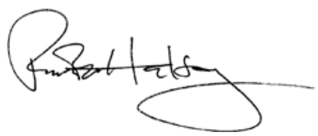
6. It was impossible to determine from the PEIR how much of the proposed program would be involving vegetation treatments on private ranch and farm land that would provide economic benefits to the owners of such lands. Would the Board please identify such projects if any exist?

Without changing the question as mentioned above, the Board of Forestry will continue to support a policy that has consistently failed to protect communities from wildland fire over the past one hundred years. It's time we start focusing on what we actually want to accomplish rather than supporting an approach that requires continual expenditures year after year on habitat clearance projects.

Plants grow back. In contrast, fire safe land planning and fire safe communities provide self-sustaining, long term solutions that do not require constant government expenditures to maintain.

Again, we urge the Board and the State of California to retract the current PEIR and instead deal with wildfire threats in a **collaborative**, science-based manner, involving all stakeholders and tailored to the wildly variable environments of California, that focuses on what really matters: lives, property, and the natural environment.

Sincerely,



Richard W. Halsey
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The California Chaparral Institute is a non-profit science and educational organization dedicated to promoting an understanding of and appreciation for California's shrubland ecosystems, helping the public and government agencies create sustainable, fire safe communities, and encouraging citizens to reconnect with and enjoy their local, natural environments. www.californiachaparral.org

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Cohen, J.D. 1999. Reducing the wildland fire threat to homes: where and how much? USDA Forest Service Gen. Tech. Report PSW-GTR-173, pp 189-195.

Institute for Business and Home Safety. 2008. Mega Fires: The Case for Mitigation. The Witch Creek Wildfire, October 21-31, 2007.

Syphard, A.D., J.E. Keeley, A. Bar Massada, T.J. Brennan, V.C. Radeloff. 2012. Housing arrangement and location determine the likelihood of housing loss due to wildfire. PLoS ONE 7(3): e33954. doi: 10.1371/journal.pone.0033954.

CALIFORNIA CHAPARRAL INSTITUTE
...the voice of the chaparral

May 7, 2013

Board of Forestry and Fire Protection
Resource Protection Committee
Attn: George Gentry
Executive Officer
VegetationTreatment@fire.ca.gov
Sacramento, CA 94244-2460

Re: Collaboration on the PEIR for the Vegetation Treatment Program (VTP)

Dear Mr. Gentry and Board Members,

We respectfully request that the Resource Protection Committee discuss a proactive proposal at today's meeting: invite members of the environmental and fire science communities who submitted detailed comment letters critical of the Draft PEIR to participate in a collaborative process to assist the Board in shaping a successful VTP.

Although there are distinct differences in how each of us would achieve the VTP's objectives, we all agree in the common goal of protecting life, property, and natural resources from wildland fire. As such, we believe by working together, we can develop a viable program that will gain the support of those who have voiced strong opposition to the current approach.

Such a collaborative effort is the preferable option.

We look forward to your positive response.

Sincerely,

Richard W. Halsey
Director
California Chaparral Institute
rwh@californiachaparral.org

October 27, 2015

California Board of Forestry and Fire Protection
Attn: Edith Hannigan, Board Analyst
Email: VegetationTreatment@bof.ca.gov

Re: Vegetation Treatment Program (VTP)

Dear Ms. Hannigan and Board Members,

We have been contributing to the development of a new Vegetation Management Program since 2005.

While we believe the current draft being developed is a vast improvement over previous attempts, it still contains significant contradictions and scientifically unsupportable statements that compromise the achievement of our common goal: protecting life, property, and the natural environment from wildland fire.

Thank you for the opportunity to provide the following comments and recommendations.

1. Ecological Restoration/resource goals
There are very few ecological communities or resource values that can be improved with the sorts of treatments the current Draft EIR proposes, with the exception of some mid-elevation (under 7,000 feet), mixed coniferous and pine forests where past logging, over grazing, and fire suppression have had impacts and altered ecological conditions outside the natural range of variability. Solid scientific justification, by experts in ecology and restoration, must be required for any project purporting to further natural resource goals.

2. Acres Treated rather than need
Project justification still appears to be based more on acreage quotas rather than actual need. The Draft EIR should ensure a "project justification process" that starts with a clear need to reduce risks, rather than the attainment of a certain number of treated acres. The 2013 San Felipe Valley prescribed burn provides an example of why this issue needs to be clearly addressed. Not only were the justifications for the project invalid, but the ecological damage caused by the burn's escape was significant. Details on this escaped burn can be found on the Chaparral Institute's website here:
http://www.californiachaparral.org/threatstochaparral/dprescribedfire.html

3. Citizen Oversight lacking within the WUI
Although the Draft EIR attempts to cover this issue with Objective #5 and indicating that the "Unit/Contract County CEQA Coordinators would seek public input and engage with stakeholders," such engagement is not spelled out other than saying the local Units will be doing it. What will the exact role be for interested stakeholders? Will they be able to see how their influence is reflected in the final plan? After the plan is finalized, is there a mechanism that will allow stakeholders to provide additional input or to object?

The Draft EIR also states that, "Each vegetation treatment project proposed would require the preparation of a Project Scale Analysis (PSA) that would document the project's consistency with the requirements and findings of this Program EIR."

However, we could not find any opportunity for the public at large to review these PSAs unless the project falls outside the 1.5 mile wide WUI. The Draft EIR dismisses concerns that this is too large an area because Cal Fire staff heard USFS representatives on the Cleveland National Forest suggested a 6-mile-wide WUI buffer (4-30). We consider this inadequate support for one of the fundamental principles that is apparently guiding the document.

The explanation as to why the 1.5-mile-wide WUI is necessary is based on the approximate distance embers can be carried from the fire front (4-29). We suggest the Board refer to USFS scientist Jack Cohen's work. His conclusions do not support such a rationale.

4. Public Meetings for projects outside the WUI?
The Draft PEIR says the "project proponent" will provide a public meeting for projects outside the WUI. What role will Cal Fire play in making sure a meeting will occur, how it will be organized, and how comments made during the public meeting will be (or not) considered. The document also does not make clear how much State Responsibility Area is actually outside the 1.5 mile wide WUI that would require a public meeting (2-46).

To satisfy the goal of full transparency, CalFire needs to maintain a **CEQA type website that lists the proposed projects** in each Unit, a general description, and the date of any stakeholder meeting, including those projects on state parks/CA Fish and Wildlife lands (2-46).

5. High-severity fire - all forests are not the same
One of the Draft EIR's key program objectives is to reduce the potential for high-severity fire within "appropriate vegetation types" (2-8). The document appears to mean "many forests in California" and only cites Thomas Bonnicksen's political testimony to Congress in 2003 to support this objective.

The document states,

"Coniferous forests in California have long been subject to frequent low-intensity fires, which played an important role in reducing hazardous fuels and maintaining ecosystem processes." (2-9)

The Draft EIR makes no distinctions for forest types. Presumably projects could thin lodgepole pine forests that do not have unnaturally high vegetation build-ups because they have natural fire return intervals over 100 years.

6. Contradictions concerning the chaparral fire regime
Although the Draft EIR recognizes the chaparral's natural fire regime as being characterized by infrequent, high-intensity fires, the author's later contradict themselves.

For example, the document first correctly indicates that chaparral species are lost at short fire return intervals (immaturity risk), then reverses itself by incorrectly stating that chaparral is resilient to short fire return intervals.

"*Over time, instances of the loss or significant reduction of species that were victims of immaturity risk began to accumulate. In addition, the study of chaparral ecosystems began to reveal that chaparral,* ***in addition to being resilient to fire at shorter intervals****, was also resilient to fire at long intervals (Sampson, 1944; Horton and Kraebel, 1955)."* (4-12)

Later in the document, after again recognizing the problems with short fire return intervals in chaparral, the document suggests that science may yet find that short fire returns are not a problem by misrepresenting Keith Lombardo's research (2009).

"... chaparral does not need more fire, it needs less (Safford and Van de Water, 2014). However, new scientific information could modify that conclusion in the future as it becomes available. For example tree-ring data collected by Lombardo et al. (2009) in bigcone Douglas-fir stands surrounded by chaparral indicate that both extensive and ***smaller fires were present in historical time****."*(4-14)

We are attaching the statement from Dr. Lombardo that we also submitted during the August, 2015, Board of Forestry meeting that makes clear his research was being misrepresented. His research does NOT suggest that short fire return intervals in chaparral were typical in historical time.

7. Erroneous Ecological Restoration treatments for northern chaparral
The Draft EIR falsely claims that chaparral in northern California is different enough from the south that the *"**ecological rationale** for fuel treatments"* can be used (4-15).

There is NO research that supports this claim. In fact, a study just released by the Joint

Fire Science Program indicates that there are indeed ecological trade-offs in reducing chaparral fire hazard in northern California (Wilkin, et al. 2015). Clearance of chaparral has also been recently suspected of increasing the spread of Lyme disease in vertebrates (Newman et al. 2015).

The Draft EIR also appears to be assuming that climate change will not modify northern California in a way that will replicate increased fire patterns found in southern California chaparral. This is in opposition to USFS research. Safford and Van de Water (2014) suggest chaparral type conversion is spreading northward into the northern Santa Lucia Range and may likely continue to spread as climate change and population growth increase the potential for ignitions.

8. Biased Case Studies/Faulty Generalization

It is critical that the Draft EIR does not ignore contrary data. The current draft does so by selecting only affirming case studies, rather than objective research, to prove a particular point.

For example, using the one-year-old prescribed burn conducted at Poppet Flats to demonstrate control of the 2006 Esperanza Fire (2-55) illustrates a failure to recognize that it is not practical to establish and maintain black ground around every vulnerable community.

The Esperanza Fire was able to be controlled at the referenced location. However, vegetation grows back, and it did in the Esperanza area, leading to the 2013 Silver Fire that re-burned a huge portion of the Esperanza scar (destroying 24 homes in the process).

Additional details concerning the 2013 reburn can be found here: http://californiachaparral.org/wordpress1/2013/08/12/silver-fire-defies-popular-beliefs-about-wildfire/

The Draft EIR must use research that examines the entire picture and how *all the fuel treatments* impact fire spread. Anecdotal stories and cherry picking data lead to faulty generalizations - a fallacy of defective induction. The following research offers a more comprehensive approach.

Home Loss

Syphard, AD, JE Keeley, A Bar Massada, TJ Brennan, VC Radeloff. 2012. Housing arragement and location determine the likelihood of housing loss due to wildfire. PLoS ONE 7(3): e33954. doi: 10.1371/journal.pone.0033954

Rather than examining a narrow set of case studies, Syphard and her coauthors gathered data on 700,000 addresses in the Santa Monica Mountains and part of San Diego County. They then mapped the structures that had burned in those areas between 2001 and 2010, a time of devastating wildfires in the region.

The authors found:
- Nearby vegetation was not a big factor in home destruction.
- Grasses that often sprout in areas cleared of native habitat like chaparral could be more of a fire hazard than the shrubs.
-Geography is most important — where is the house located and where are houses placed on the landscape.

Defensible Space
Syphard, A.D., T.J. Brennan, and J.E. Keeley. 2014. The role of defensible space for residential structure protection during wildfires. International Journal of Wildland Fire 23:1165-1175.

The authors found:
- The most effective measures to reduce structure losses are to "reduce the percentage of woody cover up to 40% immediately adjacent to the structure and to ensure that vegetation does not overhang or touch the structure."
- There is no additional structure protection provided by clearing beyond 100 feet, even on steep slopes, and the most important treatment zone is from 16-58 feet.
- The amount of cover reduced is as important as the fuel modification distance; however complete removal of cover is not necessary. The term "clearance" should be replaced with "fuel modification" to emphasize this fact.

Fuel Breaks
Syphard, A.D., J.E. Keeley, T.J. Brennan. 2011. Comparing fuel breaks across southern California national forests. Forest Ecology and Management 261: 2038-2048.

The authors found:
- A substantial number of fuel breaks are never intersected by fires.
- Firefighter access — to fuel breaks for backfires and other control measures — was the most important determinant of their effectiveness.
- Among the forests studied, only 22% to 47% of fires stopped at fuel breaks, even when firefighters could access them.

9. Green House Gases
The Draft EIR fails to establish a reasonable/accurate way to measure greenhouse gas (GHG) emissions for treatment projects. The assumption that treated sites would create less GHG emissions than if burned in a wildfire, and thus sequestering carbon (meaning projects have no impact), is questionable.

Instead, the VTP needs to use a 100-year timeline for greenhouse gas (GHG) emissions. We recommend a 100-year timeline in part because carbon offset projects by groups such as the Climate Action Reserve run on 100-year timelines, and because it is our understanding that CalFire and the Board of Forestry are partially responsible for

California's carbon sequestration efforts. To us it makes sense to calculate the GHG impacts of the VTP using the same metrics that are used to calculate carbon sequestration by other projects overseen by CalFire.

An example in how a 100-year timeline is used follows.

- On the project impact side, the total GHG emissions are calculated from a project over a 100-year time span. To determine the impact on a site that is repeatedly treated every 10 years, the sum of the total GHG emissions for 100 years of treatments (10 sequential vegetation treatments) is calculated.

- On the natural impact side, GHG emissions are calculated from fires, using the calculated "natural" fire return interval, and again summed over 100 years. If there is a 50 year fire return interval for a project site, emissions are calculated as if the site burned twice in the 100 year period. The sum of the GHG emissions from the two fires is calculated.

- The two sets of emissions are compared, and the difference between them is the cumulative GHG impact. This method provides a fairly simple standard for quantitative calculations that fits in with what the Board is starting to do with reforestation for carbon sequestration. By including treatment repetition times and fire return intervals and scaling up across the entire VTP area, the Board can calculate the real impacts of the VTP.

10. Climate change and species migration

From the available science, it appears that California's plants adapted to climate change during the ice ages by migrating (Lancaster, L. T., and K. M. Kay. 2013. Origin and Diversification of the California Flora: Re-Examining Classic Hypotheses with Molecular Phylogenies. Evolution 67:1041-1054), and there is no reason to think that plants will not respond to future climate change by continuing to migrate, although their migration routes are massively limited by development, agriculture, and silviculture.

CalFire, through the VTP, quite possibly controls the outcome of migrations in the few areas that remain open. Both fires and especially clearances in areas critical to successful migration could exacerbate the loss of sensitive species by killing individuals that attempt to establish in treatment areas. To the degree that the data exist, critical migration corridors need to be identified, and impacts of the VTP upon these areas need to be analyzed and mitigated as necessary.

Our understanding is that plant migration was analyzed in the EIR for the Desert Renewable Energy Conservation Plan (DRECP), and we strongly suggest that impacts on migration corridors be studied as part of the next VTP EIR.

Other Points Needing Clarification

- Condition Class 3 (4-39) needs to clearly indicate it can meant either not enough fire or too much. Additionally, the fuel rank of 3 needs to be detailed out to include "too much fire."
- Climate change/carbon sequestration is only related project to emissions. It needs to reference carbon sequestration balances.
- There is no definition for old-growth chaparral. (4-16) Fifty-year-old stands and above qualify.
- The WUI definition needs to be based on science, not agency opinions.
- The structure of the public meetings needs to be clarified.
- "Critical infrastructure" needs to be defined.
- Different forest types need to be recognized.
- The Draft EIR fire modeling shows fuel breaks on every ridgeline without incorporating the science that clearly shows this is not an effective strategy and causes unnecessary damage to plant communities.

What we wrote in our 2005 comment letter on the draft VTP then being considered still applies to the current draft.

> If a thorough analysis of the true costs of various fuel modification treatments is performed (one has never been done), we believe concentrating efforts directly where loss of life and property can occur will produce the greatest and most effective benefit.

We are hopeful such an analysis will also be imbedded in the current effort.

Sincerely,

Richard W. Halsey
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Frank Landis, PhD (Botany)
Conservation Chair
California Native Plant Society
San Diego Chapter

CALIFORNIA CHAPARRAL INSTITUTE
...the voice of the chaparral

May 24, 2016

California Board of Forestry and Fire Protection
Attn: Edith Hannigan, Board Analyst
Email: VegetationTreatment@bof.ca.gov

Dear Ms. Hannigan and Members of the Board,

It is with a deep sense of disappointment to find that the current Draft Programmatic Environmental Impact Report (DPEIR) for the state's proposed Vegetation Treatment Program contains many of the same errors (some with the exact wording), contradictions, and failures to identify environmental impacts that were pointed out in previous versions.

Many of the productive suggestions provided to the Board of Forestry on how they could improve the draft DPEIR were ignored, including those from the California Legislature's required review by the California Fire Science Consortium, the Department of Fish and Wildlife, fire scientists, and environmental groups.

Potential impacts are dismissed by the DPEIR without support, mitigations of impacts are unenforceable and unmeasurable, the treatment of northern chaparral is justified by non sequitur reasoning, and the research of several scientists continues to be misrepresented (despite corrections being submitted). The lack of transparency remains a significant issue – using a local newspaper to inform the public about projects is no longer adequate.

One of the most egregious examples of the DPEIR's failure is the continued use of outdated and inadequate spatial data that provides the foundation for the entire Program. Although updated data is available from Cal Fire itself, **the DPEIR ignores this rich resource** and depends instead on questionable information from decades ago.

As a consequence, the current DPEIR fails to meet the requirements of the California Environmental Quality Act (CEQA).

The DPEIR also reveals **a significant number of inconsistencies** as the document initially references current science to only qualify or ignore it later in order to support the Program's objectives. By using contradictory statements, undefined terms, and legally inadequate mitigation processes, the document is a testament in ambiguity. It appears to be a program in search of confirming data rather than one developed from examining the actual problem.

The most concerning issue, however, relates to the failure of the document to provide a key component of a programmatic EIR - providing a more exhaustive consideration of effects and cumulative impacts than could be accomplished at the project level (14 CCR § 15168).

Instead, volumes of repetitive text are punctuated with the unsupported claim that determining impacts is impossible, pushing it off to project managers to determine with a checklist and standard project requirements that depend on subjective judgments.

How does the DPEIR justify ignoring a thorough examination of impacts as required by CEQA? The document vacillates between claiming the Program is too large and complex to analyze, or the treatment areas are too small to have an impact.

As a consequence, the current DPEIR

- fails to provide adequate support for concluding that the proposed program will not have a significant effect on the environment
- fails to provide adequate guidance to prevent significant environmental harm
- fails to adequately support Cal Fire's mission to protect life, property, and natural resources

Briefly, the reasons for these failures include:

1. Circumventing CEQA

- impacts determined to be less than significant by the "Fallacy of Authority" (our conclusions are true because we say so – no evidence provided)
- lack of detail as required within a programmatic EIR
- passing on responsibility to project managers to determine potential impacts
- inadequate mitigation measures
- Significance Criteria to determine impact to biological resources dismissed without support

2. Substandard Research

- misrepresenting cited scientific literature
- dependence on anecdotal evidence
- contradictory statements
- ignoring information in the record
- cited references missing, non sequiturs

3. Inadequate Data

- outdated fire hazard analysis model/data unsuitable for project level planning
- utilizing coarse-scale maps that cannot provide sufficient detail for competent analysis
- WUI assessments based on 26-year-old information
- dependence on maps that no longer reflect current conditions

The DPEIR also fails to properly address the impacts the Program may have on **carbon emissions and the loss of carbon sequestration** by the clearance of native habitats.

A list of **Suggested Improvements** will follow the evaluation below.

Our Hope

Having worked on the Vegetation Treatment Program since 2005, our experience with this process allows us to offer a uniquely informed evaluation of the DPEIR.

Despite addressing the same problems over and over again, after all the well-informed feedback, all the legal battles, and all the delays caused by failures to meet requirements of environmental compliance, we remain hopeful that a quality Vegetation Treatment Program will emerge in a collaborative manner.

For a quality Program to develop, however, the process must focus on **"How do we protect lives and property from wildfire?"** rather than the current priority, "How do we manage fuel?" These are different questions with very different solutions.

1. Circumventing CEQA

Failure to Determine Impacts

The lack of detail in the DPEIR is a clear violation of the California Environmental Quality Act's requirements for a programmatic EIR.

Throughout the document, the DPEIR completely ignores the necessary detail needed to determine if the Program will have significant impacts. Instead, it defers to managers at the individual project level because the Program is either too "large and complex" to consider the true environmental impacts within the DPEIR (4-116 among others), or too small because the projects average 260 acres (5-44 among others). By using the "Fallacy of Authority," the DPEIR claims without providing supporting evidence,

> *Because of the amount of acreage eligible but not receiving treatment under the VTP, the proposed Program would likely result in a less than significant cumulative effect on biological resources at the bioregional scale.* (5-27)

The DPEIR frequently follows up these claims, again without supporting evidence, with the suggestion that the Program may actually provide a net environmental gain because it may "decrease the frequency, extent, or severity of wildfire." (5-32)

Such rationales have no merit. There is a rich source of literature describing the potential impacts, both local and cumulative, of “fuel treatments” as well as the ecological benefits of high-severity fires in crown fire ecosystems. The DPEIR should adhere to the requirements of CEQA and determine the overall environmental impact of the Program, not pass the responsibility on to individual project managers via a checklist based on subjective opinions.

This failure to account for environmental impacts is troubling because it gives the impression that the DPEIR was not produced to comply with CEQA, but rather to accomplish its stated goal of streamlining the regulatory process (1-7). In fact, this is in line with the Board of Forestry’s 2010 Strategic Fire Plan which endorses efforts to "remove regulatory barriers that limit hazardous fuel reduction activities” (Fire Plan Goal #5, objective “b”).

While it may be within the rights of the Board of Forestry to lobby the legislature to change laws, CEQA is quite clear about what programmatic EIRs need to address. An EIR’s purpose is to examine environmental impacts. The Board should produce a document that does so.

As we wrote in our comment letter on the draft 2010 Fire Plan,

> “Rather than seeking ways to circumvent proper scientific oversight and efforts to insure that scarce fire management resources are used wisely and in the most effective way, the Plan should recommend inclusive community processes that embrace environmental review and invite all stakeholders. While democracy can be inconvenient and collecting information that may question a proposed project frustrating, it is the best way to create a successful fire risk reduction strategy.”

Inadequate Standard Project Requirements (SPRs)

Even if the law allowed the lead agency to pass along all the environmental impact determinations/responsibilities to local project managers, the DPEIR’s project checklist and undefined “Standard Project Requirements” (SPRs) make such a task impossible.

SPRs are essentially mitigation measures. Such measures as per CEQA must be legally adequate. The DPEIR must demonstrate with solid evidence that mitigation measures are feasible, effective, and enforceable.

- Many of the Program’s SPRs fail to provide enforceable procedures (via legally binding agreements) that will produce measurable effectiveness.
- Important terms are not defined, allowing for inconsistent implementation and unknown impacts of projects.
- Some SPRs are so vague and allow for so much subjectivity that they are meaningless.

For example, despite the fact that BIO-5 appears to provide a mechanism to reduce the impact of "fuel treatments" in old-growth chaparral (2-57), it essentially requires nothing of the project manager for the following reasons:

Only southern chaparral. Without justification, the DPEIR excludes all chaparral from BIO-5 except that which occurs in nine southern and central counties.

Old-growth chaparral undefined. The term "old-growth" is not defined, an issue that was pointed out to the Board after the previous draft. Is old-growth chaparral just outside the average fire return interval? Is it more than a century old? Is the presence of 135-year-old *Arctostaphylos glauca* individuals required? Is it different in San Diego County in comparison to Fresno County?

Median fire return interval undefined. Although the DPEIR discusses fire return intervals, there is no guidance in the SPR to assist the local manager in determining what this value happens to be. Given the fact that there is tremendous misunderstanding and resistance to accepting the latest science about this topic (Halsey and Syphard 2015), it is critical that the DPEIR addresses this issue.

Critical infrastructure/forest health undefined. The project manager may dismiss BIO-5 if a proposed project is not deemed necessary to protect "critical infrastructure" or "forest health." Neither term is defined, therefore a project can be approved that destroys valuable, old-growth chaparral because again, the DPEIR does not provide the necessary guidelines.

Projects causing significant environmental harm are not speculative. One such project occurred July 4, 2013 when Cal Fire conducted a prescribed burn in the San Felipe Valley Wildlife Area, San Diego County. The approximately 100-acre fire escaped and burned 2,781 acres, causing significant damage to an old-growth stand of rare desert chaparral in addition to other plant communities.

Cal Fire's partial justification for the project was that it would provide "indirect community protection to Julian and Shelter Valley." This justification was erroneous. Julian is 4.5 miles distant to the project location and 2,000 feet higher in elevation. Shelter Valley is 6 miles distant with extremely light, arid vegetation between it and the project. The project also violated the land management plan for the site and was out of prescription when ignited (CCI 2013).

Clear, unambiguous definitions are required to prevent this type of incident from occurring again. In addition, it would be helpful if the San Felipe escaped burn could be highlighted in a case study to help managers avoid similar situations.

Preventing type-conversion unspecified. There are no guidelines on how to prevent the type conversion of native shrublands. In fact, the concept appears to be misunderstood in the document. It is not the instant conversion of shrublands ("brush fields") to non-native grasslands ("range") as the DPEIR discusses, but is typically a gradual process. It begins with the loss of biodiversity by the elimination of obligate seeding shrubs leading to a combination of resprouting shrubs and native sage scrub species or resprouters and alien grasses (Halsey and Syphard 2015). While still appearing to be "chaparral" to the casual observer, it is in fact a seriously compromised habitat.

Vague consultations. The purpose and outcomes of consultations with the California Department of Fish and Wildlife (CDFW) and the California Native Plant Society (CNPS) are not specified. What will happen if CNPS indicates the project will cause significant environmental harm or if it rejects the project on grounds that several 135-year-old manzanita specimens will be destroyed? Will Cal Fire cancel the project? Reduce the size? Again, since old-growth chaparral is not defined, the consultation becomes fraught with subjective opinions and uncertain impacts.

Inadequate transparency/public notification. Publishing a notice about a project workshop in "a newspaper that is circulated locally" may have been adequate public notice twenty-five-years ago, but no longer.

The need for greater transparency and communication was emphasized as important in the DPEIR. The subject was raised previously by CNPS and us in both written and oral testimony. It was also a key recommendation in the California Fire Science Consortium's Panel Review Report of the previous VTP draft (CFSC 2014) whereby,

Projects should include a general description of what is expected to be done. This should be announced at least six weeks before the project takes place. A more detailed description of the project, including project goals ***and scientifically-grounded rationale*** *as to why and how these goals will be met, should be released prior to the project implementation. The monitoring plan and its results should be made publically available when completed.*

At minimum, the above information should be posted on a website database **(emphasis ours).** *Additional outreach via newsletters, TV, radio, or events may be included.*

There are additional suggestions from the Panel Review Report concerning transparency that the DPEIR ignored that need to be incorporated into the Program.

Outcome of public workshops unknown. If people show up to such a workshop, how will the information gathered on the "potential for significant impacts" be incorporated in the project planning phase? If a group or organization provides evidence that a project has serious environmental impacts, what recourse will the public have if the evidence is ignored and the project proceeds? Considering the current DPEIR process and the time that has been required to include current science, we are not optimistic that the public's input will be seriously considered.

BIO-5 is a prime example of how the DPEIR allows the project manager to make subjective decisions that may cause significant impacts without a reasonable opportunity for mitigation or independent oversight to assist in preventing such environmental harm.

Inadequate Analysis of Significance Criteria

The entirety of Chapter 5 regarding the dismissal of cumulative impacts can be summed up with the following (parentheses/bold added) (5-41):

> *Landscape constraints, Standard Project Requirements, and Project Specific Requirements developed as a result of the Project Scale Analysis will, in the aggregate, reduce cumulative impacts to* --- **(fill in the biological resource in question)** --- *to a less than significant level as assessed at the scale of the bioregion. Reduction in the occurrence of high severity wildfire as a result of vegetation treatment technique application is expected to provide additional benefits to aquatic resources although to a degree not presently determinable.*

Without supporting evidence, Chapter 5 goes through all the possible biological resources and dismisses the possibility of significant impacts by again employing the Fallacy of Authority. The repeated claim that the Program will reduce high-severity wildfire is added here too, and again the DPEIR defers supporting evidence because it is "not presently determinable."

In summary, the DPEIR is stating that there is not enough research to determine the environmental impact of the Program. This is contrary to available information in the record.

2. Substandard Research

Another key recommendation of California Fire Science Consortium's Panel Review Report (CFSC 2014) was to, "Include additional scientific findings throughout," and that,

> *… **a sound scientific foundation** should be reflected with each vegetation management plan providing a clear rationale for the selected action. This should be done by providing additional references to support claims in the VTDPEIR and including additional scientific concepts that are relevant to the planned actions.*

The DPEIR has improved its review of the chaparral's fire regime. However, as to developing a sound scientific foundation for the plan, the DPEIR fails to do so.

Research misrepresented

There are numerous examples of scientific research being misrepresented in order to support the goals of the Program.

Northern chaparral fires are increasing (Safford and Van de Water 2014). The DPEIR claims northern chaparral is not threatened by increased fire frequencies like southern chaparral (4-113). It cites Safford and Van de Water 2014 as support. This is a fallacy of incomplete evidence ("cherry picking"). While Safford and Van de Water do indeed note this condition, they also warn that,

> ...recent trends in fire activity, burned area, and fire severity suggest that the situation is rapidly changing as climate warms and fuels continue to accumulate.

The Safford and Van de Water paper also notes that increasing fire frequencies appear to be spreading into the northern Santa Lucia Range. It is likely this trend will continue to spread northward as climate change and population growth increase the potential for ignitions in the northern part of the state.

While dismissing increasing fire threats to northern chaparral in Chapter 4, the document's Introduction presents a contradiction by emphasizing the fact that fires in northern California are indeed increasing.

> *These types of anthropogenic alterations are some of the reasons why wildfire frequency in Northern California has increased 18 percent in the period from 1970 to 2003...* (1-2)

If the Board desires the DPEIR to be a plan for the future, as the DPEIR explicitly states it is doing, it should plan for that future rather than depend on conditions of the past. It would also be helpful for the DPEIR to be internally consistent. In descriptions of the fire hazard severity zone analysis Cal Fire repeatedly states that the goal is to model fire hazard based on potential future (NOT current) conditions.

Non Sequitur. The DPEIR follows its misrepresentation of the Safford and Van de Water paper by leaping to the conclusion that fuel treatments in northern chaparral can be used for ecological purposes. This is a non sequitur. There is no scientific evidence to support such action.

The failure to correct this section is perplexing since CNPS and we offered testimony specifically discussing these errors. We wrote in our letter of October 27, 2015 (Appendix C),

> "There is NO research that supports this claim (treating northern chaparral for ecological purposes). In fact, a study just released by the Joint Fire Science

> Program indicates that there are indeed ecological trade-offs in reducing chaparral fire hazard in northern California (Wilkin, et al. 2015). Clearance of chaparral has also been recently suspected of increasing the spread of Lyme disease in vertebrates (Newman et al. 2015).
>
> The Draft EIR also appears to be assuming that climate change will not modify northern California in a way that will replicate increased fire patterns found in southern California chaparral. This is in opposition to USFS research. Safford and Van de Water (2014) suggest chaparral type conversion is spreading northward into the northern Santa Lucia Range and may likely continue to spread as climate change and population growth increase the potential for ignitions."

It is gratifying that this version of the DPEIR recognizes that every ecosystem has its own special relationship to fire. However, **the artificial truncation of northern and southern California chaparral is not based on research or ecological realities.** The DPEIR needs to correct this error and recognize that chaparral, California's most extensive plant community, can be threatened by increasing fire frequencies throughout the state. In addition, the DPEIR needs to recognize that any treatment of chaparral should be viewed as a **resource sacrifice** unless proven otherwise.

Ironically, the issue of "cumulative impacts to chaparral communities from program treatments and wildfires" is cited as an Area of Controversy in the DPEIR. As such, the topic should have been addressed in a thorough, scientific manner.

Claiming that chaparral in northern California can be treated for ecological benefit is one of the most significant errors in the DPEIR

Infrequent, large fires are the pattern (Lombardo et al. 2009). After recognizing the problems with short fire return intervals in chaparral, the DPEIR appears to hopefully suggest that science may yet find that short fire returns are not a problem by misrepresenting Lombardo et al. (2009).

> *"... chaparral does not need more fire, it needs less (Safford and Van de Water, 2014). However, new scientific information could modify that conclusion in the future as it becomes available. For example tree-ring data collected by Lombardo et al. (2009) in bigcone Douglas-fir stands surrounded by chaparral indicate that both extensive and smaller fires were present in historical time."*(4-111)

This is the exact wording used in the last version of the DPEIR. The Board consequently ignored testimony and a letter from the lead author of this paper that the DPEIR was misrepresenting the cited research (Appendix D).

The Board is ignoring information in the record in violation of CEQA.

Prescribed fire and seeds (Keeley and Fotheringham 1998). (3-18) The DPEIR incorrectly uses this paper to support the positive benefits of prescribed fire for restoration. This paper actually deals with seed germination of chaparral plant species in southern California, the very same region that the DPEIR acknowledges as being threatened by too much fire, stating correctly that, *"burning in chaparral may lead to adverse ecological results."* (4-112)

This citation is another example of the DPEIR's internal inconsistency and failure to provide a proper interpretation of literature being cited.

References inadequate for a science-based document

A significant number of references used to support statements in the DPEIR are from testimony or reports to Congress. While such references can provide overviews, many are too broad or political in nature to be of any use in developing a scientific foundation. And because such references are not peer-reviewed, there is no mechanism for determining how factual, evidence-based, or scientifically accurate they are.

McKelvey et al. 1996, a report to Congress on the forest of the Sierra Nevada, is cited out of context to support the notion that, "prescribed fire is believed to benefit the overall health of fire adapted ecosystems" (4-151). While true for some Sierra Nevada forests, this is not true for chaparral. This represents a chronic problem in the DPEIR – citing papers that are not applicable to the statement being made, but are used to support the general objectives of the Program.

Bonnickson 2003 (2-11) was testimony provided during a politically charged Congressional hearing after the 2003 fires. Much of the contents are opinion, not scientific fact.

Although used to support a statement in the DPEIR, the Bonnickson paper does not appear in the reference list. In fact, there are other papers cited but not listed in the references, or in the reference list and not cited in the text (e.g. Countryman 1972 – a speculative narrative, not scientific research). A simple editing program could resolve this problem.

Incorrect citations

The Sugihara et al. 2006 citation, an introductory chapter in a book about fire in California is used 12 times within Chapter 4. We searched for the specific DPEIR point the citation was supposed to be supporting within the Sugihara et al. work, but were unable do so in most instances. In other words, the statement the DPEIR is using the citation to support does not exist within the Sugihara et al. reference.

Using an introductory book chapter multiple times to establish a scientific foundation for the DPEIR is inappropriate. Original peer-reviewed research needs to be used and the research needs to be double checked to verify that cited references are in fact relevant to the point in question.

Anecdotal evidence

Unsupportable WUI definition. In several instances, the DPEIR depends on anecdotal, rather than scientific evidence to support its conclusions.

For example, the DPEIR claims a 1.5 mile wide WUI is necessary because this is assumed to be the approximate distance embers can be carried from the fire front (4-36). The DPEIR dismisses concerns that its definition of the Wildland Urban Interface is too large an area because Cal Fire staff overheard USFS representatives from the Cleveland National Forest talk about a 6 mile wide WUI buffer. (4-36) Casual conversations are not legitimate scientific references.

The only citation the DPEIR uses for support is the Sierra Nevada Forest Plan Amendment. (3-39) This is a serious misrepresentation. The Amendment does not provide any evidence for a 1.5 mile WUI, but rather is a management document that established an arbitrary distance to determine the number of homes/communities affected by the Plan.

Ironically, the DPEIR discounts a smaller WUI, such as the 1,000 foot version in one of the alternatives (3-39), because, "A review of the literature found no scientific basis to limiting WUI treatments to 1,000 feet."

This perspective is more appropriate for the DPEIR's 1.5 mile WUI as there is significant evidence indicating fuel treatments even beyond 300 feet (the length of a football field) are excessive for the purpose of reducing fire risk to communities (see Cohen's extensive research).

The DPEIR appendix, "Characterizing the Fire Threat to Wildland-Urban Interface Areas in California" is equally unscientific and does not provide the necessary information to properly assess the characteristics of the WUI.

For example, Figure 1 does not distinguish fuel types, slope conditions, how heat per unit area and rate of spread is estimated/modeled/calculated. The axes are not mentioned in the descriptions. Another important point omitted from this section is that flame length as an indicator of fire risk varies by vegetation type – 12 foot flame lengths in conifer forests are routine, but not in grasslands.

As a tool, Figure 1 is not useful.

Considering the expense and extensive environmental damage that can occur with fuel treatments, the Board should base the size of the WUI on available science, not arbitrary numbers (see Appendix A: Ember Behavior: Why the 1.5 mile WUI is Excessive).

3. Outdated/Inadequate Data

Ignoring Cal Fire Data

Inexplicably, **the DPEIR is based on decades old data** even though Cal Fire's GIS analysts have completed two updated fire hazard analyses since, and are now working on a third. The current document is based on products from a fire hazard analysis done in 2001-2003 which is used a wildland urban interface WUI model based on the 1990 U. S. Census. (2-17)

The U. S. Census is conducted every ten years. GIS analysts at the University of Wisconsin-Madison have produced block housing density maps and derived WUI maps serially using the 1990, 2000, and 2010 Census data. They are free to the public. Cal Fire uses these datasets as input for their new fire hazard analyses.

The DPEIR does not mention that Cal Fire has produced an updated, revised version of the 2003 fire hazard analysis in 2007 using the 2000 U. S. Census data. They issued revised fire hazard analysis maps that were reviewed and in some cases amended by local firefighting agencies in every county:
http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones

The DPEIR does not mention that Cal Fire updated fire hazard maps again in 2010, apparently adding some new fire history data inputs:
http://frap.cdf.ca.gov/data/assessment2010/pdfs/2.1wildfire_threat.pdf

The DPEIR does not mention that a Cal Fire webpage dated April 2016 says the agency is currently gathering updated data to do another wildfire hazard analysis:
http://cdfdata.fire.ca.gov/fire_er/fpp_planning_severehazard

There is a significant amount of information about the fire hazard analyses and planning based on them on the Cal Fire webpage. It's been there for years (most of it dates to the 2007 update). The current DPEIR ignores much of this.

Legal origins of the program:
http://cdfdata.fire.ca.gov/fire_er/fpp_planning_severehazard

Non-technical overview of the program and analysis:
http://osfm.fire.ca.gov/codedevelopment/pdf/Wildfire%20Protection/FHSZ%202007%20fact%20sheet.pdf

Discussion of methods including a flowchart of the GIS analysis: http://osfm.fire.ca.gov/codedevelopment/pdf/Wildfire%20Protection/FHSZ%20model%20primer%20Fact%20Sheet%202007.pdf

Discussion of applying the analysis to natural resources on wildlands: http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones_development

Minimal fire hazard predictability. The input data and analysis the DPEIR is based on remain woefully inadequate for project level planning.

Syphard et al. (2012) proved this point by comparing Cal Fire's 2003 final fire hazard analysis products (Fire Threat, Fire Threat People, and Communities at Risk) to actual structure loss data from 2003 and 2007 wildfires. They found that the Cal Fire fire hazard analysis had **no value in predicting the likelihood of structure loss.**

As per the California Fire Science Consortium Panel Report, the DPEIR should be informed by findings of modern fire science. But the DPEIR still proposes to base the entire Program on an old and flawed fire hazard analysis that has been proven in peer-reviewed fire science publications to have no predictive value. It is our understanding that this finding supports the professional opinion of the Cal Fire GIS staff that performed the analysis back in 2003.

Cal Fire acknowledges the limitations of the data on their Wildfire Hazard Real Estate Disclosure web page (http://frap.cdf.ca.gov/projects/hazard/hazard#VHFHSZdatalim).

> "… the map data showing VHFHSZ is out-of-date, incomplete, and reflects an inconsistent application of decision rules reflecting physical conditions contributing to hazard."

The DPEIR should not be allowed to cite an outdated analysis as a valid or credible tool for decision-making.

Cal Fire's GIS staff is very competent and should be utilized. They can provide a useful, statistically valid spatial analysis fire hazard model with good data, especially when following the best probability-based methodology as outlined in Scott (2006).

Inadequate maps. The maps provided in the DPEIR cannot provide enough information to properly assess the Program. They do not reflect data-rich research nor Cal Fire's expertise.

As in previous drafts, the DPEIR presents fuzzy, indistinct graphics reduced far beyond the point of legibility. The effective scale of these maps onscreen or printed is about 1:16

million. At 72dpi screen resolution each fuzzy indistinct pixel represents about 3.5 miles (approximately 8,000 acres) on the ground.

However, despite the extremely pixilated quality of the maps, significant contradictions can still be seen. For example, the three maps of the state in the Executive Summary and elsewhere, comparing State Responsibility Areas (SRA), Treatable Vegetation Formations, and Treatable Acres in the VTP. (E-7) The graphic appears to convey the treatable areas within SRAs, excluding some vegetation types as inappropriate to treat. And yet it is clear that the treatable areas in the third map include some areas that fall outside the SRA footprint shown in the first map.

This is not just about illegible maps, but one example of a much larger, systemic problem. The Program must be based on a solid, statistically valid technical analysis, undertaken in good faith, based on appropriately solid, modern data, and peer-reviewed fire science. CEQA requires it. The current DPEIR does not follow this standard.

Suggested Improvements to the Draft DPEIR

- Detail impacts. Examine possible direct and cumulative impacts and develop legally adequate mitigations for those impacts as required by CEQA.

- Recognize all chaparral as potentially threatened. Chaparral in the northern part of the state will likely be threatened by higher fire frequencies as the climate continues to change. There is no ecological rationale for fuel treatments in shrub dominated ecosystems in northern or southern California.

- Define terms. Define all terms utilized in the text needed to ensure consistency in use such as old growth chaparral, critical infrastructure, forest health, etc.

- Redefine WUI. Establish a reasonable distance for the WUI by using science rather than anecdotal information (see Appendix A and B).

- Use most current Cal Fire Fire hazard data. It is inadequate to utilize a fire hazard analysis done in 2000-2003 that uses a wildland urban interface (WUI) model based on the 1990 U.S. Census. The DPEIR needs to base the Program on current, scientifically verified information available from Cal Fire.

- Research support for conclusions. Conclusions in a DPEIR need to be supported by research, not by employing the Fallacy of Authority. Sweeping generalizations like the one below should not be in a science-based document.

> "*Landscape constraints, Standard Project Requirements, and Project Specific Requirements developed as a result of the Project Scale Analysis will, in the aggregate, reduce cumulative impacts to less than significant.*"

- Maintain consistency and research quality. Eliminate contradictions, errors in citations, and inconsistencies throughout the document.

- Consultation on chaparral treatments. All projects involving chaparral should be developed in consultation and in agreement with the California Native Plant Society.

- Real alternatives. Create at least one new alternative that focuses on a program that emphasizes the reduction of fire risk by using "from the house out" approach – reducing home flammability, properly maintained defensible space, community fire safe retrofits, then strategic fuel treatments within 1,000 feet if needed.

- Account for biodiversity in chaparral. Incorporate into the cumulative impact analysis how biodiversity may be impacted by the Program. See Halsey and Keeley (2016).

- Increase transparency. Develop a web-based public notification process for projects similar to the US Forest Service SOPA website. For example: http://www.fs.fed.us/sopa/forest-level.php?110502

- Plan for the future. Base project need, selection, and treatment approach, on projected climate change scenarios, not past, anecdotal experiences (Please see Appendix E: Global Warming and Future Fire Regimes).

- Proper account of carbon sequestration. Recalculate the loss of carbon to account for the loss of below ground carbon sequestration in healthy chaparral communities.

With the impacts of human-caused climate change accumulating much faster than even the most severe predictions, it is imperative that every policy we implement from here on out must honestly and exhaustively examine how such policy can facilitate the reduction of carbon in the atmosphere and the protection of what natural environment remains.

The current DPEIR fails to do so.

Regarding carbon emissions, the DPEIR uses the same response it does throughout to dodge examining significant impacts – it merely states there won't be any impacts because of unsupported assumptions.

> *While there is not a direct correlation between implementation of a vegetation treatment project and a proportionate reduction in numbers of fires or acres burned, it is reasonable to acknowledge that while the VTP program would result in emissions of GHGs as a result of prescribed fire, it would likely result in some reduction in the numbers of fires and/or burned acres from wildfires and, therefore, would avoid some emissions associated with those fires. The VTPs contribution to cumulative GHG emissions would not result in a considerable contribution to GHGs and would result in a less than significant impact.*

The DPEIR assumes all the projects will work out properly, and treated plant communities will not type convert to low carbon sequestering grasslands because of the Program's project requirements. These requirements are legally inadequate and unenforceable.

The DPEIR fails to account for the loss of underground carbon storage with the concomitant loss of above ground shrub cover in shrublands, an important carbon sink (Jenerette and Chatterjee 2012, Luo 2007). The DPEIR also fails to address the research that has shown vegetation treatments often release more carbon than wildfires (Mitchell 2015, Law et al. 2013, Meigs et al. 2009).

By using assumptions based on anecdotal evidence and focusing on the short term (such as how to reduce flame lengths, remove dead trees, or increase the number of clearance projects), the DPEIR will likely exacerbate climate impacts, increase the loss of habitat, and fail to adequately accomplish its primary goal – protecting life and property from wildfire loss.

- Reduce fire risk from the house out. As we have written many times over the past decade, the most effective way to prevent the loss of life and property from wildland fires is to work from the house out, rather than from the wildland in. In other words, focus on reducing home flammability first (ember-resistant vents, replacing flammable features, cleaning roof gutters, etc.). Properly maintained defensible space is the other important half of the fire risk reduction equation. Wildland fuel treatments (beyond the defensible space zone) offer the least effective strategy to protect communities from wildfire.

All fire science points to this. Many county fire programs support "from the house out" concept. Cal Fire promotes this strategy too, and has since at least 2007.
http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_faqs#gen01

Unfortunately, DPEIR ignores these facts and focuses exclusively on vegetation management. This bias is reflected in Cal Fire's and the Board's public messages as well.

During Wildfire Awareness Week (May 1- 8, 2016), Cal Fire made 8 posts on their official Facebook page about protecting your home from fire. None mentioned the importance of home flammability. All focused on vegetation clearance.

On April 21, 2016, Cal Fire began a #ShareYourDefensibleSpace photo challenge on their Facebook page. We are submitted a photo of an ember-resistant attic vent to the contest with the suggestion to begin a companion #ShareYourFireSafeHome photo challenge to emphasize the main reasons homes actually ignite and burn down - unsafe structure design and flammable, non-vegetative materials around the home. Our photo was deleted shortly thereafter.

We resubmitted the photo and it remained online for several weeks. The Cal Fire Facebook moderator (Heather) thanked us for pointing out the importance of home flammability. Unfortunately, it appears the original contest post and the photo entries have now been deleted.

We urge the Board to reconfigure the DPEIR so that it incorporates the entire fire risk reduction equation, not just vegetation management. Suggestions on how to do so, and examples of programs that have worked, can be found in Appendix B: An Appeal to California's Fire Agencies.

- Reassess the efficacy of remote fuel modifications. Current research makes it clear that strategic fuel modification has only helped stop fires in fire weather if fire suppression forces can quickly and safely access them. Remote, back country fuel modifications are generally not effective in stopping fires and, as a consequence, haven't generated any significant reductions in total annual area burned in southern California (Keeley et al. 2009, Syphard et al. 2011).

Global surveys concerning fuel modifications have also demonstrated that even very large amounts of strategic fuel modification are not very effective in reducing total areas burned. This research makes a compelling case that constructing and maintaining large fuel treatments is not the most effective use of fire risk reduction resources (Price et al. 2015, Price et al. 2015b).

Conclusion

As we have in the past, we urge the Board of Forestry and Cal Fire to produce a document that starts by responding to the following question, **"How do we protect lives and property from wildfire?"** instead of "How do we manage fuel?" These are two different questions resulting in two different answers.

Such a powerful approach will challenge everyone to leverage their own experiences, be willing to consider new paradigms, and honestly collaborate with others, especially with those who have different perspectives. Otherwise, we will continue practices that have brought us to this point – increased loss of homes, increased loss of habitat, and increasing levels of carbon in our atmosphere.

It was suggested to us after our testimony to the Board on August 26, 2015, that, "scientists used to believe a lot of things that we've learned were wrong. So we can't just wait around for science to find the correct answer. We need to move forward."

We do need to move forward, but we need to do so by utilizing *all the information available to us today,* not depend on outdated models, poor research, and incorrect assumptions.

Therefore, we urge the Board to prepare a revised DPEIR by addressing and incorporating the suggested improvements above.

We owe it to ourselves and future generations to get it right this time, especially because the changing climate will not be forgiving if we squander the opportunity.

Sincerely,

Richard W. Halsey
Director
The California Chaparral Institute

Attachments:
Appendix A. Ember Behavior: Why the 1.5 mile WUI is Excessive
Appendix B. An Appeal to California Fire Agencies
Appendix C. Resubmission of our letter of October 30, 2015
Appendix D. Understanding the Relationship between Fire/Chaparral - K.J. Lombardo
Appendix E. Global Warming and Future Fire Regimes

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Appendix A

Ember Behavior: Why the 1.5 mile WUI is Excessive

The likelihood of an ember travelling 1.5 miles from a flaming front and igniting any single given house (or any other given small, discretely located type of potential receptive fuel) downwind is likely quite small. However, ignition by a single ember is usually not how most houses burn down.

If a structure lies downwind of a weather-driven wildfire, chances are excellent that a large number of shorter range embers will ignite everything that can burn between here and there, creating more embers all along the way, and allowing the head fire to blow hopscotch over, across, and through just about anything to reach that house. The collective fire spreading effect of all the embers makes the head fire's downwind progress all but unstoppable while the fire weather lasts.

Tracked in real time, the instantaneous rates of ember production and subsequent transport by turbulent, gusty winds must be very transient and highly dynamic. In general, averaged over time, it is likely most embers fall near the flaming front in a decay curve as you move further and further downwind of the instantaneous location of any flaming front. At 1.5 miles, the tail of the decay curve is likely quite small. Chances are a structure will burn when the flaming front is close and the site is under the “thicker” part of that ember distribution curve.

The rationale for fuel treatments in areas a long way upwind of a community is that they will produce some additional fire safety even if they can't stop the fire because they will reduce the density of embers falling on a structure or community. **Such a claim is conjectural at best.**

Since fires produce embers by the millions, and ignition probabilities likely approach 100% in very dry fire weather, it is not at all clear what value reducing ember density might actually have in protecting structures or helping firefighters reduce fire spread.

We are unaware of any recorded quantitative data on ember density-by-distance.

Firefighter experience and the research have shown that weather-driven wildfires tend to spread across landscapes with very little regard to fuel type, or age (Mortiz et al. 2004). This spread is mostly through a large number of separate spotting events that start a large number of new fires running out ahead of any fire's flaming front. If structures are in the way, then fire will spread up to them, go over, and around them, and then move on downwind.

Like the onset of a coming rainstorm, at a given location one might experience a single ember, then another, then two, then more and more, until the main flaming front comes through and the ember density gets heavy. Ember density will decline as the fire passes by and continues downwind.

Once there is a modest amount of defensible space around a structure to make the surface fire stop short of direct flame impingement (varies with terrain, often no more than 30ft) and to prevent ignition by radiant heating (100ft max), and to be safe in case of potential turbulent convective heating so firefighters can feel safe enough to stay and defend (up to 150ft?), then it's all about ember ignition. Whether any given structure burns or not has everything to do with **how receptive it is to ignition by windborne embers** when that unstoppable fire comes through.

That NIST report on structure loss during the 2007 Witch Creek Fire, and much of their subsequent work, documents very clearly that lots of structures with good defensible space of up to 100 or more feet can and do get ignited by embers. Firefighters or civilians onsite defending a structure do so primarily by extinguishing spot fires on and in the structure before they can get big.

http://www.nist.gov/el/fire_research/wildland/project_wui_data.cfm

http://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.1796.pdf

This is exactly why risk reduction must work from the "house out." All fire science points to this. Many county fire programs support this concept as well. Cal Fire promotes the "house out" strategy too, and has since at least 2007.

http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_faqs#gen01

Unfortunately, vegetation management gets the primary focus (please see Appendix B: An Appeal to California's Fire Agencies).

Fire agencies, firefighters, fire scientists, and environmental groups are on the same page about this. What we've been fighting about all these years are questions about the efficacy of doing anything to "fuels" beyond the home ignition zone and beyond the largest plausible defensible space buffer.

The WUI as a concept should be determined by fire operation concerns of fighting fire at the edge of town. So WUI as a concept is all about defensible space and how much of that do we need.

USFS fire scientist Jack Cohen has clearly demonstrated that about 100ft is all any structure needs to avoid ignition by radiant heating from even the hottest wildfire on flat ground with little wind. Add those factors drive heat and convection horizontally and more space will be needed.

Let's assume for discussion that a 300 ft defensible space would be desirable for doing point protection versus long, completely sideways flames that might be expected in the very most hazardous fire terrain imaginable. Three hundred feet of defensible space would be very excessive in all but the most pathological cases of structures built in terrain where no one should be living and no firefighters should be asked to make a stand against fire.

Three hundred feet is only 5% of the way to the 8,000ft (=1.5miles) that the DPEIR currently proposes everywhere.

So the 1.5 mile definition of WUI everywhere is excessive.

Ember travel distance

As far as we know, the longest distance spotting event documented in fire literature occurred on Feb 7, 2009 ("Black Saturday") during the 2009 Victoria, Australia firestorms. Spot fire ignitions from Bunyip Park were documented at 20km (approx 12 miles).

Below are two annotated references concerning that event and another from the recent Fort McMurray Fire in Alberta, Canada.

Campbell, Peter. 2010. 2009 Victorian bushfires.
Greenlivingpedia.org
http://www.greenlivingpedia.org/2009_Victorian_bushfires

Local weather stations on “Black Saturday” 2/7/2009 recorded sustained winds of approximately 30mph blowing nonstop from the N and NW for about 12 hours during the worst of the fires. The winds reversed direction during the course of the incident, blowing from the SE. This would be quite typical for a major Santa Ana wind event in southern California. In fact, Santa Ana winds often blow even stronger than this. The duration and the reversal are also typical of Santa Ana winds.

Daily high temperature was a record-setting 46.4degC (114degF). Relative humidity was as low as 5%. This is a higher temperature than we are ever likely to see in southern California, but our relative humidity often goes lower than this (to near zero) during our worst fire weather.

The area of Victoria State, Australia, had gone for a record-setting 38 days without any rain. Southern California’s seasonal drought is commonly 5-6 months.

Widespread and very long distance spotting was observed. Fire spread rates of up to 100km/hr (62 miles/hr) were observed. Fire spread through all types of land cover, including farmland, and forests where extensive fuel modification by Rx burning had been performed for fire safety. Fire officials emphasized that this fire was driven primarily by weather, not fuels.

The main fire at Bunyip Park was started by lightning. Several other fires in the area were confirmed or suspected to be arson.

Egan, Carmel and Steve Holland. 2009. Inferno terrorizes communities as it rages out of control. The Age, Feb 8, 2009.
http://www.theage.com.au/national/inferno-terrorises-communities-as-it-rages-out-of-control-20090207-80fw.html

> *The Bunyip Ridge inferno lived up to its menacing threat yesterday, bearing down on one tiny Gippsland community after another and forcing firefighters to retreat ahead of its towering fire head.*
>
> *More than 300 firefighters battled the three-kilometre-wide fire front before being forced to pull back as it made its run out of the state forest around 4pm towards the*

villages and towns of Labertouche, Tonimbuk, Longwarry, Drouin and Jindivick.

By 6pm, fanned by gale-force north-westerly winds, it had burnt 2400 hectares of forest and farmland and unknown numbers of homes and outbuildings.

Flaming embers started spot fires up to 20 kilometres to the south and threatened homes as far away as Warragul.

Ha, Tu Thanh. 2016. The perfect storm of conditions: here's how the blaze reached Fort McMurray, and why it spread so fast. The Globe and Mail. http://www.theglobeandmail.com/news/alberta/albertas-highway-of-fire/article29863650/

The fire that jumped over the Athabasca River was a spot fire, Mr. Schmitte said.

Mr. Burnett said he had seen situations where spotting enabled a forest fire to leap eight to 10 kilometres ahead of its main line.

Spot fires are also troublesome when they are near urban areas, he said, because embers ignite rooftops or rain gutters clogged with dead leaves and pine needles.

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Appendix B

An Appeal to California's Fire Agencies

Emphasizing home flammability, as well as vegetation management, can save more homes during wildfires.

Local, state, and federal fire agencies are urged to expand their fire education efforts. Currently, the primary, and sometimes the only message citizens hear is to clear native vegetation ("brush") from around their homes. While creating defensible space is a critical component of fire risk reduction, it fails to address the main reason homes burn - embers landing on flammable materials in, on, or around the home, igniting the most dangerous concentration of fuel available, the house itself.

Fire risk reduction education must emphasize BOTH how to reduce home flammability and how to create defensible space. As seen in the photo on the next page, **many homeowners have complied with defensible space regulations only to see their homes burn in a wildfire.**

Educational materials and public announcements must make clear that without addressing the entire fire risk reduction equation, your home has a greater chance of burning in a wildfire. This includes creating defensible space AND retrofitting flammable portions of homes such as,
- the replacement of wood shake roofing and siding
- installation of ember resistant attic vents
- removal of flammable landscaping plants such as Mexican fan palms and low-growing acacia
- removal of leaf litter from gutters and roofing
- removal of flammable materials near the home such as firewood, trash cans, wood fences, etc.
- roof/under eave low-flow exterior sprinklers

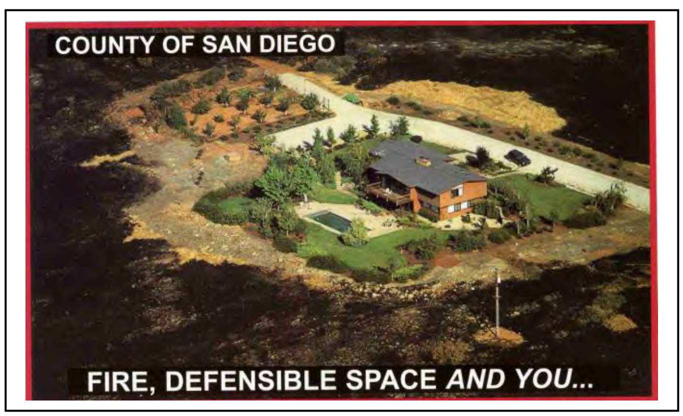
It also must be made clear to homeowners that by having well maintained and lightly irrigated vegetation within the outer 70 foot portion of the defensible space zone can play an important role in protecting the home from flying embers and radiant heat. Bare earth clearance creates a bowling alley for embers and can actually increase fire risk if invaded by flammable, non-native weeds.

We urge Cal Fire to address the full fire risk reduction equation when revising the draft of their proposed Vegetation Treatment Program.

A comprehensive approach to home protection can be found here:
http://www.californiachaparral.org/bprotectingyourhome.html

The New Message. The photo above shows a home with extensive defensible space and proper vegetation management that burned during the May 14, 2014, Poinsettia Fire in Carlsbad, California. Addressing the entire fire risk reduction equation is essential.

The Old Message. The photo to the right, distributed widely after the 2003 California firestorm, creates a false sense of security by implying that defensible space is adequate to protect a home from wildfire.



Mountain communities learning to use federal grants to eliminate wood roofs, a lead cause of home loss in wildfire

David Yegge, a fire official with the Big Bear Fire Department, is about to submit his fourth grant proposal to the FEMA pre-disaster mitigation grant program to pay up to 70% of the cost of re-roofing homes with fire-safe materials in the Big Bear area of San Bernardino County. Yegge has also assisted the towns of Idyllwild and Lake Tahoe to do the same. The grant includes the installation of non-ember intrusion attic vents.

Yegge's first grant was for $1.3 million in 2008. He identified 525 wooden-roofed homes in need of retrofits in the community of Big Bear Lake. Only 67 remain. Helping to push homeowners to take advantage of the program is a forward-thinking, "no-shake-roof" ordinance passed by the Big Bear City Council in 2008 requiring roofing retrofits of all homes by this year. San Bernardino County passed a similar ordinance in 2009 for all mountain communities. Homeowners have until next year to comply. Such "future effect clause" ordinances can be models for other local governments that have jurisdiction over high fire hazard areas. "The California Legislature should adopt such an approach and Cal Fire should incorporate such retrofit programs into its new Vegetation Treatment Program," Halsey said.

In order to qualify for the FEMA grant, a cost/benefit analysis must be completed. "Our analysis indicated that $9.68 million would be saved in property loss for every $1 million awarded in grant funds," Yegge said. "FEMA couldn't believe the numbers until they saw the research conducted by then Cal Fire Assistant Chief Ethan Foote in the 1990s. There's a 51% reduction in risk by removing wooden roofs."

"The FEMA application process is challenging, but well worth it," said Edwina Scott, Executive Director of the Idyllwild Mountain Communities Fire Safe Council. "More than 120 Idyllwild homes are now safer because of the re-roofing program."

Additional Information

The state agency that manages the grants is the California Governor's Office of Emergency Services (Cal OES), Hazard Mitigation Grants Division. Cal OES is the go between agency and they decide what grants get funded based upon priority established by the State Hazard Mitigation Plan. Without the help and assistance of Cal OES, it is not likely the FEMA grants would have be funded.

David Yegge given fire leadership award:
http://kbhr933.com/current-news/david-yegge-awarded-firewise-leadership-award/

The Mountain Area Safety Taskforce re-roofing program:
http://www.thinisin.org/shake/

The Big Bear re-roofing ordinance:
http://www.thinisin.org/home/images/stories/downloads/Ord_2008-383.pdf

The San Bernardino County re-roofing ordinance:
http://www.thinisin.org/shake/images/DOWNLOADS/ORDINANCES/ord_4059.pdf

FEMA grant program:
http://www.fema.gov/pre-disaster-mitigation-grant-program

Appendix D

Understanding the Relationship between Fire and Chaparral

From Lombardo, K.J., T.W. Swetnam, C.H. Baisan, M.I. Borchert. 2009. Using bigcone Douglas-fir fire scars and tree rings to reconstruct interior chaparral fire history. Fire Ecology 5: 32-53.

Main Points

1. The southern California landscape was rich with fire from the early 1600s (and likely much earlier) to the mid 1800s. During this time we saw both localized fire events and landscape-sized events occurring. Large fires are a natural phenomenon of the southern California chaparral dominated landscape (1-3 per century).

2. By the early 1900s, many of the small fire events were absent from the record. Most of these small fires were likely the product of Native American activity. While small fires were frequent in the past, they did not effectively control or contain large events from occurring.

3. In limited cases, fire return intervals of less than 10-15 years were recorded by the same individual tree. Such short intervals, however, do not reflect what was happening on the broad landscape. The ecologic impact following those localized events is unknown. It is unlikely, however, that many of the chaparral species in those areas survived such frequent fire return intervals based on life history traits and modern day observations.

4. The presence of non-native species, such as grasses, has dramatically altered modern post-fire landscapes by quickly colonizing frequently burned areas.

Reconstructing Past Fire Regimes

Understanding the interactions between wildfire and native vegetation is critical to understanding how to manage the landscape for resource benefit. This is particularly true in our landscapes that are, or in some cases were, dominated by chaparral and coastal sage scrub species.

Fire plays a critical role in shaping these landscapes, however, while they are often referred to as "fire-dependent", these suites of species are actually quite sensitive to fire at particular intervals. Using modern era records to understand what has occurred on our landscapes is certainly informative; however, prior to drawing any conclusions we must first acknowledge that the ecological events and processes in the modern era are heavily influenced by anthropogenic activities (e.g. grazing, logging, settlement, climate change, etc.). To eliminate some of these influences and elucidate past ecologies that may have functioned in a more natural state, we must look into the deep past.

Historical reconstruction of ecological processes and events is one of the best tools available to land managers who are interested in understanding how our systems operated prior to advent modern day influences that have dramatically altered landscapes, species compositions and ecological processes. Present day managers can use the findings of these studies to establish natural baselines and guide restoration efforts whose aim is to re-create, as best as possible, fully functioning ecologies.

In the western United States, historic reconstructions that pre-date the 1800s, have been used extensively to establish the parameters for what is believed to be the natural operating state of the landscape. Native Americans have certainly had a degree of influence upon the American landscape for 1000s of years. We can't ignore the impact their land use and practices may have had on ecological processes and these impacts are embedded within the signals we detect in our modern day studies of the past. However, we do understand that their impacts were substantially lighter and spatially far less extensive than anything that has occurred in the past 200 years. So while we must always account for the potential impacts that these past anthropogenic practices may have played, we can examine historical records gleaned from natural data and begin to see how these landscapes may have operated with minimal human influence.

The Southern California National Forest Study
As a graduate student at the University of Arizona, I worked with Drs. Tom Swetnam and Don Falk on a reconstruction of fire histories in the southern California National Forests (Mark Borchert, a long standing USFS ecologist, was also a significant contributor to this study). The aim of our study was to document, examine and interpret the historical fire regime of the chaparral vegetation in these forest using Bigcone Douglas fir (BCDF) as a proxy species given that it is long-lived, able to withstand multiple fire events and relatively accessible in places. We only sampled stands that were completely surrounded by chaparral vegetation so that we could eliminate any influence on the BCDF fire record from fire that may have been more reflective of those originating and burning in mixed conifer stands.

In general, our results showed that fires, both big and small, were commonplace in the southern California forests from the 1600s to the mid 1800s. By the early 1900s, many of the smaller fire events were observed in the tree-ring record had ceased to exist. However, the large fire events that are familiar to many of us today, continued to occur. This was a common signal seen in Los Padres, Angeles and San Bernardino National Forests. While these results seem relatively cut and dry, detailed analysis and a clear understanding of the sampling techniques used to create tree-ring records, reveal a slightly more complicated story.

Below I have listed several distinct thoughts and interpretations that we believe are the main points to be taken from this work.

- The landscape was rich with fire from the early 1600s (and likely much earlier) to the mid 1800s. During this time we saw both localized fire events and landscape-sized events occurring. By the early 1900s, many of the small fire events were absent from the record. We believe that the absence of these types of events is due to the advent of fire suppression and the removal of Native Americans from the landscape. Furthermore, this result signifies to us that large fires are a natural phenomenon of the southern California chaparral dominated landscape.

- While, small fires were frequent in the past, they did not effectively control or contain large events from occurring. Even in present day landscapes, wind-driven fire events (i.e. Santa Ana fires) can burn over, through and around recently burned landscapes that would be a deterrent to fires in normal weather conditions.

- We believe that the frequent fires of the past are a reflection of Native American burning practices meant as a means of landscape management and manipulation. Preliminary analysis suggests that fire frequencies reconstructed near known Native American settlements are higher than those reconstructed in areas not known to have been frequented by these peoples. However, further work needs to be done to provide a more robust understanding of the spatial and temporal patterns of Native American use of fire in this region.

- We generated mean fire return intervals (MFI) for both large and small sized fire events across all three forests. While these MFIs are often the most cited result from dendrochronology studies, they are often not used in the current context. For example, when a study cites a MFI of 10 years, in nearly all dendrochronology work, that refers to a fire of a certain size which has occurred somewhere within the sampled landscape once every ten years (on average). It does not mean that a fire occurs at the same point in a forest every ten years (on average). The ecological reality of those two situations is extremely different, especially in the case of chaparral.

- There were instances that we observed, in the tree-ring record, fires occurring at intervals of less than 10-15 years and were recorded by the same individual tree. In these limited cases, we do find that fires in southern California chaparral can occur at high frequencies. We don't know what the ecologic impact was following those events. Given what well-respected research has shown us, it is unlikely that many of the chaparral species in those areas survived the event based on life history traits and modern day observations. However, like the influence of Native Americans on fire regimes, we need to acknowledge the substantial impact the introduction of non-native species has had upon our landscapes. Prior to the mid 1800s, we lacked many of the now invasive non-native species that are abundant today. And those that were present were far more limited in their extent than in the present day. Unlike we see on the modern day landscape, when fire frequencies exceeded the ability of chaparral species to withstand closely repeated events, what followed was likely a barren landscape and not a field of aggressive, non-native species. These barren patches would slowly be colonized by native vegetation from surrounding areas or native species within the seedbank that survived the event. The ecological consequence was low, and would remain low to this day, if the suite of quick moving and ubiquitous non-native species were not present. That is certainly not the case now and any benefits gained by short fire frequencies would quickly be negated by the advance of non-native species at the expense of native.

- Dr. Keith J. Lombardo

Global Warming and Future Fire Regimes

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Summary
Climate and weather have long been noted as playing key roles in promoting wildfires. Global warming is generally expected to exacerbate fire problems. After reviewing the scientific studies of fire-climate relationships, the following conclusions can be drawn. 1) Annual temperature is a crude predictor of ecosystem responses since many processes respond to specific seasonal temperature signals. For example, on landscapes where past climate signals are correlated with fire activity, winter and autumn temperatures are generally irrelevant, but spring and summer temperatures play an important role. 2) Annual fire activity in California has been strongly influenced by climate only in the mid- to higher-elevation forests. However, in lower elevations throughout the state, but most particularly in southern California, fires in shrublands and grasslands have not been strongly correlated with annual variations in temperature during any season. 3) Past fire activity has been strongly influenced by land use activities (e.g., suppression of natural fires or human ignitions) and the impacts have been radically different in the northern and southern parts of the state. These two very different landscapes need to be viewed separately when planning future fire management practices. Global warming is occurring along with a number of other global changes that may have greater influences on future fire regimes, including population growth, changes in land management policy, shifts in vegetation types, and patterns of fire ignitions. All of these factors interact in complicated ways, making future forecasts a challenge.

Current realities
Temperature has always been a key factor in wildfire danger indices, and global warming predictions are a major concern. Historical analyses have shown that the *sine qua non* of a severe fire season in California forests is dry spring weather. It is now widely recognized that this relationship between climate and fire activity has important implications for climate change impacts on fire regimes of the future. However, it is important to recognize that temperature effects are seasonally dependent. Based on historical analysis of the last 100 years of fire records, it is apparent that warmer winters or warmer autumns have had no discernible effect on fire activity, whereas spring and summer temperatures do play a pivotal role. It cannot be stressed enough that this fire-climate relationship is largely restricted to montane coniferous forest ecosystems. Lower elevations and most elevations in the lower part of the state are generally less responsive to yearly changes in temperature. These latter landscapes appear to be more strongly affected by direct anthropogenic impacts, including timing and location of ignitions.

California covers a greater latitudinal range than any other western state and, as such, comprises a huge range of climates and very diverse fire regimes. In terms of California fire issues, the recent United States Forest Service (USFS) analysis illustrates two distinct regions within the state (Figure 1). Due to the success of a century of fire-suppression policy, forests in the Sierra Nevada and the northern portion of the state have experienced far fewer fires than historically recorded. In contrast, the nonforested landscapes in the southern part of the state, although managed with the same fire suppression policy, have not experienced a deficit of burning. This is in part due the difficulty of suppressing fires in chaparral-dominated landscapes coupled with the greater numbers of human-caused ignitions in this southern region.

Scientific opportunities and challenges

Balancing fire hazard reduction and resource protection poses a major challenge in a state as diverse as California. This equation plays out very differently in northern versus southern ecosystems in the state. Most of California's forests have historically experienced frequent low-severity understory burning, and both understory herbaceous and shrubby species as well as overstory tree species are adapted to this fire regime. Managing these landscapes with frequent prescription burning has the potential for both reducing fire hazard and enhancing these resources

Research needs for forested landscapes include parsing out the effects of global warming in different seasons and developing models that equate temperature increases with expected fire activity. Because the effect of global warming may have multiple effects, including increases in the length of fire season as well as increasing fire frequency, this research can be complicated. A further complication is that as fire frequency increases, the current ecosystem may be set on a trajectory for a different vegetation type with different fire regime characteristics.

In the southern half of the state there is a need for a better understanding of other global change issues that will potentially have greater impacts than global warming. In particular, there is need for understanding how population growth and patterns of growth will impact future fire regimes, something that is particularly critical in light of the fact that human activity accounts for more than 95% of all fires. Issues in need of research are causes of ignitions and placement of prefire fuel treatments. On these southern California landscapes, humans dominate the ignitions and as ignitions have increased over the past century there has been a well-documented conversion from native shrublands to nonnative grasslands. These latter systems are much more flammable, increasing the length of the fire season and frequency of burning, which feeds back into even greater landscape conversion and resource degradation. Additional issues in need of research are ignition causes and placement of prefire fuel treatments.

Policy issues

The U.S. Geological Survey has been an active player in the development of wildland fire management policy. The Cohesive Strategy developed by federal agencies has focused on using sound scientific evidence when choosing among alternative management approaches.

On an annual basis, California wildfires are responsible for a small portion of the total acreage burned in the Western United States. However they consume the bulk of federal fire suppression dollars. This is largely due to the high population density of metropolitan areas juxtaposed with watersheds of dangerous chaparral fuels. Since the beginning of the 21st century California has averaged a loss of 1,000 homes a year from wildfires mostly in the southern half of the state.

- **Forested ecosystems.** These ecosystems have missed fires due to past fire-suppression policy (Figure 1) that has resulted in substantial increases in forest fuels threatening to change fire regimes to high-intensity crown fires. Forest restoration requires prescription burning or other fuel reduction tactics. One of the primary constraints on burning is air-quality, which applies to both allowing wildland fires to burn, as well as prescription burning. One solution to reducing surface fuels (e.g., leaves, small dead wood) and ladder fuels (e.g., young trees) could be mechanical treatments. Constraints on this approach are the greatly increased costs associated with mechanical treatments plus economic limitations to such tactics on National Park Service lands. Making these treatments pay for themselves through commercial contracts raises serious issues about trees of value to be removed versus the impact on fire hazard. These are issues in need of serious discussion.

- **Nonforested ecosystems.** These landscapes comprise shrublands, which are the dominant plant community in southern California. Since the California State Legislature mandates a resource assessment of only timber and rangeland, these shrublands are perhaps not as well understood as is needed to assess their fire potential. On these landscapes the important global changes need to be viewed broadly to include more than climate change. Humans account for the vast majority of fires and human growth predictions are an order of magnitude greater than temperature warming in the coming decades.

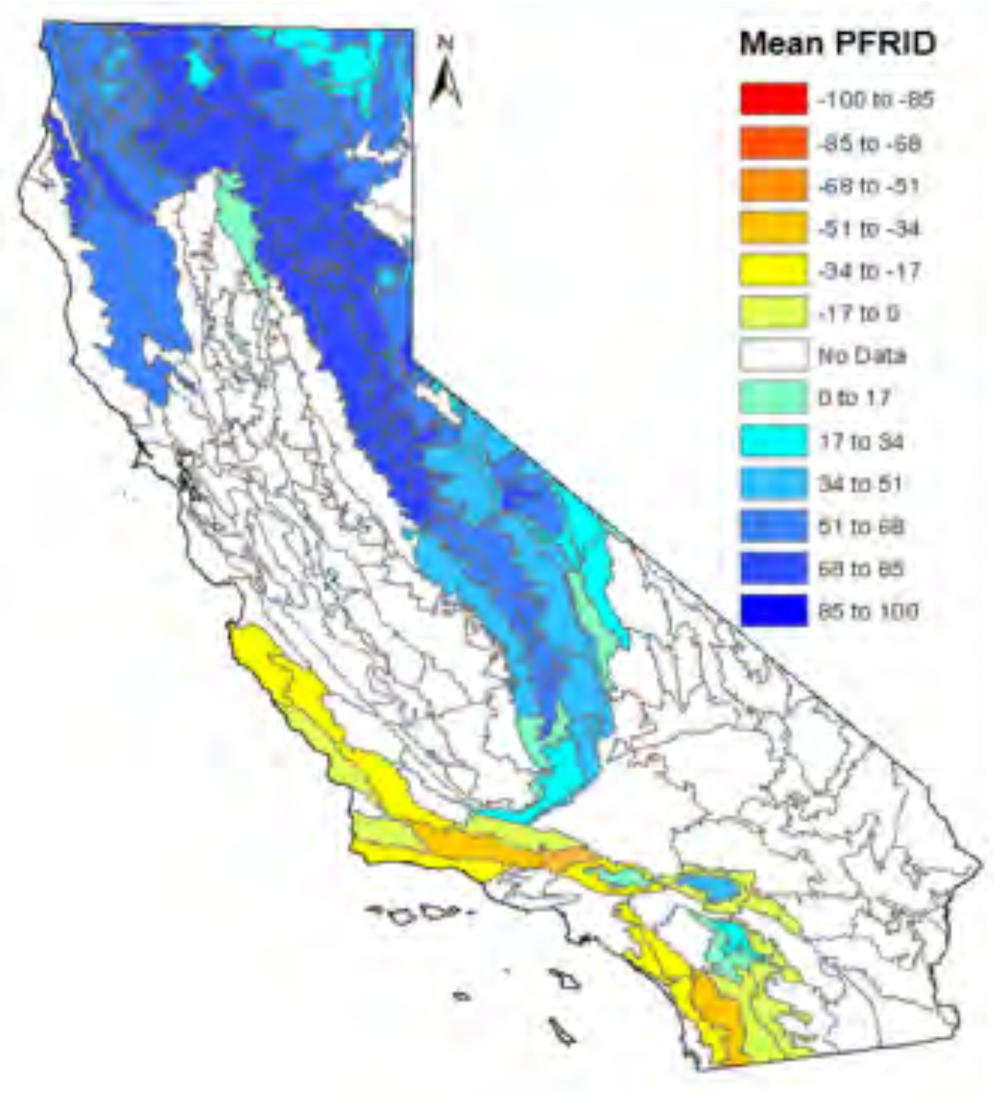
  Critical concerns do not only involve increased anthropogenic ignitions, but the spatial distribution of ignitions as well. In the south, the majority of fires that become catastrophic are ones that ignite in the interior and are driven by desert-to-ocean offshore winds known as Santa Ana winds. The more that development expands to the interior landscapes, the more likely such fires will increase in size. A closer relationship between fire management practices and land planning decisions could have positive effects.

  Throughout the western U.S. there has been an inordinate concern on landscape-level fuel treatments for handling wildfire issues. In southern California this issue is doubtful because catastrophic fires are driven more by factors such as weather than the state of the vegetation. We currently lack clear evidence that landscape-level fuel treatments change fire outcomes, particularly with respect to property losses. The model that seems to have the most support is that of fire management focused on “the house out,” which describes a concern on focusing fire hazard reduction at the house and Wildland Urban Interface (WUI) zone, and decreasing emphasis as one moves out on the landscape. Particularly in these nonforested landscapes, additional research is needed to determine the appropriate strategic placement of vegetation treatments.

  Other issues that need further discussion include the state-mandated “clearance” requirements. Total clearance is not required for defensible space and thus a change in terminology may enhance communication. Recognition that embers are a major source of home ignition points to the need for more research on specific changes in maintenance required to produce fire safe conditions. The role of evergreen trees as ember catchers needs further research as well.

*** A position paper prepared for presentation at the conference on* Water and Fire: Impacts of Climate Change*, convened by the Institute on Science for Global Policy (ISGP), April 10–11, 2016, at California State University, Sacramento*

Figure 1



Fire departure map for USFS lands in California. Areas in blue indicate landscapes that, relative to historical fire regimes, have missed fires and are in need of prescription burning or other related vegetation treatments. Yellow and orange represent landscapes that, despite a century of fire suppression, have had more fire than historically was the case and 'restoring' fire is not needed (from Safford and van de waters 2014).

CALIFORNIA CHAPARRAL INSTITUTE
...the voice of the chaparral

January 12, 2018

California Board of Forestry and Fire Protection
Attn: Edith Hannigan, Board Analyst
Email: VegetationTreatment@bof.ca.gov

Dear Ms. Hannigan and Members of the Board,

We respectfully ask the Board to consider the following question: *Would the fuel treatments, as envisioned in the current Draft Programmatic Environmental Impact Report (DPEIR) for the state's proposed Vegetation Treatment Program (VTP), have prevented or significantly reduced the devastating loss of life and property during the 2017 Tubbs Fire, Nuns Fire, Atlas Fire, and the Thomas Fire?*

Based upon our preliminary research, we do not believe it would have.

Considering that such fires are predicted to increase due to climate change, the presence and continued building of communities in very high fire hazard zones, and the frequency of ignitions likely increasing with a growing population, the second question that we respectfully ask is:

How can we help the Board develop a comprehensive fire risk reduction plan that will save lives, property, and protect natural resources from the wildfires that are responsible for killing the most people and causing the most damage?

We understand that strategic fuel treatments beyond community boundaries can be effective fire suppression tools during non-wind-driven fire events. But those are not the fires that that cause the most devastating losses. In fact, we believe the DPEIR's current focus on vegetation treatments may facilitate the type of poor planning that allowed the kind of developments that were devastated by the 2017 wildfires.

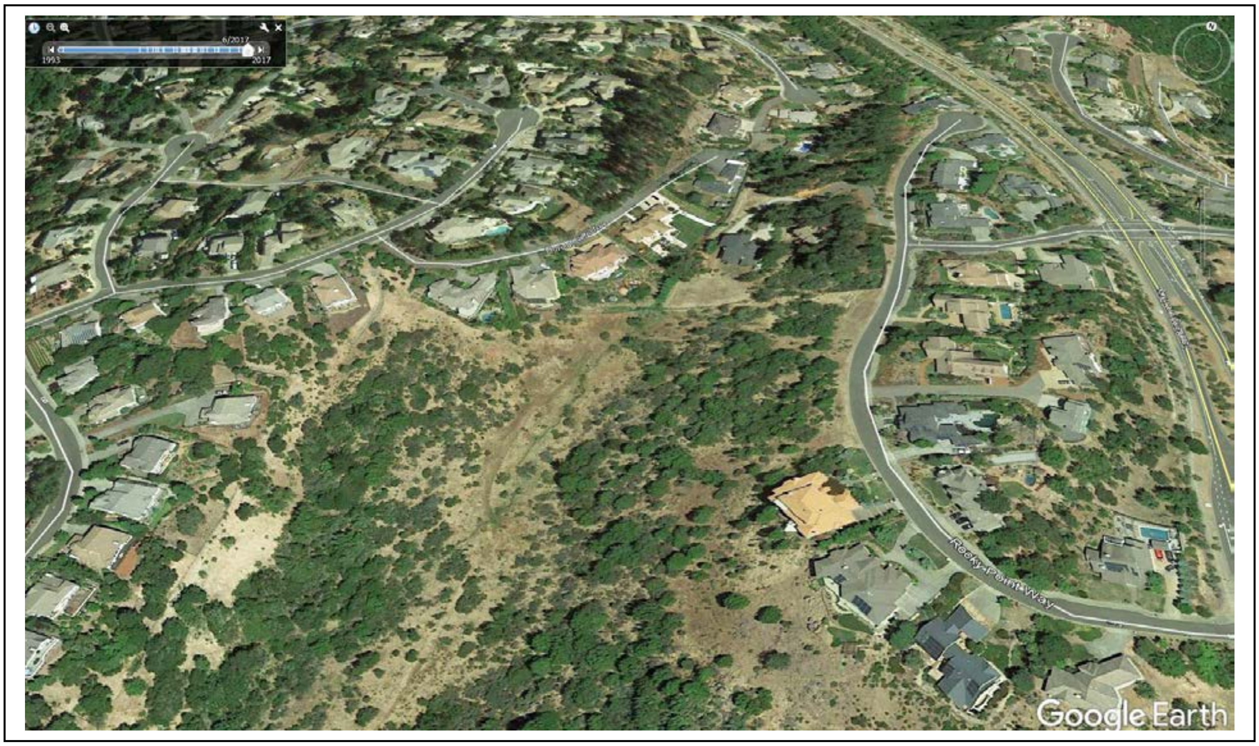
We also understand the Board believes that vital fire risk reduction activities (e.g. regulating buildings in which people live, land planning, defensible space), "exist outside the scope of the proposed program." (1-15)

However, after witnessing multiple, wind-driven fires devastate so many lives and communities in which fuel treatments of the type the VTP envisions have had little impact, we believe it is time for the Board and Cal Fire to change their approach to a comprehensive one. Rather than focusing on **trying to control wildfires with fuel treatments,** a more effective approach would be to **focus on saving lives and property.**

www.californiachaparral.org PO Box 545, Escondido, CA 92033 760-822-0029

If not the Board, the State Fire Marshal, and Cal Fire, who would be responsible for coordinating such a comprehensive program?

The number of lives lost and homes burned in the 2017 wildfires should inspire a new approach to fire protection, because what we have been doing (focusing on fuel) is not working.



Figures 1 and 2. Fountaingrove, Santa Rosa, California. Before and after the 2017 Tubbs Fire.

For example, nearly all of the homes in the Fountaingrove II community of Santa Rosa (Figs. 1 and 2) were built either right on or near ridgelines, geographical features well known for high fire danger (Fig. 3). Despite significant amounts of defensible space (note cluster of homes in the cul-de-sac at the lower right in Fig. 1), the homes were devastated by the Tubbs Fire. Also note the post-fire condition of forested areas in the upper portion of Figs. 1 and 2, and upper right in Fig. 3.

Figure 3. Ridgeline destruction at Fountaingrove II. This photo was taken looking north across the canyon from the former site of the orange-roofed home in the lower right corner of Figure 1.

As was the case in the 2007 Witch Creek Fire (IBHS 2009), it is likely nearly all these homes ignited from wind-blown embers and/or house to house radiant heat rather than flame contact from surrounding wildland vegetation.

The Fountaingrove II Open Space Maintenance Association had a rigorous fuel management program. The Association also understood well the danger of dry grasses and embers. In a 2013 bulletin to homeowners they warned,

> Over 90% of the homes destroyed by fires generated in the Wildlands are lost due to flying embers, not from fire lapping at their doorstep. A properly "Fire-scaped" home next to the Wildland Urban Interface can survive – if the owners have landscaped their property in a fire wise manner and keep all weeds and grasses clipped. (FOSMA 2013)

Yet the community was devastated in the Tubbs Fire.

We respectfully ask the Board, given that the Fountaingrove II community followed a vegetation management program with a focus similar to what is being proposed in the DPEIR, what policies would the Board help facilitate that would more successfully address the devastation caused to the community by the Tubbs Fire?

Figure 4. Coffey Park, Santa Rosa, California. Distance between community and wildland.

Figure 4 shows the community of Coffey Park in Santa Rosa (at the tip of the red arrow) devastated by the Tubbs Fire, and its distance from the nearest significant amount of wildland vegetation. – nearly a mile. Highway 101 was also between the community and the fire. Similar fire jumps over multi-lane highways and other large areas occurred during the 2003 Cedar Fire and the 2007 Witch Creek Fires in San Diego County.

Figure 5: Loss at Coffey Park. An older neighborhood far from the fire front, the entire community was ignited by a massive rain of embers driven by strong winds.

We respectfully ask the Board, what would have prevented these homes from igniting during the Tubbs Fire and what policies would the Board be willing to propose to prevent this kind of disaster in the future?

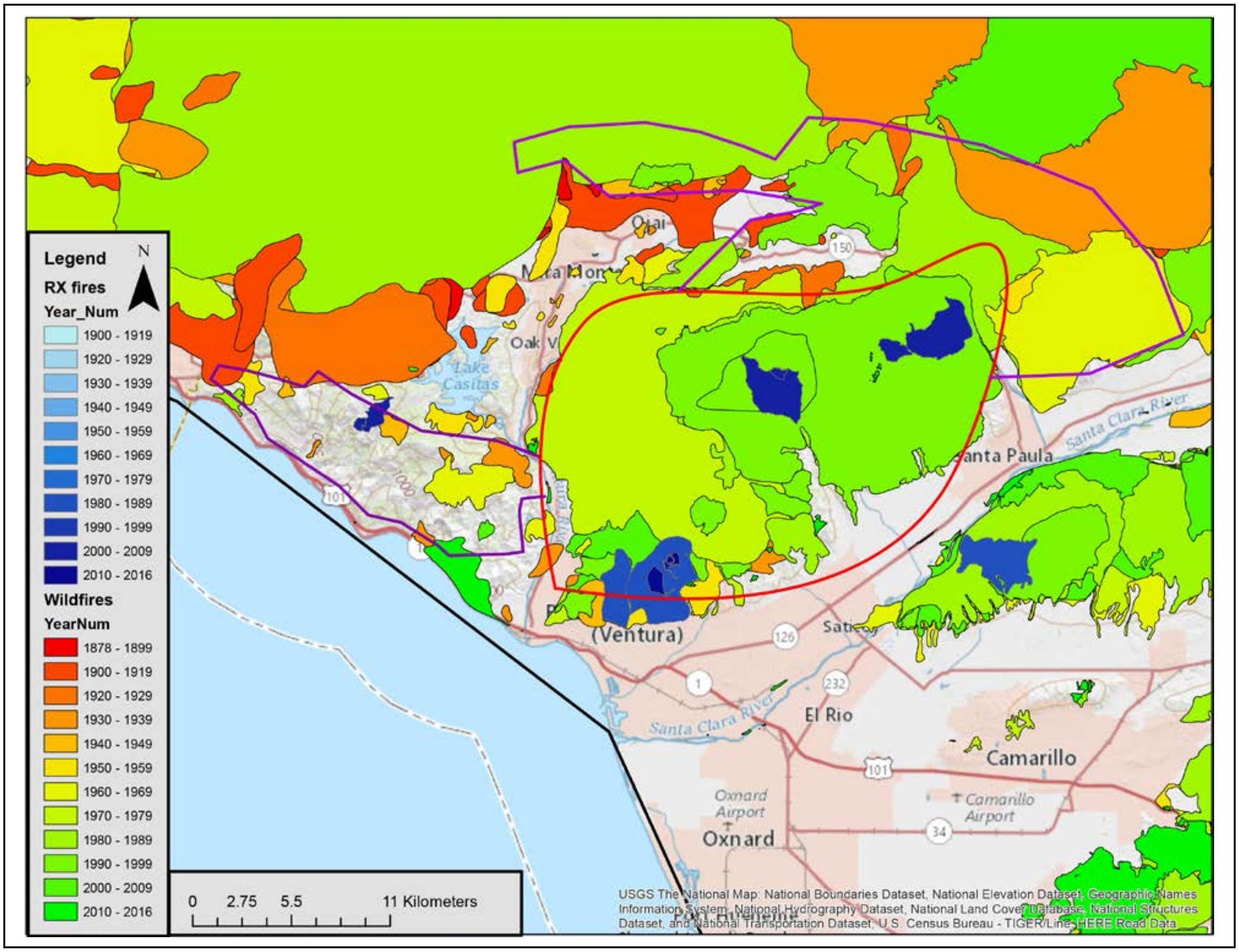


Figure 6. Prescribed burns within the Thomas Fire. The blue polygons show recent prescribed burns conducted by the Ventura County Fire Department. The red outline shows the rough perimeter of the Thomas Fire during its first hours. Source: USGS.

One of the key treatments described in the DPEIR is prescribed burning. As evidenced in Fig. 6 above, recent prescribed burn treatments (shown in blue) were not helpful in preventing the spread of the 2017 Thomas Fire.

The easternmost prescribed burn off Salt Marsh Road is approximately downwind of the probable origin of the Thomas Fire. The middle burn is in Aliso Canyon. Neither of these appear to have provided much in the way of anchor points for fire suppression activities.

Wind-driven fire generally spreads faster through grassy fuels than shrub fuels. Consequently, it is likely that the fire actually spread faster through these fuel treatments than it might have through the native shrubs that were present prior to treatment. Of course, with the high winds and low humidity that characterized the fire, nothing else really mattered than the extreme fire weather conditions.

The burns near the southern edge of the fire, in Hall, Barlow, and Sexton Canyons, have been worked on for years and were intended to create opportunities for controlling a fire.

In the initial run, the head fire spread 14 miles from the origin outside of Santa Paula to downtown Ventura in about five hours, spreading by ember ignited spot fires the entire way. This kind of fire behavior would likely defeat any fuel break - nothing on the ground can stop a fire that is basically flying through the air.

Further research is obviously needed to determine all the factors involved in the Thomas Fire's spread, but the consequences are clear from the damage assessment shown in Figure 7 below. The prescribed burns did little to protect the community. This is especially the case for the southernmost prescribed burn just above the northern edge of Ventura.

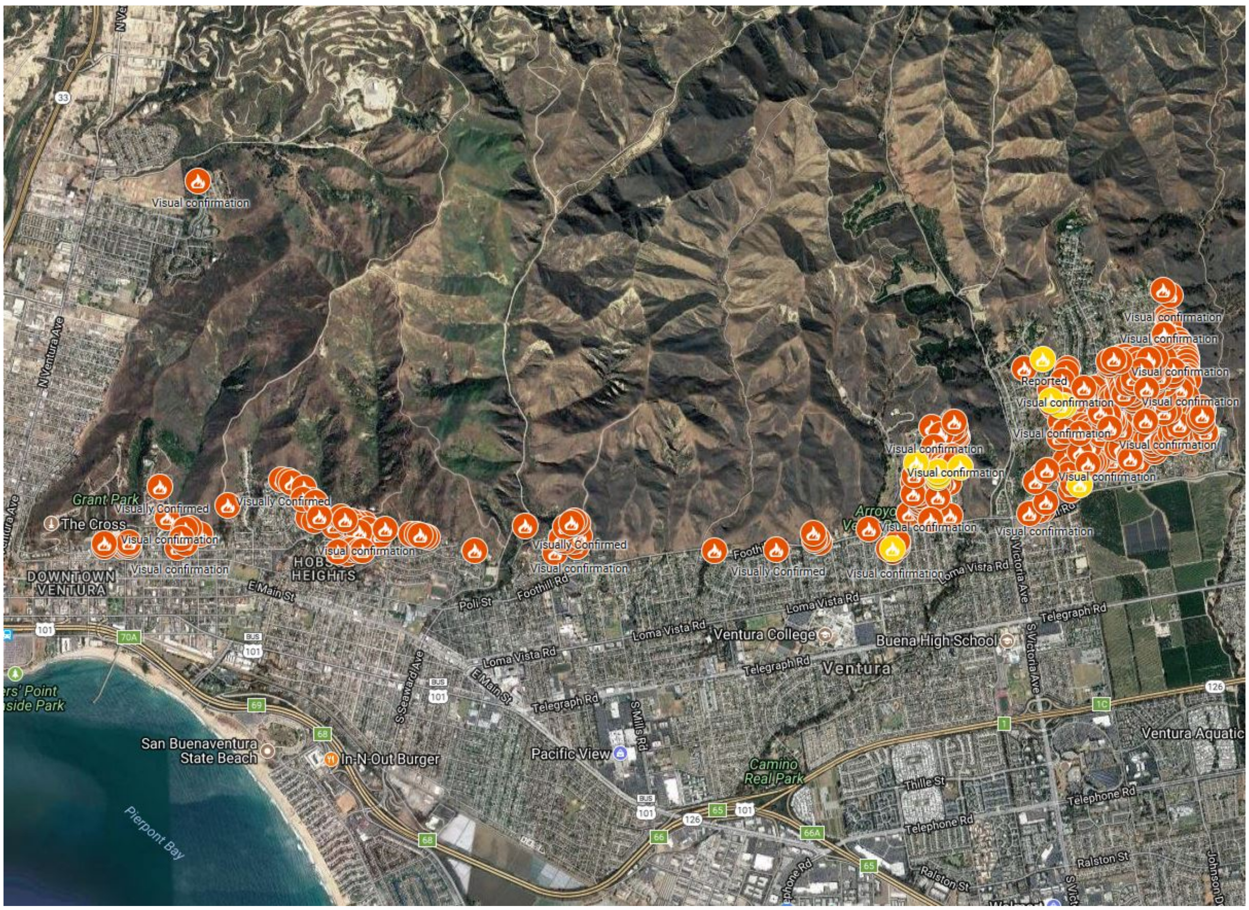
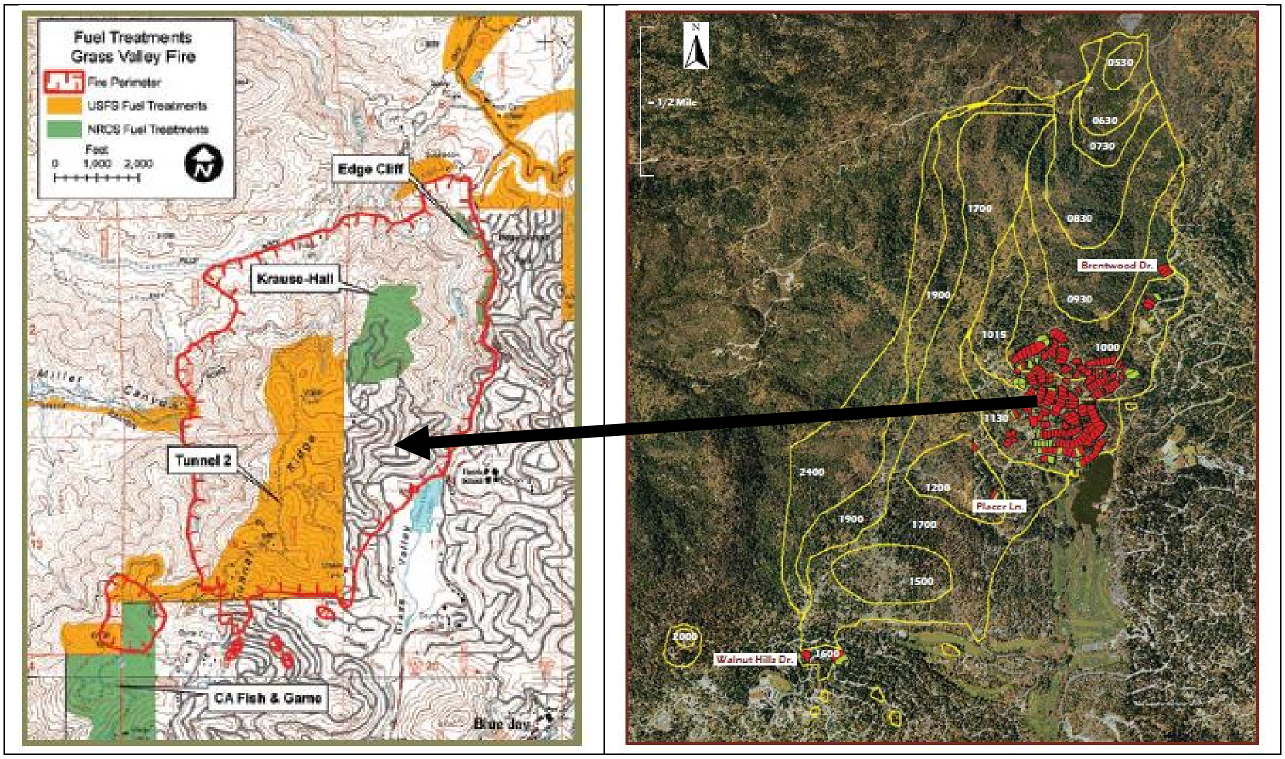


Figure 7. Home losses from the Thomas Fire on the edge of Ventura. Burned homes are indicated by orange dots. A prescribed burn was conducted just above the burned homes in the center middle of the image. Based on visual confirmation as of 12/8/2017: https://www.google.com/maps/d/viewer?mid=10S-m7mBzbjvG1rjiJ8wFAIbeG-F5VoKS&ll=34.2989948363656%2C-119.20525410881879&z=16



Figures 8 and 9. The 2007 Grass Valley Fire, Lake Arrowhead, California. Map on the left show fuel treatments as orange and green polygons (Rogers et al. 2008). Map on the right shows location of 174 homes burned in the fire (Cohen and Stratton 2008).

In the 2007 Grass Valley Fire, the US Forest Service and the Natural Resource Conservation Service conducted several fuel treatments around the community of Lake Arrowhead (Fig. 8). Reportedly, the fuel treatments performed as expected by allowing firefighters to engage the fire directly and reducing the rate of spread and intensity (Rogers et al. 2008). However, the end result for the community was much less positive. One hundred and seventy-four homes were lost (Fig. 9).

The comprehensive analysis of the Grass Valley Fire by US Forest Service scientists (Cohen and Stratton 2008) concluded that,

> Our post-burn examination revealed that most of the destroyed homes had green or unconsumed vegetation bordering the area of destruction. Often the area of home destruction involved more than one house. This indicates that home ignitions did not result from high intensity fire spread through vegetation that engulfed homes. The home ignitions primarily occurred within the HIZ due to surface fire contacting the home, firebrands accumulating on the home, or an adjacent burning structure.
>
> Home ignitions due to the wildfire were primarily from firebrands igniting homes directly and producing spot fires across roads in vegetation that could subsequently spread to homes.

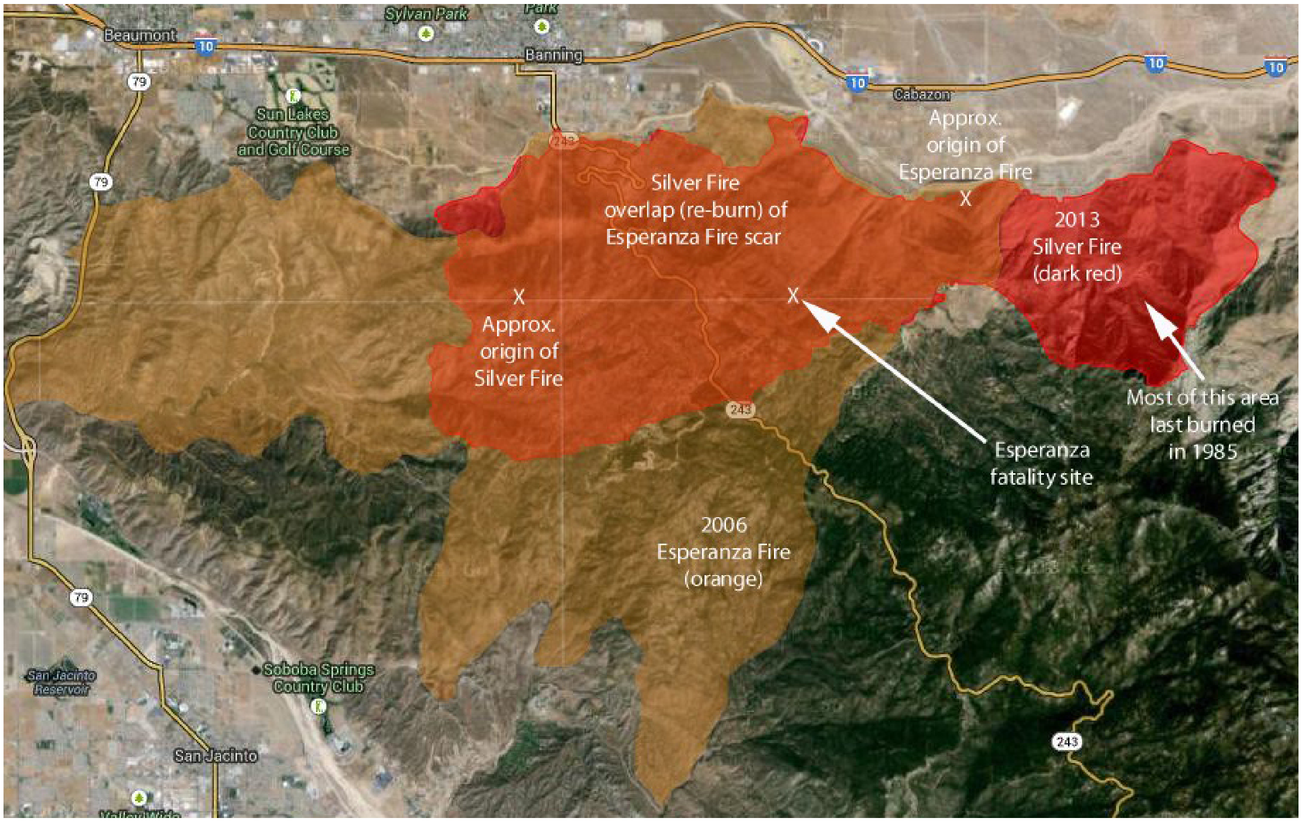


Figure 10. Reburned after seven years. The 2013 Silver Fire reburned almost entirely within the deadly 2006 Esperanza Fire scar near Banning, California.

The 2013 Silver Fire near Banning, California (Fig. 10) challenged the fundamental assumption of the DPEIR that treating older vegetation is an effective way to prevent devastating wildfires. Most of the fire burned through invasive weeds and young, desert chaparral that was recovering from the deadly 2006 Esperanza Fire. **Twenty-six homes were lost in a fire that was fueled by seven-year-old vegetation.**

There are numerous other examples and a number of solid research papers explaining why and how homes burn. What nearly all of them demonstrate can be best summarized by Cohen and Stratton (2008). They wrote,

> These incidents remind us to focus attention on the principal factors that contribute to a wildland-urban fire disaster—the home ignition zone.

We know that the DPEIR cites numerous case studies as well, claiming to show how effective fuel treatments can be. We also know there are numerous examples of when fire suppression has been facilitated when the flames meet previous fire perimeters. Suppression of the 2017 Thomas Fire was reportedly aided when its western edge interacted with the 2008 Tea and 2009 Jesusita Fire perimeters in the mountains above Santa Barbara. However, the weather changed as well.

We are not arguing with the fact that fuel modification is a tool that can be used to help control non-wind driven wildfires. However, the nearly exclusive focus, both financially and through time spent in planning, on fuel modification as presented in the DPEIR has failed us. How else can we account for the loss of 46 lives and more than 9,500 structures in wildfires from October to December this past year?

We believe nearly everyone can agree that that level of loss is unacceptable.

We also believe the current approach in dealing with fire risk as proposed in the DPEIR is also unacceptable. It is unacceptable not only because the DPEIR's justifications for its approach are flawed, but because **it does not deal with the wind-driven fires that cause nearly all the damage nor the actual causes that place people in harm's way in the first place.**

In its only attempt to address the effectiveness of fuel treatments involved in devastating wind-driven fires, the DPEIR cites Jin et al. (2015), listing the percentage of final fire perimeters found along fuel breaks (8%) and roads (56%) (4-38). Although fire perimeter data can be helpful, it does not necessarily indicate why a fire stopped where it did. Was it a change in the weather? Was it a back fire? Was it fuel moisture?

However, consistent with previous research, Jin et al. (2015) concluded **when examining the full data set that**,

> SA (Santa Ana wind-driven) fire probability did not depend on stand age, and we did not find evidence that age-dependent flammability limits SA fire spread…

In other words, whether it be young or old-growth, sparse or dense chaparral and associated plant communities (including highly flammable non-native grasses), wind-driven fires defy control and basically stop when the weather permits.

The omission of this conclusion by Jin et al. (2015) is symptomatic of a problem that plagues the entire DPEIR document – substandard research and a failure to provide substantial evidence that the program's goals, and the goals of the revised 2010 California Fire Plan, will be achieved.

Even though the latest draft makes efforts to incorporate relevant science, it often cherry picks statements out of papers that have nothing to do with the research cited, ignores the main conclusions of cited papers, or attempts to use anecdotal stories to diminish scientific findings contrary to the DPEIR's assumptions about fuel treatments.

As a consequence, among other reasons as described below, **the DPEIR lacks substantial evidence to support its conclusion that the environmental impacts of the program would be mitigated below the level of significance**, much less that the program would protect life, property, and the environment from exceptional, damaging wildfires.

As per CEQA Statute and Guidelines (AEP 2012),

> **CCR S. 15384.** [Substantial Evidence]
>
> (a) "**Substantial evidence**" as used in these guidelines means enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached. Whether a fair argument can be made that the project may have a significant effect on

> the environment is to be determined by examining the whole record before the lead agency. Argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly erroneous or inaccurate, or evidence of social or economic impacts which do not contribute to or are not caused by physical impacts on the environment does not constitute substantial evidence.
>
> (b) Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts.
>
> (Note: Authority cited: Section 21083, Public Resources Code; References: Sections 21080, 21082.2, 21168, and 21168.5, Public Resources Code; No Oil, Inc. v. City of Los Angeles (1974) 13 Cal.3d 68; Running Fence Corp. v. Superior Court (1975) 51 Cal.App.3d 400; Friends of B Street v. City of Hayward (1980) 106 Cal.App.3d 988.)

We provide detailed examples of this problem plus other failings of the DPEIR in the analysis below.

As we have in the past, we urge the Board of Forestry and Cal Fire to produce a document that starts by responding to the following question, **"How do we protect lives and property from wildfire?"** instead of "How do we manage fuel?" These are two different questions resulting in two different answers. And focusing on lives and property suggests questions that are precluded by the fuel approach taken by the DPEIR - questions that allow us to address the actual problem (poor land planning) rather than just symptoms of the problem (lives lost, communities destroyed).

Such a powerful approach will challenge everyone to leverage their own experiences, be willing to consider new paradigms, and honestly collaborate with others, especially with those who have different perspectives. Otherwise, we will continue practices that have brought us to this point – increased loss of homes, increased loss of habitat, and increasing levels of carbon in our atmosphere.

After our testimony to the Board on August 26, 2015, the Board's Chair said that, "Scientists used to believe a lot of things that we've learned were wrong. So, we can't just wait around for science to find the correct answer. We need to move forward."

We do need to move forward, but we need to do so by utilizing *all the information available to us today,* not depend on outdated models, poor research, and incorrect assumptions.

Therefore, we urge the Board to prepare a revised DPEIR by correcting the errors and incorporating the suggested improvements below.

We owe it to ourselves and future generations to get it right this time, especially because the changing climate will not be forgiving if we continue to squander the opportunity.

1. Transparency Eliminated

We respectfully ask the Board, what was your rationale for removing recommendations from the California Fire Science Consortium regarding greater transparency from the DPEIR? How do you feel the removal of these recommendations will increase the achievement of the goals of the DPEIR?

The need for greater transparency and communication was a key recommendation in the California Fire Science Consortium's Panel Review Report of the 2012 DPEIR (CFSC 2014) whereby,

> Projects should include a general description of what is expected to be done. This should be announced at least six weeks before the project takes place. A more detailed description of the project, including project goals and scientifically-grounded rationale as to why and how these goals will be met, should be released prior to the project implementation. The monitoring plan and its results should be made publically available when completed.
>
> At minimum, the above information should be posted on a website database. Additional outreach via newsletters, TV, radio, or events may be included.

Following the Panel's recommendation, the Board included several opportunities for the public and local stakeholders to participate in the project process. For example, in the previous DPEIR, treatments in southern California old-growth chaparral would not take place, "without consultation regarding the potential for significant impacts with the CDFW and the CNPS."

In addition, the 2014 DPEIR (2-57) stated that,

> During the project planning phase provide a public workshop or public notice in a newspaper that is circulated locally describing the proposed project during the project planning phase for projects outside of the WUI. The notification will be used to inform stakeholders and to solicit information on the potential for significant impacts during the project planning phase.

Unfortunately, the Board eliminated these opportunities for community involvement and transparency in the current DPEIR.

2. Ecological Restoration

We respectfully ask the Board, why does the DPEIR claim "ecological restoration" (i.e. more fire) is needed in southern California chaparral (as per Condition Class maps) despite the fact that the document itself acknowledges that such areas are threatened by increasing fire frequencies? Why does the DPEIR claim fuel treatments can be used for "ecological *restoration" in northern California because of undocumented "observed recovery of these ecosystems post-fire" rather than cited research?*

The DPEIR repeatedly recognizes that chaparral,

> ... in its present state, and in consideration of the substantial pressure from human-caused or human-related fire, chaparral does not need more fire, it needs less. (4-179)

Then, in one of the most perplexing contradictions, the DPEIR identifies large stands of chaparral in need of "treatment" due to Condition Class 2 and 3 without specifying how such determinations have been made (Condition Class 2 and 3 according to the DPEIR are "areas where fire behavior is uncharacteristic and vegetation composition is altered due to the loss of the key components of an ecosystem"). Complicating such determinations is the fact that the DPEIR does not indicate if such stands are either positively or negatively deviating from their natural fire return intervals.

Complicating the situation further are maps showing where the DPEIR considers "ecological restoration" is needed. The maps are basically useless in determining where the sites are located. There is a database link that provides more detail in Appendix (A-7), but it requires the user to have expertise in GIS software. Such a critical component of the DPEIR needs to be made available in a form the general public can be able to use.

It appears the root of the problem is that the DPEIR is using a Condition Class data product that dates from 2003 (that is the only Condition Class GIS data product we can find from CDF-FRAP online today).

It appears that the cutoff date for fire history in that analysis for Condition Class is no more recent than 2002 and may be several years older than that. Fifteen of the 20 biggest fires in California history have occurred since 2002. None of them would be reflected in this 2003 analysis that Cal Fire proposes to base statewide public policy on in 2018 and beyond.

This is the same outdated, flawed data product we discussed in our previous comments. Cal Fire could easily recalculate Condition Class with modern methodology and newer, more robust data by using Safford et al. (2011).

The Board needs to update Cal Fire's Fire Return Interval Departure (FRID) and Condition Class (CC) data products if they intend to use them for any kind of actual decision-making. Using best available modern fire history data to calculate Condition Class can be easy. With Safford et al. (2011) methodology that calculates positive **and negative** departures from presumed historic fire frequency, the conceptual model for FRID (and Condition Class) was given some validity for the first time.

Data issues aside, as mentioned above, Cal Fire's 2003 model for Condition Class can only produce nonsensical maps because it does not distinguish between over- and under-burned departures from presumed prehistoric fire frequencies.

3. Substandard Research

We respectfully ask the Board what process was followed to ensure cited references applied to statements being made in the DPEIR and why that process continued to allow scientific work (e.g. Lombardo et al. 2009, Safford and Van de Water 2014) to be misrepresented after the problem was revealed in our comment letter of May 24, 2016 and after one of the affected scientists provided corrections?

We also respectfully ask the Board to acknowledge these and additional misrepresentations made in the latest DPEIR as described below (e.g. Syphard et al. 2011, Keeley and Syphard 2016) and make the necessary corrections.

A key recommendation of California Fire Science Consortium's Panel Review Report (CFSC 2014) was to, "Include additional scientific findings throughout," and that,

> … a sound scientific foundation should be reflected with each vegetation management plan providing a clear rationale for the selected action. This should be done by providing additional references to support claims in the VTDPEIR and including additional scientific concepts that are relevant to the planned actions.

The DPEIR has improved its review of the chaparral's fire regime. However, as to developing a sound scientific foundation for the plan, the DPEIR fails to do so.

A. Infrequent, Large Fires are the Pattern for Chaparral (Lombardo et al. 2009)

Inexplicably, after detailing the most recent research that has shown short fire return intervals in chaparral are unnatural, the DPEIR then misrepresents Lombardo et al. to suggest that science may yet find that such a conclusion incorrect.

> DPEIR (4-179)"… chaparral does not need more fire, it needs less (Safford and Van de Water, 2014). However, new scientific information could modify that conclusion in the future as it becomes available. For example tree-ring data collected by Lombardo et al. (2009) in bigcone Douglas-fir stands surrounded by chaparral indicate that both extensive and smaller fires were present in historical time."

Lombardo et al. make it very clear that smaller fires were generally centered in or around Douglas-fir stands and that, "the historical and modern records both imply that large, landscape-scale fires are inevitable in chaparral landscapes."

The DPEIR is cherry picking statements out of context from a scientific research paper to support its stated goals, statements that are contrary to the research paper's fundamental conclusions.

The paragraph quoted above is the exact wording used in the last two versions of the DPEIR.

The Board is ignoring information in the record in violation of CEQA and ignoring testimony and a letter from the lead author of the cited paper that it is misrepresenting the cited research (Appendix A).

B. Plan for the Future, Not the Past - Fires in Northern California (Safford and Van de Water 2014)

The DPEIR claims northern chaparral is not threatened by increased fire frequencies like southern chaparral and therefore can be treated (4-180). It cites Safford and Van de Water (2014) as support. This is a fallacy of incomplete evidence ("cherry picking"). While Safford and Van de Water do indeed note that northern California does not suffer the higher fire frequencies that southern California does, they also warn that,

> ...recent trends in fire activity, burned area, and fire severity suggest that the situation is rapidly changing as climate warms and fuels continue to accumulate.

The Safford and Van de Water paper also notes that increasing fire frequencies appear to be spreading into the northern Santa Lucia Range. It is likely this trend will continue to spread northward as climate change and population growth increase the potential for ignitions in the northern part of the state. The recent Thomas Fire in Ventura and Santa Barbara Counties and the 2017 firestorm in Napa and Sonoma Counties lend support to this hypothesis.

While dismissing increasing fire threats to northern chaparral in Chapter 4, the document's Introduction presents a contradiction by emphasizing the fact that fires in northern California are indeed increasing.

> DPEIR (1-3) These types of anthropogenic alterations are some of the reasons why wildfire frequency in Northern California has increased 18 percent in the period from 1970 to 2003...

If the Board desires the DPEIR to be a plan for the future, as the DPEIR explicitly states it is doing, it should plan for that future rather than depend on conditions of the past. It would also be helpful for the DPEIR to be internally consistent. In descriptions of the fire hazard severity zone analysis Cal Fire repeatedly states that the goal is to model fire hazard based on potential future (NOT current) conditions.

C. Justifying Ecological Restoration for Chaparral with a Logical Fallacy

The DPEIR follows its misrepresentation of the Safford and Van de Water paper with a non sequitur regarding ecological restoration of chaparral in northern California. Chaparral in southern California is currently being threatened by high fire frequencies. Chaparral in the north is presumably not being threatened by such high frequencies. Therefore, Cal Fire believes it can burn/masticate chaparral in the north for "ecological restoration" purposes. Not only does such a conclusion not follow the observations, there is no scientific evidence to support it.

Presumably the DPEIR's reason to suggest burning chaparral in northern California for "ecological restoration" is that it is too old. Yet the DPEIR recognizes that such an idea is based on outdated notions.

> Contrary to ideas that chaparral was subject to significant senescence, it was observed that the accumulation of dead and dying plants was part of a normal cycle of post fire stand development. (4-178)

The failure to correct this section for the second time (it appeared in the previous DPEIR as well) is perplexing since CNPS and we offered testimony specifically discussing these errors. We wrote in our letter of October 27, 2015 (Appendix B),

> "There is NO research that supports this claim (treating northern chaparral for ecological purposes). In fact, a study just released by the Joint Fire Science Program indicates that there are indeed ecological trade-offs in reducing chaparral fire hazard in northern California (Wilkin, et al. 2015). Clearance of chaparral has also been recently suspected of increasing the spread of Lyme disease in vertebrates (Newman et al. 2015).
>
> The Draft EIR also appears to be assuming that climate change will not modify northern California in a way that will replicate increased fire patterns found in southern California chaparral. This is in opposition to USFS research. Safford and Van de Water (2014) suggest chaparral type conversion is spreading northward into the northern Santa Lucia Range and may likely continue to spread as climate change and population growth increase the potential for ignitions."

The artificial truncation of northern and southern California chaparral is not based on research or ecological realities. The DPEIR needs to correct this error and recognize that chaparral, California's most extensive plant community, can be threatened by increasing fire frequencies throughout the state. In addition, the DPEIR needs to recognize that any treatment of chaparral should be viewed as a **resource sacrifice** unless proven otherwise.

Ironically, the issue of "cumulative impacts to chaparral communities from program treatments and wildfires" is cited as an Area of Controversy in the DPEIR (2-54). As such, the topic should have been addressed in a thorough, scientific manner.

Claiming that chaparral in northern California can be treated for ecological benefit continues to be one of the most significant errors in the DPEIR.

D. Prescribed Fire and Seeds (Keeley and Fotheringham, 1998)

> DPEIR (3-18) Prescribed burning elicits a host of ecological interactions potentially important to restoration in an environment, including release from plant competition, greater access to light and water, nutrient enrichment, destruction of germination retardants, and the beneficial effects of smoke on plant germination (Keeley and Fotheringham, 1998).

The DPEIR also incorrectly uses this paper to support the positive benefits of prescribed fire for restoration. This paper actually deals with seed germination of chaparral plant species in southern California, the very same region that the DPEIR acknowledges as being threatened by too much fire.

In fact, prescribed burning in chaparral has been shown to cause ecological damage when burns are usually conducted, during winter or spring. In a comprehensive review of the literature regarding the ecological impacts of prescribed burning, Knapp et al. (2009) wrote,

> Observations suggest that vegetation response to such prescribed burns often differs from response to natural wildfires, with reduced germination of certain herbs and potentially altered species composition.

E. Political Testimonies/Reports are Not Scientific Citations

A significant number of references used to support statements in the DPEIR are from testimony or reports to Congress. While such references can provide overviews, many are too broad or political in nature to be of any use in developing a scientific foundation. And because such references are not peer-reviewed, there is no mechanism for determining how factual, evidence-based, or scientifically accurate they are.

McKelvey et al. (1996), a report to Congress on the forest of the Sierra Nevada, is cited out of context to support the notion that, "prescribed fire is believed to benefit the overall health of fire adapted ecosystems" (4-186). While true for some Sierra Nevada forests, this is not true for chaparral. This represents a chronic problem in the DPEIR.

The reference to Bonnickson (2003) (2-10) was his testimony provided during a politically charged Congressional hearing after the 2003 fires. Much of the content is opinion, not scientific fact.

Finally, we were surprised to see that the Board chose to use a quote from Secretary of the Interior Ryan Zinke from a political press release to lead the DPEIR's introduction (E-2).

> It is well settled that the steady accumulation of vegetation in areas that have historically burned at frequent intervals exacerbates fuel conditions and often leads to larger and higher-intensity fires…

Excepting the fact that it is far from settled that accumulating vegetation leads to larger fires, this statement only applies to some forested systems below 7,000 feet. In addition, most of the wildfire risk in California is within areas that have little to do with the kind of ecosystem the secretary appears to be describing.

We respectfully ask the Board what the rationale was in choosing to use a quote from a politically polarizing individual who has no background in wildfire, is on the record making *misleading claims to promote logging in the Katahdin Woods National Monument, and appears to advocate logging in national parks (Zinke 2017, McKean 2018).*

Does such a quote belong in a collaborative, non-partisan planning document?

F. Raising Doubt Over Established Science

> DPEIR (4-176): Studies are indicating a difference in data regarding type conversion or invasive spread of exotic/non-native species. Although these studies have differing methodologies and analysis characteristics, they offer an insight to the challenges in evaluating encroachment of non-native species. One study looked at the disturbance of plant communities after fuel break construction used for firefighting activity. This study identified potential impacts to the ratio of native and non-native species in the study area, which consisted of chaparral/grassland mosaic on an ecological reserve (Moroney and Rundel, 2013). However, another study found overall type conversion of existing species composition in chaparral may be difficult and rare across a landscape (Meng et al., 2014).

The risk of type conversion and the spread of invasive species due to fuel break construction, soil disturbance, or high fire frequency in chaparral is an established fact (Zedler et al. 1983, Haidinger and Keeley 1993, Jacobson et al 2004, Brooks et al. 2004, Merrriam et al. 2006).

Characterizing the evaluation of non-native species as challenging and citing one inconclusive paper (Meng et al. 2014) to raise doubts about type conversion occurring in chaparral reflects the DPEIR's inconsistent attitude toward the degradation of native shrubland ecosystems. On pages following the above quote, the DPEIR states,

> Burning in southern chaparral systems, to enhance ecological function, at intervals shorter than natural fire return frequencies, may lead to adverse ecological results. (4-180)

then

> For these reasons, an ecological rationale for fuel treatments in shrub dominated and co-dominated ecosystems in northern California can be used. (4-180)

The problem with Meng et al. is that it makes conclusions not justified by the collected data. The paper begins by raising some skepticism about the ability of repeat fire to affect type conversion by pointing out the difficulty early 20th-century range managers experienced in using fire to "improve" ranges that were supposedly plagued by chaparral. These managers typically relied on herbicides and mechanical destruction for thorough replacement of shrubs to more useful grazing lands. However, as pointed out by Keeley and Brennan (2012), managers only utilize fire under narrow prescription conditions, which are generally not capable of carrying repeat fires at short fire return intervals; hence, their difficulty in meeting their objective. In contrast, wildfires typically burn outside prescription with 100 kilometer/hr (about 62 mile/hr) wind gusts and relative humidity less than five percent.

Then by using remote sensing, Meng et al. attempted to answer the question of how extensive type conversion is due to repeat fires occurring in the last decade. While the technique cannot address the changes in diversity and species composition that are known to occur with short interval fires, it has some potential for viewing grosser changes in functional types such as shrubs and annual plants. Although these authors concluded that widespread type conversion is not an immediate threat in southern California, this conclusion deserves closer scrutiny since documenting fire-related vegetation change across large landscapes over just a 25-year period using remote sensing is fraught with potential errors.

One reason for error is that numerous spatially and temporally different human and biophysical factors can influence the process of post-fire recovery; these factors should be controlled for before attribution can be determined. In the Meng et al. paper, the control and overlap areas were located on somewhat adjacent, but very different parts of the landscape that varied by factors such as aspect, terrain, or soil type. The areas could have also experienced different landscape disturbance legacies. This is especially possible given the topographic complexity of the region and researchers' use of the California's Fire Resource and Assessment Program's Fire History Database (FRAP) for discerning precise stand ages. This database is broadly useful for management planning but must be used carefully in a research context.

For example, Keeley et al. (2008) found across 250 sites that the FRAP database did not accurately portray stand age (as determined by ring counts) for 47% of the sites, presumably due to the scale at which fires are mapped and by generally ignoring fires less than 40 hectares (100 acres) in size. This is a fundamental problem the DPEIR does not recognize.

Another concern is that the Meng et al. method of documenting vegetation change may not be sensitive enough to resolve gradual shifts in composition that would likely occur after only one repeat fire event. They used a vegetation index derived from remotely sensed imagery from a satellite as a way of assessing vegetation "cover," or "greenness" of each 30-meter pixel of the image. Because different pigments are stimulated by different parts of the light spectrum, this index essentially assesses chlorophyll content, which is correlated with biomass and assumed to represent the relative cover of evergreen shrubs. However, it does not account for differences among chaparral species, whose composition in the plots was unknown. Additionally, different species of chaparral have varying sensitivities to repeat fires and thus it might require multiple repeat fires of differing intervals to discern enough vegetation change that it would be detected by this index.

Given that vegetation change is likely a gradual, cumulative process, the results reported by Meng et al., contrary to their conclusions, are actually consistent with a potential for widespread chaparral conversion. Slightly more than half of the area that burned twice in their study did have lower cover, as defined by the index, than the control. Given enough fire on the landscape over a long enough period of time, gradual shifts may result in significant change and impact.

Before the DPEIR cites a paper that raises doubts about long confirmed research, it should closely examine the data and the conclusions. Just because a paper appears to confirm a particular position, does not mean it actually does.

G. Overgeneralized “Park-like” Forests

Contrary to the assertions made in Chapter 2 of the DPEIR, historical forests of California were highly variable in density. The notion that many were “generally open and park-like” is an over-generalized statement that has been challenged by a significant number of researchers. This fact has been ignored by the DPEIR.

While many forested areas below 7,000 feet have missed fire cycles and it is likely that a small portion of California’s forests were "open", many more were probably closer to being moderately to very dense. Recent investigations have proposed that historical forests may have been 2-3 times denser than has been suggested in recent USFS studies (Baker 2014, Hanson and Odion 2016 a, Baker and Hanson 2017).

Mixed-intensity fire in mixed-conifer and yellow pine forests is essential to maintain and enhance native biodiversity in California's forests. Many species depend on the unique habitat created by mixed-intensity fires, including large fires and large high-intensity fire patches (Tingley et al. 2016).

The DPEIR also ignores recent research which finds that increased logging may not reduce fire intensity (Bradley et al. 2016). Nor is the DPEIR's assumption about fire and water flows consistent with current science (Boisrame et al. 2016). Post-fire sedimentation is natural after fires and occurs in pulses that wane within a relatively short period of time post-fire, whereas post-fire logging creates chronic sedimentation that lasts for many years (Wagenbrenner et al. 2015).

H. Incorrect citations

The Sugihara et al. 2006 citation, an introductory chapter in a book about fire in California is used nine times within Chapter 4. We searched for the specific DPEIR points the citation was supposed to be supporting within the Sugihara et al. work, but were unable do so in most instances. In other words, the statement the DPEIR is using the citation to support does not exist within the Sugihara et al. reference.

Regardless, using an introductory book chapter multiple times to establish a scientific foundation for the DPEIR is inappropriate. Original peer-reviewed research needs to be used and the research needs to be double checked to verify that cited references are in fact relevant to the point in question.

4. Mischaracterizing Fuel Treatment Research

We respectfully ask the Board if it has conducted a cost/benefit analysis of fuel treatment/fuel break construction and use in order to support its support of such activities?

Searching for Support Where There is None (Keeley and Syphard 2016)

> DPEIR (4-55): The impacts of fire suppression have changed the historical fire activity in the 20th century, and prescribed fire is a tool that can help maintain appropriate fire regimes (Keeley and Syphard, 2016).

Keeley and Syphard (2016) never concluded this. The paper is an analysis of projecting future fire regimes based on climate models. There is one sentence in the entire paper that mentions prescribed burning (pg. 10), but it is merely a reference to another paper. Citing Keeley and Syphard to support a claim about prescribed burning is inconsistent with the standards of academic research.

Anecdotal Information is Not a Substitute for Science (Syphard et al. 2011)

One of the primary advantages of scientific research is that it can filter out biases and opinions formed from anecdotal evidence by examining large sets of data. However, the DPEIR depends heavily on anecdotal evidence, sometimes to discount scientific research.

> DPEIR (2-23): There is also a level of uncertainty in the scientific literature on the effectiveness of fuel breaks that are staffed by fire suppression personnel (Syphard et al., 2011). Effectiveness can be impacted by the type of treatment used (prescribed fire, herbivory, mechanical tools, etc), position on the landscape, condition of surrounding vegetation, time since treatment, and the seasonality and weather conditions during the wildfire(s) intersecting the treatment. Due to these variables, the scientific evidence on the effectiveness of treatment suffers from some limitations of the ability to extrapolate beyond the study area. While not controlled experiments, there are case studies that CAL FIRE and other local fire agencies have developed that can point to site specific treatments that helped suppression efforts. The Toro Creek Fire Case Study within this section is a good example, as well as several others in Chapter 4.1.5.2.

There are two Syphard et al. (2011) papers in the DPEIR reference list, but they are improperly identified so it is unclear which one the document is referencing. But the one titled, “Comparing the role of fuel breaks across southern California national forests,” assembled a very large data set - a spatial database of fuel breaks and fires from the last 30 years in all four national forests in southern California. The researchers also interviewed firefighters.

The study indicated that on average, 23% of the fires studied intersected fuel breaks. During those intersections, fuel breaks helped about half the time, but “only when they facilitated fire management, primarily by providing access for firefighting activities.”

But more relevant to the goals of the DPEIR is the following conclusion from Syphard et al.:

> …this study strongly supports the notion of constructing fuel breaks along the wildland–

> urban interface where firefighters will have better access to the fuel breaks, and where the fuel breaks will provide an immediate line of defense adjacent to homes that are at risk. The case studies from all four national forests demonstrate that fuel breaks will not stop fires without firefighter presence. Therefore, constructing fuel breaks in remote, backcountry locations will do little to save homes during a wildfire because most firefighters will be needed to protect the wildland–urban interface, and fires will not be stopped by those fuel breaks that are located farther away.

Misrepresenting Research (Reinhardt et al. 2008)

The scientific research shows that the most effective way to protect lives and property is to focus directly in and around where people live. Perhaps unknowingly, the DPEIR references research that supports this approach (Reinhardt et al. 2008), but incorrectly cites it as supporting the vegetation management program.

> DPEIR (2-7): There is strong scientific agreement that the use of fuel treatments helps to reduce the impact and damage from wildfires (Reinhardt et al., 2008; Safford et al., 2009; Schoennagel and Nelson, 2011). This objective seeks to reduce the size of fires through the use of appropriate vegetation treatments. The assumption is that decreasing fire size will have a resulting decrease on overall fire suppression costs.

Here is what the cited Reinhardt et al. paper actually says:

Treating fuels to reduce fire occurrence, fire size, or amount of burned area is ultimately both futile and counter-productive. In the long run, fuel treatments are a sustainable management option only if they increase the acceptability of wildfire.

In such situations, destruction in the WUI is primarily a result of the flammability of the residential areas themselves, rather than the flammability of the adjacent wildlands. It may not be necessary or effective to treat fuels in adjacent areas in order to suppress fires before they reach homes; rather, it is the treatment of the fuels immediately proximate to the residences, and the degree to which the residential structures themselves can ignite that determine if the residences are vulnerable.

By reducing the flammability of structures, WUI fuel treatments can be designed such that an extreme wildfire can occur in the WUI without having a residential fire disaster. Although general wildfire control efforts may not benefit from fuel treatments during extreme fire behavior, fuel modifications can significantly change outcome of a wildfire within a treatment area. Research has shown that a home's characteristics and its immediate surroundings principally determine the WUI ignition potential during extreme wildfire behavior.

It is a natural mistake to assume that a successful fuel treatment program will result in reduced suppression expenditures. Suppression expenditures rarely depend directly on fuel conditions, but rather on fire location and on what resources are allocated to suppression. The only certain way to reduce suppression expenditures is to make a decision to spend less money suppressing fires.

Fuel Breaks – does the cost justify the benefit?

> DPEIR (4-38): An article by Syphard et al. (2011) conducted a spatial analysis of the Los Padres National Forest in southern California and concluded that fires stopped at fuel breaks 46 percent of the time. Preexisting fuel breaks allowed fire suppression activity to take advantage of the lighter fuels along the ridge lines to cut control lines. This was useful in both the wilderness areas (utilizing hand line and hose lays) and areas outside the wilderness where heavy equipment could aid in suppression efforts (Syphard et al.,2011).

The DPEIR mischaracterizes Syphard et al. (2011) and places the research in the wrong context. What the paper shows is that only 20 out of 95 fires intersected fuel breaks, fuel breaks stopped only one fire without firefighters present, and that fuel breaks were ineffective under severe fire-weather conditions.

> A key conclusion by Syphard et al. that the DPEIR ignored was the following:
>
> Although fuel breaks surrounding communities clearly serve an important role in creating a safe space for firefighting activities, fuel breaks in remote areas and in areas that rarely or never intersect fires have a lower probability to serve a beneficial function. It is important to consider strategic placement in terms of values at risk, near communities and the WUI, in shrubland ecosystems or other areas where the resource benefits of fuel treatments have not been demonstrated as they have been in forests. Despite strong arguments for locating fuel breaks near communities where protection is most needed (Winter *et al*. 2002; Halsey 2005; Keeley *et al*. 2009*b*), most fuel break proposals continue to be located in more remote wildland areas (Ingalsbee 2005; Schoennagel *et al*. 2009). Other finer-scale factors may also be important for strategic placement (e.g. placing them on ridgelines or other landscape features that offer tactical advantages; Ingalsbee 2005). It is also important to consider that many homes are not ignited owing to direct fire spread, but from firebrands (embers), and more research is needed on the location of fuel breaks relative to firebrand production and structure exposure (Mell *et al*. 2010).

The question of examining the actual cost/benefit of fuel break construction/use is also an important issue. In a recent paper from the University of Montana (Naughton and Barnett 2017), researchers found that,

> There exists an assumption within the wildland fire science and management community that investments in fuel treatments will result in decreased future fire management costs. In order for this to manifest, wildland fires must interact with fuel treatments during the lifespan that treatments remain effective. Our finding that 6.7%

> of treatments on federal lands between 1999 and 2012 were encountered by a subsequent fire by 2013, and that only 7.7% of the total treated area was burned by a subsequent fire through 2013, raises questions over the validity of such an assumption.

The observation that back country fuel modifications are generally not effective in stopping fires and, as a consequence, haven't generated any significant reductions in total annual area burned in southern California, has been confirmed by other research as well (Keeley et al. 2009, Syphard et al. 2011).

Global surveys concerning fuel modifications have also demonstrated that even very large amounts of strategic fuel modification are not very effective in reducing total areas burned. This research makes a compelling case that constructing and maintaining large fuel treatments is not the most effective use of fire risk reduction resources (Price et al. 2015, Price et al. 2015b).

Additional research also questions the entire concept of pouring millions of dollars into trying to suppress wildfires. As Bridge et al. (2005), in examining fires in the boreal forests of Canada, writes,

> … it seems that in large-area burned years, the conditions are such that the sheer number of fire starts and their quick rate of spread can overwhelm fire management agencies (KPMG 1999), and it is unlikely that suppression can significantly influence the total area burned.
>
> Thus, to date there is insufficient empirical evidence that fire suppression has significantly changed the fire cycle in the boreal forest of Ontario.

If the Board intends to establish an effective fire risk reduction program, it should investigate research that not only supports its assumptions, but also questions them. The DPEIR does not do this.

A WUI Without Scientific Merit

The DPEIR claims a 1.5-mile wide Wildland Urban Interface (WUI) is necessary because this is assumed to be the approximate distance embers can be carried from the fire front (4-33). The DPEIR dismisses concerns that its definition of the WUI is too large an area because Cal Fire staff overheard USFS representatives from the Cleveland National Forest talk about a 6-mile wide WUI buffer (4-33). Casual conversations are not legitimate scientific references.

The only citation the DPEIR uses for support is the Sierra Nevada Forest Plan Amendment. (3-38) This is a serious misrepresentation. The Amendment does not provide any evidence for a 1.5-mile WUI, but rather is a management document that established an arbitrary distance to determine the number of homes/communities affected by the Plan.

Ironically, the DPEIR discounts a smaller WUI, such as the 1,000-foot version in one of the alternatives (3-38), because, "A review of the literature found no scientific basis to limiting WUI treatments to 1,000 feet."

This perspective is more appropriate for the DPEIR's 1.5-mile WUI as there is significant evidence indicating fuel treatments even beyond 300 feet (the length of a football field) are excessive for the purpose of reducing fire risk to communities (see Cohen's extensive research, e.g. Cohen 2004).

In DPEIR Appendix A, "Characterizing the Fire Threat to Wildland-Urban Interface Areas in California" is equally unscientific and does not provide the necessary information to properly assess the characteristics of the WUI.

For example, Figure 1 does not distinguish fuel types, slope conditions, how heat per unit area and rate of spread is estimated/modeled/calculated. The axes are not mentioned in the descriptions. Another important point omitted from this section is that flame length as an indicator of fire risk varies by vegetation type – 12-foot flame lengths in conifer forests are routine, but not in grasslands.

As a tool, Figure 1 is not useful.

Considering the expense and extensive environmental damage that can occur with fuel treatments, the Board should base the size of the WUI on available science, not arbitrary numbers (see Appendix C: Ember Behavior: Why the 1.5-mile WUI is Excessive).

Finally, the Board needs to reconsider how the WUI is defined in order to help us address the actual issues that are causing so many losses due to wildfires – poor land planning. Gregory Simon (2017) makes this clear in his book, "Flame and Fortune in the American West." He writes,

> … the inadequacy of the WUI as a concept lies in its inability by itself to reveal the forces behind its own creation.

5. Inadequate Data

The maps provided in the DPEIR cannot provide enough information to properly assess the Program. They do not reflect data-rich research nor Cal Fire's expertise.

As in previous drafts, the DPEIR presents fuzzy, indistinct graphics reduced far beyond the point of legibility. At 72dpi screen resolution each fuzzy indistinct pixel represents about 3.5 miles (approximately 8,000 acres) on the ground.

This is not just about illegible maps, but one more example of a much larger, systemic problem mentioned several times above. The Program must be based on a solid, statistically valid technical analysis, undertaken in good faith, based on appropriately solid, modern data, and peer-reviewed fire science. CEQA requires it. The current DPEIR does not follow this standard.

6. Circumventing CEQA

Throughout the document, the DPEIR completely ignores the necessary detail needed to determine if the Program will have significant impacts. Instead, it defers to managers at the individual project level because the Program is either too "large and complex" to consider the true environmental impacts within the DPEIR (4-198 among others), or too small because the projects average 260 acres (5-35 among others). By using the "Fallacy of Authority," the DPEIR claims without providing supporting evidence,

> Because of the amount of acreage eligible but not receiving treatment under the VTP, the proposed Program would likely result in a less than significant cumulative effect on biological resources at the bioregional scale. (5-33)

The DPEIR frequently follows up these claims, again without supporting evidence, with the suggestion that the Program may actually provide a net environmental gain because it may "decrease the frequency, extent, or severity of wildfire." (5-37)

Such rationales have no merit. There is a rich source of literature describing the potential impacts, both local and cumulative, of "fuel treatments" as well as the ecological benefits of high-severity fires in crown fire ecosystems. The DPEIR should adhere to the requirements of CEQA and determine the overall environmental impact of the Program, not pass the responsibility on to individual project managers via a checklist based on subjective opinions.

This failure to account for environmental impacts is troubling because it gives the impression that the DPEIR was not produced to comply with CEQA, but rather to accomplish its stated goal of streamlining the regulatory process (1-7). In fact, this is in line with the Board of Forestry's 2010 Strategic Fire Plan which endorses efforts to "remove regulatory barriers that limit hazardous fuel reduction activities" (Fire Plan Goal #5, objective "b").

Inadequate Standard Project Requirements (SPRs) and Mitigation Measures (MMs)

Even if the law allowed the lead agency to pass along all the environmental impact determinations/responsibilities to local project managers, the DPEIR's project checklist, Standard Project Requirements (SPRs), and Mitigation Measures (MM) make such a task impossible.

Mitigation Measures as per CEQA must be legally adequate. The DPEIR must demonstrate with solid evidence that Mitigation Measures are feasible, effective, and enforceable.

- Many of the Program's SPRs and MMs fail to provide enforceable procedures (via legally binding agreements) that will produce measurable effectiveness.
- Important terms are not defined such as "critical infrastructure," allowing for inconsistent implementation and unknown impacts of projects.
- Some SPRs and MMs are vague and allow for so much subjectivity that they are meaningless.

For example, despite the fact that MM BIO-2 appears to provide a mechanism to reduce the impact of "fuel treatments" in chaparral (4-211), it essentially requires little of the project manager for the following reasons:

Only southern chaparral. Without justification, the DPEIR excludes chaparral from BIO-2 except that which occurs in nine southern and central counties. As indicated above, the exclusion of chaparral in northern California by the DPEIR is not supported by scientific evidence.

Considering ecosystem values of chaparral removed. Inexplicitly, an important mitigation measure that was part of BIO-2 in the 2014 DPEIR (BIO-5, 2-57) was removed from the latest DPEIR:

> Take into account the local aesthetics, wildlife, and recreation of the shrub dominated subtype during the planning and implementation of the project.

This presumably means such concerns will not be taken into consideration.

Median fire return interval undefined. Although the DPEIR discusses fire return intervals, there is no guidance in the SPRs and MMs to assist the local manager in determining what this value happens to be. Given the fact that there is tremendous misunderstanding and resistance to accepting the latest science about this topic (Halsey and Syphard 2015), it is critical that the DPEIR addresses this issue within the SPRs and MMs.

Critical infrastructure/forest health undefined. The project manager may dismiss BIO-2 if a proposed project is not deemed necessary to protect "critical infrastructure" or "forest health." Neither term is defined, therefore a project can be approved that destroys valuable, old-growth chaparral because again, the DPEIR does not provide the necessary guidelines.

Projects causing significant environmental harm are not speculative. One such project occurred July 4, 2013 when Cal Fire conducted a prescribed burn in the San Felipe Valley Wildlife Area, San Diego County. The approximately 100-acre fire escaped and burned 2,781 acres, causing significant damage to an old-growth stand of rare desert chaparral in addition to other plant communities.

Cal Fire's partial justification for the project was that it would provide "indirect community protection to Julian and Shelter Valley." This justification was erroneous. Julian is 4.5 miles distant to the project location and 2,000 feet higher in elevation. Shelter Valley is 6 miles distant with extremely light, arid vegetation between it and the project. The project also violated the land management plan for the site and was out of prescription when ignited (CCI 2013).

Clear, unambiguous definitions are required to prevent this type of incident from occurring again. In addition, it would be helpful if the San Felipe escaped burn could be highlighted in a case study to help managers avoid similar situations rather than using case studies that merely confirm the Board's preferred program.

> **Preventing type-conversion unspecified**. There are no guidelines on how to prevent the type conversion of native shrublands within the MMs. Since it is not the instant conversion of shrublands to non-native grasslands, but typically a gradual process, guidelines should be established to assist project managers to recognize the native shrubland's condition. Type-conversion in shrublands begins with the loss of biodiversity by the elimination of obligate seeding shrubs leading to a combination of resprouting shrubs and native sage scrub species or resprouters and alien grasses (Halsey and Syphard 2015). While still appearing to be "chaparral" to the casual observer, it is in fact a seriously compromised habitat.

BIO-2 is a prime example of how the DPEIR allows the project manager to make subjective decisions that may cause significant impacts without a reasonable opportunity for mitigation or independent oversight to assist in preventing such environmental harm.

Suggested Improvements to the Program to Reduce Fire Risk

- Reduce fire risk from the house out -

We are aware that the Board prefers to only deal with vegetation management, but if such a strategy does not protect lives and property during wind-driven fires, what is the point?

The Board and Cal Fire should stop focusing on modifying fuels in order to try to control wildfires and focus instead on saving lives and property by focusing directly on communities. The science is overwhelming in support of this approach. Schoennagel et al. (2017) offers some compelling options that will help us move in this direction:

> The majority of home building on fire-prone lands occurs in large part because incentives are misaligned, where risks are taken by homeowners and communities but others bear much of the cost if things go wrong. Therefore, getting incentives right is essential, with negative financial consequences for land-management decisions that increase risk and positive financial rewards for decisions that reduce risk. For example, shifting more of the wildfire protection cost and responsibility from federal to state, local, and private jurisdictions would better align wildfire risk with responsibility and provide meaningful incentives to reduce fire hazards and vulnerability before wildfires occur. Currently, much of the responsibility and financial burden for community protection from wildfire falls on public land-management agencies. This arrangement developed at a time when few residential communities were embedded in fire-prone areas. Land-management agencies cannot continue to protect vulnerable residential communities in a densifying and expanding WUI that faces more wildfire (Moritz et al. 2014).
>
> Providing incentives for counties, communities, and homeowners to plan fire-safe residential development for both existing and new homes and discouraging new development on fire-prone lands will make communities safer (Calkin et al. 2014; Abrams et al. 2015; Syphard et al. 2013; Alexandre et al. 2016).

Changing incentives require policy changes, but such changes are achievable if properly organized. An example is requiring approving, local entities in charge of development (cities, counties) to assume responsibility for future losses due to wildfire and issue Fire Development Bonds for any development approved in a Very High Fire Hazard zone. These Bonds would be funded by a significant portion of the tax revenue that is generated by said development and the developer of the property. Residents could be responsible for a small portion of the Fire Development Bond as well. The bonds would be used to help pay for any damage caused by a future wildfire.

Such an approach would internalize the costs of fire hazards instead of forcing society to shoulder the burden. The ultimate goal would be to make development in Very High Fire Hazard zones prohibitively expensive.

All homes already within VHFH zones should be required to retrofit to improve fire safety within 20 years, similar to the code passed by the City of Los Angeles in 2016 to retrofit older buildings for earthquake safety.

A retrofit that is not typically used in California, but used effectively in Australia and Canada is external sprinklers (Mitchell 2005). Such an approach is uncommon because traditionally home fires started inside, hence the use of internal fire sprinklers. However, internal sprinklers are designed to save lives, not homes (Fig. 11 below).

External sprinklers, coupled with an independent water supply (swimming pool or water tank), should be required for all homes within very high fire hazard zones. Clusters of homes could be served by a community water tank that should be a requirement for every planned development.

Many residents have taken it upon themselves to retrofit their own homes with external sprinkler systems. Under-eave misters on the Conniry/Beasley home played a critical role in allowing the structure to survive the 2003 Cedar Fire in San Diego County. The home was located in a canyon where many homes and lives were lost to the flames (Conniry 2008).

Figure 11. External sprinklers. As a wildfire approaches, external sprinklers wet the structure at risk, the surrounding environment, and increase the local humidity to prevent ignition. Photo: A conference center in New South Wales, Australia.

The Current DPEIR

If the intent is to maximize the impact of the VTP in terms of saving lives, property, and natural resources it needs to focus directly on the WUI. **Alternative A comes closest to this approach, however the 1.5-mile distance for the WUI needs to be drastically reduced and based on scientific research.**

This alternative also needs to be rewritten to emphasize the reduction of fire risk by using “from the house out” approach (as discussed above) – proper land planning, reducing home flammability, properly maintained defensible space, community fire safe retrofits (e.g. external sprinklers, ember-resistant vents, ignition resistant internal framing), then strategic fuel treatments within 1,000 feet of a community if needed.

Many county fire programs support “from the house out” concept. Cal Fire promotes this strategy too, and has since at least 2007.
http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_faqs#gen01

We urge the Board to reconfigure the DPEIR so that it incorporates the entire fire risk reduction equation, not just vegetation management. Additional suggestions on how to do so, and examples of programs that have worked, can be found in Appendix D: An Appeal to California's Fire Agencies.

Other recommended improvements to the DPEIR include:

- Detail impacts. Examine possible direct and cumulative impacts and develop legally adequate mitigations for those impacts as required by CEQA.

- Recognize all chaparral as potentially threatened. Chaparral in the central and northern part of the state will likely be threatened by higher fire frequencies as the climate continues to change. There is no ecological rationale for fuel treatments in shrub dominated ecosystems in northern or southern California.

- Define terms. Define all terms utilized in the text needed to ensure consistency in use such as critical infrastructure, forest health, etc.

- WUI distance. Establish a reasonable distance for the WUI by using science rather than anecdotal information.

- **Redefine the WUI.** Redefine the WUI to include the social environment as well as the physical. "From a management perspective this approach suggests that decision-makers pay greater attention to the systemic causes of change, risk, and vulnerability – factors that are quite often implicated in policies promoting increased wealth and profit opportunities for stakeholder in urban and exurban settings" (Simon 2017).

- Redefine defensible space. The present definition includes the term clearing, implying that defensible space should be clear of all vegetation. Creating large areas of clearance with little or no vegetation creates a **"bowling alley" for embers**. Without the interference of thinned, lightly irrigated vegetation, the house becomes the perfect ember catcher. In addition, when a fire front hits a bare fuel break or clearance area, a shower of embers is often released (Koo et al. 2012).

- Research support for conclusions. Conclusions in a DPEIR need to be supported by research, not by employing the Fallacy of Authority.

- Maintain consistency and research quality. Eliminate contradictions, errors in citations, and inconsistencies throughout the document.

- Consultation on chaparral treatments. All projects involving old-growth chaparral (in excess of 60 years from the last fire) should be developed in consultation and in agreement with the California Native Plant Society as was previously indicated in the prior DPEIR.

- Account for biodiversity in chaparral. Incorporate into the cumulative impact analysis how biodiversity may be impacted by the Program. See Halsey and Keeley (2016).

- Increase transparency. Develop a web-based public notification process for projects similar to the US Forest Service SOPA website. For example: http://www.fs.fed.us/sopa/forest-level.php?110502

- Plan for the future. Base project need, selection, and treatment approach, on projected climate change scenarios, not past, anecdotal experiences.

- Reassess the efficacy of back country fuel modifications.

- Proper account of carbon sequestration. Recalculate the potential increase in atmospheric carbon from the proposed program to account for the loss of below ground carbon sequestration in healthy chaparral communities due fuel treatments. The assumption in the DPEIR that the proposed program will have no significant impact on atmospheric carbon is based on incomplete calculations.

With the impacts of human-caused climate change accumulating much faster than even the most severe predictions, it is imperative that every policy we implement from here on out must honestly and exhaustively examine how such policy can facilitate the reduction of carbon in the atmosphere and the protection of what natural environment remains.

The current DPEIR fails to do so.

The DPEIR assumes all the projects will work out properly and treated plant communities will not type convert to low carbon sequestering grasslands because of the Program's project requirements. These requirements are legally inadequate and unenforceable.

The DPEIR fails to account for the loss of underground carbon storage with the concomitant loss of above ground shrub cover in shrublands, an important carbon sink (Jenerette and Chatterjee 2012, Luo 2007). The DPEIR also fails to address the research that has shown vegetation treatments often release more carbon than wildfires (Mitchell 2015, Law et al. 2013, Meigs et al. 2009).

By using assumptions based on anecdotal evidence and focusing on the short term (such as how to reduce flame lengths, remove dead trees, or increase the number of clearance projects), the DPEIR will likely exacerbate climate impacts, increase the loss of habitat, and fail to adequately accomplish its primary goal – protecting life and property from wildfires.

A final note.

At the May 25, 2016 California Fire Service Task Force on Climate Impacts, members of the task force were discussing changes that still needed to be accomplished to improve California's response to wildfires.

Orange County Fire Chief Jeff Bowman spoke up and distributed an After Action Report concerning the Southern California Wildfire Siege. He pointed out that its 95 recommendations for improving future responses to major fire incidents were nearly identical to those recommended by the Governor's Blue Ribbon Fire Commission after the 2003 wildfires.

Chief Bowman then asked everyone in the meeting to look at the date of the After Action Report. It was 1993, ten years prior to the Blue Ribbon Commission recommendations.

In 2018, we are still discussing.

We are hopeful the Board and Cal Fire will help change the conversation about how we address wildfire risk, improve the DPEIR so that it addresses how to save lives, property, and habitat, and turns to fire science for help in doing so.

Sincerely,

Richard W. Halsey, Director
California Chaparral Institute

Kathryn Phillips
Sierra Club California

Dan Silver, Executive Director
Endangered Habitats League

Jeff Kuyper
Los Padres ForestWatch

Marily Woodhouse, Director
Battle Creek Alliance

Michael Welborn, President
Friends of Harbors, Beaches and Parks

Jim Wells

Susan A. Robinson
Ebbetts Pass Forest Watch

Brian Nowicki
Center for Biological Diversity

Ara Marderosian
Sequoia ForestKeeper

Dan McCarter, Vice President
Urban Creeks Council

Rob DiPerna
Environmental Protection Information Ctr

Attachments:

Appendix A. Understanding the Relationship between Fire/Chaparral - K.J. Lombardo
Appendix B. CCI letter of October 27, 2015
Appendix C. Ember Behavior: Why the 1.5-mile WUI is Excessive
Appendix D. An Appeal to California's Fire Agencies
Appendix E. CCI letter of May 24, 2016

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Appendix C

Ember Behavior: Why the 1.5 mile WUI is Excessive

The likelihood of an ember travelling 1.5 miles from a flaming front and igniting any single given house (or any other given small, discretely located type of potential receptive fuel) downwind is likely quite small. However, ignition by a single ember is usually not how most houses burn down.

If a structure lies downwind of a weather-driven wildfire, chances are excellent that a large number of shorter range embers will ignite everything that can burn between here and there, creating more embers all along the way, and allowing the head fire to blow hopscotch over, across, and through just about anything to reach that house. The collective fire spreading effect of all the embers makes the head fire's downwind progress all but unstoppable while the fire weather lasts.

Tracked in real time, the instantaneous rates of ember production and subsequent transport by turbulent, gusty winds must be very transient and highly dynamic. In general, averaged over time, it is likely most embers fall near the flaming front in a decay curve as you move further and further downwind of the instantaneous location of any flaming front. At 1.5 miles, the tail of the decay curve is likely quite small. Chances are a structure will burn when the flaming front is close and the site is under the “thicker” part of that ember distribution curve.

The rationale for fuel treatments in areas a long way upwind of a community is that they will produce some additional fire safety even if they can't stop the fire because they will reduce the density of embers falling on a structure or community. **Such a claim is conjectural at best.**

Since fires produce embers by the millions, and ignition probabilities likely approach 100% in very dry fire weather, it is not at all clear what value reducing ember density might actually have in protecting structures or helping firefighters reduce fire spread.

We are unaware of any recorded quantitative data on ember density-by-distance.

Firefighter experience and the research have shown that weather-driven wildfires tend to spread across landscapes with very little regard to fuel type, or age (Mortiz et al. 2004). This spread is mostly through a large number of separate spotting events that start a large number of new fires running out ahead of any fire's flaming front. If structures are in the way, then fire will spread up to them, go over, and around them, and then move on downwind.

Like the onset of a coming rainstorm, at a given location one might experience a single ember, then another, then two, then more and more, until the main flaming front comes through and the ember density gets heavy. Ember density will decline as the fire passes by and continues downwind.

Once there is a modest amount of defensible space around a structure to make the surface fire stop short of direct flame impingement (varies with terrain, often no more than 30ft) and to prevent ignition by radiant heating (100ft max), and to be safe in case of potential turbulent convective heating so firefighters can feel safe enough to stay and defend (up to 150ft?), then it's all about ember ignition. Whether any given structure burns or not has everything to do with **how receptive it is to ignition by windborne embers** when that unstoppable fire comes through.

That NIST report on structure loss during the 2007 Witch Creek Fire, and much of their subsequent work, documents very clearly that lots of structures with good defensible space of up to 100 or more feet can and do get ignited by embers. Firefighters or civilians onsite defending a structure do so primarily by extinguishing spot fires on and in the structure before they can get big.

http://www.nist.gov/el/fire_research/wildland/project_wui_data.cfm

http://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.1796.pdf

This is exactly why risk reduction must work from the “house out.” All fire science points to this. Many county fire programs support this concept as well. Cal Fire promotes the "house out" strategy too, and has since at least 2007.

http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_faqs#gen01

Unfortunately, vegetation management gets the primary focus (please see Appendix B: An Appeal to California’s Fire Agencies).

Fire agencies, firefighters, fire scientists, and environmental groups are on the same page about this. What we've been fighting about all these years are questions about the efficacy of doing anything to “fuels” beyond the home ignition zone and beyond the largest plausible defensible space buffer.

The WUI as a concept should be determined by fire operation concerns of fighting fire at the edge of town. So WUI as a concept is all about defensible space and how much of that do we need.

USFS fire scientist Jack Cohen has clearly demonstrated that about 100ft is all any structure needs to avoid ignition by radiant heating from even the hottest wildfire on flat ground with little wind. Add those factors drive heat and convection horizontally and more space will be needed.

Let’s assume for discussion that a 300 ft defensible space would be desirable for doing point protection versus long, completely sideways flames that might be expected in the very most hazardous fire terrain imaginable. Three hundred feet of defensible space would be very excessive in all but the most pathological cases of structures built in terrain where no one should be living and no firefighters should be asked to make a stand against fire.

Three hundred feet is only 5% of the way to the 8,000ft (=1.5miles) that the DPEIR currently proposes everywhere.

So the 1.5 mile definition of WUI everywhere is excessive.

Ember travel distance

As far as we know, the longest distance spotting event documented in fire literature occurred on Feb 7, 2009 ("Black Saturday") during the 2009 Victoria, Australia firestorms. Spot fire ignitions from Bunyip Park were documented at 20km (approx 12 miles).

Below are two annotated references concerning that event and another from the recent Fort McMurray Fire in Alberta, Canada.

Campbell, Peter. 2010. 2009 Victorian bushfires.
Greenlivingpedia.org
http://www.greenlivingpedia.org/2009_Victorian_bushfires

Local weather stations on "Black Saturday" 2/7/2009 recorded sustained winds of approximately 30mph blowing nonstop from the N and NW for about 12 hours during the worst of the fires. The winds reversed direction during the course of the incident, blowing from the SE. This would be quite typical for a major Santa Ana wind event in southern California. In fact, Santa Ana winds often blow even stronger than this. The duration and the reversal are also typical of Santa Ana winds.

Daily high temperature was a record-setting 46.4degC (114degF). Relative humidity was as low as 5%. This is a higher temperature than we are ever likely to see in southern California, but our relative humidity often goes lower than this (to near zero) during our worst fire weather.

The area of Victoria State, Australia, had gone for a record-setting 38 days without any rain. Southern California's seasonal drought is commonly 5-6 months.

Widespread and very long distance spotting was observed. Fire spread rates of up to 100km/hr (62 miles/hr) were observed. Fire spread through all types of land cover, including farmland, and forests where extensive fuel modification by Rx burning had been performed for fire safety. Fire officials emphasized that this fire was driven primarily by weather, not fuels.

The main fire at Bunyip Park was started by lightning. Several other fires in the area were confirmed or suspected to be arson.

Egan, Carmel and Steve Holland. 2009. Inferno terrorizes communities as it rages out of control. The Age, Feb 8, 2009.
http://www.theage.com.au/national/inferno-terrorises-communities-as-it-rages-out-of-control-20090207-80fw.html

> *The Bunyip Ridge inferno lived up to its menacing threat yesterday, bearing down on one tiny Gippsland community after another and forcing firefighters to retreat ahead of its towering fire head.*
>
> *More than 300 firefighters battled the three-kilometre-wide fire front before being forced to pull back as it made its run out of the state forest around 4pm towards the*

villages and towns of Labertouche, Tonimbuk, Longwarry, Drouin and Jindivick.

By 6pm, fanned by gale-force north-westerly winds, it had burnt 2400 hectares of forest and farmland and unknown numbers of homes and outbuildings.

Flaming embers started spot fires up to 20 kilometres to the south and threatened homes as far away as Warragul.

Ha, Tu Thanh. 2016. The perfect storm of conditions: here's how the blaze reached Fort McMurray, and why it spread so fast. The Globe and Mail. http://www.theglobeandmail.com/news/alberta/albertas-highway-of-fire/article29863650/

The fire that jumped over the Athabasca River was a spot fire, Mr. Schmitte said.

Mr. Burnett said he had seen situations where spotting enabled a forest fire to leap eight to 10 kilometres ahead of its main line.

Spot fires are also troublesome when they are near urban areas, he said, because embers ignite rooftops or rain gutters clogged with dead leaves and pine needles.

Cited Reference

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Appendix D

The 2017 Appeal to Planning and Fire Agencies After the Devastating Napa/Sonoma Wildfires

Emphasizing home flammability, fire safe land planning and the value of nature can save more homes during wildfires and help create healthier communities

In light of the devastating Napa/Sonoma wildfires, planning and fire agencies are urged to expand their approach to reduce loss of life and property to wildfires.

Currently, the primary message citizens hear is to clear native vegetation ("fuel") from around their homes. While creating defensible space is a critical component of fire risk reduction, it fails to address the main reason homes burn - embers landing on flammable materials in, on, or around the home, igniting the most dangerous concentration of fuel available, the house itself.

In addition, by designating native habitat as merely “fuel,” citizens are encouraged to see nature as something dangerous rather than a valuable part of their local community. **Intact natural habitat provides vital ecosystem services** that are necessary to maintain the health and well-being of surrounding human communities**.**

Fire risk reduction efforts must emphasize BOTH how to reduce home flammability and how to create defensible space without blaming nature. **Many homeowners have complied with defensible space regulations only to see their homes burn in a wildfire.**

Public education materials must make clear that without addressing the entire fire risk reduction equation your home has a greater chance of burning in a wildfire. This includes creating defensible space AND retrofitting flammable portions of homes such as,
- the replacement of wood shake roofing and siding
- installation of ember resistant attic vents
- removal of flammable landscaping plants such as Mexican fan palms and low-growing acacia
- removal of leaf litter from gutters and roofing
- removal of flammable materials near the home such as firewood, trash cans, wood fences, etc.
- roof/under eave low-flow exterior sprinklers

It also must be made clear to homeowners that by having well maintained and lightly irrigated vegetation within the outer 70 foot portion of the 100 foot defensible space zone can play an important role in protecting the home from flying embers and radiant heat. Bare earth clearance **creates a bowling alley for embers** and can actually increase fire risk if invaded by flammable, non-native weeds. In addition, research has shown that there is **no additional structure protection provided by clearing beyond 100 feet**, even on steep slopes, and the most important treatment zone is from 16-58 feet.

Applicable fire research and a comprehensive approach to home protection can be found here: http://www.californiachaparral.org/bprotectingyourhome.html

Mountain communities learning to use federal grants to install ember-resistant vents and eliminate wood roofs, vital to reducing home loss during wildfires

David Yegge, a fire official with the Big Bear Fire Department, is about to submit his fourth grant proposal to the FEMA pre-disaster mitigation grant program to pay up to 70% of the cost of re-roofing homes with fire-safe materials in the Big Bear area of San Bernardino County. Yegge has also assisted the towns of Idyllwild and Lake Tahoe to do the same. The grant includes the installation of non-ember intrusion attic vents.

Yegge's first grant was for $1.3 million in 2008. He identified 525 wooden-roofed homes in need of retrofits in the community of Big Bear Lake. Only 67 remain. Helping to push homeowners to take advantage of the program is a forward-thinking, "no-shake-roof" ordinance passed by the Big Bear City Council in 2008 requiring roofing retrofits of all homes by this year. San Bernardino County passed a similar ordinance in 2009 for all mountain communities. Homeowners have until next year to comply. Such "future effect clause" ordinances can be models for other local governments that have jurisdiction over high fire hazard areas. "The California Legislature should adopt such an approach and Cal Fire should incorporate such retrofit programs into its new Vegetation Treatment Program," Halsey said.

In order to qualify for the FEMA grant, a cost/benefit analysis must be completed. "Our analysis indicated that $9.68 million would be saved in property loss for every $1 million awarded in grant funds," Yegge said. "FEMA couldn't believe the numbers until they saw the research conducted by then Cal Fire Assistant Chief Ethan Foote in the 1990s. There's a 51% reduction in risk by removing wooden roofs."

"The FEMA application process is challenging, but well worth it," said Edwina Scott, Executive Director of the Idyllwild Mountain Communities Fire Safe Council. "More than 120 Idyllwild homes are now safer because of the re-roofing program."

Additional Information

In California, the state agency that manages the grants is the Governor's Office of Emergency Services (Cal OES), Hazard Mitigation Grants Division. Cal OES is the go between agency and they decide what grants get funded based upon priority established by the State Hazard Mitigation Plan.

The Mountain Area Safety Taskforce re-roofing program:
http://www.thinisin.org/shake/

The San Bernardino County re-roofing ordinance:
http://www.thinisin.org/shake/images/DOWNLOADS/ORDINANCES/ord_4059.pdf

FEMA grant program:
http://www.fema.gov/pre-disaster-mitigation-grant-program