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Open Letter to Decision Makers Concerning Wildfires in the West

As scientists with backgrounds in ecological sciences and natural resources management, we are greatly concerned about proposals to speed up and expand logging on public lands in response to recent increases in wildfires in the West – proposals such as the House version of the 2018 Farm Bill. There are pragmatic, science-based solutions that can maintain biologically diverse fire-dependent ecosystems while reducing risks to communities and firefighters facing some of the most active fire seasons in recent memory. Unfortunately, such solutions are getting lost in the endless rhetoric and blaming that has characterized wildfires in the media, Congress, and the Trump administration. We the undersigned are calling on decision makers to facilitate a civil dialogue and careful consideration of the science to ensure that any policy changes will result in communities being protected while safeguarding essential ecosystem processes.

Why Is the West Burning and Is This Unnatural?

Wildfires have shaped the ecology of western ecosystems for millennia, whether lit by lightning or managed by American Indian tribes for cultural benefits. Wildfires vary in intensity and occurrence, across regions and vegetation types, elevation and climatic gradients, so there is no one-size-fits all strategy. The West has always burned and will always burn, and it needs to in order to maintain ecosystems and the myriad services they provide to the public in the form of carbon sequestration, clean water, abundant wildlife, and outdoor amenities. Attempting to suppress fires that are not a risk to communities is impractical, costly, risky to firefighters, and ecologically damaging. Also, forests are not the majority of the area burned annually on average in the United States; grasslands and shrublands are a large component of area burned annually that is unaffected by any forest management.

What is different today about wildfires is they are now burning over larger landscapes (more acres) since the 1980s, although overall fewer acres are burning today compared to that estimated in early decades and historical timelines.[1] Wildfire season in the West recently has lengthened from an average of five to seven months, and the number of large wildfires (>1,000 acres) has increased from 140 to 250 per year.[2] This is occurring as average annual temperature in the West has risen by nearly 2 degrees Fahrenheit since 1970s and winter snow pack has declined.[3] Increases in acres burning can now be attributed, in part, to climate change[4] and the

[1]Littell, J.S. et al. 2009. Climate and wildfire area burned in western U.S. ecoprovinces, 1916-2003. Ecol. Applic. 19:1003-1021. Egan, T. 2009. The Big Burn. Mariner Books: Boston, NY. Parks, S.A. et al. 2015. Wildland fire deficit and surplus in the western United States, 1984-2012. Ecosphere 6:1-13.
[2]Dennison, P. et al. 2014. Large wildfire trends in the western United States, 1984-2011. Geophysics Research Letters 41:2928-2933.
[3]Union of Concerned Scientists (UCS). 2017. Western wildfires and climate change. http://www.ucsusa.org/global_warming/science_and_impacts/impacts/infographicwildfires-climate-change.html#.WcBXE5OGNTb
[4]Abatzoglou, J.T., and A.P. Williams. 2017. Impact of anthropogenic climate change on wildfire across western US forests. PNAS 113:11770-11775.

increase is expected to continue in many areas with additional warming, leading to even greater suppression costs and loss of life.[5]

In addition to climate change, more than 80 percent of fires nationwide have been caused by people,[6] and millions of homes are now in harm's way,[7] resulting in skyrocketing costs. Putting more money into fire suppression will not reduce homeowner losses as long as homes continue to be built next to fire-adapted ecosystems, lack defensible space[8] and/or fire-proofing, and measures are not taken to reduce human-caused wildfire ignitions.[6]

What Is Active Management and Does It Work to Reduce Fire Activity?

Active management has many forms and needs to be clearly defined in order to understand whether it is effective at influencing fire behavior. Management can either increase or decrease flammable vegetation, is effective or ineffective in dampening fire effects depending on many factors, especially fire weather, and has significant limitations and substantial ecological tradeoffs.

Thinning Is Ineffective in Extreme Fire Weather – Thinning is most often proposed to reduce fire risk and lower fire intensity. When fire weather is not extreme,[9] thinning-from-below of small diameter trees followed by prescribed fire, and in some cases prescribed fire alone,[10] can reduce fire severity in certain forest types for a limited period of time[11]. However, as the climate changes, most of our fires will occur during extreme fire-weather (high winds and temperatures, low humidity, low vegetation moisture). These fires, like the ones burning in the West this summer, will affect large landscapes, regardless of thinning, and, in some cases, burn hundreds or thousands of acres in just a few days.[12] Thinning large trees, including overstory trees in a stand, can increase the rate of fire spread by opening up the forest to increased wind velocity, damage soils, introduce invasive species that increase flammable understory vegetation, and impact wildlife habitat.[9] Thinning also requires an extensive and expensive roads network that degrades water quality by altering hydrological functions, including chronic sediment loads.

Post-disturbance Salvage Logging Reduces Forest Resilience and Can Raise Fire Hazards – Commonly practiced after natural disturbances (such as fire or beetle activity), post-disturbance clearcut logging hinders forest resilience by compacting soils, killing natural regeneration of

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[5]Schoennagel, T., et al. 2017. Adapt to more wildfire in western North American forests as climate changes. PNAS 114:4582-4590.
[6]Balch, J.K., et al. 2016. Human-started wildfires expand the fire niche across the United States. PNAS 114: 2946-2951.
[7]Syphard, A.D., et al. 2013. Land use planning and wildfire: development policies influence future probability of housing loss. PLoS ONE 8(8):71708. Strader, S.M. 2017. Spatiotemporal changes in conterminous US wildfire exposure from 1940 to 2010. Nat. Hazards https://doi.org/10.1007/s11069-018-3217-z.
[8]Cohen, J.D. 2000. Preventing disaster: home ignitability in the wildland-urban interface. J. of Forestry 98: 15-21.
[9]Moritz, M.A., et al. 2014. Learning to coexist with wildfire. Nature 515: 58-66. Schoennagel, T., et al. 2017. Ibid.
[10] Zachmann, L.J. et al. 2018. Prescribed fire and natural recovery produce similar long-term patterns of change in forest structure in the Lake Tahoe basin, California. For. Ecol. and Manage. 409:276–287
[11]Stone, C. et al. 2003. Forest harvest can increase subsequent forest fire severity. https://www.fs.fed.us/psw/publications/documents/psw_gtr208en/psw_gtr208en_525-534_stone.pdf
Brown, R.T., et al. 2004. Forest restoration and fire: principles in the context of place. Cons. Biol. 18:903-912. Kalies, E.I., and L.L.Y. Kent. 2016. Tamm Review: Are fuel treatments effective at achieving ecological and social objectives? A systematic review. For. Ecol. and Manage. 375:84-95. Goodwin, M.J. et al. 2018. The 15-year post-treatment response of a mixed-conifer understory plant community to thinning and burning treatments**.** https://doi.org/10.1016/j.foreco.2018.07.058
[12]Stephens, S.L., et al. 2015. Large wildfires in forests: what can be done? Action Bioscience April 15

conifer seedlings and shrubs associated with forest renewal, increases fine fuels from slash left on the ground that aids the spread of fire, removes the most fire-resistant large live and dead trees, and degrades fish and wildlife habitat.[13] Roads, even "temporary ones," trigger widespread water quality problems from sediment loading. Forests that have received this type of active management typically burn more severely in forest fires.[13]

Wilderness and Other Protected Areas Are Not Especially Fire Prone – Proposals to remove environmental protections to increase logging for wildfire concerns are misinformed. For instance, scientists[14] recently examined the severity of 1,500 forest fires affecting over 23 million acres during the past four decades in 11 western states. They found fires burned more severely in previously logged areas, while fires burned in natural fire mosaic patterns of low, moderate and high severity, in wilderness, parks, and roadless areas, thereby, maintaining resilient forests. Consequently, there is no legitimate reason for weakening environmental safeguards to curtail fires nor will such measures protect communities.

Closing Remarks and Need for Science-based Solutions

The recent increase in wildfire acres burning is due to a complex interplay involving human-caused climate change coupled with expansion of homes and roads into fire-adapted ecosystems and decades of industrial-scale logging practices. Policies should be examined that discourage continued residential growth in ecosystems that evolved with fire. The most effective way to protect existing homes is to ensure that they are as insusceptible to burning as possible (e.g., fire resistant building materials, spark arresting vents and rain-gutter guards) and to create defensible space within a 100-foot radius of a structure. Wildland fire policy should fund defensible space, home retrofitting measures and ensure ample personnel are available to discourage and prevent human-caused wildfire ignitions. Ultimately, in order to stabilize and ideally slow global temperature rise, which will increasingly affect how wildfires burn in the future, we also need a comprehensive response to climate change that is based on clean renewable energy and storing more carbon in ecosystems.

Public lands were established for the public good and include most of the nation's remaining examples of intact ecosystems that provide clean water for millions of Americans, essential wildlife habitat, recreation and economic benefits to rural communities, as well as sequestering vast quantities of carbon. When a fire burns down a home it is tragic; when fire burns in a forest it is natural and essential to the integrity of the ecosystem, while also providing the most cost-effective means of reducing fuels over large areas. Though it may seem to laypersons that a post-fire landscape is a catastrophe, numerous studies tell us that even in the patches where fires burn most intensely, the resulting wildlife habitats are among the most biologically diverse in the West.[15] For these reasons, we urge you to reject misplaced logging proposals that will damage

[13]Lindenmayer, D.B., et al. 2008. Salvage logging and its ecological consequences. Island Press: Washington, D.C. Thompson, J.R., and T.A. Spies. 2009. Vegetation and weather explain variation in crown damage within a large mixed-severity wildfire. For. Ecol. Manage 258:1684-1694.

[14]Odion et al. 2004. Fire severity patterns and forest management in the Klamath National Forest, northwest California, USA. Cons. Biol. 18:927-936. Zald, H., and C. Dunn. 2018. Severe fire weather and intensive forest management increase fire severity in a multi-ownership landscape. Ecol. Applic. 4:1068-1080. Bradley, C.M., et al. 2016. Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States? Ecosphere 7:1-13.

[15]DellaSala, D.A., and C.T. Hanson. 2015. The ecological importance of mixed-severity fire: nature's phoenix. Elsevier: Boston http://www.sciencedirect.com/science/book/9780128027493 (Chapters 1 through 5, and 11).

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