

# DAY ONE PROJECT

Preventing Catastrophic Wildfire  
Under Climate Change

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## Summary

Wildfires, damages, and deaths are increasing because of unnatural accumulations of wood from outdated forest policies and intensifying heat from human-caused climate change. Preventing catastrophic wildfires requires improved, science-based policies that will shift the government from after-the-fact firefighting to proactive controlled burning. This would improve the lives of Americans and the health of our ecosystems by reducing deaths and damage due to wildfire, restoring damaged forests that naturally require fire, and decreasing the carbon emissions that cause climate change.

This memorandum outlines a policy approach to achieve these outcomes. Executive action will establish a national strategy for proactive fire management. Legislation will ensure revenue neutral implementation by reallocating funds currently used for firefighting to less expensive and more effective fire prevention. Finally, fire managers will increase prescribed burning and use of natural fires, relying on scientific analyses to target areas at greatest risk under climate change.

## Challenge and Opportunity

Many forests naturally require periodic wildfires, which kill pests, release tree seeds to sprout, thin out small trees, and serve other functions essential for forest health. Century-old federal policies of suppressing all fires, even natural ones, have caused unnatural accumulations of woody fuel in the form of dense stands of small trees and layers of dead woody debris.

At the same time, human-caused climate change has intensified the heat that drives wildfires and has doubled burned area over natural levels across the western U.S. since 1984.<sup>1</sup> The combination of old fuel accumulation and climate change increased burned area 900% since 1984.<sup>2</sup> These fires are burning more severely and increasing the carbon emissions that drive climate change.<sup>3</sup> With more people moving into fire-prone areas<sup>4</sup>, the eruption of wildfire has contributed to a doubling of deaths and 60% increase in wildfire damage costs since 2008.<sup>5</sup>

Continued climate change could increase wildfire frequencies in western U.S. forests as much as five times historical levels by 2050<sup>6</sup>, push fires farther north in Alaska, and exacerbate fire risks in

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<sup>1</sup> Abatzoglou, J.T. and A.P. Williams. 2016. Impact of anthropogenic climate change on wildfire across western US forests. *Proceedings of the National Academy of Sciences of the USA* 113: 11 770-11 775. <https://www.pnas.org/content/113/42/11770>

<sup>2</sup> Holden, Z.A., et al. 2018. Decreasing fire season precipitation increased recent western US forest wildfire activity. *Proceedings of the National Academy of Sciences of the USA* 115: E8349-E8357. <https://www.pnas.org/content/115/36/E8349>

<sup>3</sup> Gonzalez, P., et al. 2015. Aboveground live carbon stock changes of California wildland ecosystems, 2001–2010. *Forest Ecology and Management* 348: 68-77. <https://www.sciencedirect.com/science/article/pii/S0378112715001796>

<sup>4</sup> Radeloff, V.C., et al. 2018. Rapid growth of the US wildland-urban interface raises wildfire risk. *Proceedings of the National Academy of Sciences of the USA* 115: 3314-3319. <https://www.pnas.org/content/115/13/3314>

<sup>5</sup> U.S. Fire Administration. 2019. Fire in the United States 2008-2017. [https://www.usfa.fema.gov/data/statistics/reports/fius\\_2008-2017.html](https://www.usfa.fema.gov/data/statistics/reports/fius_2008-2017.html)

<sup>6</sup> Barbero, R., et al. 2015. Climate change presents increased potential for very large fires in the contiguous United States. *International Journal of Wildland Fire* 24: 892-899. <https://www.publish.csiro.au/WF/WF15083>

Hawai'i and the eastern U.S.<sup>7</sup> Preventive action today would avert much of the projected future increases in wildfires and the deaths and damages they would cause.

Scientific research and field practice have shown that two actions in particular can reduce fuel loads and effectively restore ecologically appropriate fire regimes:

1. Prescribed burning – Pre-emptively setting low-severity fires during cooler weather
2. Managed wildland fire – Allowing remote natural fires to burn

When a wildfire crosses into an area previously burned with one of these practices, the fire generally continues along the ground at low severity.<sup>8</sup> Ground-level fires clear the understory, enabling trees to grow larger and store more carbon in the long-term. In contrast, wildfires in unburned areas can become catastrophic, completely burning stands of trees at high severity.

Proactive fire management can be much less expensive in the long-term than firefighting. For one large wildfire in New Mexico, financial analyses indicate that proactive fire prevention could have reduced costs 55%.<sup>9</sup> Yet, 85% of the federal wildfire budget in FY2018 went to airplanes and other major expenses for firefighting while just 14% went to reducing fuels.

The intensifying heat of climate change makes proactive fire management more urgent. Scientific advances now make it possible to target areas most at risk of severe wildfire due to climate change. In addition, analyses of forest carbon can quantify the carbon storage gains from proactive burning that can mitigate other emissions from the burning of fossil fuels.

Moving from after-the-fact firefighting to proactive use of preventive fires and linking fire management to climate change science can reduce catastrophic wildfires. This would:

1. Decrease deaths and damage due to wildfires, compared to no action
2. Restore damaged ecosystems that naturally require fire
3. Mitigate climate change through reduced carbon emissions

## Plan of Action

**Executive Action:** An executive order from the President or memorandum from the Office of Science and Technology Policy or Council on Environmental Quality should direct the federal Wildland Fire Leadership Council to revise and update the 2001 version of the 1995 Federal Wildland Fire Policy. After the Council, led by the Departments of Agriculture and the Interior, completes a revision with stakeholder input, the President should issue the new policy under a

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<sup>7</sup> Moritz, M.A., et al. 2012. Climate change and disruptions to global fire activity. *Ecosphere*. 3: art49. <https://esajournals.onlinelibrary.wiley.com/doi/full/10.1890/ES11-00345.1>

<sup>8</sup> Parks, S.A., et al. 2015. Wildland fire as a self-regulating mechanism: The role of previous burns and weather in limiting fire progression. *Ecological Applications* 25: 1478-1492. <https://esajournals.onlinelibrary.wiley.com/doi/full/10.1890/14-1430.1>

<sup>9</sup> Heines, B., et al. 2018. Assessing the economic trade-offs between prevention and suppression of forest fires. *Natural Resource Modeling* 31: e12159. <https://onlinelibrary.wiley.com/doi/full/10.1111/nrm.12159>

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new executive order, thereby establishing a national strategy of proactive fire management, guided by ecological and climate change science.

**Legislation:** Following the executive actions, a law adopting the new wildfire policy would most effectively ensure its sustained implementation under future administrations. With or without that legislation, the Office of Management and Budget should, in its Congressional Budget Justification, request reallocations of funding from fire suppression to prevention. The funding requests would need to be enacted in Congressional appropriations legislation.

**University and government research:** Scientific information on climate change, wildfire, and carbon provide an essential foundation for wildfire policy. After enactment of appropriations, the federal Joint Fire Science Program should reallocate funding for university and government scientists from fire suppression research to climate change research.

**Agency implementation:** The primary responsible agencies are the Bureau of Indian Affairs, Bureau of Land Management, Fish and Wildlife Service, Forest Service, and the National Park Service. With direction from the new wildfire policy, funding from Congress, and research from scientists, fire personnel would implement prescribed burning and managed wildland fire in the field, starting with urban areas and other places at highest risk.

## Frequently Asked Questions

### Hasn't the Federal Government already shifted from fire suppression to preventive fire?

This Day One Project memo recommends fully implementing and solidifying a shift from fire suppression to preventive use of fire that was introduced in the 1995 Federal Wildland Fire Policy but was never fully realized. The 1995 policy broke ground by acknowledging the importance of natural fire; a 2001 update translated that into a mandate for fire planning. Those actions, however, were in the form of memoranda that were superseded by the 2003 Healthy Forests Restoration Act, which promoted timber harvesting and reduced environmental protections for natural forests. The 2014 National Cohesive Wildland Fire Strategy, a report to Congress, reinstated actions to restore natural fire. It was superseded in 2018 by Executive Order 13855, which again promoted timber harvesting over fire. The action plan proposed here would achieve a durable shift of government action to proactive use of fire. The plan would also take the new step of linking fire management to climate change science to specifically address the connections between wildfire and climate change.

### Can we afford to take funding from fire suppression?

Under the action plan in this Day One Project memo, the U.S. would maintain an emergency response capacity to protect people from wildfires. The new wildfire policy would seek to halt the increasingly exorbitant costs of firefighting, which increased from \$0.5 billion in 1985 to \$3.1 billion in 2018 (real dollars, adjusted for inflation).<sup>10</sup> Costs per unit area also doubled in that period. Firefighting consumed 40% of the Forest Service budget in 2018.<sup>11</sup> Some of the fires federal agencies have fought occurred in wilderness areas and could have been left to burn, reducing future fire risks. The new wildfire policy would reallocate expenditures from such discretionary incidents. While costs vary widely, prescribed burning and managed wildland fire operations generally cost a fraction of the expense of fire suppression for the same area. Moreover, preventive actions reduce fire risk and long-term costs while discretionary fire suppression can aggravate risk. Reallocating funding from fire suppression to proactive fire management would achieve less expensive and more effective prevention of catastrophic fires.

### Wouldn't it be better to thin forests and sell the trees instead of burning them?

Thinning is a practice appropriate for areas close to towns and suburbs where burning poses higher risk. Thinning complements prescribed burning and managed wildland fire and should be part of an updated fire management strategy. Thinning cannot, however, replicate the long-term risk reduction and ecological benefits of fire and it removes biomass and nutrients essential for

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<sup>10</sup> National Interagency Fire Center. 2020. Fire Suppression Costs. [https://www.nifc.gov/fireInfo/fireInfo\\_documents/SuppCosts.pdf](https://www.nifc.gov/fireInfo/fireInfo_documents/SuppCosts.pdf)

<sup>11</sup> U.S. Department of Agriculture. 2020. FY2021 Budget Justification. Forest Service. <https://www.fs.usda.gov/sites/default/files/2020-02/usfs-fy-2021-budget-justification.pdf>

forest health. Moreover, thinning is too expensive to cover the vast areas that require fuel reduction.

## **Won't preventive fires get out of control?**

Wildland fire professionals have developed and extensively implemented methods to safely conduct prescribed burns and managed wildland fires. Fire personnel plan prescribed burns at cooler and moister times of the year and only initiate a burn if prescription parameters for temperature, humidity, wind, vegetation moisture, and other factors are met. Managed wildland fires burn in previously identified remote areas far from towns and suburbs. Each action is monitored by fire personnel deployed around the perimeter who are prepared to fight a fire in case it shows signs of approaching an inhabited area.

## **Won't preventive fires produce smoke?**

Catastrophic wildfires produce thick, voluminous, and uncontrolled clouds of smoke that cause acute health problems and death. In contrast, prescribed burns produce smaller amounts of smoke at planned times, allowing local authorities to take precautions. Managed wildland fires generally occur farther from inhabited areas, so smoke risk is lower. Smoke is an inevitable product of fire. Proactive use of fire can prevent the hazardous smoke of catastrophic wildfires.



### About the Author

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### About the Day One Project

The Day One Project is dedicated to democratizing the policymaking process by working with new and expert voices across the science and technology community, helping to develop actionable policies that can improve the lives of all Americans, and readying them for Day One of a future presidential term. For more about the Day One Project, visit [dayoneproject.org](http://dayoneproject.org).