



The Honorable Governor Edmund G. “Jerry” Brown  
 State Capitol Building  
 Sacramento, CA 95814

**Re: Fire Response**

May 16, 2018

Dear Governor Brown,

We have reviewed your May 10, 2018, Executive Order on forests and fire. We are writing to urge you to develop a response to our increasingly flammable environment by **focusing on the factors that led to the loss of so many lives and homes in the 2017 wildfires, not on forests far from our communities most at risk.**

The current focus on dead trees in forests is especially misguided because all of the wildfires most devastating to communities in California had nothing to do with such forests. And while it is reasonable to remove hazard trees immediately adjacent to roads and homes, it makes no sense to spend millions of dollars to treat entire forests while the actual fire threat facing thousands of families occurs very far away from these forests.

We urge you to break from the conventions that have led to the current crisis and to turn California toward a more rational and effective response to the threat of wildfire. What we have been doing, trying to control the natural environment, is not working.

While large, wind-driven, high-intensity wildfires and post-fire debris flows are an inevitable part of California, the devastation to our lives and communities is not inevitable. We can choose to reject the predominant view that there is little we can do to stop the destruction to communities caused by wind-driven fires, but it will **require a significant change in thinking.**

Part of that change in thinking requires us to realize that the unacceptable loss of nearly 10,000 structures and 45 lives in the 2017 wildfires and the losses caused by the 2018 Montecito debris

flow **have little to nothing to do with forests or the treatment of wildland habitat.** Most of these losses resulted from building flammable homes on flammable terrain, not the condition of the surrounding natural environment.

The current approach sees nature as the “fuel.” Eliminate the “fuel,” the thinking goes, and we can control the fires. Consequently, millions of dollars are spent clearing habitat and removing dead trees. The focus on fuel has become so powerful that some incorrectly view *all* of our forests, native shrublands, and even grasslands as “overgrown” tangles ready to ignite, instead of valuable natural resources. As evidenced by the 2017 wildfires, the wildland fuel approach is failing us.

We must look at the problem from the house outward, rather than from the wildland in. The state must take a larger role in regulating development to prevent local agencies from ignoring known wildfire risks as the city of Santa Rosa ignored with the approval of the Fountaingrove community in the 1990s (Fig. 1). The state should support retrofitting homes with proven safety features that reduce flammability – external sprinklers, ember-resistant vents, fire-resistant roofing and siding – and focus vegetation management on the immediate 100 feet surrounding homes.



**Figure 1.** The devastation of the Fountaingrove II community in Santa Rosa during the 2017 Tubbs Fire was predictable. The city was warned this area was too dangerous to place homes. The area had burned in a wind-driven fire in 1964. In 2001, the city’s planning division issued a report concluding the development did not properly follow the city’s general plan’s goals and policies (Regalia et al. 2001).

**We must address the conditions that are actually causing so many lost lives and homes: wind-driven wildfires and the embers they produce that ignite flammable structures placed in harm's way.** We have provided a list of recommendations below that will help us do so.

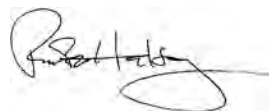
As we incorporate this new way of thinking into our wildfire response, we must also endeavor to implement the changes we seek.

After the 2007 wildfires in southern California, former San Diego Fire Chief Jeff Bowman and others formed the San Diego Regional Fire Safety Forum. Chief Bowman introduced the Forum during a press conference on February 19, 2008, by dropping a large stack of fire task force documents from previous decades on the podium, documents filled with unrealized recommendations.

Eight years later, during the May 25, 2016, meeting of the California Fire Service Task Force on Climate Impacts, Chief Bowman distributed the After Action Report for the 1993 Southern California Wildfire Siege. As he did after the 2007 fires, he pointed out that the report's 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. Again, most of those recommendations remain unrealized.

We urge you to break with the conventions that have led to the crisis and focus fire risk reduction efforts where it matters most – directly on our homes and communities, not forests far from where most of us live. This will allow us to tailor fire policy to the needs of our families most at risk.

Sincerely,



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John Muir Project  
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Los Padres ForestWatch

Frank Landis  
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Sequoia ForestKeeper

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Santa Barbara Urban Creeks  
Council

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Network

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Ecologist/Author

## Recommendations

**1. Shift the focus** to saving lives, property, and natural habitats rather than trying to control wildfires. These are two different goals with two radically different solutions. This new focus can help existing communities withstand wind-driven wildfires, and improve alerts and evacuation procedures and programs, instead of continually pouring resources into modifying a natural environment that continually grows back and will always be subject to wildfire (Moritz et al. 2014).

**2. Quantify all the risks, statewide.** Conduct a comprehensive examination of fire and debris flow hazards across the state. Require the use of fire hazard maps, post-fire debris flow maps, and local expertise to play a significant role in planning/development/zoning decisions. One of the primary objectives in land use planning should be to prevent developers and local planning departments from putting people in harm's way.

**3. Start at the structure first** when developing local plans to protect homes. Develop action plans in Community Wildfire Protection Plans (CWPPs), similar in scope and detail to those traditionally developed for vegetation treatments, that address the wildfire protection issue from the house outward, rather than from the wildland in. Require that Fire Safe Councils include structure and community retrofits as a significant portion of their activities. This approach has been endorsed by a strong consensus of fire scientists and is illustrated well in this National Fire Protection Association video with Dr. Jack Cohen: ([https://youtu.be/vL\\_syp1ZScM](https://youtu.be/vL_syp1ZScM)).

**4. Encourage retrofits.** Promote legislation on the state and local level to assist existing neighborhoods-at-risk in retrofitting homes with known safety features (e.g., *external* sprinklers, ember-resistant vents, replacing flammable roofing and siding with fire-resistant Class A material, etc.). Establish a tax rebate program, similar to the one used to promote the installation

of solar panels, to encourage homeowners to install such fire safety features. Provide incentives to roofing companies to develop and provide *external* sprinkler systems for homes.

**5. Identify all flammability risks.** Create and promote a fire safety checklist that encourages the complete evaluation of a home's vulnerability to wildfire. Beyond structure flammability, it is imperative that this list cover flammable conditions around the home, such as the presence of dangerous ornamental vegetation, under-eave wooden fences/yard debris, and flammable weeds.

**6. Help with grants.** Promote legislation on the state and local level to assist community Fire Safe Councils in acquiring FEMA pre-disaster grants to assist homeowners in retrofitting their homes to reduce their flammability.

**7. Comprehensive evacuation plans.** Promote the development of clear evacuation/response plans that all communities can understand. Promote programs that will dedicate a regular time each year for communities to practice their evacuation plans.

**8. Incentives to prevent building in high fire hazard zones.** Beyond restricting development in high fire/flood hazard areas, the state could also internalize the costs of fire protection so developers assume the responsibility for possible losses caused by future wildfires and post-fire debris flows. Creating incentives to reduce or prevent development in high fire/flood hazard areas is an achievable goal.

The City of Monrovia implemented another creative approach – creating a wider urban-wildland buffer by purchasing parcels in high fire hazard zones.

*Because the city's hillside acreage was both publicly and privately owned, the City Council decided to seek voter approval for two measures. The first designated city-owned foothill land as wilderness or recreational space and limited development on the private property. The other was a \$10-million bond, the revenues from which would be used to purchase building sites from willing sellers. Both passed by a wide margin. In the end, [Monrovia spent \\$24 million for 1,416 acres](#), paying off the bonds with parcel taxes and gaining an added benefit: a deeper urban-wildland buffer. (Miller 2018)*

**9. Science-based defensible space guidelines.** Expand defensible space guidelines so treatment and distances are based on science and recognize the physical impact of bare ground on ember movement, increased flammability due to the spread of invasive weeds, and increased erosion and sediment movement in watersheds. The research has clearly indicated that [defensible space distances beyond 100 feet can be counterproductive](#).

**10. Peer-reviewed Vegetation Treatment Program.** Require Cal Fire to submit its latest Vegetation Treatment Program Environmental Impact Report (EIR) to an outside, independent, science-based, peer-review process prior to its public release for public comment. Such a review was required by the state legislature for the 2012 version. Require Cal Fire to follow the recommendations offered by the independent review committee in both the EIR's supporting background information and proposed action plan.

**11. Establish an interdisciplinary, statewide Fire Preparedness Task Force (FPTF)** versed in Catastrophic Risk Management (CRM) to evaluate our response to wildfire hazard. CRM is

successful because it helps managers in high-risk organizations make better decisions by reducing their tendency to “normalize deviance,” engendering a focus on positive data about operations while ignoring contrary data or small signs of trouble. Airlines use CRM to objectively analyze plane crashes, thereby creating safer planes. Without CRM, small deviations from standard operating procedures are often tolerated until disasters, such as the Deepwater Horizon offshore oil platform blow out, the Challenger Space Shuttle explosion, or unprecedented losses caused by the 2017 wildfires expose an organization’s failures. Ensure that a majority of task force members can speak freely, enabling them to offer creative solutions, and that half of the membership is outside the fire profession.

**12. Reduce human-caused ignitions.** Since nearly all of California’s devastating wildfires are human-caused, significant resources should be dedicated to reducing such ignitions. One of the objectives of the **FPTF** should be to develop a statewide action plan, in collaboration with land management agencies, Cal Trans (since many ignitions occur along roads), Cal Fire, and public utilities (since many of the largest fires have been caused by electrical transmission lines), to reduce the potential for human-caused ignitions. The following suggestions should be considered: requiring the underground placement of electrical lines, placement of roadside barriers to reduce vehicle-caused sparks/ignition sources, closure of public lands during periods of extreme fire danger, and increasing the number of enforcement personnel to monitor illegal access, campfire, gun use, etc. on public lands.

#### **Additional Information:**

1. A thorough analysis of Cal Fire’s Vegetation Management Program:  
<http://www.californiachaparral.com/threatstochaparral/helpcalfireir.html>
2. Detailed research and proven strategies on how to protect communities from wildfire:  
<http://www.californiachaparral.com/bprotectingyourhome.html>
3. Successful grant programs that help communities retrofit structures to reduce flammability:  
<http://www.californiachaparral.com/fire/apleaitstheembers.html>
4. Detailed analysis on assumptions concerning the 2017 Napa/Sonoma wildfires.  
<https://californiachaparralblog.wordpress.com/2018/01/17/how-we-think-about-nature-and-fire/>

#### **Resources:**

**Diane Vaughan** (dv2146@columbia.edu)

Dept. of Sociology, Columbia University, specializing in how high-risk industries are prone to “normalizing deviance,” whereby managers focus on positive data about their operations and tune out contrary data/signs of trouble until disasters, such as the Deepwater Horizon offshore oil rig, the Challenger Space Shuttle, and the 2017 wildfires, necessitate a change in thinking.

**Max Moritz** (mmoritz@ucsb.edu)

College of Natural Resources, UC Berkeley, specializing in understanding the dynamics of fire regimes at relatively broad scales and applying this research to ecosystem management.

**Jeff Bowman**

Retired, former fire chief for the City of Anaheim, San Diego, and Orange County, specializing in developing and managing quality municipal fire organizations.

**Gregory L. Simon** (gregory.simon@ucdenver.edu)

Dept. of Geography & Environmental Sciences, University of Colorado, Denver, specializing in human-environment relations, environmental policy and governance, and how the inadequacy of the Wildland-Urban-Interface as a concept lies in its inability by itself to reveal the forces behind its own creation.

**Alexandra Syphard** (asyphard@consbio.org)

Senior Research Scientist, Conservation Biology Institute, specializing in landscape change that results from the interplay between human and natural disturbances, especially wildfire, climate, and urban growth, and with extensive focus on understanding fire risk to communities.

**Karlene Roberts** (karlene@haas.berkeley.edu)

Center for Catastrophic Risk Management, UC Berkeley, specializing in the design and management of high reliability organizations in which errors can have catastrophic consequences, but which are managed so well that errors infrequently occur.

**Carla D'Antonio** (carla.dantonio@lifesci.ucsb.edu)

Professor, Department of Ecology, Evolution and Marine Biology, University of California, Santa Barbara, specializing in understanding controls over variation in plant community change across landscapes and how the invasion of species affects ecosystem composition, structure, and functioning.

**Marti Witter** (Marti\_Witter@nps.gov)

Fire ecologist for the National Park Service and central and southern California coordinator for the California Fire Science Consortium, specializing in chaparral fire response and fire plans.

**Jon E. Keeley** (jon\_keeley@usgs.gov)

Senior Scientist, USGS, specializing in the ecological impacts of wildfires.

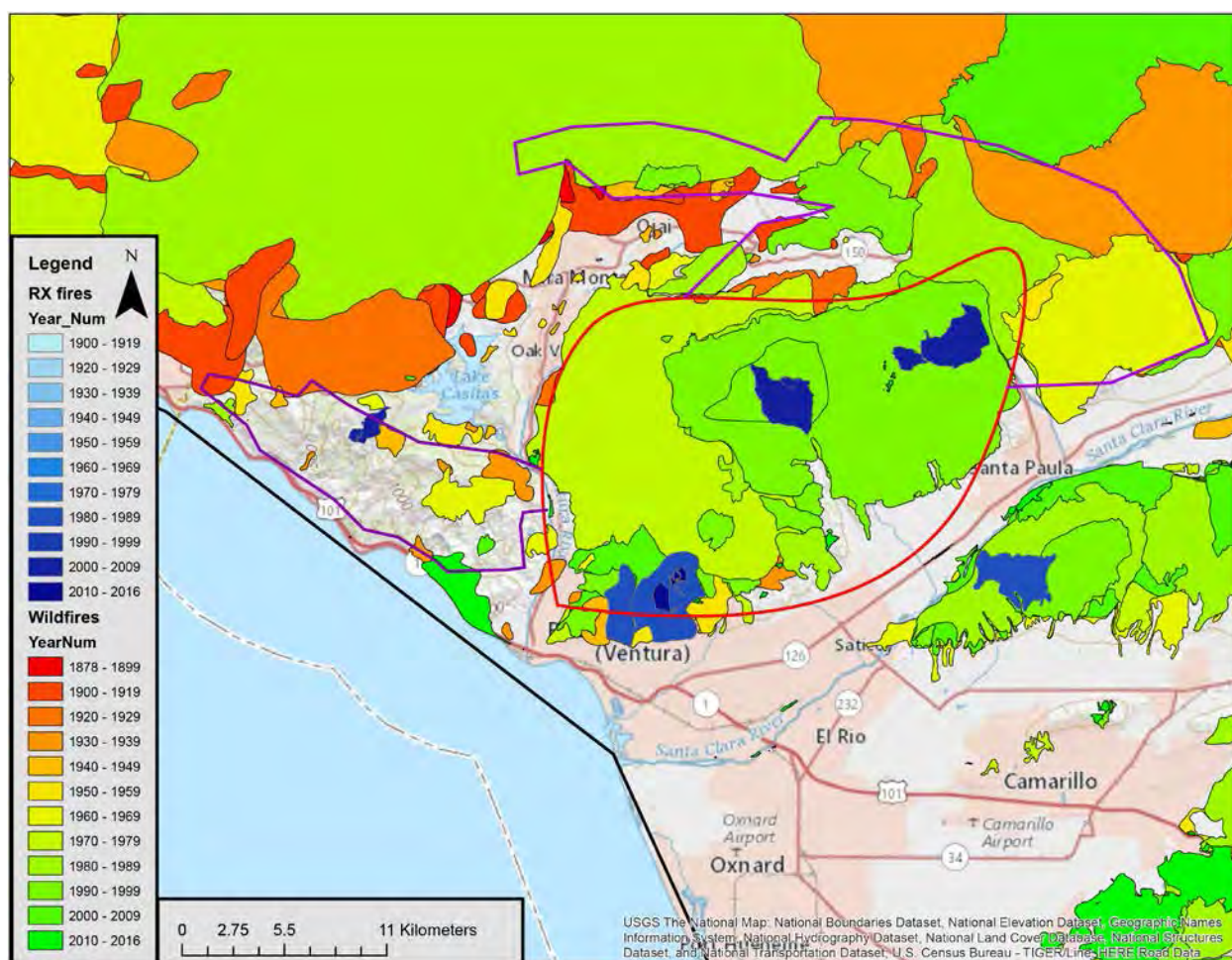
**Jack Cohen**

Retired, Research Physical Scientist, Missoula Fire Sciences Lab, US Forest Service, specializing in how wildland-urban fire disasters occur and how homes ignite during extreme wildfires.

# A Primer on Wildland Fire in California

**1. Fuel treatments are often ineffective in stopping wind-driven fires and can create more flammable conditions by type-converting native chaparral shrublands to highly-flammable, non-native weedy grasslands.**

There are dozens of anecdotal stories about fires stopping at previous fire scars. There is no doubt that happens. However, when assessing the use of scarce resources, government agencies must consider the cost/benefit of every action to ensure they are not spending money on efforts that are less effective than others.



**Figure 2. 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 2017 Thomas Fire during its first hours. Source: USGS.

As evidenced in Fig. 2, recent prescribed burn treatments (shown in blue) were not helpful in preventing the spread of the 2017 Thomas Fire.

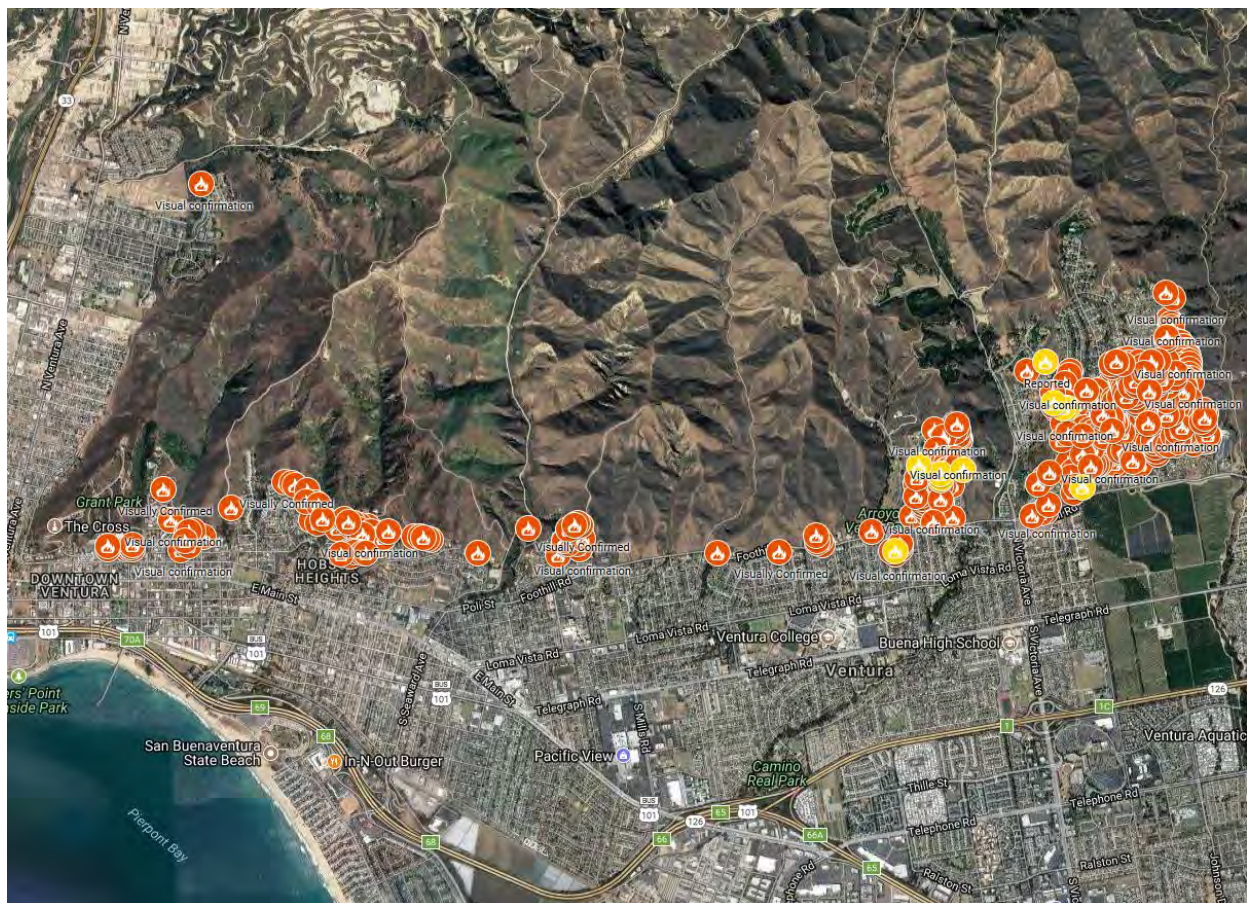


The easternmost prescribed burn in Fig. 2 is off Salt Marsh Road, downwind of the probable origin of the Thomas Fire. The middle burn is in Aliso Canyon. Neither of these appear to have provided anchor points for fire suppression activities.

The burns near the southern edge of the fire, in Hall, Barlow, and Sexton Canyons, have existed for many years and were intended to create opportunities for controlling a fire; however, they did little to stem fire spread.

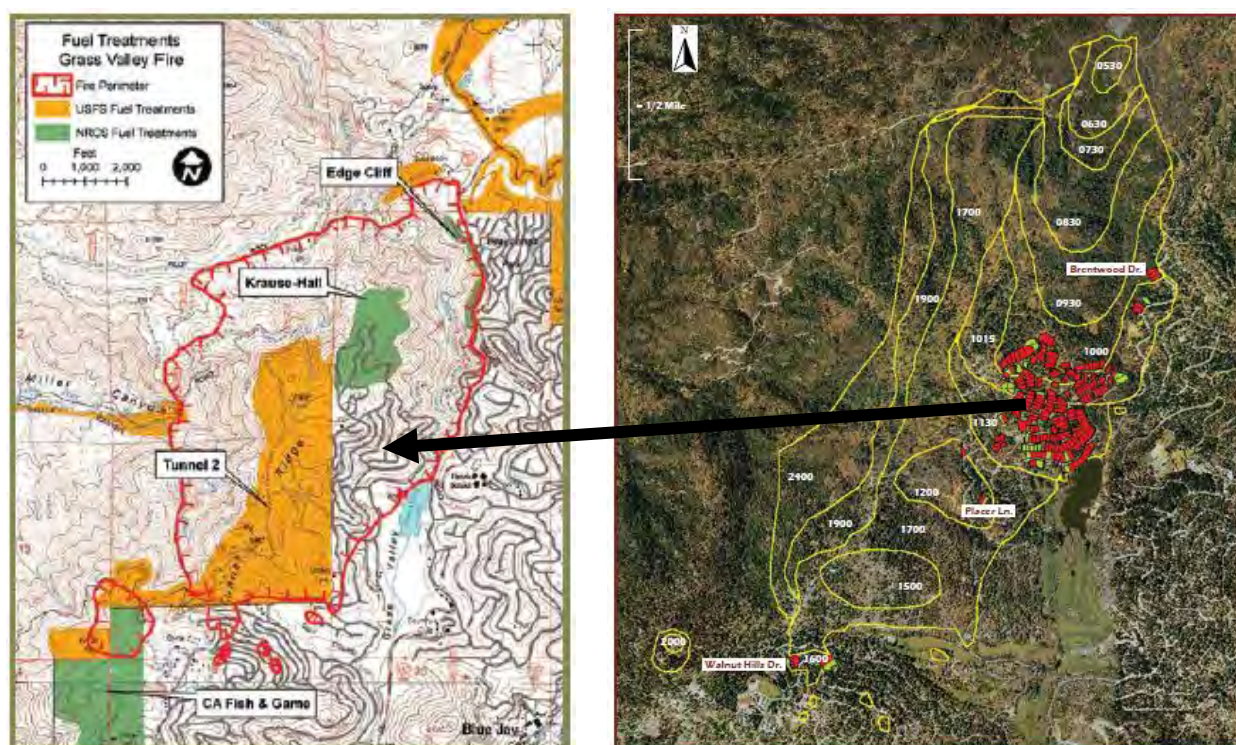
Initially, the head fire spread 14 miles from its origin outside of Santa Paula to downtown Ventura in about five hours, with spot fires ignited by embers along the entire way. This kind of fire behavior would likely defeat any fuel break.

Further research is needed to determine all the factors involved in the Thomas Fire's spread, but the consequences are clear from the damage assessment shown in Fig. 3 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 3. Home Losses from the Thomas Fire, 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-m7mBzbjvG1rjIj8wFAlbeG-F5VoKS&ll=34.2989948363656%2C-119.20525410881879>

In the 2007 Grass Valley Fire, the US Forest Service and the Natural Resource Conservation Service had created several fuel treatments in the forest (e.g., thinning trees, clearing understory shrubs) around the community of Lake Arrowhead (Fig. 4). 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: 174 homes were lost, the majority of structures in the hillside neighborhood of about 90 acres (Fig. 5).



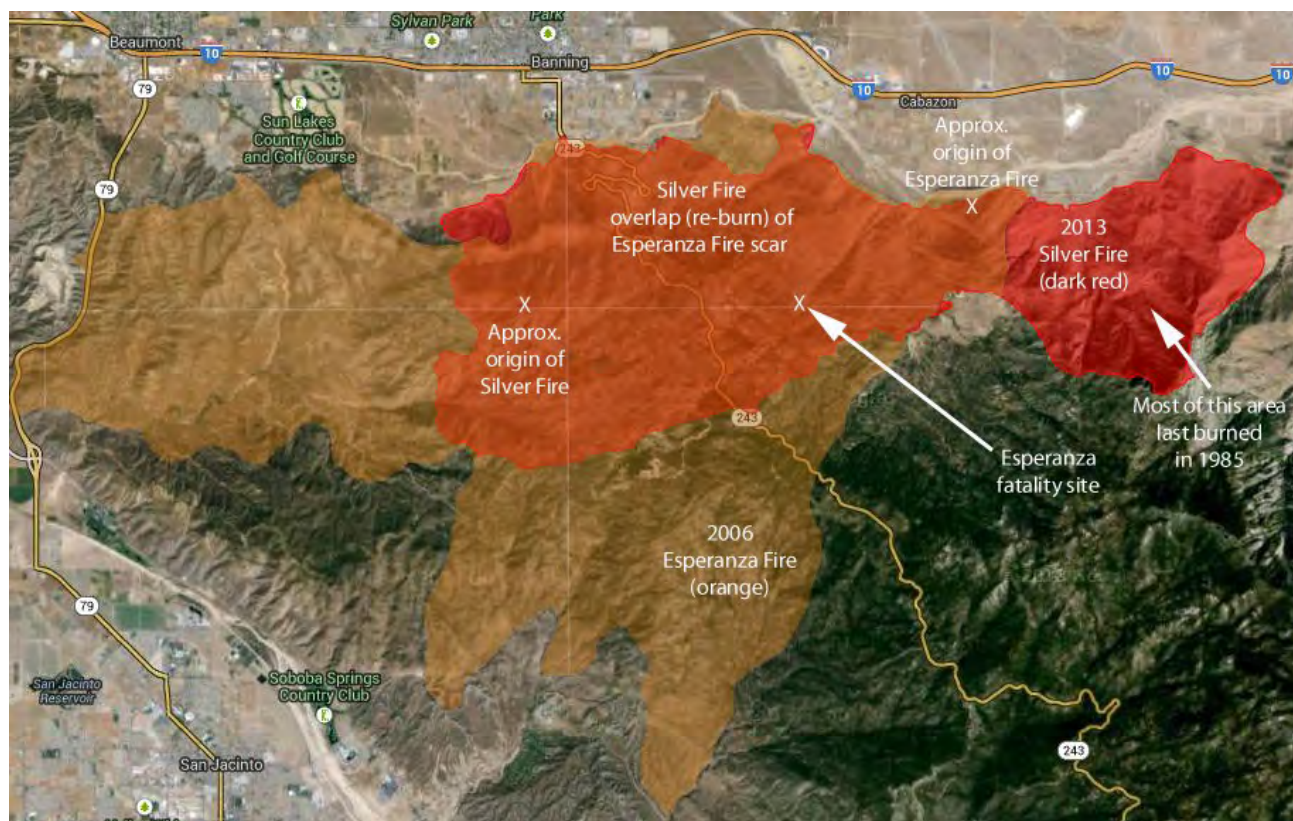
**Figures 4 and 5. The 2007 Grass Valley Fire, Lake Arrowhead, California.** Map on the left shows forest fuel treatments as orange and green polygons (Rogers et al. 2008). Map on the right shows location of 174 homes burned in the fire (Cohen and Stratton 2008).

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 (*Home Ignition Zone*) 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.

The 2013 Silver Fire near Banning, California (Fig. 6) challenged the fundamental assumption of 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 that killed five US Forest Service firefighters. **Twenty-six homes were lost in the 2013 fire that was fueled by seven-year-old vegetation.**



**Figure 6. Reburned After Seven Years.** The 2013 Silver Fire reburned almost entirely within the deadly 2006 Esperanza Fire scar near Banning, California.

There are numerous other examples and a number of solid research papers explaining why and how homes burn. Cohen and Stratton (2008) summarized information from these fires:

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

**We are not arguing whether fuel modification can be a tool that can help control non-wind-driven wildfires.** Under non-extreme fire weather conditions, fuel treatments can assist fire suppression efforts. But again, these are not the fires that cause the most damage to our communities. The nearly exclusive financial and time focus on fuel modification is failing us.

How else can we account for the loss of 45 lives and nearly 10,000 structures in wildfires from October to December 2017?

## 2. External Sprinklers

External sprinklers, a retrofit that has been employed effectively in Australia and Canada, are not typically used in California ([Mitchell 2005](#)). Although internal fire sprinklers certainly help save lives within homes, additional external sprinklers can save both lives and homes (Fig. 7 below).

External sprinklers, coupled with an independent water supply (swimming pool or water tank) and an independent power source should be required for all homes within very high fire hazard zones. Clusters of homes could be served by a community water tank and should be a required retrofit for communities already built in fire-prone areas. Each house should also be required to maintain a gas-powered pump to support the sprinkler system when regional power systems fail.

Many residents have retrofitted their homes with external sprinkler systems to protective effect. For example, 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 ([Conniry 2008](#)).



**Figure 7. 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.

### 3. FEMA Pre-disaster Grants

#### **Mountain communities can use federal grants to install ember-resistant vents and eliminate wood roofs, vital to reducing home loss during wildfires**

In 2013, David Yegge, a fire official with the Big Bear Fire Department, submitted 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 also has assisted Idyllwild and Lake Tahoe in applying for grants, including the costs of installing non-ember-intrusion attic vents.

Yegge's first \$1.3 million grant in 2008 retrofitted all but 67 of 525 wooden-roofed homes needing retrofits in Big Bear Lake. A forward-thinking, "no-shake-roof" ordinance passed by the Big Bear City Council in 2008 required roofing retrofits for all homes by this year. San Bernardino County passed a similar ordinance in 2009 for all mountain communities, with compliance required by next year. Such "future effect clause" ordinances can be models for other local governments that have jurisdiction over high fire hazard areas.

To qualify for a 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 administrative agency and decides what grant proposals are funded based on priorities established by the State Hazard Mitigation Plan.

The Mountain Area Safety Taskforce re-roofing program:

<http://www.thisisin.org/shake/>

The San Bernardino County re-roofing ordinance:

[http://www.thisisin.org/shake/images/DOWNLOADS/ORDINANCES/ord\\_4059.pdf](http://www.thisisin.org/shake/images/DOWNLOADS/ORDINANCES/ord_4059.pdf)

FEMA grant program:

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

#### 4. The Impact of Improper Vegetation Treatments/Clearance Activities

After investigating why homes burn in wildfires, research scientists Syphard et al. (2012) concluded, “We’re finding that geography is most important – where is the house located and where are houses placed on the landscape.”

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.

Buildings on steep slopes, in Santa Ana/sundowner wind corridors, and in low-density developments intermingled with wild lands had the highest probability of burning. **Nearby vegetation was not an important factor in home destruction.**

The authors also 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.

Creating large areas of clearance with little or no vegetation creates a **“bowling alley” for embers** (Fig. 8). Without the interference of thinned, lightly irrigated vegetation, the house becomes the perfect ember catcher. To make matters worse, when a fire front hits a bare fuel break or clearance area, a shower of embers is often released (Koo et al. 2012).



**Figure 8. Three-hundred Feet of Clearance.** Such bare ground can create a potential “bowling alley” effect, directing embers directly at the structure.

## 5. Excessive Fuel Treatments Can Destroy Native Habitats and Create More Flammable Landscapes

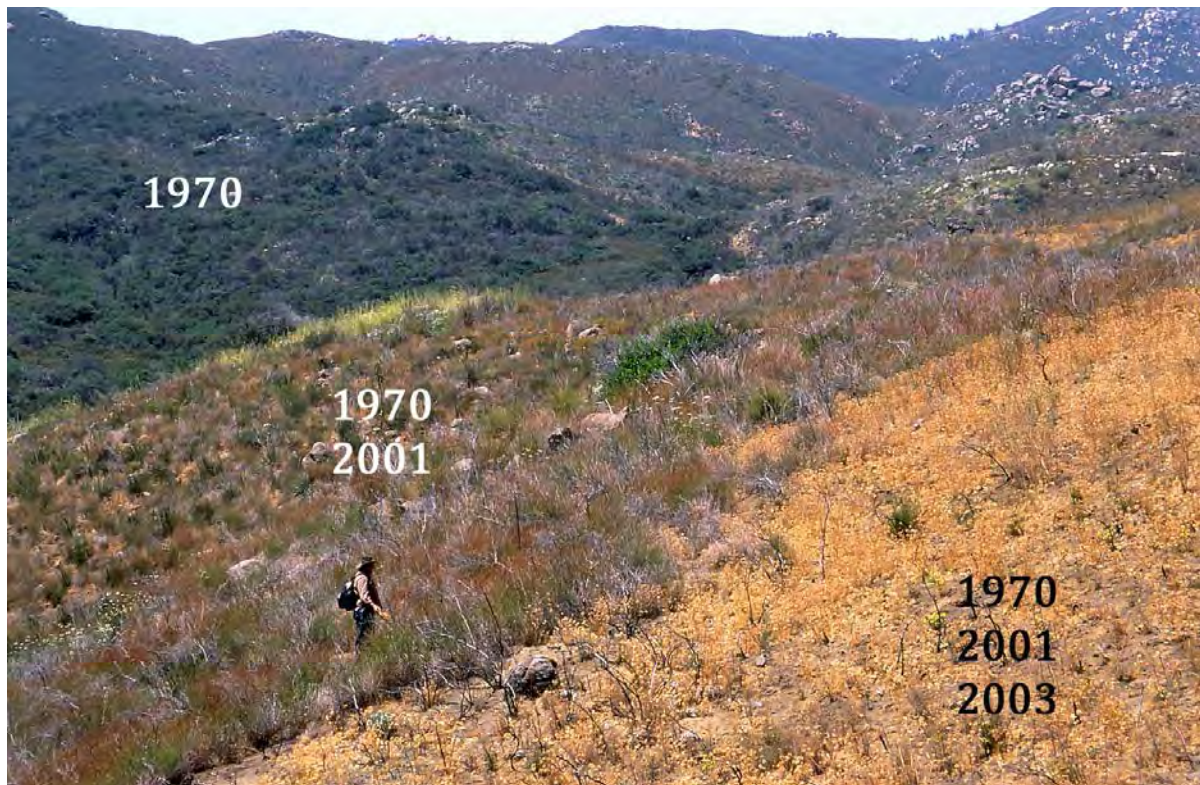
As shown in Fig. 9 below, a rich, old-growth stand of chaparral has been systematically compromised by clearance activities funded by a local Fire Safe chapter in the community of Painted Cave, Santa Barbara County. The foreground represents the impact of mastication, showing significant soil disturbance. In the background, the longer-term impact of earlier treatments shows 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. Since the focus of wildfire risk reduction has been on the surrounding landscape, comparably little has been done to reduce the flammability of the Painted Cave community itself.



**Figure 9.** The invasion of non-native weeds resulting from significant soil disturbance caused by an improper vegetation treatment project above the community of Painted Cave, Santa Barbara County.

## 6. Native Chaparral Shrublands Are Threatened by Too Much Fire

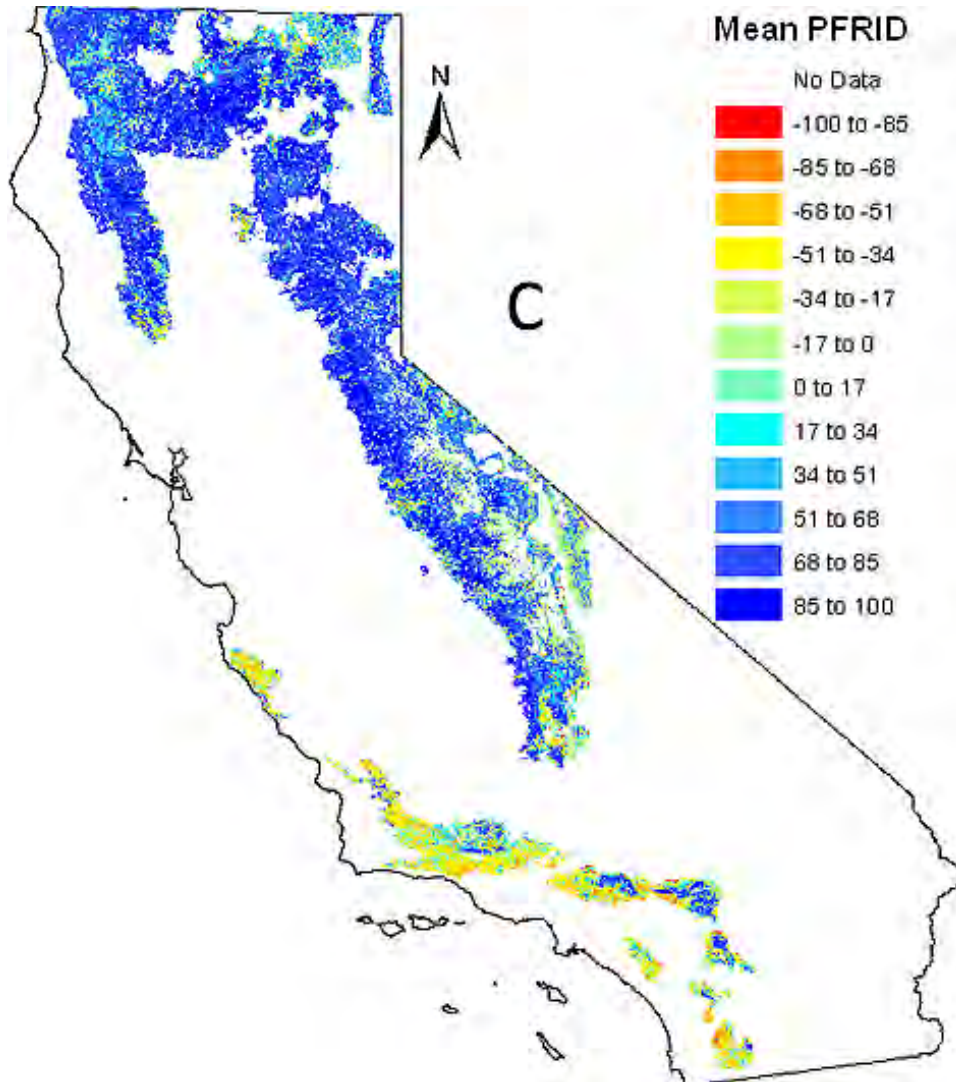
Chaparral is California's most extensive native plant community. However, its continued existence in many areas is threatened by the increasing number of fires. Fire frequency greater than the chaparral's natural fire return interval of 30 to 150 years or more can type convert chaparral to highly-flammable, non-native grasslands (Fig. 10). Such grasslands played a significant role in spreading the 2017 Tubbs, Nuns, Atlas, and Thomas fires.



**Figure 10. The Impact of Excessive Fire on Chaparral.** This area has been subjected to three wildfires. The first, the 1970 Laguna Fire, burned the entire area shown in the photograph. The far left shows mature chaparral that has grown since 1970. The middle area is recovering after being burned again in the 2001 Viejas Fire. It is composed primarily of native shrubs such as chamise, deerweed, and several other species. To the right is a portion that was burned a third time during the 2003 Cedar Fire. The interval between the 2001 and 2003 fires was too short for the chaparral to properly recover. Consequently, the majority of the resprouting shrubs were killed and the area was overwhelmed by non-native grasses. Since this photo was taken (2004), the area has been restudied in 2018. It remains compromised by non-native grasses, with significant areas of bare ground and lower biodiversity compared to the adjacent area burned in 2001. Location: east of Alpine off Interstate 8, San Diego County. From Halsey and Syphard (2015).

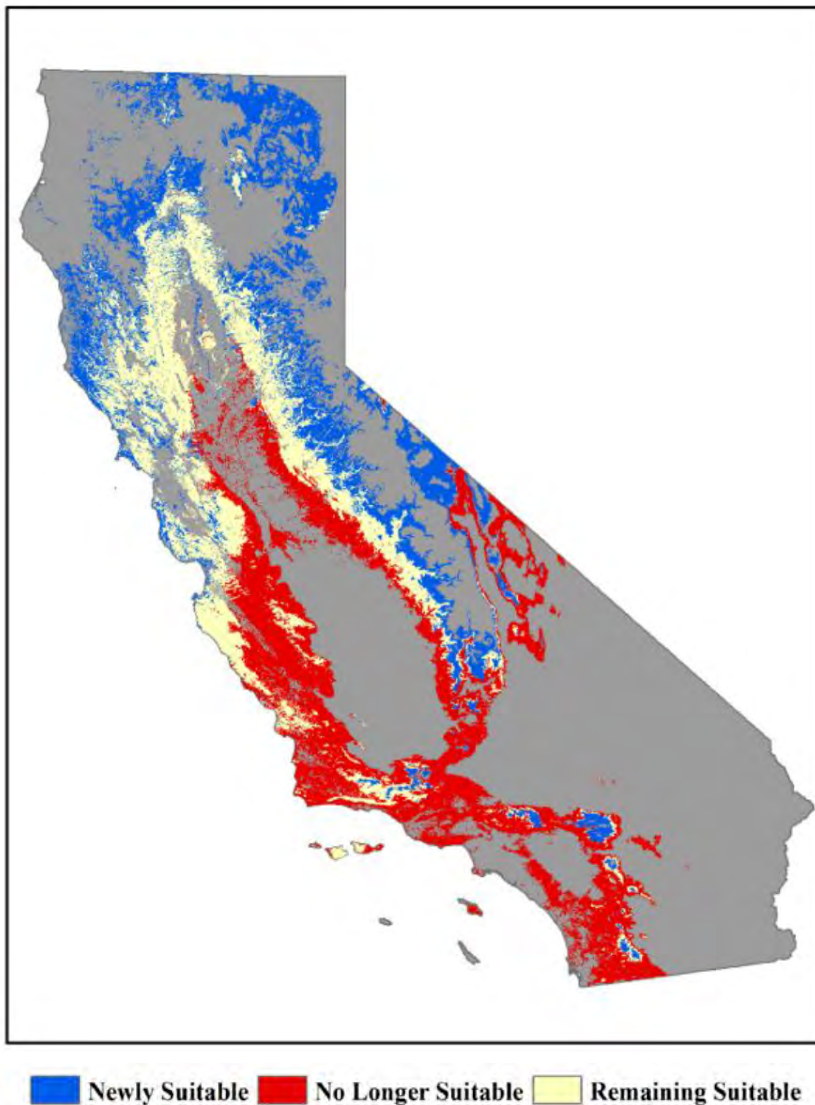


The threat of excessive fire to native shrublands is statewide but is especially extreme in the southern portion (Fig. 11). As shown in the map below, most of the plant communities within the four national forests of southern California are threatened by too much fire (shown in red to yellow colors).



**Figure 11. A Tale of Two Californias.** Most chaparral in California is threatened by too much fire as shown by the map's color variations representing the Fire Return Interval Departure percentages (PFRID) for national forest lands in California. Note the color differences between the southern California national forests which are dominated by chaparral (yellows), and the conifer dominated forests in the Sierra Nevada (blues). The warm colors identify areas where the current fire return interval is shorter than pre-European settlement (negative PFRID), threatening native plant communities. Cool colors represent current fire return intervals that are longer than pre-European settlement (positive PFRID), indicating a fire deficit in higher elevation forests. From Safford and Van de Water (2014).

As climate change continues to impact California, it is predicted that the loss of chaparral will accelerate in the southern and central parts of the state. The ecosystem will also begin to lose ground further north (Fig. 12). Some regions may become more suitable for chaparral, but considering the speed at which the climate is changing, it is difficult to predict what vegetation communities will ultimately develop in those areas. Such changes need to be considered when developing fire and development plans. Unfortunately, the current draft of the California Board of Forestry’s (and Cal Fire’s) Vegetation Treatment Program fails to properly account for these predicted changes and calls for “treatment” of chaparral in northern California for “ecological purposes.” Rather than “treating” chaparral, the Board of Forestry should develop strategies to protect its further loss.



**Figure 12. Potential Loss of Chaparral.** Predicted end-of-century chaparral distribution change under a continued high carbon emissions and hot/dry climate change scenario. From Thorne et al. (2016).

## References

- [CCI. 2013. Escaped Cal Fire Prescribed Burn, San Felipe Valley Wildlife Area. The California Chaparral Institute, July 4, 2013.](#)
- [Cohen, J.D. and R.D. Stratton. 2008. Home Destruction Examination Grass Valley Fire, Lake Arrowhead, CA. USDA, USFS, R5-TP-026b.](#)
- [Conniry, S. 2008. Prepared. In R.W. Halsey, Fire, Chaparral, and Survival in Southern California. Sunbelt Publications.](#)
- [Halsey, R.W. and A.D. Syphard. 2015. High-severity fire in chaparral: cognitive dissonance in the shrublands. In D.A. DellaSalla and C.T. Hansen \(eds\), The Ecological Importance of Mixed-Severity Fires, Nature's Phoenix. Elsevier Press. Pgs. 177-209.](#)
- [Koo, E, R.R. Linn, P.J. Pagni, and C.B. Edminster. 2012. Modeling firebrand transport in wildfires using HIGRAD/FIRETC. International Journal of Wildland Fire 21: 396-417.](#)
- [Miller, C. 2018. A way to break the terrifying pattern of fire and flood. Los Angeles Times. January 11, 2018.](#)
- [Mitchell, J.W. 2005. Wind-enabled ember dousing. Fire Safety Journal 41: 444-458.](#)
- [Moritz, M.A. et al. \(2014\). Learning to coexist with wildfire. Nature 515\(7525\): 58–66.](#)
- [Regalia, C., R. Allen, M. Rich, B. Smith, C. Parkinson. 2001. Hillsides and Ridgelines. A Survey and Analysis of Hillside and Ridgeline Subdivisions in Santa Rosa.](#)
- [Rogers, G., W. Hann, C. Martin, T. Nicolet, and M. Pence. Fuel Treatment Effects on Fire Behavior, Suppression Effectiveness, and Structure Ignition. Grass Valley Fire. USDA, Forest Service. R5-TP-026a.](#)
- [Safford, H.D. and K.M. Van der Water. 2014. Using Fire Return Interval Departure \(FRID\) Analysis to Map Spatial and Temporal Changes in Fire Frequency on National Forest Lands in California. USDA, Forest Service. PSW-RP-266.](#)
- [Syphard, A.D., J.E. Keeley, A. Bar Massada, T.J. Brennan, and 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](#)
- [Thorne, J.H, R.M. Boynton, A.J. Holguin, J.A.E. Stewart, and J. Bjorkman. 2016. A Climate Change Vulnerability Assessment of California's Terrestrial Vegetation. University of California, Davis.](#)

**The California Chaparral Institute** is a 501(c)(3) nonprofit educational and research organization dedicated to the preservation of the chaparral, California's most extensive ecosystem, and supporting the creative spirit as inspired by nature.

The Institute was established shortly after the 2003 Cedar Fire in San Diego County, the 273,000 acre wildfire that marked the beginning of the California's new era of catastrophic mega fires.

During and after the Cedar Fire, chaparral was inaccurately blamed by some as the cause of the fire's devastation. San Diego County responded to this misperception by proposing a program to clear 300 square miles of backcountry habitat. After six years of involvement by the Institute and others to help the county develop a new fire risk reduction plan based on science, the county proceeded with their original program. The program was dropped after the Institute successfully challenged it in court.

Since 2003, the Institute has produced publications and provided hundreds of public presentations explaining the value of the chaparral ecosystem and how we can live safely within California's fire-prone environment. The Institute has also coined several popular concepts to help promote science-based fire safety and an appreciation for the chaparral including reducing fire risk in our communities *"from the house out rather than from the wildland in"* and identifying legacy chaparral stands over 60-years-old as *"old-growth chaparral."*

Chaparral now is more commonly recognized as an important part of California's natural environment. The US Forest Service has issued a major policy statement recognizing the value and fragility of the chaparral and has held several symposia focusing on the ecosystem services it provides. New publications are also helping the public recognize and appreciate the chaparral.

Still, there remains an artificial distance between people and nature that continues to propel environmentally damaging projects and perceptions about the natural environment. As a consequence, the California Chaparral Institute continues to encourage leaders to tackle the difficult problems – land use changes, planning, creative approaches to reduce the flammability of homes and communities from within and encouraging all of us to allow nature to play a positive and restorative role in our lives.

