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**RVCC**  
Rural Voices for  
Conservation  
COALITION

# Fighting Fire with Fire

Policy Options to Increase the Use of  
Prescribed Fire on National Forests

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# INTRODUCTION

The 193 million acres of national forest land managed by the United States Forest Service (Forest Service) provide irreplaceable services including clean water, wildlife habitat, and recreational opportunities. These services are made possible by ecological processes like wildland fire that renew the landscape. But past management practices as well as climate change have left both human and natural communities vulnerable to fast moving, high severity fire.

There is a critical need to reintroduce fire to protect human communities and benefit natural ecosystems. There is a consensus among scientists that the only long-term solution to moderating the impacts of large high severity fire is *fire*—preventing large wildfires burning under extreme weather conditions by prescribing fire to reduce fuel loads and restore forest resilience under more favorable weather conditions.<sup>1</sup> Yet despite the near consensus in the scientific community on the importance of prescribed fire, use of prescribed fire is flat or declining in most of western United States.<sup>2</sup> The need to reintroduce fire to western landscapes grows more acute every year as the economic and ecological impacts of wildfires grow larger. The impacts will grow worse still as the climate continues to warm.<sup>3</sup> The time is now to reintroduce fire to achieve multiple resource benefits and prevent the worst impacts from large climate change-driven fires.

This report provides an overview of the current science and need for prescribed fire, describes barriers to the use of prescribed fire on public lands in the western U.S. managed by the Forest Service, and describes policy options to overcome these barriers. The report focuses specifically on prescribed fire and does not address other aspects of wildfire risk reduction, such as home hardening, land use planning, and mechanical thinning. All are important tools to keep communities safer from uncharacteristically severe wildfire, but prescribed fire is unique in serving to both reduce the risks associated with wildfire and to help restore ecological function in natural systems. The broader topic of wildfire risk reduction is an important one, and where possible this report points to other resources that address those specific topics in greater detail.

The recommendations of this report are derived from multiple sources, including peer-reviewed academic publications, discussions with both prescribed fire practitioners and policy experts, reviews of past prescribed fire policy proposals, and the personal experience of the authors.

# SCIENCE SYNTHESIS

## What do we know about wildfire, wildfire suppression, and the need for prescribed fire?



Indigenous communities used fires for thousands of years to manage natural resources.<sup>4</sup> Prior to Euro-American colonization of the western U.S., a combination of human and natural ignitions created a rich mosaic of resilient forest communities that were shaped and sustained by fire. Fire created new habitat structures, stimulated new growth, helped cycle nutrients, and removed excess fuels.<sup>5</sup> In the early 20th century, Forest Service managers began to suppress fires in the misguided belief that fire destroyed future timber crops.<sup>6</sup> These fire exclusion policies, coupled with harvest practices, grazing, and climate change have led to a large contemporary fire deficit relative to historical conditions in western North American forests.<sup>7</sup> One study found that forests of different ecoregions in the western U.S. are currently burning at rates 12% to 2,220%— with an average of 300%—lower than they did prior to the adoption of fire exclusion policies.<sup>8</sup>

High severity fire that kills most of the trees in a stand has always been an important component of the natural fire regime of some western forests.<sup>9</sup> But prior to the beginning of fire suppression policies, seasonally dry forests that are widespread across the western U.S. were characterized by frequent, low intensity surface fire that maintained open stands of older trees.<sup>10</sup> Today's dry forests have abnormally high tree density, surface fuel loading, and fuel continuity.<sup>11</sup> The sustained failure to allow low severity surface fire to remove fuels under moderate weather conditions means that when fire escapes control, usually because of extreme weather conditions, fast-moving fires leave large

patches where most trees are killed, with significant negative impacts to old-growth trees, water quality, and wildlife.<sup>12</sup>

Human communities are also increasingly vulnerable to high severity wildfire. For instance, the state of California lost an average of 2,800 structures a year from wildfire from 2000 to 2018, and losses from wildfire in California in 2018 alone totaled approximately 150 billion dollars, or 1.5% of California's gross domestic product.<sup>13</sup> Smoke from wildfires has significant negative health effects, including altered immune function, increased susceptibility to respiratory infection, and worsening of asthma, pulmonary disease, and cardiovascular disease.<sup>14</sup> Smoke from wildfires may also be more toxic than the same dosage from other sources.<sup>15</sup>

Although the area of western U.S. national forest land treated by mechanical thinning has increased in recent decades, prescribed fire applied to national forests has remained flat over the last 20 years due to shortfalls in funding, insufficient workforce capacity, and Forest Service priorities and business models that are explored further in this report.<sup>16</sup> Many scientific studies show that mechanical thinning to reduce forest density is most effective at preventing high severity fire when it is followed by prescribed fire that removes surface fuels.<sup>17</sup> **There is a near consensus among scientists that the only way to fight fire is with fire—that managers can only prevent fast-moving high severity fire burning under extreme weather conditions by reintroducing fire under moderate weather conditions.**<sup>18</sup>

Doubling down on fire suppression is no longer a viable option, either ecologically or economically. Firefighting costs are ballooning at an unsustainable rate. Between 1985 and 1990, Forest Service fire suppression expenditures averaged \$257 million per year. Suppression expenditures between 2015 and 2020 averaged \$1.9 billion a year, a 630% increase.<sup>19</sup> Firefighting expenses currently account for between 52% and 55% of the Forest Service's total annual budget and are expected to account for 67% of the agency's annual budget within the next three years.<sup>20</sup> And while fire suppression costs spiral, the Forest Service's budget for vegetation, watershed, and hazardous fuels management that allows the agency to get in front of the fire problem with thinning and prescribed fire has shrunk by 25%.<sup>21</sup> States also bear an increasing burden of wildfire costs—fire suppression currently accounts for 2% of California's general fund expenditures and costs continue to rise.<sup>22</sup>

Climate change, while not the only cause of increased fire severity, is further exacerbating the tempo and extent of fires across the west. Climate change is associated with earlier springs, longer fire seasons, and drier fuels with higher maximum summertime temperatures conducive to rapid fire spread.<sup>23</sup> Warming trends have also extended the fire season into the fall when most strong wind events that drive rapid fire spread occur.<sup>24</sup>

Current policy will lead to more and more out of control wildfires, more human and natural infrastructure losses, and higher and higher expenditures. **Put simply, we no longer have a choice about whether to have smoke and fire. We only have a choice about when and where to have smoke and fire.**



# POLICY OPTIONS TO INCREASE THE USE OF PRESCRIBED FIRE

## INTRODUCTION

Restoring resilient forests and protecting communities from severe wildfires is a major public policy goal for national forests. While scientific understanding of the importance of prescribed fire has been clear for decades, significant interest in crafting policy specific to increasing prescribed fire use has been more recent.

Prescribed fire policy is entangled with a host of complex issues including wildfire suppression, agency budgets and bureaucratic systems, forest planning, rural workforce development, and climate change. Prescribed fire should be considered in the broader context of wildfire risk reduction and ecosystem restoration, but it is also deserving of a singular focus. While this report touches on other important aspects of wildfire policy, it focuses primarily on prescribed fire. As noted above, mechanical thinning alone is usually not enough to reduce severe fire risk in most fire-adapted ecosystems. **Prescribed fire is the final, necessary, and long-neglected ingredient in fuels reduction projects.**

The sharp increase in destructive wildfires in the western U.S., as well as increased attention to and awareness of the harmful effects of climate change, has sparked growing congressional interest in prescribed fire and wildfire policy. Recent examples of congressional interest in fire policy include changes to how wildfire suppression is funded, proposals focused on carbon and climate change, and at least one bill focused specifically on prescribed fire.<sup>25</sup> In the Appropriations Act for Fiscal Year 2021 (FY21), Congress also made significant changes to the structure of the Forest Service budget with potential impacts on how funds are allocated for prescribed fire and risk reduction work.<sup>26</sup> Older efforts to reduce fire risk include the Healthy Forest Restoration Act passed by Congress in 2003, which streamlined planning processes, and the Collaborative Forest Landscape Restoration Program (CFLRP) autho-



rized in 2009, which provides augmented restoration funding for high priority national forest landscapes.<sup>27</sup>

The Biden Administration has called for significant investments in agency fire risk reduction budgets.<sup>28</sup> The Forest Service is also exploring potential changes to prescribed fire policy, the use of outcomes-based performance measures, and a greater reliance on partnerships with tribes, states, and local communities.<sup>29</sup>

In addition to increased interest from political leaders, decades of experimentation through national pilot programs and local projects have yielded important lessons in collaborative conservation. Programs including CFLRP and the Joint Chiefs Landscape Restoration Partnership have allowed for innovation and experimentation in all-lands restoration planning at a field level. Monitoring efforts tied to these programs have further identified areas for improvement in the policies and practices of the Forest Service.<sup>30</sup> Place-based collaborative conservation has also flourished in the last two decades, with collaboration becoming a standard ingredient of forest management in many locations.<sup>31</sup> Community-based organizations (CBOs) and national nongovernmental organizations (NGOs), most notably The Nature Conservancy, have also developed the capacity to implement prescribed fire. Indeed, external partners represent most of the increase in prescribed burning on lands managed by the Forest Service in the past two decades.<sup>32</sup>

Despite these efforts, increasing the use of prescribed fire faces critical challenges. During both the 2020 and 2021 fire seasons Forest Service leadership issued restrictions on the use of prescribed fire in light of difficult fire seasons and the pandemic.<sup>33</sup> Longer, hotter, more dangerous fire seasons have also led to a strained wildland firefighting workforce – another factor cited in the 2021 direction from the Chief to not make use of prescribed fire. Longer, drier wildfire seasons also limit the available burn windows for prescribed fire. Further challenges to the use of prescribed fire come from the private insurance industry, which has indicated declining support for insuring prescribed fire practitioners, potentially forcing nongovernmental partners to cease burn programs entirely.

The following sections detail policy options that can lead to increased use of prescribed fire on national forests. While some suggestions may individually increase the use of prescribed fire, we should also recognize that increasing the use of prescribed fire is a complex policy problem and will require comprehensive adoption of changes at multiple scales of the Forest Service, some of which may be feasible administratively and others that will require acts of Congress or leadership from an administration.



## FUNDING

### CURRENT SITUATION

In 2018, Congress approved a much-needed change in how the federal government funds wildfire suppression – the “fire funding fix” – with the intention of stopping the steady absorption of the Forest Service’s land management budget by wildfire suppression costs.<sup>34</sup> However, the Trump Administration did not ask for, and Congress did not restore, much of the anticipated cost savings back into agency budgets, which instead saw only a moderate increase in FY19-FY21 (the years after the fire funding fix).<sup>35</sup>

Significant investment is needed in many existing programs and agency budget line items to get ahead of rising of wildfire risks. The Forest Service estimates that an additional \$20 billion in funds over ten years is necessary to reduce wildfire risk.<sup>36</sup> And a recent report on wildfire funding by The Nature Conservancy notes the need for minimum investment of between \$5 and \$6 billion per year over ten years for the highest priority work across all land ownerships.<sup>37</sup>

Currently, no single line item in the Forest Service budget is dedicated exclusively to prescribed fire. The “hazardous fuels” line item is the only source of funding for planning and implementation of prescribed fire, and it must also cover other activities, including salary for more general project planning and mechanical fuels reduction work.<sup>38</sup>

FY21 also saw the start of a new budget structure for the Forest Service – one that separates out personnel, project funding, and administrative costs.<sup>39</sup> This brings the budget structure of the Forest Service more in line with other federal agencies and may provide more insight to Congress as to how the agency allocates funds between the three categories. While additional budget controls may provide greater accountability and help ensure that hazardous fuels funding is directed to projects on the ground, the new structure also removes some of the flexibility of so-called “salary savings,” or leaving staff positions unfilled while still funded. Importantly, salary savings have historically supplied critical funding for district and forest level staff to fund partnership-driven work, including on prescribed burns.



## POLICY OPTIONS:

### INCREASE FUNDING TO NEW AND EXISTING PROGRAMS

As noted above, the Forest Service lacks a dedicated budget line item or program devoted to prescribed fire. The “hazardous fuels” line item is the best existing option to channel funding to this work.<sup>40</sup> An increase in funding for prescribed fire should also provide a clearer incentive to burn as well as accountability mechanisms. Short term limitations to such an approach (e.g., a lack of a known baseline funding level) can and should be overcome, ideally creating a more conducive atmosphere for either a prescribed fire budget line item or for competitive programs dedicated to burning.

A variety of policy changes are appropriate to make budgeting practices reflect the need to increase prescribed fire, including:

- Congress should consider creating a separate budget line item for prescribed fire, or budget notes that instruct the Forest Service to dedicate a certain portion of the hazardous fuels budget to prescribed fire. Congress should continue to press the agency to document a baseline level of funding for burning and report on needed budgets to meet the scale of need.
- Congress should create an internally competitive program dedicated to prescribed fire. Such a program could be modelled on the successful and popular Collaborative Forest Landscape Restoration Program. Augmented funding for prescribed fire could be provided to high-priority landscapes that are able to leverage partnerships to increase the extent of prescribed fire within collaborative frameworks.
- Congress should create a competitive grant program for tribal, state, and nonprofit partners that funds prescribed fire work, both on federal land and other jurisdictions. A good model is the Oregon Plan for Salmon and Watersheds, which created watershed councils that can apply for state funding to implement watershed restoration projects on state, private, and federal lands.<sup>41</sup>
- Given that prescribed or managed wildfire is needed to “finish” many fuels reduction treatments, Congress could consider conditioning funding such that equal portions must be spent on prescribed or managed fire and mechanical fuels reduction.
- Congress should initiate a review of the new budget structure and include external partners in the process to better understand what impacts, if any, it has had on both internal and external efforts to conduct burning, and what additional steps may be required to secure sufficient funds for partnership-driven burn work.



## FOREST SERVICE BUSINESS MODEL

### CURRENT SITUATION

The mission of the Forest Service has changed over the agency's more than 100-year history, and organizational and bureaucratic changes have followed. Despite the recognition of "ecosystem management" as a core shift in how the Forest Service approaches forest management, many of the business models and much of the bureaucratic architecture of the agency has remained rooted in the commodity production model of the last century, including performance measures, data systems, contracting and agreement models, and approaches to planning.<sup>42</sup>

These bureaucratic systems reinforce and reflect agency priorities in critical ways. Performance measures help to drive both systemic and individual behavior through annual evaluations and internal budget allocations. The Forest Service is still largely organized around out-of-date performance measures focused on annual outputs, not outcomes, although some outcomes-based measures are being explored.<sup>43</sup> While the agency tracks multiple "key performance indicators" (KPIs) capturing a variety of interests, these are largely not used for internal budget allocation or performance review.<sup>44</sup> More important are the "targets": simplified

during the Trump Administration to a timber volume target and a target of acres treated for fuels reduction.

The timber volume target is a poor proxy for fire risk reduction, even though commercial work is often feasible and desirable within a risk reduction project. Even the widely used performance measure of "acres treated" fails to capture the need to reintroduce fire to the landscape, instead giving equal weight to treatments of any kind and with no regard for comprehensively reducing risk or treating the highest-value acres. Furthermore, current fuels treatment targets are modest and easily met, disincentivizing agency staff from prioritizing fuels work and leading, in some cases, to underperformance.

Data systems within the agency – most notably the Forest Service Activity Tracking System (FACTS) and the Timber Information Manager (TIM) – are likewise organized primarily around accounting for annual outputs, not landscape outcomes, and do not cleanly link environmental planning documents to work on the ground, often leading to the implementation of planned projects in piecemeal fashion. Coupled with a contracting system that is designed around wood as a valuable commodity to be protected, rather than as a risk the agency should pay to remove, this can result in projects that emphasize the sale of commercial timber while ignoring other needed, planned work such as prescribed fire or mechanical fuels treatments.

## POLICY OPTIONS: PERFORMANCE MEASURES AND BUDGETING

- Immediate action can be taken by elevating the existing “acres mitigated” KPI to a principal target on par with the two existing timber volume and acres treated targets. “Acres mitigated” is a better measure of the comprehensive action needed to reduce fire risk on one footprint acre than the current “acres treated” target. While any annual output target still suffers from the risk of prioritizing the easiest acres for treatment, use of the existing “acres mitigated” KPI would serve as a good bridge to more outcomes-based performance measures.
- Deprioritize the core performance measure of “timber volume sold.” This metric has long guided agency budget allocation and has been used as a benchmark of individual employee career success. While the agency tracks many KPIs, the timber volume target plays a disproportionate role in agency behavior. Addition of new KPIs is insufficient to motivate agency change without also relaxing the timber volume target. Furthermore, the timber volume target should not be conflated with a fire risk reduction outcome.
- Incentivize exceeding fuels reduction targets. So long as annual output targets remain in effect, performance measurement systems – and accompanying budget impacts – should incentivize overperformance, not penalize it. Currently, if a unit exceeds a fuels reduction target, they are expected to perform to the same advanced level in future budget years, essentially disincentivizing innovation and excellence. Performance above target could be rewarded with additional funding.
- The Forest Service should work with the Office of Management and Budget and key external partners to propose new outcomes-based targets that capture the complex, modern mission of the agency. While outcome measures are more difficult to achieve than simpler annual output targets, there are models for such practices already in existence (see on-the-ground example below).

### EXAMPLE ON THE GROUND

The Colorado Forest Restoration Institute has led participatory mapping to develop fire risk reduction maps that balance multiple values and account for local concerns and knowledge. Such a process could form the core of an outcomes-based performance measure. Agency performance could be evaluated based on annual reports from the agency to local stakeholders demonstrating accomplishments based on priority maps, showing progress towards locally determined goals. Such a performance measure would serve to provide accountability to local stakeholders as well as agency leadership and Congress.

## **POLICY OPTIONS:**

### **DATA SYSTEMS AND SCIENCE SUPPORT**

Increasing the scale of prescribed fire on national forests and developing capacity to significantly expand prescribed fire will require a commitment on the part of agencies to improve data collection, data management, and data sharing, and to continue investment in new research and development. Many of the recommendations in this report would benefit from long-term investment that is prioritized by risk analysis, implying tighter partnerships between agency and university scientists, managers, and policymakers. Specific policy needs include:

- Develop a publicly available database of areas treated with prescribed fire. Related to the recommendation above to develop outcomes-based performance measures, public and congressional support for agency efforts could be greatly improved with access to transparent, publicly available, spatially explicit information.
- Modernize accomplishment reporting systems (FACTS and TIM) to better track accomplishments on the ground and more clearly link them to planning documents. The disconnect between planning and implementation is a source of frustration to external stakeholders and makes measurement of success difficult.
- Increase investments in new smoke modeling methods that inform permitting processes and allow for more accurate smoke modelling and therefore increased permitting. Prescribed fire managers have shared that more burning could be done within the confines of existing state Clean Air Act rules, but better equipment and modelling is required to achieve this goal.
- Given the complex and changing nature of the prescribed fire policy problem – to say nothing of the importance of biophysical monitoring more generally– Congress should continue to fund the Joint Fire Sciences Program to provide critical research to underpin adaptive management.

# WORKFORCE

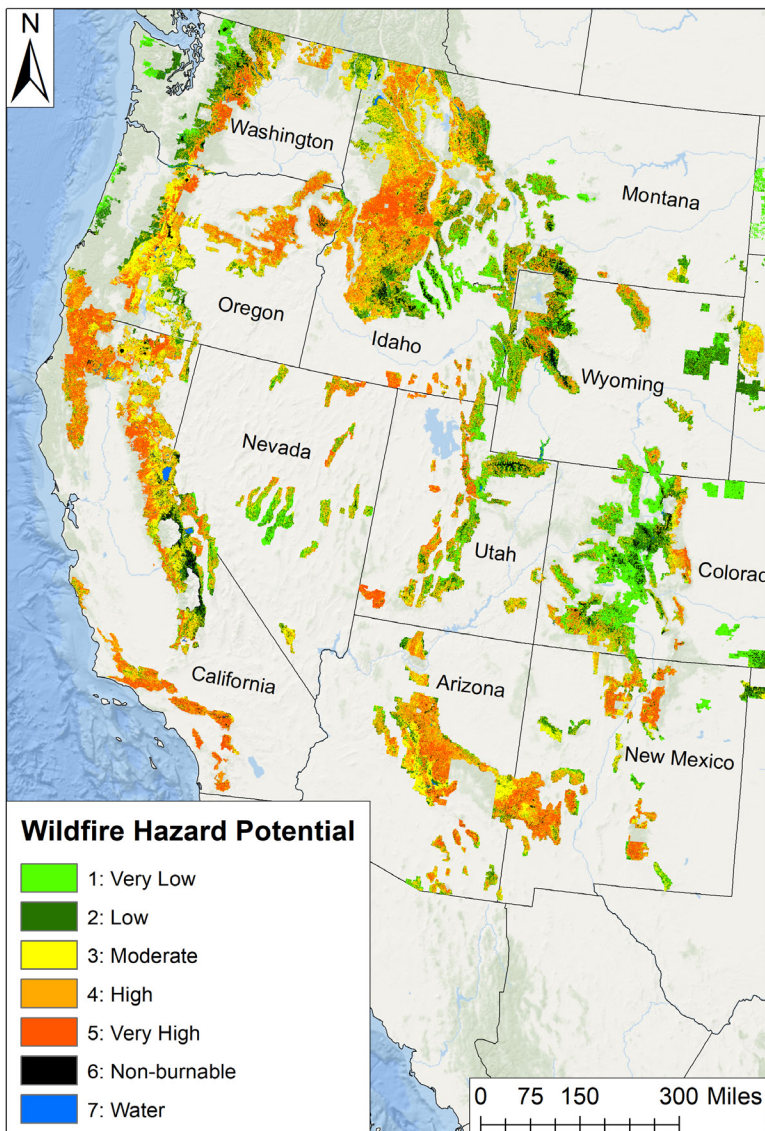
## CURRENT SITUATION

One of the greatest barriers to widespread reintroducing fire is a lack of workforce capacity.<sup>45</sup> As depicted in Figure 1, there are more than 65 million acres of forestland (more than 40% of national forest lands) that are at high or very high risk of fire that will be difficult to control. The workforce needed to accomplish fire risk reduction – both planning and implementation – is severely lacking and shrinking. Fuels management staff at the Forest Service and the Department of Interior declined by a combined 745 Full Time Equivalencies

(FTEs) between 2008 and 2013 – or 22%.<sup>46</sup> Fuels staff in Region 6 of the Forest Service, which comprises Oregon and Washington, estimate they currently treat between 100,000 and 150,000 acres per year, but using the historical and expected disturbance regimes as a template, the annual footprint treated would need to approach 781,000 acres to get ahead of the region’s fire risk.<sup>47</sup>

The lack of workforce capacity reflects a complex mix of administrative barriers to hiring and training, poor incentives to engage in prescribed fire work, poor integration of external partners, a lack of clarity around agreement and partnership mechanisms, and an outdated fire staffing model that is leaving fire personnel exhausted and strained as fire seasons grow more severe.

**Figure 1 Wildfire hazard potential across the western United States**



The current Forest Service staffing model used for wildland firefighting, of which the prescribed fire workforce is a part, is outdated and insufficient for the modern realities of longer fire seasons and the need to implement prescribed fire during the “shoulder season” (spring and fall). Reforms are needed to the staffing model overall, but changes are also needed to create more parity within the system for those who work on prescribed fire.

Staffing is organized around a seasonal, low-skilled, low-pay workforce. Most rank-and-file wildland firefighters are classified in a catch-all occupational series that does not capture the unique skills required for the job, nor does it offer sufficient baseline pay for the work.<sup>48</sup> Prescribed fire work is particularly impacted as so much of the work needs to be conducted in the shoulder seasons when workforce capacity ebbs. Furthermore, prescribed fire is penalized by a lack of hazard pay and often shorter hours – meaning that prescribed fire projects are less incentivized relative to wildfire suppression.

Workforce capacity is further constrained by a lack of access to training for critical specialized certifications, such as the “burn boss” qualification needed to manage prescribed burns. External partners are even further sidelined in the existing qualification

system established by the National Wildfire Coordinating Group (NWCG) by a lack of access to training and a dearth of opportunities to develop and demonstrate applied competency, which is required for full certification.

Finally, the overall increased stress placed on the wildland fire workforce by lack of capacity and longer fire seasons, to say nothing of the pandemic, is leading to exhaustion and declining participation. Greater summer exhaustion impacts prescribed fire by limiting the potential workforce available and willing to continue to work after long and taxing fire seasons.

More generally, external partners are poorly integrated into the prescribed fire workforce despite real interest in being a part of the solution. Mechanisms for working with partners – usually participating agreements – are confusing for all parties involved and Forest Service staff awareness of how best to formalize partner-

ships is extremely variable.<sup>49</sup> Even when agreements are put in place, matching funding is required, creating yet another barrier to increasing the prescribed fire workforce. Rather than treating external partners as a needed boost to the limited workforce, matching funding requirements essentially require partners to pay for the privilege of helping to address the problem of rising wildfire risk. Deserving of separate consideration from nonprofit partners, some tribes also wish to participate in prescribed fire and cultural burning more fully, yet similar barriers exist despite sovereign and treaty rights.

This lack of capacity can be addressed by augmenting the Forest Service's existing prescribed fire capacity, emphasizing development of local workforces, embracing a tribal co-management approach to prescribed fire, increasing training opportunities, or, ideally, a mix of all the policy options described on the following pages.



## POLICY OPTIONS:

### AUGMENTING THE FOREST SERVICE'S PRESCRIBED FIRE WORKFORCE

The Forest Service's current fire business model emphasizes fire suppression and treats fire as an annual emergency that requires a large temporary workforce to deal with large fires that in recent years have burned millions of acres every year. Increasing the Forest Service's capacity to conduct prescribed fire to help manage future wildfire will involve improved training, pay and benefits for temporary workforces; creating additional permanent positions to reintroduce fire; and building partnerships that share prescribed fire resources from other federal agencies, nongovernmental organizations, and tribal, state, and local governments. Specific policy changes needed include:

- Higher baseline salaries for fire personnel and incentives to accept temporary employment including eligibility for health insurance, paid time off, and retirement packages. The agency should also consider the creation of a dedicated job classification in the federal hiring system for wildland firefighters.
- Transition more temporary, seasonal employees to year-round work reintroducing fire before and after wildfire season as well as other forest restoration work.
- Provide the same pay, benefits, and opportunities for training certification and promotion for work on prescribed fire projects as wildfire suppression to incent staff participation in the reintroduction of fire.
- Consider creation of a dedicated intergovernmental prescribed fire workforce, including regional prescribed fire burn modules (teams) that facilitate the reintroduction of fire across diverse landscapes within particular regions of the country.
- Develop interagency western U.S. prescribed fire centers that facilitate better training and coordination among different agencies and external partners for sharing personnel to manage prescribed burns and wildfire across agencies and jurisdictions. The centers would be tasked with growing prescribed fire workforce capacity and skills across the region and coordinating, allocating, and deploying equipment.<sup>50</sup>
- Utilize more retirees with important fire qualifications using the “administrative determination” system. Wildland firefighting benefits allow for relatively early retirement (after 20 years of service).<sup>51</sup> This creates a pool of potential as-needed employees with advanced qualifications who could play an important role, particularly as a larger workforce is still being trained.

# POLICY OPTIONS:

## LOCAL WORKFORCE

Even with the needed changes to Forest Service fire management policy described above; it is likely that the need for prescribed fire still outpaces Forest Service capacity. Managers and policy makers increasingly recognize the need to take an “all hands, all lands” approach to management of fire-prone western forests. Nongovernmental actors often play a critical role in utilizing prescribed fire on private lands. A variety of policy changes are needed to create more roles for non-federal actors in partnering with Forest Service managers to reintroduce fire to national forests and private land.

- Congress should act to create new federal grant programs and lower matching fund requirements of existing grant programs to facilitate the development of prescribed fire capacity within nongovernmental organizations and tribal, state, and local governments. In particular, lowering or removing cash match requirements will facilitate greater partner participation in prescribed burning.
- Agency leadership should streamline partner involvement by providing common operating language for agreements that address NGO/partner-specific topics subject to conflicting interpretation, including liability and appropriate roles and responsibilities.
- Agency leadership should engage in a broad partnership modernization effort to review the limitations of current agreement structures and approaches to working in partnership.
- Congress could help address liability barriers to the application of prescribed fire by placing a cap on damages from prescribed fire implemented by certified professionals and facilitating the creation of insurance pools to cover claims against damages from prescribed fire.
- Agency leadership should direct multiyear funding to partners for prescribed fire efforts, serving to incentivize and support an expanded partner workforce and provide secure, long-term investment for that will attract outside leveraged funding.
- National fire leadership should create pathways for NGOs to achieve federally recognized or NWCG equivalent certifications. This should also include granting a national nonprofit a seat on the NWCG and allowing them to administer training and certification to nonprofit partners.
- Agencies should support options that allow partners to be mutual aid entities to create opportunities for NGO staff to build their qualifications, establish relationships with fire managers, and build trust with federal partners.
- Congress should act to create the 21<sup>st</sup> Century Civilian Conservation—or Climate Corps—which has as a primary task the reintroduction of fire to national forest lands.



## **POLICY OPTIONS: TRIBAL CO-MANAGEMENT**

Tribes have extensive experience using fire to increase the resilience of forests, provide valuable resources, and protect communities from fire. Many tribes also have treaty rights that provide access to resources on national forest lands. Furthermore, tribes already have a relationship with the Bureau of Indian Affairs, providing some level of integration with federal agency systems. Developing increased capacity to conduct burning by tribal fire practitioners is an important part of any program to increase use of fire on national forest lands and is fundamentally important as a recognition of tribal sovereignty. Of particular interest to policy makers should be opportunities to use and expand existing authorities to create a larger role for tribes in conducting prescribed fire operations on agency land. For a more comprehensive look at barriers to tribal cultural burning, see the 2021 report “Good Fire: Current Barriers to the Expansion of Cultural Burning and Prescribed Fire in California and Recommended Solutions.”<sup>52</sup>

Specific policy changes include:

- Increase the use of 638 agreements between tribes and the Forest Service to reintroduce fire to Forest Service landscapes by providing dedicated funding sources for these agreements.
- Increase the utility of Good Neighbor Authority for tribes by extending the revenue management provision to tribes. This provision already exists for states and may help increase the use of the authority by tribes.
- Create dedicated Forest Service positions to act as liaisons in support of tribal burn programs.
- Congress should act to exempt tribally led prescribed fire from the Clean Air Act if it is carried out to improve and create habitat, provide for traditional foods, reduce fuels, and protect communities.

## **THE INDIAN SELF DETERMINATION AND EDUCATION ASSISTANCE ACT (ISDEAA)**

The ISDEAA (PL 93-638) was passed by Congress in January, 1975 to provide “maximum Indian participation in the Government and education of the Indian people; to provide for the full participation of Indian tribes in programs and services conducted by the Federal Government for Indians and to encourage the development of human resources of the Indian people; to establish a program of assistance to upgrade Indian education; to support the right of Indian citizens to control their own educational activities; and for other purposes.” The Act, commonly referred to as 638, provides for self-determination contracts that allow tribes to complete work to benefit tribal resources on federal lands. Use of 638 contracting has been hampered by a lack of dedicated funding and seeming confusion on the part of agency staff on how best to use the authority. Better use of 638 contracting could provide a critical tool to tribal participation in prescribed fire efforts on national forests.



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## CONCLUSION

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Prescribed fire is a complex topic, but the need to integrate landscape-scale burning into land management is more important than ever. We have an opportunity to get ahead of the growing threat of uncharacteristically severe wildfire, but to do so, we need to act swiftly. Increasing the use of prescribed fire to an extent that we see real impacts will require a massive reconsideration of funding levels, a redesign of the basic bureaucratic architecture of the Forest Service, and a significant investment in the workforce available to conduct burning. Incremental change is not enough. We need a sea change in the way we approach prescribed fire and land management.



# Sources

1. North, M., B.M. Collins, and S. Stephens. 2012. Using fire to increase the scale, benefits, and future maintenance of fuels treatments. *Journal of Forestry* 110(7): 392-401.  
Prichard, S.J., P.F. Hessburg, R.K. Haggmann., N.A. Povak, S.Z. Dobrowski, M.D. Hurteau, V.R. Kane, et al. 2021. Adapting western North American forests to climate change and wildfires: Ten common questions. *Ecological Applications*. DOI:10.1002/eap.2433.
2. Melvin, M.A. 2020. *2020 National Prescribed Fire Use Report*. Technical Bulletin 04-20. Coalition of Prescribed Fire Councils, Inc. Washington, DC, USA.
3. Parks, S.A. and J.T. Abatzoglou. 2020. Warmer and drier fire seasons contribute to increases in area burned at high severity in western US forests from 1985 to 2017. *Geophysical Research Letters*, 47(22). e2020GL089858.
4. Armstrong, C.G., J.E. Miller, A.C. McAlvay, P.M. Ritchie, and D. Lepofsky. 2021. Historical Indigenous Land-Use Explains Plant Functional Trait Diversity. *Ecology and Society* 26(2):6. <https://doi.org/10.5751/ES-12322-260206>.  
Carter, V. A., A. Brunelle, M.J. Power, R.J. DeRose, M.F. Bekker, I. Hart, S. Brewer, et al. 2021. Legacies of Indigenous land use shaped past wildfire regimes in the Basin-Plateau Region, USA. *Communications Earth & Environment*, 2(1), 1-9. <https://doi.org/10.1038/s43247-021-00137-3>.  
Roos, C.I., T.W. Swetnam, T.J. Ferguson, M.J. Liebmann, R.A. Loehman, J.R. Welch, E.Q. Margolis, et al. 2021. Native American fire management at an ancient wildland–urban interface in the Southwest United States. *Proceedings of the National Academy of Sciences* 118(4). e2018733118.
5. Turner, M.G. and R.H. Gardner. 2015. *Landscape ecology in theory and practice: Pattern and process*, 2nd ed. Springer, New York.  
Johnstone, J.F., C.D. Allen, J.F. Franklin, L.E. Frelich, B.J. Harvey, P.E. Higuera, M.C. Mack, et al. 2016. Changing disturbance regimes, ecological memory, and forest resilience. *Frontiers in Ecology and the Environment* 14(7): 369-378. <https://doi.org/10.1002/fee.1311>.
6. Pyne, S.J. 2017. *Fire in America: a cultural history of wildland and rural fire*. University of Washington Press.
7. Marlon, J.R., P.J. Bartlein, D.G. Gavin, C.J. Long, R.S. Anderson, C.E. Briles, K.J. Brown, et al. 2012. Long-term perspective on wildfires in the western USA. *Proceedings of the National Academy of Sciences* 109(9) E535-E543.
8. Parks, S.A., C. Miller, M.A. Parisien, L.M. Holsinger, S.Z. Dobrowski, and J. Abatzoglou. 2015. Wildland fire deficit and surplus in the western United States, 1984–2012. *Ecosphere* 6(12): 1-13.
9. Schoennagel, T., T.T. Veblen, and W.H. Romme. 2004. The interaction of fire, fuels, and climate across Rocky Mountain forests. *BioScience* 54(7), 661-676.
10. Haggmann, R.K., P.F. Hessburg, S.J. Prichard, N.A. Povak, P. Brown, P.Z. Fulé, R.E. Keane, et al. 2021. Evidence for widespread changes in the structure, composition, and fire regimes of western North American forests. *Ecological Applications*. doi:10.1002/eap.2431
11. Abella, S.R., W.W. Covington, P.Z. Fulé, L.B. Lentile, A.J.S. Meador, and P. Morgan. 2007. Past, present, and future old growth in frequent-fire conifer forests of the western United States. *Ecology and Society* 12(2).  
Hessburg, P.F., and J.K. Agee. 2003. An environmental narrative of Inland Northwest United States forests, 1800–2000. *Forest Ecology and Management* 178:23–59.
12. Jones, G.M., R.J. Gutiérrez, H.A. Kramer, D.J. Tempel, W.J. Berigan, S.A. Whitmore, and M.Z. Peery. 2019. Megafire effects on spotted owls: elucidation of a growing threat and a response to Hanson et al. (2018). *Nature Conservation* 37:31.  
Sankey, J.B., J. Kreidler, T.J. Hawbaker, J.L. McVay, M.E. Miller, E.R. Mueller, N.M. Vaillant, S.E. Lowe, and T.T. Sankey. 2017. Climate, wildfire, and erosion ensemble foretells more sediment in western USA watersheds. *Geophysical Research Letters* 44(17):8884-8892.  
Williams, J. 2013. Exploring the onset of high-impact mega-fires through a forest land management prism. *Forest Ecology and Management* 294: 4-10.
13. Keeley, J.E., and A.D. Syphard. 2019. Twenty-first century California, USA, wildfires: Fuel-dominated vs. wind-dominated fires. *Fire Ecology*, 15(1), 1-15.  
Wang, D., D. Guan, S. Zhu, M. Mac Kinnon, G. Geng, Q. Zhang, H. Zheng, et al. 2021. Economic footprint of California wildfires in 2018. *Nature Sustainability* 4: 252-260. <https://doi.org/10.1038/s41893-020-00646-7>.
14. Burke, M., A. Driscoll, S. Heft-Neal, J. Xue, J. Burney, and M. Wara. 2021. The changing risk and burden of wildfire in the United States. *Proceedings of the National Academy of Sciences* 118(2) e2011048118.  
Reid, C.E., M. Brauer, F.H. Johnston, M. Jerrett, J.R. Balmes, and C.T. Elliott. 2016. Critical review of health impacts of wildfire smoke exposure. *Environmental Health Perspectives* 124:1334–1343. <http://dx.doi.org/10.1289/ehp.1409277>.
15. Aguilera, R., T. Corringham, A. Gershunov, and T. Benmarhnia. 2021. Wildfire smoke impacts respiratory health more than fine particles from other sources: observational evidence from Southern California. *Nature Communications* 12(1): 1-8.
16. Kolden, C.A. 2019. We're not doing enough prescribed fire in the Western United States to mitigate wildfire risk. *Fire* 2(2):30. <https://doi.org/10.3390/fire2020030>.  
Engelbreton, J.M., T.E. Hall, J.J. Blades, C.S. Olsen, E. Toman, S.S. Frederick. 2016. Characterizing public tolerance of smoke from wildland fires in communities across the United States. *Journal of Forestry* 114:601–609.

- Quinn-Davidson, L.N., and J.M. Varner. 2012. Impediments to prescribed fire across agency, landscape, and manager: An example from northern California. *International Journal of Wildland Fire*, 21:210-218.
17. Willms, J., A. Bartuszevige, D.W. Schwilk, and P.L. Kennedy. 2017. The effects of thinning and burning on understory vegetation in North America: a meta-analysis. *Forest Ecology and Management*, 392:184-194.
- Kalies, E.L., and L.L.Y. Kent. 2016. Tamm review: are fuel treatments effective at achieving ecological and social objectives? A systematic review. *Forest Ecology and Management* 375:84-95.
- Martinson, E.J., and P.N. Omi. 2013. Fuel Treatments and Fire Severity: A Meta-analysis. Res. Pap. RMRS-RP-103WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 38 p.
- Fulé, P.Z., J.E. Crouse, J.P. Roccaforte, and E.L. Kalies. 2012. Do thinning and/or burning treatments in western USA ponderosa or Jeffrey pine-dominated forests help restore natural fire behavior? *Forest Ecology and Management* 269:68–81.
18. Vaillant, N.M., and E.D. Reinhardt. 2017. An evaluation of the Forest Service Hazardous Fuels Treatment Program—Are we treating enough to promote resiliency or reduce hazard?. *Journal of Forestry* 115(4):300-308.
- North, M., A. Brough, J. Long, B. Collins, P. Bowden, D. Yasuda, J. Miller, and N. Sugihara. 2015. Constraints on mechanized treatment significantly limit mechanical fuels reduction extent in the Sierra Nevada. *Journal of Forestry* 113(1):40-48.
- North, M., B.M. Collins, and S. Stephens. 2012. Using fire to increase the scale, benefits, and future maintenance of fuels treatments. *Journal of Forestry* 110(7):392-401.
19. National Interagency Fire Center (<https://www.nifc.gov/fire-information/statistics/suppression-costs>).
20. From <https://www.fs.usda.gov/sites/default/files/2015-Fire-Budget-Report.pdf>
21. Schultz, C.A., M.P. Thompson, and S.M. McCaffrey. 2019. Forest Service fire management and the elusiveness of change. *Fire Ecology*, 15(1), 1-15.
- USDA Forest Service. 2015. The rising cost of wildfire operations: the effects on the Forest Service's non-fire work (<http://www.fs.fed.us/sites/default/files/2015-Rising-Cost-Wildfire-Operations.pdf>).
22. Cattau, M.E, C. Wessman, A. Mahood, and J.K. Balch. 2020. Anthropogenic and lightning-started fires are becoming larger and more frequent over a longer season length in the U.S. *Global Ecology and Biogeography* 29(4): 668–81.
- Cook, P. S., and D.R. Becker. 2017. *State funding for wildfire suppression in the Western US*. College of Natural Science, University of Idaho, Moscow, Idaho, United States.
23. 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*, 113(42), 11770-11775.
24. Williams, A. P., J.T. Abatzoglou, A. Gershunov, J. Guzman-Morales, D.A. Bishop, J.K. Balch, and D.P. Lettenmaier. 2019. Observed impacts of anthropogenic climate change on wildfire in California. *Earth's Future*, 7(8), 892-910.
25. S. 4625 National Prescribed Fire Act of 2020. <https://www.congress.gov/bill/116th-congress/senate-bill/4625>.
26. FY20 Appropriations and <https://www.fs.usda.gov/sites/default/files/2020-02/usfs-fy-2021-budget-justification.pdf>.
27. Pub. L. 108-148.
- Radmall, L. 2004. President George W. Bush's Forest Policy: Healthy Forest Restoration Act of 2003. *Journal of Land Resources and Environmental Law*, 24:511.
- Pub. L. 111-11.
- Butler, W.H., A. Monroe, and S. McCaffrey. 2015. Collaborative implementation for ecological restoration on US public lands: implications for legal context, accountability, and adaptive management. *Environmental Management*, 55(3):564-577.
28. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/06/30/fact-sheet-the-biden-harris-administration-acts-to-address-the-growing-wildfire-threat/>
29. Santo, A., T. Bertone-Riggs, and H. Huber-Stearns. 2020. Implementing Outcome-Based Performance Measures aligned with the Forest Service's Shared Stewardship Strategy. Rural Voices for Conservation Coalition. <https://www.fs.usda.gov/sites/default/files/toward-shared-stewardship.pdf>.
30. Butler, W.H. and C.A. Schultz (Eds.). 2018. *A New Era for Collaborative Forest Management: Policy and Practice Insights from the Collaborative Forest Landscape Restoration Program*. Routledge. New York, NY.
31. Abrams, J., H. Huber-Stearns, H. Gosnell, A. Santo, S. Duffey, and C. Moseley. 2019. Tracking a Governance Transition: Identifying and Measuring Indicators of Social Forestry on the Willamette National Forest. *Society & Natural Resources*, DOI: 10.1080/08941920.2019.1605434.
32. Kolden, C.A. 2019. We're not doing enough prescribed fire in the Western United States to mitigate wildfire risk. *Fire* 2(2):30.
33. Moore, R. (Aug. 16, 2021). From the Chief's Desk: Fire, COVID updates and GMA interview. <https://www.fs.usda.gov/inside-fs/leadership/chiefs-desk-fire-and-covid-updates>
34. Clavet, C., C. Topik, M. Harrell, P. Holmes, R. Healy, and D. Wear. 2021. Wildfire Resilience Funding: Building Blocks for a Paradigm Shift. [https://www.nature.org/content/dam/tnc/nature/en/documents/WildfireResilienceFunding\\_TNC\\_6-30-21.pdf](https://www.nature.org/content/dam/tnc/nature/en/documents/WildfireResilienceFunding_TNC_6-30-21.pdf)

35. See FY2022 for charts of past budgets: <https://www.fs.usda.gov/sites/default/files/usfs-fy-2022-budget-justification.pdf>.
36. Testimony of Victoria Christiansen to the Senate Energy and Natural Resources Committee. June 17, 2021. <https://www.energy.senate.gov/hearings/2021/6/full-committee-hearing-to-examine-the-president-s-fy-2022-budget-request-for-the-u-s-forest-service>.
37. Clavet, C., C. Topik, M. Harrell, P. Holmes, R. Healy, and D. Wear. 2021. Wildfire Resilience Funding: Building Blocks for a Paradigm Shift. [https://www.nature.org/content/dam/tnc/nature/en/documents/WildfireResilienceFunding\\_TNC\\_6-30-21.pdf](https://www.nature.org/content/dam/tnc/nature/en/documents/WildfireResilienceFunding_TNC_6-30-21.pdf)
38. Skelly, D., personal communication, Sept. 3rd, 2021.
39. United States Department of Agriculture. Four Things You Should Know About Budget Modernization. [https://www.nafsr.org/docs/2020/BudgetModernization/Budget\\_Modernization%20Paper%2009282020.pdf](https://www.nafsr.org/docs/2020/BudgetModernization/Budget_Modernization%20Paper%2009282020.pdf)
40. For a comprehensive look at programs across the whole of government, see the 2021 Nature Conservancy document *Wildfire Resilience Funding: Building Blocks for a Paradigm Shift* for a list of existing programs ready for investment.
41. For more information, see <https://www.oregon.gov/oweb/resources/Pages/opsweb.aspx>
42. Forest Service Wildland Fire Suppression Costs Exceed \$2 Billion. (Sept. 14, 2017). USDA Press Office. <https://www.usda.gov/media/press-releases/2017/09/14/forest-service-wildland-fire-suppression-costs-exceed-2-billion>.
43. For more information, see recent Forest Service Budget Justifications: <https://www.fs.usda.gov/sites/default/files/usfs-fy-2022-budget-justification.pdf>.
44. Santo, A., T. Bertone-Riggs, and H. Huber-Stearns. 2020. Implementing Outcome-Based Performance Measures aligned with the Forest Service's Shared Stewardship Strategy. Rural Voices for Conservation Coalition. <https://www.fs.usda.gov/sites/default/files/toward-shared-stewardship.pdf>
45. Schultz, C.A., C. Moseley, A. Amos, C. Bone. 2021. Policy Barriers to Prescribed Fire: Identifying Opportunities and Mechanisms for Change. Joint Fire Sciences project ID: 16-1-02-8. [https://www.firescience.gov/projects/16-1-02-8/project/16-1-02-8\\_final\\_report.pdf](https://www.firescience.gov/projects/16-1-02-8/project/16-1-02-8_final_report.pdf).
46. US Department of Agriculture and US Department of Interior, 2014. 2014 Quadrennial Fire Review. Washington, DC: USDA and DOI.
47. Skelly, D., personal communication, Sept. 3rd, 2021.
48. Fact Sheet: The Biden-Harris Administration Acts to Address the Growing Wildfire Threat. June 30, 2021. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/06/30/fact-sheet-the-biden-harris-administration-acts-to-address-the-growing-wildfire-threat/>.
49. RVCC Natural Climate Solutions White Paper. 2021 (In production).
50. Miller, C. and G.H. Aplet. 2016. Progress in wilderness fire science: Embracing complexity. *Journal of Forestry*, 114(3), 373-383.
51. 214 Quadrennial Fire Review. 2015. Developed by Booze Allen Hamilton on behalf of USDA Forest Service and Department of Interior.
52. Clark, S.A., A. Miller, and D.L. Hankins. 2021. *Good fire: current barriers to the expansion of cultural burning and prescribed fire in California and recommended solutions, Karuk Tribe, Happy Camp, CA*. [https://karuktribeclimatechange/projects.files.wordpress.com/2021/03/karuk-prescribed-fire-rpt\\_final-1.pdf](https://karuktribeclimatechange/projects.files.wordpress.com/2021/03/karuk-prescribed-fire-rpt_final-1.pdf)

