REDUCE WILDFIRE RISKS
or we'll continue to pay more for fire disasters

a position statement developed by

ASSOCIATION FOR FIRE ECOLOGY
INTERNATIONAL ASSOCIATION OF WILDLAND FIRE
THE NATURE CONSERVANCY

April 16, 2015

Association for Fire Ecology

International Association of WILDLAND FIRE

EXECUTIVE SUMMARY

The true cost of wildfires is much higher than the public is aware of, and much higher than currently accounted for by government assessments. These costs have increased significantly in the last decade, impacting taxpayers and multiple levels of government. The cost of wildfires also accrues over time – sometimes as much as a decade after the incident. Investments to mitigate the potential damage to communities and ecosystems from wildfire have not risen to meet these increasing costs.

Recent analysis of the direct , indirect plus long-term post-fire costs of wildfires in the United States, for example, show that the true cost that communities, businesses and governments actually pay can be from two to 30 times the amount of the official estimate of large wildfire costs.

The true costs of wildfires are more than we're counting. Wildfire disasters are increasing in frequency, scale and economic damage.. When considered together, these factors support a fiscal logic for funding cost-effective mitigation activities – so we may manage our wildfire-impacted landscapes and communities before the fires become a disaster.

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WILDFIRES COST MORE THAN WE ARE COUNTING

The true costs of wildfires for society are currently ill accounted for. Missing from most accounting of wildfire costs are those indirect costs, such as rehabilitation, real estate devaluation, and emergency services, that can be two to 30 times more than the actual expenses to fight the fire.

Traditional means of evaluating wildfire costs have a range of limitations: they tend to focus on measurable costs only, thus ignoring the broader loss assessment process and costs such as the loss of ecosystem services. A traditional, forest industry approach to the economics of fire prevention treatments is a major contributor to this lack of alignment. Wildfire is treated differently from other high-cost, high-risk natural disturbance events. Consider expenditures associated with mitigating earthquake damage, which costs the US an average $5.6 billion annually (Federal Emergency Management Agency and US Geological Survey). Yet legislators allocate billions of dollars, raise taxes, and otherwise earmark funds for retrofitting infrastructure at a clear economic loss.

In contrast, wildfire mitigation measures, such as fuels reduction treatments, are typically implemented only if they are economically viable. For example, costs of fuels reduction is expected to be offset by profit from extracted biomass and timber products.

Since the true annual cost of wildfires is even greater than the current multi-billion dollar price tag, we should expand investment in wildfire mitigation beyond considerations of forestry products profit. Wildfire mitigation should be treated like other high-cost natural disturbance events, where indirect costs are included in cost/benefit analyses.

Reducing costs means overcoming the policy, legal, social, and economic hurdles to wildfire preparedness measures including fuels reduction treatments and public education campaigns. Failure to act will only result in the cost of wildfires taking a steadily larger proportion of local, regional and national budgets. The key causes, context, and potential solutions are summarized in this position statement.

ANALYSIS OF COSTS

#1. SUPPRESSION COSTS INCREASING.

The cost of wildfire suppression has continued to increase over the last decade. Wildfire cost statistics from the US National Interagency Fire Center (NIFC) and the National Association of State Foresters (NASF) indicate a significant increase in local, state, and federal wildfire suppression expenditures over the last four decades (Figure 1). The per acre suppression cost is also increasing (Figure 2) with costs attributed to increased development in the wildland-urban interface, past forest and rangeland management practices, and climate change.

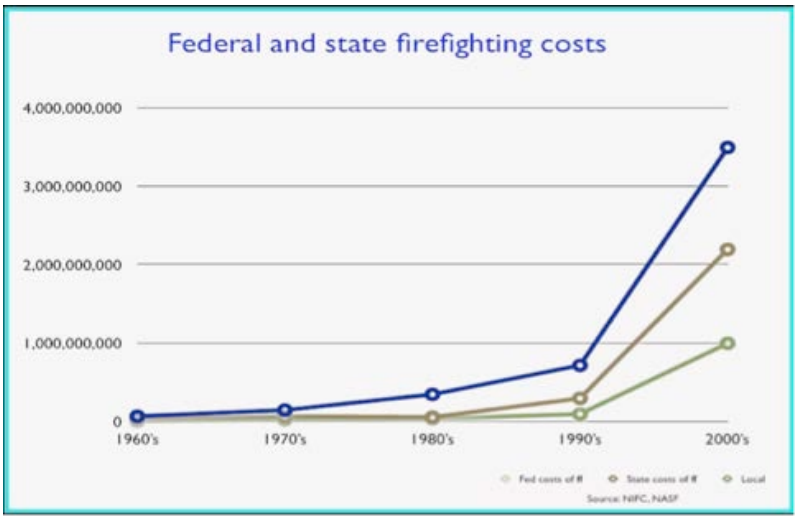

***Figure 1**.Example from the US where federal (blue line), state (gold line) and local (green line) wildfire suppression costs show increasing trends by decade since 1960 (Source: NIFC and NASF).*

#2. FIRES ARE COSTING TAXPAYERS MORE.

Wildfires are costing taxpayers far more than is typically reported by governments and the media. The immediate and post-fire wildfire expenditures reported by governments and the media only include the direct costs of wildfire suppression (firefighting), and other wildfire-related expenses including evacuations, equipment damage, damaged property, school and playground closures and public health alerts. What is missing in all wildfire cost assessments is a comprehensive accounting of losses both concurrent to the wildfire and those incurred weeks, months, and even decades after the incident. Examples include capital value losses to property, homes, agriculture, timber, and other public and private equity; long-term human health effects and increased medical costs; loss of income and opportunity losses; erosion and sedimentary effects on drinking water and aquatic resources, and more. Recent efforts to more fully account for the real price tag

of wildfires have demonstrated that actual costs are significant and, in the case of fires in the US, range from two to 30 times the cost of suppression and immediate resource impacts (Figure 3). More detailed total wildfire cost accounting efforts in Australia, for example, have indicated that costs are similarly high relative to suppression (Ashe et al. 2009; Stephenson et al. 2013).

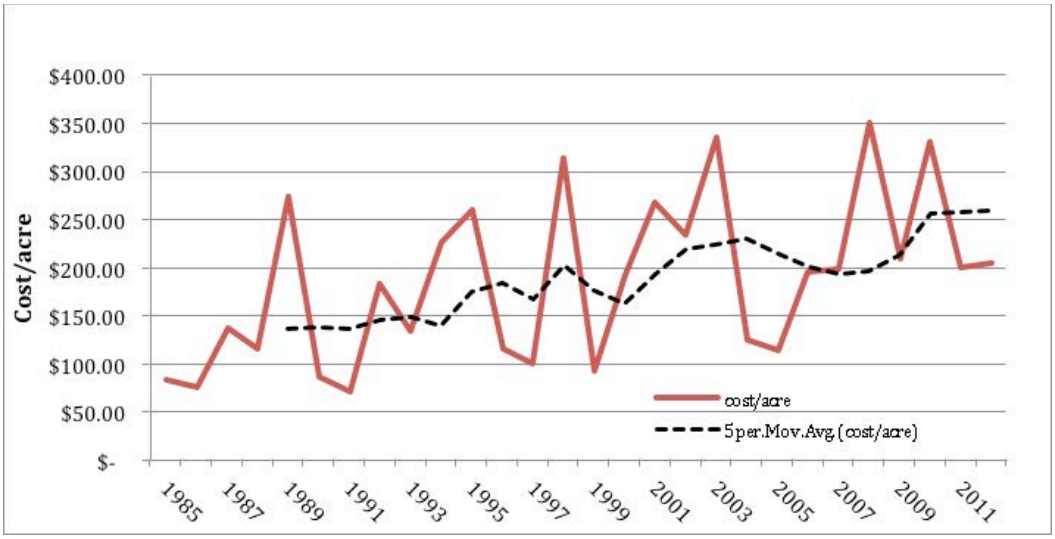

***Figure 2**. Although year-to-year fluctuation related to weather exists, the 5-year running mean for US wildfire suppression costs per acre for the period 1985-2012 clearly show an upward trend over time (Source: NIFC).*

#3. INVESTMENTS NEEDED.

Investment in wildfire hazard mitigation needs to be increased and maintained. In the US, momentum is building to fund wildfire suppression as an emergency response, similar to funding for hurricanes, floods and other natural disasters. However, if we only fund wildfire suppression we will not be pro-actively working to manage and reduce the increasing wildfire risk and fire impact costs.

We have examples of how to fund wildfire preparedness. Following the 2000 fire season in the US, for example, as part of the National Fire Plan (2001), the federal government significantly increased funding in wildfire preparedness/ preparation, aimed primarily at community wildfire risk identification and hazardous fuels mitigation. This program was initially well-funded and led to a significant increase in hazardous fuels treatment areas. As a result, an increasing number of treated acres have survived the passage of wildfires. Unfortunately, annual appropriations in prevention have steadily declined as has the capacity of federal and state agencies to carry out the work.

Similar programs and patterns have been initiated in the Canadian province of British Columbia following a highly damaging fire

season in 2003, and in the Australian State of New South Wales following the tragic 2012 fire season. A series of reports by Australia's Climate Council details the growing importance of preparing for climate change, with current and projected impacts that include hotter and longer burning seasons and increased fire risk (https://www.climatecouncil.org.au/category/reports).

#4. FUELS TREATMENTS NEED TO BE TREATED RIGHT.

Fuel treatments are supported by current and developing science. Some researchers and fire-fighting professionals view fuel treatments as too risky and a bad investment. Such a debate is a core part of the process of applying scientific research to real-world practices, and should continue as we refine the best practices for specific landscapes. A review of fuel treatment effectiveness in countless case studies (e.g., Kennedy and Johnson 2014; Kim et al. 2013; Stevens-Rumann, et al. 2013; van Wagtendonk et al. 2012; Outcalt and Wade 2004; Pollet and Omi 2002) indicate that investments in fuel treatments are merely too limited, and that evaluation of effectiveness requires a broader analysis over a longer time period and across a range of landscapes. In light of climate-related increases in the length and intensity of wildfire seasons, fuel-treatment investments and the study of their effectiveness are even more critical to ensure resilient forests and rangelands in the future.

One initiative that supports progress in facing the fuels challenge is the National Cohesive Wildland Fire Management Strategy, which includes a wide set of collaborating partners from the US Federal, State, Tribal, local and non-governmental sectors. The overall goal of the Cohesive Strategy is to make real progress towards resilient landscapes, fire adapted communities and a safe, integrated wildfire response. While the Cohesive Strategy philosophical approach does not include additional funding for wildland fuel mitigation, it does emphasize the need for stakeholders to understand the risk, accept their responsibilities and work together to tackle the problem of reducing risk to our human and natural communities. If we are to make significant strides in reducing wildland fire risk, participation of all stakeholders in the solutions will be necessary.

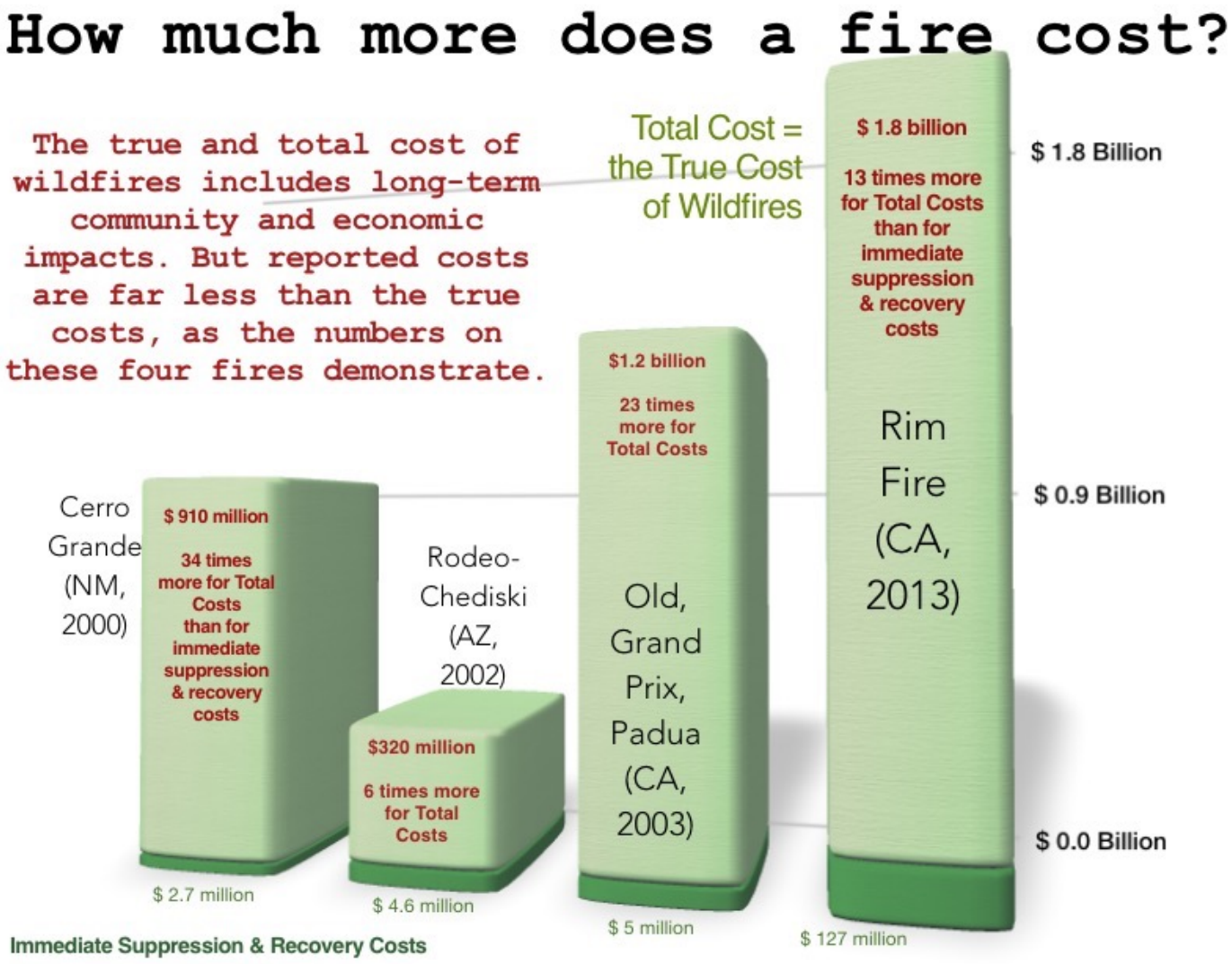

Figure 3. *Total long-term wildfire costs from four large fires in the western US demonstrates that long-term total costs (the "true cost" of wildfires) is many times greater than the reported costs of fire suppression and near-term recovery (Western Forestry Leadership Coalition 2009, with Rim Fire added).*

Defining the costs of wildfire

Direct Costs	The costs of the emergency response to and controlling of a wildfire and wildfire-related expenses. Includes suppression costs, evacuations, business disruption, equipment damage, burnt homes, cars, and personal property, school and playground closures, additional air quality monitoring, public health alerts, or other costs directly related (and generally concurrent) to the fire.
Indirect Costs	Costs concurrent with a fire but typically over-looked in accounting for wildfire damages. Includes amortized wildfire preparedness expenditures such as crew-training, equipment and supplies, depletion planning, and fire insurance premiums. Additional costs include damage to capital investments that may impact communities and recreational structures, devalued experiences, investments in forest management (reforestation, thinning), agriculture (crop establishment and treatments), past property taxes, reduced air and water quality, and changed landscape aesthetics.
Post-Fire Costs	Long-term damages (losses), direct and indirect, to society and the environment. Includes capital value losses to timber, agriculture, homes, and other public and private equity. Post-fire losses can be difficult to quantify and may become apparent over time, such as health effects, increased costs of medical care, reduced property values due to wildfire smoke damage, rehabilitation costs for publicly and privately damaged facilities, negative impacts on affected livelihoods, and sediment management in reservoirs impacted by increased soil erosion. Such post-fire costs may be attributed to specific wildfire events. Not yet documented are wildfire smoke emission effects on possible climate change.

Zybach, B., Dubrasich, M., Brenner, G., and J. Marker. 2009. U.S. wildfire cost-plus-loss economics project: the “one-pager” checklist. Advances in Fire Practices. Wildland Fire Lessons Learned Center.

CONSEQUENCES OF NOT TAKING ACTION

Mitigation actions tested to date, especially hazardous fuels treatments, have decreased wildfire behavior, improved ecosystem resilience, increased property values and firefighter safety, supported local economies, and more. Areas treated to date, while mostly affecting wildfires at the stand-scale, have not been extensive enough to have a positive landscape-scale impact on wildfire effects and costs.

At the current pace of investment, limited by static budgets and legislative impediments, a larger proportion of funding will need to be directed to maintaining areas already treated, instead of treating additional areas of high hazard. The outcome of such under-treatment will lead to increased burned area with severe economic, social, and environmental impacts. Without investments in fuels management and community preparedness, these increasing hazards will not be mitigated and costs will increase -- to manage wildfire disasters, restore fire-impacted landscapes, repair post-fire damages, and support community redevelopment. And in some cases, post-fire recovery will not be possible.

These expenditures are likely to be borne by multiple levels of government as well as individuals and local economies. It is critically important that any fuel treatment be ecologically valid and also serve as a restoration treatment for declining fire-prone landscapes. Some fuel treatments create conditions that never occurred historically, which could ultimately render the treatment ineffective, not only for ecosystem restoration but also for fuel hazard reduction.

WHAT WE CAN DO

The supporting organizations offer these actions for consideration and plan to continue research and analysis into solutions for wildfire hazard mitigation.

☑ Current legislation in the US seeks to fund wildfire suppression similarly to other natural disasters. This funding reform is key, but managing fires after they've begun to threaten communities is risky and not as cost-effective as preparedness. At the same time that legislators seek to fund wildfire suppression adequately, they should also increase investments for fuel treatments, since such pre-treatment can reduce the social, economic and ecological impacts of wildfires. Such expenditures for wildfire preparedness need to be treated like preparedness for other high-risk, high-cost natural disturbances and should be separated from the unattainable requirement of near-term economic viability.

☑ Policymakers and government administrations need to reduce or remove legislative, bureaucratic and market impediments to more ambitious hazardous fuels mitigation where appropriate. Often, domestic legislation and international trade agreements require forest management operations to derive a profit (market-driven forest management) which is inappropriate for the long-term management of many fire-prone ecosystems and constitutes a significant barrier to hazard reduction activities. Treatment subsidies should be permissible even in cases where merchantable wood is sold into the forest products market. Incentives and allowances should be incorporated in the renewable energy market as an economical solution to the disposal of non-merchantable biomass (e.g. hazardous fuels).

☑ As part of a comprehensive approach to fuels reduction, opportunities for increasing safe and effective fuels management using prescribed fire, or wildfires managed for resource benefits, should be emphasized. These fuels reduction techniques have been proven to be safe, economic, and effective for decades, from the Australian outback and the the southern US (e.g. Davis and Cooper 1963) to the western and northern national parks and forests in Canada and the US. Recent estimates from the southern US suggest prescribed burning can reduce wildfire suppression costs with a total savings of over $65 per acre treated (e.g. Hinkely and Wallace 2012). Such savings should be considered when allocating funding to support alternative models for wildfire risk reduction, such as regional fuels mitigation teams that work across land ownership to reduce wildfire risk for all citizens.

☑ Long-term and multi-sector economic losses due to wildfire need to be tracked and incorporated into existing wildfire risk prediction systems. Many current wildfire hazard and risk rating systems incorporate a narrow range of values potentially affected by wildfire, but miss key components that are affected after the incident over time. Symbiotic disturbances, such as heavy rainfall events on burned soils, are not currently part of risk rating systems either, but contribute significantly to long-term wildfire costs and potential for subsequent disturbances (e.g. landslides). Updated risk-rating systems should be used to prioritize prevention and mitigation efforts.

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WHO WE ARE

This Position Statement was developed and is supported by

ASSOCIATION FOR FIRE ECOLOGY (AFE) is a nonprofit organization dedicated to improving the knowledge and use of fire in land management. Our members include scientists, educators, students, managers, practitioners, policymakers, and interested citizens. Anyone who supports our mission can become a member of AFE and through active involvement can help shape the emerging profession and growing field of fire ecology. www.afe.org

INTERNATIONAL ASSOCIATION OF WILDLAND FIRE (IAWF) is uniquely positioned as an independent organization whose membership includes experts in all aspects of wildland fire management. IAWF's independence and breadth of global membership expertise allows it to offer a neutral forum for the consideration of important, at times controversial, wildland fire issues. www.iawfonline.org

THE NATURE CONSERVANCY (TNC) is the leading conservation organization working around the world to protect ecologically important lands and waters for nature and people. We work to maintain fire's role where it benefits people and nature, and keep fire out of places where it is destructive. www.conservationgateway.org/ConservationPractices/FireLandscapes/Pages/fire-landscapes.aspx

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