



DEVELOPING AND SUPPORTING THE FEDERAL WILDLAND FIRE WORKFORCE

A Report by the *Smoke: Wildfire Science and Policy Practicum*¹ | August 2023



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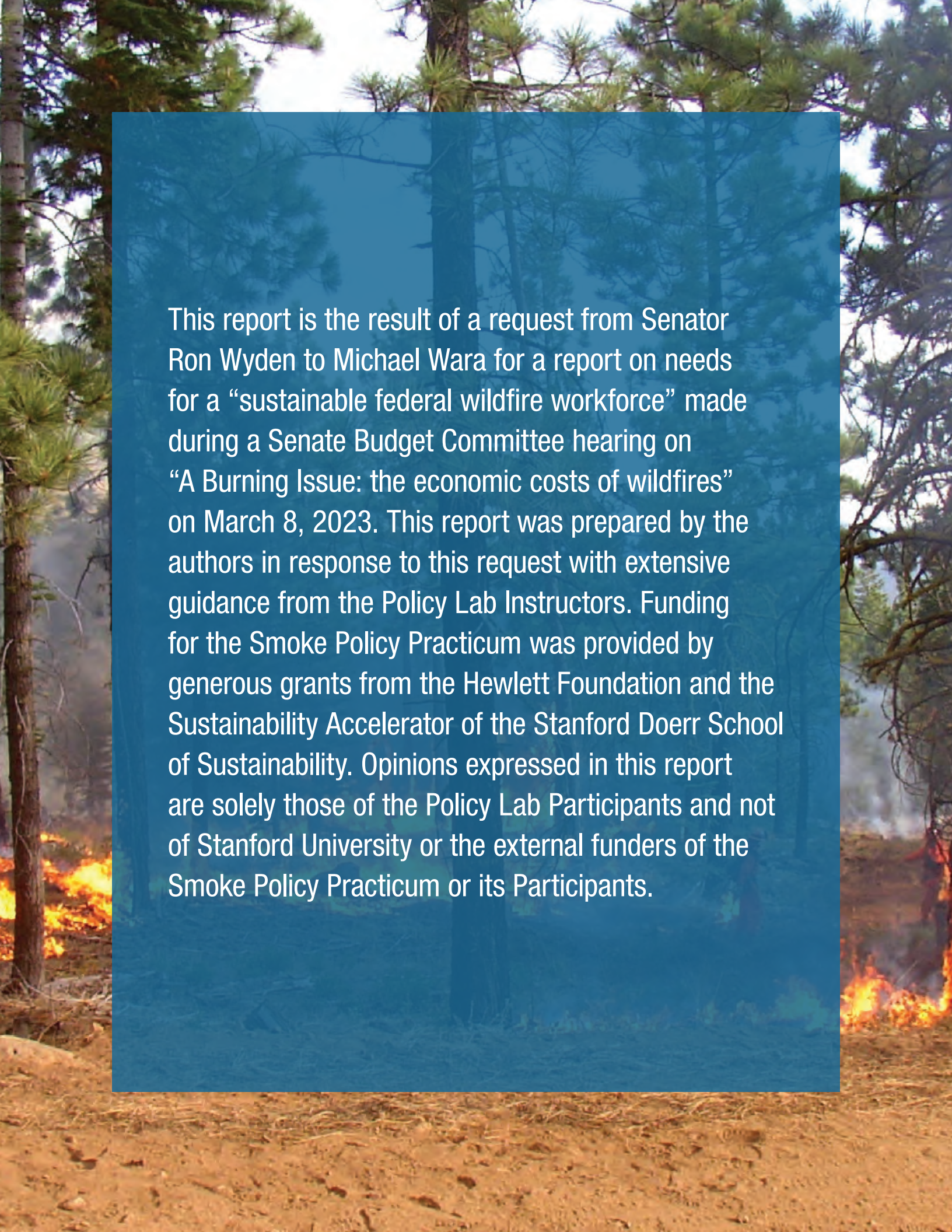
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1 Stanford's Smoke: Wildfire Science and Policy Practicum engages students in learning about and helping to craft policy solutions to some of the significant challenges wildfires pose. The Practicum is directed by Michael Wara and Deborah Sivas. Report authored by Abigail Varney and Samuel Wallace-Perdomo under the direction of the teaching team.

The background image shows a forest fire with bright orange flames and thick white smoke rising from the ground. Several tall, dark green pine trees are visible in the foreground and background. A large, semi-transparent blue rectangle is overlaid on the center of the image, containing white text.

This report is the result of a request from Senator Ron Wyden to Michael Wara for a report on needs for a “sustainable federal wildfire workforce” made during a Senate Budget Committee hearing on “A Burning Issue: the economic costs of wildfires” on March 8, 2023. This report was prepared by the authors in response to this request with extensive guidance from the Policy Lab Instructors. Funding for the Smoke Policy Practicum was provided by generous grants from the Hewlett Foundation and the Sustainability Accelerator of the Stanford Doerr School of Sustainability. Opinions expressed in this report are solely those of the Policy Lab Participants and not of Stanford University or the external funders of the Smoke Policy Practicum or its Participants.

EXECUTIVE SUMMARY

For the past several decades, forests across the American West have been changing in unprecedented ways. These changes are more apparent than ever in the increasingly severe wildfire seasons that we are now seeing year in and year out. Though fire is a normal and often necessary component of forest ecology, uncharacteristically severe wildfires now pose a significant threat to communities, infrastructure, and natural resources.

Increased development in ecosystems that require fire to be healthy – in combination with a wildfire regime shifting towards more large, high severity fires – means that many wildfires now pose an extreme risk to human life and property, creating a social imperative for wildfire control. However, firefighting resources are becoming increasingly strained, exacerbating the challenges firefighters face while working under dangerous conditions. Federal wildland firefighters also face compensation, classification, and welfare challenges that have largely gone unaddressed at a meaningful scale.

Fire suppression activities alone are unable to protect our communities and the infrastructure and landscapes they depend on from wildfire. While the costs and risks associated with catastrophic wildfires have grown, investment in promoting resilience to wildfire has been lagging. Increased investment and program coordination by federal, state, and tribal governments, as well as private partners, to reduce wildfire risk must occur at a pace and scale commensurate with the urgent need to address this growing crisis in a strategic way across landscapes.

This whitepaper provides recommendations to Congress to better support the federal wildland fire workforce and to develop a workforce that looks beyond fire suppression in order to accomplish needed wildfire resilience treatments. The reality is that wildfire suppression and better forest stewardship are highly skilled, labor-intensive activities that will require greater support if the federal lands are to break a cycle of larger, higher intensity and higher severity wildfire. This means better support for the personnel in the fire suppression workforce and development of a much more robust federal forest stewardship workforce and capacity. A key recommendation of our work is that given the role that improved forest stewardship could play in moderating the severity of wildfire seasons, one of the best ways to support the existing workforce is to develop a resilience-focused workforce.



RECOMMENDATIONS

Prioritizing Stewardship Through Workforce

Proactively treating landscapes for wildfire risk and preparing communities at the required scale to face those risks necessitates a specialized, year-round workforce charged with restoring fire resilience that currently does not exist. Federal wildland firefighter workforce policy must begin making a longer-term shift in institutional priorities toward proactive, stewardship-oriented wildfire governance. In addition to hazard response and post-fire recovery, this workforce should have personnel dedicated to promoting wildfire resilience through efforts including but not limited to education, planning and zoning, community preparedness, landscape-scale treatments, and restoration of historic fire regimes.

Policy Proposal:

Establish a federal entity—with funding and staffing streams separate from suppression-focused elements of fire management—dedicated to stewardship efforts including, amongst others, forest resilience, prescribed burns, and co-management collaborations. This will require:

- Restructuring wildland fire management occupational series and career paths to create accessible and attractive stewardship-related career advancement opportunities.
- Expanding stewardship collaborations with Tribes, particularly through initiatives affording greater co-management rights that acknowledge shared sovereignty.

Work / Life Balance

Longer and more severe fire seasons have increased both the time and frequency of firefighter deployments. Additionally, current cultural and policy issues have placed longevity and success in the fire service at odds with the ability to properly care or be present for one's own family or personal needs. Providing viable and diverse opportunities for career advancement or transitions will support the recruitment and retention of firefighters who will be able to contribute to their agency's mission in a myriad of ways that also align with their personal circumstances and values at different points along their careers.

Policy Proposal:

- Mandate that federal wildland firefighters shall be allowed a period of 180 days of unpaid leave in order to care for a family member.
- Establish a career transition fund to assist wildland firefighters in achieving their career development goals.
- Increase the number of mental health clinicians and expand the services of the Employee Assistance Program (EAP) to help firefighters address work/life challenges.

Compensation and Classification

Low pay is the most commonly cited barrier to recruitment and retention of federal wildland firefighters. Federal wildland firefighters often earn significantly less than their counterparts in non-federal firefighting entities and are more reliant on unplanned income – or the proportion of wages coming from overtime and hazard pay.

Policy Proposal:

- Establish a new pay scale for federal wildland firefighters that starts at or above the GS6 Step 3 (\$20.09) level.
- Establish portal-to-portal pay.
- Allow federal wildland firefighters to include overtime pay as basic pay when calculating their retirement annuity.
- Include Wildland Fire Dispatchers in the new wildland firefighter occupational series.

Comprehensive Health and Wellbeing

The physical strain of working long hours, receiving little-to-no sleep, and being exposed to traumatic or life-threatening situations can negatively affect firefighters' health and wellbeing. Providing comprehensive services to improve the welfare of wildland firefighters is critical to sustaining a workforce that can safely and effectively complete their mission, without causing undue mental and physical burdens or high attrition rates.

Policy Proposal:

- Grant presumptive health coverage to federal wildland firefighters for acute and chronic illness due to environmental job-related exposure.
- Create a National Federal Wildland Firefighter Cancer and Cardiovascular Disease Database.
- Develop and fund a robust mental health program with expanded mental health services specific to wildland firefighters and their families.

For supporting background information, please contact the Stanford Law School / Stanford Doerr School of Sustainability *Smoke: Wildfire Science and Policy Practicum* Teaching Team



INTRODUCTION

For the past several decades, forests across the American West have been changing in unprecedented ways, including the staggering buildup of forest fuels created by more than a century of fire suppression policies combined with management decisions that fostered replanting with single species even aged stands after logging. These changes have come into sharp focus with the increasing severity of wildfire seasons experienced in the region in recent years. Fire is a natural and often necessary component of forest ecology, as many wildlands are historically adapted to periodic fires and rely on fire for ecosystem management and benefits. For centuries, Indigenous Peoples have managed the landscape with the frequent, deliberate, and highly knowledgeable application of fire. Lightning ignitions also played a role in introducing fire to fire-evolved landscapes. As non-Indigenous Americans settled westward, federal and state governments forced Indigenous Peoples to relinquish most of their ancestral territories and homelands, repressing tribal use of fire as well as suppressing naturally-ignited fires.² The past century of fire exclusion and the focus of landscape-scale forest management on resource extraction, among other land management practices, has resulted in formerly open, park-like forests giving way to dense, crowded tree coverage with excessive fuel loads populated by tree species that are less tolerant to fire and drought and more vulnerable to insects and disease.³ Climate change has only exacerbated this issue, as increased temperatures and drier conditions heighten the probability and severity of wildfires.⁴

Though fire continues to play a critical role in shaping the landscape, wildfires that are uncharacteristically severe compared to natural fire regimes now pose a significant threat to communities, infrastructure, and natural resources. The cumulative impact of the prohibition of Indigenous burning, fire suppression policies, forest management policies, climate change, insect and disease outbreaks, and development within or adjacent to fire-prone ecosystems has created a landscape that is more susceptible to large and destructive wildfires. In the last decade, wildfires across the United States have burned an average of 7.4 million acres annually, more than double the acres burned in the 1990s.⁵ Nationally, wildfire seasons are now more than 80 days longer than they were in the 1970s, with three times more large fires that are greater than 1,000 acres.⁶ This is despite continued growth in the budget for federal wildland fire suppression at rates significantly in excess of inflation.

As the wildfire crisis intensifies throughout the western United States, so too have its associated costs. Wildfires affect the federal budget primarily through dollars spent on fire suppression, which totaled an annual average of \$2.5 billion per fiscal year between 2016 and 2020.⁷ During the same period, the federal government provided state and

2 Montana Forest Action Advisory Council, *Montana Assessment of Forest Conditions*, Indigenous People and Forests, 6, 9-10, December 2020.

3 The Montana Forest Action Advisory Council, *Montana Forest Action Plan*, 13, December 2020.

4 Karuk Department of Natural Resources, *Karuk Climate Adaptation Plan*, 17, March 2019.

5 Congressional Budget Office, *Wildfires*, 3, June 2022.

6 USDA Forest Service, *The Rising Cost of Wildfire Operations: Effects on the Forest Service's Non-Fire Work*, 2, August 2015.

7 Congressional Budget Office, *Wildfires*, 1, June 2022.

local governments with an additional \$5 billion through disaster financial assistance programs.⁸ In 2020, the State of California alone spent several billion dollars on wildfire suppression activities and property damages were estimated to exceed \$8 billion.⁹ These figures do not include indirect costs to communities, such as lost wages, reduced business revenue, or agricultural crop losses, nor can they account for the loss of life, destruction of habitat, and adverse public health outcomes, especially from wildfire smoke, whose impacts are difficult to quantify.

Increased development in fire-prone ecosystems – in combination with a wildfire regime shifting towards more large, high severity fires – means that many wildfires now pose an extreme risk to human life and property, creating a social imperative for wildfire control. However, firefighting resources are becoming increasingly strained, exacerbating the challenges firefighters face while working under dangerous conditions. The federal wildland firefighting workforce is composed of close to 20,000 firefighters, a figure which includes fire managers and support staff.¹⁰ In recent years, barriers to recruitment and retention – including low pay, career advancement challenges, poor work-life balance, limited workforce diversity, and mental health impacts on the workforce – have led to a declining number of personnel available to fill incident management needs, placing even more of a burden on these employees.¹¹ Increased federal investment is required to build, support and importantly, retain, a well-trained, well-resourced, and adequately staffed firefighting workforce that is able to operate safely and effectively.

The last few decades have made it increasingly clear that fire suppression activities alone are unable to protect communities – and the infrastructure and landscapes they depend on – from wildfire. Alongside active forest management (e.g., mechanical thinning and prescribed burning), a robust community preparedness strategy is one of the most important tools to reduce the risk and severity of wildfire for nearby communities.¹² Building sustainable wildfire resilience capacity in fire-prone communities can yield significant results in mitigating wildfire risk.¹³ By preparing natural areas and communities for wildfire, land managers can allow fire to play a beneficial role in restoring healthy forest ecological processes. Active forest management and community wildfire preparedness efforts also play an important role in creating safer conditions for firefighters responding to wildfires.¹⁴ However, while the costs and risks associated with catastrophic wildfires have continued to grow, investment in promoting socio-ecological resilience to wildfire has been lagging.¹⁵ The USDA Forest Service (USFS) currently appropriates about 30% of its total budget to wildland fire management,¹⁶ and average annual spending on fire suppression more than tripled between 1989 and 2020.¹⁷ For fiscal year 2024, the Forest Service requested \$1 billion for wildfire suppression operations in addition to the \$2 billion made

8 Congressional Budget Office, *Wildfires*, 1, June 2022.

9 Karuk Department of Natural Resources, *Good Fire: Current Barriers to the Expansion of Cultural Burning and Prescribed Fire in California and Recommended Solutions*, 1, February 2021; see also, Aon plc, *Global Catastrophe Recap*, September 2020, https://www.aon.com/reinsurance/getmedia/371b885e-a3aa-49f5-b9f7-7b25822d2c3f/20200810_analytics-if-september-global-recap.pdf.aspx (last visited July 26, 2023).

10 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 4, November 2022.

11 See Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 11-31, November 2022.

12 The Montana Forest Action Advisory Council, *Montana Forest Action Plan*, 41, December 2020.

13 Kimiko Barrett, Headwaters Economics, *Policy Recommendations to Reduce Community Wildfire Risks*, 1, March 2023 (internal communication).

14 The Montana Forest Action Advisory Council, *Montana Forest Action Plan*, 42, December 2020.

15 The Nature Conservancy, *Wildfire Resilience Funding: Building Blocks for a Paradigm Shift*, 3, June 2021.

16 USDA Forest Service, *Fiscal Year 2024 Budget Justification*, 30a-6, March 2023.

17 Congressional Budget Office, *Wildfires*, 8, June 2022.

available annually through the wildfire funding fix, compared to just over \$300 million requested for hazardous fuels management activities.¹⁸

Increased investment and program coordination by federal, state, and tribal governments, as well as private partners, to reduce wildfire risk must occur at a pace and scale commensurate with the urgent need to strategically address this growing crisis across landscapes. Performing necessary wildfire-risk reduction treatments at the level necessary to address the scale of the current wildfire crisis will only be successful with a well-trained and holistically focused workforce.

This whitepaper aims to answer two questions: first, **how can Congress better support the federal wildland fire workforce?**; and second, **how can Congress develop a workforce able to accomplish wildfire resilience treatments at a pace and scale commensurate with the need?** We find that the two questions are inextricably linked; given the role that better forest stewardship would play in moderating the pace and intensity of wildfire seasons, one of the best ways to support the existing workforce is to develop a resilience-focused workforce.

In Part I, we summarize the current structure of the federal wildland fire workforce and analyze recent efforts to sustain a more robust workforce, identifying gaps that persist in the government's ability to do so. We also describe the factors that contribute to federal agencies' disproportionate focus on fire suppression over wildfire resilience. In Part II, we provide additional recruitment and retention recommendations developed from conversations with federal firefighters and advocacy organizations and best practices currently utilized by states and other non-federal firefighting agencies. In Part III, we analyze opportunities to better prioritize proactive, landscape-scale stewardship through changes to workforce policy that increase staffing, funding, and program coordination. Part IV concludes this report with an eye towards next steps.

¹⁸ USDA Forest Service, *Fiscal Year 2024 Budget Justification*, 30a-147-30a-157, March 2023.



I. BACKGROUND

A. The Federal Wildland Fire Management Workforce

The federal wildland firefighting workforce is composed of roughly 20,000 firefighters, fire managers, and support staff from across two departments and five agencies: the Department of Agriculture's Forest Service and the Department of the Interior's Bureau of Land Management, Bureau of Indian Affairs (BIA), National Park Service (NPS), and Fish and Wildlife Service (FWS).¹⁹ 70% of these firefighters are employed by the Forest Service and 20% are employed by the Bureau of Land Management, with the remaining 10% split between FWS, BIA, and NPS.²⁰ There are three categories of wildland firefighter employees: permanent-full time positions (48%); permanent-seasonal positions (18%); and temporary seasonal firefighters (33%).²¹

In FY'21, over half of the federal firefighting workforce were employed as either temporary or permanent seasonal firefighters whose terms of employment generally cannot exceed the lesser of 1,040 hours or six months of work, excluding overtime. This represents a significant surge in the workforce available to bring on during peak fire season.²² This workforce is often further supplemented by administratively determined employees (ADs), many of whom are retired firefighting personnel, hired under a federal pay plan for emergency workers.²³

As stated by the Government Accountability Office, "[f]ederal wildland firefighters have primary responsibility for responding to [wild]fires on about 640 million acres of federal lands" across the United States, and also regularly "help state and local firefighters respond to [wild]fires on non-federal lands."²⁴ An interagency incident management system is used to improve cooperation and coordination between federal, state, tribal, and local fire protection agencies.²⁵ Through this system, federal and nonfederal agencies are able to share firefighting resources, including personnel and equipment, and work together to respond to incidents across jurisdictional boundaries.²⁶

19 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 4, November 2022.

20 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 4, November 2022.

21 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 5-6, November 2022.

22 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 5, November 2022.

23 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 5 n 13, November 2022.

24 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 1 n 1, November 2022.

25 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 8, November 2022.

26 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 8, November 2022.

All wildland firefighters, regardless of agency affiliation, must meet the same minimum training, experience, and physical fitness tests in order to work on an incident.²⁷ Firefighting crews are typically deployed on 14-day assignments, excluding travel days, and are required to receive two days of rest for every 14 days worked upon return to their home unit.²⁸ When deployed, firefighters regularly work in difficult conditions and face environmental hazards including steep terrain, hot temperatures, hazardous air quality, and difficult-to-control fires.²⁹ Experienced wildland firefighters develop both technical skills and, as important, operational judgement over years that are impossible to replace with inexperienced personnel, thus retention and health of experienced employees is critical to the success of the mission.

Federal wildland firefighters are paid under the General Schedule (GS) pay system, which determines base pay rates based on the GS level of a position.³⁰ Since 1972, most firefighting positions have been classified under the forestry or range technician occupational series, which sets the grade levels for each position.³¹ Most federal wildland firefighters hold lower-grade level positions, with 70% of the Forest Service's and 59% of the Department of the Interior's wildland fire workforce at grade GS-07 or below.³² Entry level firefighters start at a base rate of \$15 per hour,³³ on top of which they may receive overtime or earn hazard pay, which are payable at 150% and 125%, respectively, of the firefighter's hourly rate of base pay.³⁴ In FY '21, almost half of fire personnel across agencies at the Department of the Interior worked between 501 and 1,903 hours of overtime.³⁵

The increasing size, severity, and length of fire seasons across the western United States has imposed significant demands on federal, state, tribal, and local firefighting resources. As the wildfire crisis has grown across the West, wildland firefighters are facing unprecedented conditions and complexity of their operating environment – and often doing so with fewer available resources. Growth in demand is outpacing the growth in supply for wildland firefighting. In 2021, the National Interagency Fire Center was unable to mobilize crews to wildfires on 1,858 occasions, versus just 339 crew mobilization orders that went unfilled in 2020 and 92 orders in 2019.³⁶ Additionally, in 2022 the Forest Service was only able to hire 10,184 seasonal firefighters, about 90% of the 11,300 personnel needed.³⁷ Despite the progress made in recent months to fill vacancies – indeed, the Forest Service has announced that the agency had met

27 The National Wildfire Coordinating Group (NWCG) develops and maintains interagency standards for wildland fire position qualifications for national mobilization to wildland fire incidents. See NWCG, *Our Mission*, <https://www.nwcg.gov/>, (last visited July 24, 2023).

28 *Wildfire in a Warming World: Opportunities to Improve Community Collaboration, Climate Resilience, and Workforce Capacity: Hearing Before the Subcomm. on Nat'l Parks, Forests, & Pub. Lands of the H. Nat. Res. Comm.*, 117th Cong. 12 (2021) (statement of Riva Duncan, Executive Director, Grassroots Wildland Firefighters).

29 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 8, November 2022.

30 *Wildfire in a Warming World: Opportunities to Improve Community Collaboration, Climate Resilience, and Workforce Capacity: Hearing Before the Subcomm. on Nat'l Parks, Forests, & Pub. Lands of the H. Nat. Res. Comm.*, 117th Cong. 12 (2021) (statement of Riva Duncan, Executive Director, Grassroots Wildland Firefighters).

31 Grassroots Wildland Firefighters, *(Mis)Classification*, <https://www.grassrootswildlandfirefighters.com/misclassification>, (Last accessed June 14, 2023).

32 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 9, November 2022.

33 The White House, *Fact Sheet: Biden-Harris Administration Announces New Pay Raises & Supports for Wildland Firefighter Workforce From Bipartisan Infrastructure Law*, June 21, 2022.

34 The USDA Forest Service, *Pay and Leave Guide: Fire Assignments Supervisor Training Guide*, 3-4, 13-14, August 2018.

35 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 18, November 2022.

36 Sam Metz, The Seattle Times, *As Fire Season Sets In, Labor Shortage Compounds Firefighter Staffing Woes*, June 22, 2022.

37 See Forest Service Chief Randy Moore's testimony to the Senate Committee on Appropriations, June 2022, <https://www.fs.usda.gov/inside-fs/leadership/chiefs-desk-june-9-testimony-senate-committee-energy-and-natural-resources>.

99% of its hiring goal as of July 2023 – an estimated 20% of USFS permanent firefighter positions are vacant and the recruitment and retention of firefighters remains particularly challenging in areas where the labor pool is low or wages offered are not competitive.³⁸

The number of resource orders that went unfilled in 2021 suggests that even if all positions in the USFS were filled, there would still not be enough personnel available to meet the demands posed by longer, busier, and more severe fire seasons. And this does not take account of the toll imposed by recent seasons on force readiness. It is likely that land management agencies will need to reconsider their methodologies for calculating the size of the workforce needed – and that they make available the equipment and resources necessary to support this needed increase in staffing size.

Federal agencies have cited their struggles to compete with non-federal entities in hiring and retaining wildland firefighters.³⁹ According to federal line officers, many of the positions going unfilled are senior fireline leadership roles and those requiring higher qualifications.⁴⁰ This experience gap creates safety issues as cumulative fireline experience levels decline and a greater proportion of firefighters are relatively inexperienced.⁴¹ A lack of proper training, qualifications, and situational awareness can have significant and even fatal consequences for the wildland firefighting workforce: since 1990, over 500 firefighters have been killed during wildland fire operations in the United States.⁴² Ensuring that the wildland fire workforce is appropriately sized and qualified to meet the growing demands of an already strenuous job is critical to protecting firefighter and public safety.

B. Recent Federal Recruitment and Retention Efforts

For decades, federal wildland firefighters have faced increasingly severe fire seasons coupled with compensation, classification, and welfare challenges that have largely gone unaddressed at a meaningful scale. Recently, however, the federal government and land management agencies have initiated and committed to a number of provisions to better support the federal wildland firefighter workforce and achieve parity with non-federal firefighting agencies.⁴³

In 2021, Congress passed the Infrastructure Investment and Jobs Act (IIJA), which directed the Departments of Agriculture and the Interior, and the Office of Personnel Management (OPM) to increase the base salary of federal wildland firefighters; develop a distinct wildland firefighter occupational series; and convert seasonal wildland firefighters to permanent full-time positions.⁴⁴ The Act also called for the development of mitigation strategies to minimize exposure to line-of-duty environmental hazards and for the establishment of health and wellbeing programs that address firefighter

38 The USDA Forest Service, *Wildland Firefighting Workforce*, <https://www.fs.usda.gov/managing-land/fire/workforce>, (last visited July 26, 2023). See also Grassroots Wildland Firefighters, *One Page Briefing Paper: Numbers Every Legislator Should Know*, <https://www.grassrootswildlandfirefighters.com/one-page-briefing-paper>, (last visited July 24, 2023).

39 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 13, November 2022.

40 Telephone interviews with multiple federal wildland fire managers who wish to remain anonymous.

41 Telephone interviews with multiple federal wildland fire managers who wish to remain anonymous.

42 Federal Emergency Management Agency (FEMA), *Wildland Urban Interface: A Look at Issues and Resolutions: A Report of Recommendations for Elected Officials, Policymakers and All Levels of Government, Tribal and Response Agencies*, 12, June 2022.

43 The White House, *Fact sheet: Biden-Harris Administration announces new pay raises & supports for wildland firefighter workforce from Bipartisan Infrastructure Law*, June 21, 2022.

44 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 2-3, 10, November 2022.

mental health needs, including post-traumatic stress disorder (PTSD), an increasingly prevalent issue for the federal wildland firefighter workforce.⁴⁵

More recently, through the Bipartisan Infrastructure Law, the Biden-Harris Administration committed \$600 million to increase firefighter pay by the lesser of \$20,000 or 50% of annual base salary through September 2023.⁴⁶ In January 2022, OPM established a special rate schedule that ensured a \$15 minimum hourly rate of basic pay for wildland firefighters.⁴⁷ Agencies have also begun using incentive payments to recruit and retain firefighters: in 2021, land management agencies issued one-time cash awards of at least \$1,000 to all firefighters at or below the GS-09 level.⁴⁸ Additional collaboration between federal firefighting agencies and Congress is now required to achieve longer-term reforms and preserve pay increases past the September 2023 sunset date.⁴⁹ However, it is still the case that reformed base pay and benefits available to federal wildland firefighters lag significantly behind what many states and other non-federal agencies are able to provide, which can disincentivize firefighters from either joining or remaining in federal service.⁵⁰

Another important reform was the creation of a new occupational series for federal wildland firefighters that more accurately reflects the current responsibilities and demands of firefighting.⁵¹ In 2022, OPM developed an occupational series that includes all positions engaging in primary firefighting duties and provides clear pathways for career advancement.⁵² In the early 1970s, the Forestry Technician occupational series was created to develop a single, seasonal workforce with flexible, multi-use functions capable of accomplishing land management agencies' dynamic and diverse missions.⁵³ It was expected that Forestry Technicians would contribute to holistic ecosystem management without being limited by title specificity, and engage in fire suppression only on a periodic or need-based basis.⁵⁴ However, wildfire management activities have grown significantly in the last few decades and the Forestry Technician occupational series no longer accurately describes the significant allocation of personnel who primarily engage in fire suppression activities.

The Forestry Technician job series has negatively impacted fire personnel who are not appropriately recognized or compensated for the expertise involved in, and the hazardous nature of, firefighting work. It has also meant that non-fire federal land management project areas lack an adequate workforce to complete essential forest stewardship activities without competing with fire suppression and fire-specific training needs.⁵⁵ During periods of low fire risk and

45 The White House, *Fact sheet: Biden-Harris Administration announces new pay raises & supports for wildland firefighter workforce from Bipartisan Infrastructure Law*, June 21, 2022.

46 The White House, *Fact sheet: Biden-Harris Administration announces new pay raises & supports for wildland firefighter workforce from Bipartisan Infrastructure Law*, June 21, 2022.

47 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 12, November 2022.

48 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 13, November 2022.

49 Senate Bill 2272 was introduced on July 12, 2023 to address the impending firefighter pay cliff.

50 Multiple federal wildland firefighters who provided insights in compiling this report and who wish to remain anonymous cited federal agencies' inability to compete with local and state firefighting agencies as a primary barrier to recruitment and retention.

51 Grassroots Wildland Firefighters, *(Mis)Classification*, <https://www.grassrootswildlandfirefighters.com/misclassification>, (last accessed June 14, 2023).

52 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 15-16, November 2022.

53 Grassroots Wildland Firefighters, *(Mis)Classification*, <https://www.grassrootswildlandfirefighters.com/misclassification>, (last visited June 14, 2023).

54 Grassroots Wildland Firefighters, *(Mis)Classification*, <https://www.grassrootswildlandfirefighters.com/misclassification>, (last visited June 14, 2023).

55 USDA Forest Service, *Confronting the Wildfire Crisis: A Strategy for Protecting Communities and Improving Resilience in America's Forests*, 20, January 2022.

activity, federal firefighters could still be utilized to accomplish their agency's mission by performing non-suppression land management project work. This can still occur by properly identifying federal firefighters as firefighters rather than forestry technicians, and by expanding the land management workforce to include employees who are not continually obligated to fire-specific objectives. Implementing the new wildland firefighter occupational series, and designating appropriate grades and pay rates to go along with it, is an important step in professionalizing the federal wildland fire workforce. This will also allow for the development of another expanded workforce that is able to accomplish the significant forest health and landscape restoration objectives that land management agencies are charged with, and that the fire suppression mission cannot succeed without.

The Forest Service and agencies in the Department of the Interior have also begun converting more temporary-seasonal positions into permanent roles.⁵⁶ IJA directed these agencies to convert at least 1,000 seasonal positions to full-time, permanent, year-round positions which will also help reduce hazardous fuels on federal land for no fewer than 800 hours per year.⁵⁷ Alongside improved compensation and classification, the addition of permanent, full-time positions will aid the recruitment and retention of federal employees who can better envision a career in fire that provides stability, opportunities for advancement, and a living wage.

While these recent efforts by the Administration and relevant agencies are certainly welcome and have already had meaningful impacts on the material conditions of federal firefighters' lives, additional investment, coordination, and creativity is required in order to meet and sustain the diverse and dynamic needs of the wildland fire workforce who face an increasingly challenging operating environment.

C. Suppression Focus; Insufficient Stewardship

Almost all of the major entities within the complex fire management ecosystem focus primarily on fire suppression. The federal wildland firefighting workforce is composed of close to 20,000 firefighters, a figure which includes fire managers and support staff.⁵⁸ The majority of these positions are filled by seasonal suppression firefighters whose term of employment is limited to the lesser of six months or 1,039 hours of work.⁵⁹ Proactively treating landscapes for wildfire risk, and preparing communities at the required scale to face those risks, necessitates a specialized, year-round workforce charged with restoring fire resilience that currently does not exist within the Forest Service nor the Department of the Interior.⁶⁰ This workforce may need to be of roughly similar scale as the current firefighting workforce in order to overcome a backlog of decades of fuel buildup.

56 The White House, *Fact sheet: Biden-Harris Administration announces new pay raises & supports for wildland firefighter workforce from Bipartisan Infrastructure Law*, June 21, 2022.

57 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 10, November 2022.

58 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 4, November 2022.

59 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 5, November 2022.

60 Kimiko Barrett, Headwaters Economics, *Policy Recommendations to Reduce Community Wildfire Risks*, 2, March 2023 (internal communication).

While wildfire mitigation work and fuels management activities are conducted under certain programs and government collaborations, this work is unevenly matched to the mitigation work needed to sustainably and effectively address the wildfire crisis. The Good Neighbor Authority and the Collaborative Forest Landscape Restoration Program are good examples, despite their coordination issues: the former allows states, counties, and tribes to form agreements with “FS or BLM to perform forest, rangeland, and watershed restoration work on the federal land managed by those agencies,” including treating insect- and disease-infested trees and “reducing hazardous fuels”;⁶¹ the latter awards 10-year funding to projects designed to restore landscapes on National Forest System lands.⁶² USFS’s Landscape Scale Restoration Program provides competitive grants for “science-based restoration of priority forest landscapes.”⁶³ But these initiatives often face constraints that prevent them from being equally prioritized alongside suppression activities. The Good Neighbor Authority, for example, has promoted fuels treatment activities but timber sales have exploded under its purview alongside fuels treatments.⁶⁴ The Collaborative Forest Restoration Landscape Program is beset by funding difficulties.⁶⁵ And the Landscape Scale Restoration Program, while promising, is another example of a wildfire mitigation program sharing space with, for example, watershed protection,⁶⁶ rather than expressly prioritizing wildfire stewardship.

More than a century’s worth of policies focused on wildfire suppression have, in part, brought us to where we are today—increasingly bearing witness to just how unworkable it is to rely on fire suppression activities alone to try to protect communities, and the infrastructure and landscapes they depend on, from wildfire. An alternative approach, which would balance suppression alongside proactive forest management, would ultimately be more protective of forests themselves. The fire science community has a strong consensus, with which the federal agencies agree in their policy documents, that active forest management, such as mechanical thinning followed by prescribed fire, is needed to reduce the risk and severity of wildfire. Active management moderates fire behavior, reduces the risk of ember production, and creates safer conditions for firefighters responding to wildfires.⁶⁷ Restoring fire to a fire-adapted ecosystem can help restore desired forest conditions and maintain ecosystem functions, while minimizing the risks of severe wildfire and smoke events to nearby populations.⁶⁸ Through fire scenario modeling, the United States Forest Service has found that targeted fuel treatments on 51 million acres will significantly reduce wildfire risk where it is highest.⁶⁹ But these treatments cannot and will not happen if there is not a sustained effort to create the workforce to carry them out.

61 Anne A. Riddle, CONG. RSCH. SERV., If11658, *The Good Neighbor Authority* 1 (2020).

62 US. DEP’T AGRIC., FOREST SERV., *Collaborative Landscape Restoration Program 10-Year Report To Congress* 1.

63 Landscape Scale Restoration, U.S. DEP’T AGRIC.: FOREST SERV., <https://www.fs.usda.gov/managing-land/private-land/landscape-scale-restoration> (last visited May 11, 2023).

64 See RIDDLE, *supra* note 58, at 2 tbl.1.

65 See Jesse Antuma, Bryce Esch, Brendan Hall, Elizabeth Munn & Frank Sturges, *Restoring Forests and Communities: Lessons From The Collaborative Forest Landscape Restoration Program* 107 (2014).

66 See Landscape Scale Restoration, *supra* note 60 (identifying funding unpredictability as hindrance to implementation of projects).

67 The Montana Forest Action Advisory Council, *Montana Forest Action Plan*, 42, December 2020.

68 Karuk Department of Natural Resources, *Good Fire: Current Barriers to the Expansion of Cultural Burning and Prescribed Fire in California and Recommended Solutions*, 1, February 2021.

69 The Nature Conservancy, *Wildfire Resilience Funding: Building Blocks for a Paradigm Shift*, 3, June 2021.

While the costs and risks associated with catastrophic wildfires have grown, investment in promoting resilience to wildfire has been lagging.⁷⁰ Increased investment and program coordination by federal, state, and tribal governments, as well as private partners, to reduce wildfire risk must occur at a pace and scale commensurate with the urgent need to address this growing crisis in a strategic way across landscapes. Moreover, insufficient staffing and financial resources have been dedicated to implementing the widespread use of these management tools at the pace and scale required to proactively address the wildfire crisis;⁷¹ staffing and funding strategies must change alongside increased program coordination.

In Part II, we explore how an entity of the sort described above might best be structured and how it might work jurisdictionally with other agencies' wildfire-related operations.

70 See, e.g., *The Nature Conservancy, Wildfire Resilience Funding: Building Blocks for a Paradigm Shift* 9 (2021) ("In many instances, funding levels have not increased to address rising fixed costs facing federal agencies, resulting in diminishing outcomes amid flat funding trends.").

71 Increasing funding to stewardship efforts may also promote a "virtuous wildfire cycle": Many wildfire resilience treatments, for example, produce co-benefits including job creation, community economic development, public health improvement, and carbon sequestration. See generally, e.g., *id.* at 5-6 (2021) (listing co-benefits recognizing their utility in resilience-building advocacy efforts).



II. RECOMMENDATIONS TO IMPROVE FEDERAL WILDLAND FIREFIGHTER RECRUITMENT AND RETENTION

The recommendations that follow address the workforce recruitment and retention issues of compensation, job classification, and permanent job creation, while also identifying means of addressing additional challenges facing firefighters, including smoke exposure and adverse physical health outcomes; unmet mental health needs; limited workforce diversity; and poor work-life balance.⁷² We believe that an equitable and modernized federal wildland firefighting workforce is one that provides firefighters with flexibility and choice, stability, and wrap-around services that match the level of work required by this profession and its high-risk nature. These recommendations will support the recruitment and retention of a strong, valued and resourced firefighting workforce that is able to successfully carry out its work objectives while maintaining firefighter safety as well as the safety of the public and the landscapes we depend on.⁷³ Only by achieving these objectives can the US create a truly sustainable wildland firefighter workforce.

It is worth noting that the best way to reduce strain on and better support federal wildland firefighters in the long run is by investing in proactive stewardship and landscape-scale restoration programs today. There is no way for any agency to firefight their way out of the wildfire crisis.⁷⁴ By dedicating adequate funding to proactively minimize wildfire risk – particularly through improving forest health, preparing communities to live with fire, and mitigating the effects of climate change – Congress can help reduce the need for the extreme firefighting interventions currently required. A fundamental paradigm shift in investment and program coordination in wildfire resilience is required to address this challenge at a pace and scale reflective of the wildfire crisis.⁷⁵

72 In their 2022 performance audit of federal agencies' efforts to hire and retain wildland firefighters, the GAO identified seven primary barriers: low pay, career and advancement challenges, poor work-life balance, mental health challenges, remote or expensive duty stations, limited workforce diversity, and hiring process challenges. The recommendations included in this paper were developed with those key issues in mind, along with others raised by collaborators and identified by the paper's authors.

73 Many of the recommendations included in this paper are included in H.R. 5631: Tim Hart Wildland Firefighter Classification and Pay Parity Act, known as "Tim's Act," which is named in honor of Tim Hart, a Smokejumper for the Forest Service who lost his life due to injuries sustained jumping on a fire. Tim's wife Michelle, with the support of the advocacy organization Grassroots Wildland Firefighters and the Bill's sponsors, is using this piece of legislation to try and achieve better working conditions and compensation for wildland firefighters like Tim. More information is available at <https://www.grassrootswildlandfirefighters.com/tims-act>.

74 See Michael Wara, *A New Strategy for Addressing the Wildfire Epidemic in California*, Stanford Woods Institute Climate and Energy Policy Program White Paper, 2021.

75 The Nature Conservancy, *Wildfire Resilience Funding: Building Blocks for a Paradigm Shift*, 3, June 2021.

A. Compensation and Classification

Low pay is one of the most commonly cited barriers to recruitment and retention of federal wildland firefighters.⁷⁶ Even with the increase in minimum wage and firefighter salaries, many federal firefighters feel that their pay doesn't reflect the risk inherent in the work and that they can still earn more by working for non-federal firefighting agencies.⁷⁷ Additionally, the funding that agencies received from Congress to put towards these pay increases is only authorized through FY'26, after which longer-term solutions will be needed.⁷⁸

Non-federal firefighting entities – including states, private contractors, and municipal fire departments – are important partners in managing increasingly severe fire years. Many of these entities have been able to offer highly competitive wages and benefits to their firefighters that the federal government has lagged behind in offering. According to Grassroots Wildland Firefighters, federal entry level wildland firefighters earn roughly 50% of their counterparts at Cal Fire and 60% of their Colorado Division of Fire and Prevention (CDFP) counterparts.⁷⁹ This pay disparity remains consistent over the course of a firefighter's career: a mid-career federal wildland firefighter will earn about 50% of a third year Cal Fire firefighter, and a federal engine captain will earn only 68% of a Colorado engine captain.⁸⁰ And of course, these state wildland firefighting agencies are also confronting the same crisis and so growing through recruitment to meet it.

In addition to net pay being lower, federal firefighters are often much more reliant on unplanned income – or the proportion of wages coming from overtime and hazard pay. This income is considered unplannable because firefighters cannot anticipate how much they will make from overtime and hazard pay at the onset of a season, making it more difficult to plan for basic needs or expenses, such as housing, child care, or health care.⁸¹ On average, the percentage of unplannable income in the federal fire service is 33%, compared to just 20% in other non-federal firefighting agencies.⁸²

These disparities between federal and state firefighting agencies persist when considering benefits. Cal Fire firefighters earn a retirement pension – for which they become eligible at age 50 – of 3% of the average of the highest three salaries they earned, multiplied by the number of seasons worked.⁸³ Firefighters in Colorado receive 2.5% per year worked after 25 years.⁸⁴ Both these state agencies provide double or close to double the retirement pension offered to

76 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 11, November 2022.

77 Multiple federal wildland firefighters who wish to remain anonymous cited a lack of competitiveness with non-federal firefighting entities when it comes to compensation and benefits as a primary reason people are leaving the federal service.

78 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 13, November 2022.

79 Grassroots Wildland Firefighters, *Pay Disparity: Cal Fire vs. Federal*, <https://www.grassrootswildlandfirefighters.com/pay-disparity-cal-fire>, (last visited June 15, 2023).

80 Grassroots Wildland Firefighters, *Pay Disparity: Cal Fire vs. Federal*, <https://www.grassrootswildlandfirefighters.com/pay-disparity-cal-fire>, (last visited June 15, 2023).

81 Telephone interview with Kelly Martin, (Ret.) Chief of Fire and Aviation, Yosemite Nat'l Park (May 26, 2023).

82 Grassroots Wildland Firefighters, *Pay Disparity: Cal Fire vs. Federal*, <https://www.grassrootswildlandfirefighters.com/pay-disparity-cal-fire>, (last visited June 15, 2023).

83 Grassroots Wildland Firefighters, *Pay Disparity: Cal Fire vs. Federal*, <https://www.grassrootswildlandfirefighters.com/pay-disparity-cal-fire>, (last visited June 15, 2023).

84 Grassroots Wildland Firefighters, *Pay Disparity: Colorado DFPC vs. Federal*, <https://www.grassrootswildlandfirefighters.com/pay-disparity-colorado-state>, (last visited June 15, 2023).

federal wildland firefighters, who receive 1.5% of what was earned each year after 25 years of service.⁸⁵ Moreover, state firefighters earn significantly more than their federal counterparts that they are able to contribute to retirement.

These factors have material impacts on where firefighters choose to accept jobs. According to one federal helicopter base manager, only one of five temporary-seasonal firefighters he hired showed up on the first day – the others all reportedly took jobs as California state firefighters.⁸⁶

The following recommendations address these frequently-cited issues with compensation and classification and would improve the sustainability of the federal wildland firefighter workforce:

Recruitment & Retention Recommendation (RRR) 1: Establish a new pay scale for federal wildland firefighters that starts at or above the GS6 Step 3 (\$20.09) level.

The re-classification of firefighters and development of a new, fire-specific occupational series has created the opportunity to reevaluate and establish a pay scale that appropriately compensates federal firefighters at a rate competitive with other firefighting agencies. This new pay scale should be tied to Consumer Price Index data for each year, and should be adjusted accordingly to the cost of living in various geographic areas.

RRR2: Establish portal-to-portal pay to allow federal wildland firefighters to be paid for the period beginning on the receipt of their resource order and ending when the employee returns from such deployment.

This is a recommendation modeled after Cal Fire's system of paying firefighters on an assignment, where crews are paid around the clock, including travel time, when responding to an incident. Doing so will better value the totality of the grueling work that firefighters do when on an assignment, and ensure that federal firefighters are compensated at a rate competitive with non-federal entities.

85 Grassroots Wildland Firefighters, *Pay Disparity: Cal Fire vs. Federal*, <https://www.grassrootswildlandfirefighters.com/pay-disparity-cal-fire>, (last visited June 15, 2023).

86 Telephone interview with a federal firefighter who wishes to remain anonymous, (May 11, 2023).

RRR3: Allow firefighters to apply temporary employment towards retirement.⁸⁷

Career wildland firefighters should be able to contribute retirement deductions for all temporary employment service, including those spent in temporary-seasonal positions limited to the lesser of six months or 1,039 hours worked. Currently, federal employees that begin their career as temporary employees are unable to contribute those years to their retirement service, often forcing firefighters to leave federal service without full benefits or work longer than their peers to receive their full benefit package. Buyback time should be calculated so that six months worked as a seasonal federal wildland firefighter can be credited as a full year of service credit.

RRR4: Allow federal wildland firefighters to include overtime pay as basic pay when calculating their retirement annuity.

Currently, firefighters are only able to contribute basic pay towards retirement. However, federal wildland firefighters routinely work over 1,000 hours of overtime over the course of a fire season. Indeed, firefighters and their managers appear to plan their total take-home pay based on an assumption of significant overtime compensation. These hours should be counted as basic pay, rather than the overtime rate, and included in retirement annuity calculations to help support firefighters and their families after they retire from a career in the federal fire service.

RRR5: Expand Hazardous Duty Pay to include parachuting, tree climbing over 20 feet, hazardous tree removal, and other hazardous work.

Hazard pay provides an additional 25% to a firefighter's base pay when on assignments classified as hazardous.⁸⁸ The current system of hazard pay does not reflect the reality that firefighters are routinely exposed to hazards, both on and off the fireline. As fire seasons grow increasingly long and severe, the risks that firefighters face will continue to grow.⁸⁹ Additionally, the opportunities to earn hazard pay for certain duties can place an outsized interest in accomplishing those goals, rather than valuable project work such as prescribed burns or mechanical thinning that will reduce wildfire risk and promote fire-resilient landscapes in the future. Hazardous Duty Pay should be expanded to accurately reflect the hazardous nature of the work as a whole.

87 The Federal Retirement Fairness Act (HR 2478), also known as the temp buyback program, would have established such a policy. See also National Federation of Federal Employees, IAMAW, AFL- CIO, *NFFE-IAM Supports the Federal Retirement Fairness Act*, <https://nffe.org/wp-content/uploads/2023/06/2023-Leg-Week-Papers-Retirement-Buy-Back.pdf> (last visited July 25, 2023).

88 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 11, November 2022.

89 *Wildfire in a Warming World: Opportunities to Improve Community Collaboration, Climate Resilience, and Workforce Capacity: Hearing Before the Subcomm. on Nat'l Parks, Forests, & Pub. Lands of the H. Nat. Res. Comm.*, 117th Cong. 12 (2021) (statement of Riva Duncan, Executive Director, Grassroots Wildland Firefighters).

RRR6: Include Wildland Fire Dispatchers in the new wildland firefighter occupational series.

The new wildland firefighter classification does not include wildland fire dispatchers, who are critical in ensuring safe response to, and effective communication during, wildland fire incidents. As of now, dispatchers are not considered primary fire personnel and are being moved to an occupational series that is not eligible for special retirement. The majority of current dispatchers are women, and additionally, dispatch can offer a viable career option for workers seeking light duty after suffering an injury or who are looking to move out of fire operations, either temporarily or permanently.⁹⁰ Congress should act to protect the retirement and benefits of all federal employees engaged in wildland fire management and operations, including fire dispatchers, who are not currently included in the new occupational series.

B. Work/Life Balance

Poor work/life balance is a critical challenge facing the federal wildland fire workforce. Longer and more severe fire seasons have increased both the time and frequency of firefighter deployments.⁹¹ Multiple federal firefighters noted in our interviews that the cumulative number of firefighting deployments they have been on has led to job burnout, either for themselves or their colleagues.⁹² Fireline leadership also cited the lack of available resources as a contributor to job burnout: leadership have been forced to take on fireline tasks above their pay grade due to a shortage of qualified resources or they feel that they cannot turn down assignments due to nationwide staffing shortages.⁹³ Fire crews are required to be staffed with a minimum number of people in order to be deployed, and individual firefighters have expressed concern over their absence preventing the rest of the crew from a potential deployment.⁹⁴

For federal wildland firefighters who derive a significant percentage of their income from overtime and hazard pay, not taking an assignment may come at the cost of a needed paycheck. By forcing federal firefighters to rely so heavily on unplanned income, land management agencies may be forcing their employees to choose financial sustainability for themselves and their families over taking time off for mental health, family matters, or other personal reasons.⁹⁵ Many people in the federal fire service have left the workforce or taken a break in service due to the challenges of achieving better work-life balance.

90 Grassroots Wildland Firefighters, *Critical Issues/Unintended Outcomes Regarding New Wildland Firefighter Classification*, <https://static1.squarespace.com/static/5f6ced5b8d33bb20b5c97c0b/t/63e71634a0e46d79a1d4cd9a/1676088884697/0456+series+unintended+outcomes.pdf>, (last visited July 25, 2023).

91 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 18, November 2022.

92 From interviews collected between April and June of 2023 with current and former federal wildland firefighters.

93 Multiple federal wildland firefighters who wish to remain anonymous.

94 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 8, November 2022.

95 *Wildfire in a Warming World: Opportunities to Improve Community Collaboration, Climate Resilience, and Workforce Capacity: Hearing Before the Subcomm. on Nat'l Parks, Forests, & Pub. Lands of the H. Nat. Res. Comm.*, 117th Cong. 12 (2021) (statement of Riva Duncan, Executive Director, Grassroots Wildland Firefighters).

Current cultural and policy issues have placed longevity and success in the fire service at odds with the ability to properly care for one's family or own needs. While policy reforms to better address work/life balance challenges are further addressed below, it is worth noting that a cultural shift will be required to proactively manage burnout and encourage employees to take time off or leave when they or their families require it. Local fire managers retain the ability to increase the number of rest days a crew receives if they need additional time to rest and recover. Agencies should provide clear guidance as well as encouragement to fire managers to build a strong workplace culture that respects personal limitations and proactively reduces the stress that firefighters experience. Additionally, prioritizing the policy reforms included in the compensation section above will reduce the challenging economic conditions many firefighters face which make work/life balance even more difficult to achieve during fire season.

The highest attrition rate of firefighters is at the mid-career level, between GS-05 and GS-07.⁹⁶ Anecdotal evidence from interviews with firefighters suggests that this is around the time that firefighters may be starting families or looking for more financial stability. The current structure of federal retirement may also affect these firefighters' willingness to return to firefighting after a break in service. Federal firefighters who work more than three years in primary positions are eligible to participate in a special retirement system, in which they pay more towards their retirement but are required to retire at age 57 or after 25 years of service.⁹⁷ After serving three years in primary positions, they can move to secondary firefighting roles (e.g. fire dispatch or fire business) while retaining eligibility for special retirement benefits.⁹⁸

These secondary positions are less physically demanding and often require less time away from home on deployments, while still allowing firefighters to continue contributing to their agency's mission and growing in their careers.⁹⁹ However, if firefighters take a break in service they must return to a primary firefighting position again to be eligible for the special retirement system, which may not be possible or appealing to firefighters for various reasons, including family caretaking duties. This system disproportionately impacts the retention of women firefighters, who may be forced to choose between starting families and a special-retirement eligible career in the fire service.

While primary wildland fire positions are certainly rigorous, they should not be incompatible with life outside of work. Appropriately classifying and compensating firefighters for their work – including increasing the portion of income derived from base pay that can be planned for – will help retain firefighters as they look for more stability in their careers and home lives. Additionally, providing viable and diverse opportunities for career advancement or transitions will support the recruitment and retention of firefighters who will be able to contribute to their agency's mission in a myriad of ways that also align with their personal circumstances and needs at different points along their careers.

This can be achieved in part through expanding the wildfire resilience workforce, and creating job opportunities not just in fire suppression but also in fuels management, community wildfire planning and resilience efforts, fire science and ecology, and forest stewardship more generally. Shifting the wildfire management paradigm to include not only suppression and post-fire response, but also measures that restore fire-adapted communities and natural landscapes

96 The Anchor Point Podcast, Episode 116, *Q&A with Assistant Director of BLM Fire and Aviation – Grant Beebe on Pay, Classification, and Other Issues*, April 25, 2023.

97 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 19, November 2022.

98 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 19, November 2022.

99 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 19, November 2022.

will allow land management agencies to meaningfully reduce the severity of the wildfire crisis while also creating diverse job opportunities that leverage hard earned experience and skills, while also providing financial stability as well as opportunities for career advancement, transitions, and flexibility.

RRR7: Mandate that federal wildland firefighters shall be allowed a period of 180 days of unpaid leave in order to care for a family member.

This break in service should not affect a firefighter's eligibility for special retirement benefits.

RRR8: Provide housing stipends or federal housing if needed for all firefighters whose assigned duty station is more than 50 miles away from their primary residence.

Many of the most fire-prone landscapes where wildland firefighters are stationed are in areas that are remote and/or expensive.¹⁰⁰ Without appropriate compensation, finding affordable housing in these areas may not be feasible. In some places, housing shortages may make it so that there is little-to-no available housing, no matter the price. Additionally, many firefighters may also have primary residences in other locations where they live outside of fire season. Federal firefighting agencies should regularly assess all duty stations to determine if there is adequate housing available, and if there is not they should offer federal housing. Providing housing stipends or federal housing offered at a discounted rate would reduce the financial strain on firefighters while ensuring that agencies are adequately staffed in these remote or expensive areas.

RRR9: Increase the number of mental health clinicians and expand the services of the Employee Assistance Program (EAP) to help firefighters address work/life challenges.

Expanded services should include couples counseling, career planning support, and life coaching. Additionally, EAP should train their clinicians to offer tailored support to the spouses and families of wildland firefighters to prepare them for, and support them through, the difficulties of the fire season as well as the challenges that may present themselves in the off-season.

100 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 24, November 2022.

RRR10: Establish a career transition fund to assist wildland firefighters in career transition including academic skill development, career and technical programs, and programs leading to the award of undergraduate and graduate degrees.

Through this program, all wildland firefighters should be made eligible to benefit from this fund annually to assist in career development goals. Doing so will allow federal wildland firefighters to proactively plan for and reach their career goals, whether that be a career in the fire service or otherwise.

C. Health and Wellbeing

In addition to – and in some cases, because of – the labor shortage placing undue strain on the firefighting workforce, wildland firefighters also face disproportionately high risk and rates of mental and physical health issues as a result of the hazardous conditions faced during their operational shifts.¹⁰¹ The physical strain of working long hours, receiving little to no sleep, and being exposed to trauma or life-threatening situations can negatively affect firefighters' health and wellbeing.¹⁰² Firefighters regularly experience close calls or near misses where they narrowly escape injury or death,¹⁰³ they bear witness to traumatic medical events; and they are at the frontlines alongside community members bearing witness to the catastrophic losses that can come when wildfire threatens human lives and critical resources.¹⁰⁴

The mental stress and fatigue that comes from the immense workload placed on wildland firefighters has resulted in significant mental health challenges for many of the people employed in fire management operations. Suicide rates for firefighters are *30 times higher* than those for the general population, at a rate of 0.3% of firefighters compared to 0.01% of the public.¹⁰⁵ Out of a sample group of 600 participants, 17.3% of wildland firefighters reported experiencing probable depression, 12.8% reported probable generalized anxiety disorder, 13.7% reported probable PTSD, 20.1% reported suicidal ideation in the past year, and 57% reported past-month binge drinking.¹⁰⁶ These rates were 2-10 times higher than rates typically seen among the general public.¹⁰⁷ In another survey regarding barriers to recruitment and retention of federal wildland firefighters, 78.5% of participants said they suffered from mental health issues they attributed to the stresses of fighting fire, yet only a third of respondents felt they could seek mental health care during

101 *Wildfire in a Warming World: Opportunities to Improve Community Collaboration, Climate Resilience, and Workforce Capacity: Hearing Before the Subcomm. on Nat'l Parks, Forests, & Pub. Lands of the H. Nat. Res. Comm.*, 117th Cong. 12 (2021) (statement of Riva Duncan, Executive Director, Grassroots Wildland Firefighters).

102 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 21-22, November 2022.

103 *Wildfire in a Warming World: Opportunities to Improve Community Collaboration, Climate Resilience, and Workforce Capacity: Hearing Before the Subcomm. on Nat'l Parks, Forests, & Pub. Lands of the H. Nat. Res. Comm.*, 117th Cong. 12 (2021) (statement of Riva Duncan, Executive Director, Grassroots Wildland Firefighters).

104 Federal Emergency Management Agency (FEMA), *Wildland Urban Interface: A Look at Issues and Resolutions: A Report of Recommendations for Elected Officials, Policymakers and All Levels of Government, Tribal and Response Agencies*, 12, June 2022.

105 Grassroots Wildland Firefighters, *One Page Briefing Paper: Numbers Every Legislator Should Know*, <https://www.grassrootswildlandfirefighters.com/one-page-briefing-paper>, (last visited July 24, 2023).

106 O'Brien, P., & Campbell, D., International Association of Wildland Fire 6th Annual Human Dimensions Conference, *Wildland Firefighter Psychological and Behavioral Health: Preliminary Data from a National Sample of Current and Former Wildland Firefighters in the United States*, May 26, 2021.

107 O'Brien, P., & Campbell, D., International Association of Wildland Fire 6th Annual Human Dimensions Conference, *Wildland Firefighter Psychological and Behavioral Health: Preliminary Data from a National Sample of Current and Former Wildland Firefighters in the United States*, May 26, 2021.

fire season.¹⁰⁸

Currently, the primary “mental-health” service available to firefighters is the Employee Assistance Program (EAP), which is a voluntary, confidential program within each federal agency that offers counseling services to federal employees.¹⁰⁹ The Program is provided by a contractor hired through a competitive bidding process. Through EAP, federal employees and their family members are eligible for up to six counseling sessions with a clinician. However, because of the short-term nature of this program, many behavioral health conditions including PTSD or depression fall outside the scope of EAP.¹¹⁰ Additionally, EAP clinicians receive little to no training in the unique needs or circumstances of wildland firefighters, making it difficult to provide tailored and meaningful interventions.

The physical health of wildland firefighters is also cause for concern. According to recent studies, firefighters are at increased risk for cardiovascular diseases and cancer.¹¹¹ While research has demonstrated the acute and long-term health impacts of smoke exposure to communities, federal agencies have yet to fully acknowledge and act on the proven relationship between exposure to particulate matter and increased rates of cancer and cardiovascular disease.¹¹² Additionally, increased development into the wildland urban interface (WUI) – areas where human development grows into or adjacent to wildland vegetation¹¹³ – further strains wildland firefighting resources and firefighters who are not adequately equipped to mitigate the unique hazards of fire suppression in the WUI. When structures, building materials, and manufactured products burn, the resulting smoke contains hazardous volatile compounds that responding firefighters are then exposed to – making additional personal protective equipment (PPE), like respirators that almost no wildland firefighters wear and are not equipped with, especially necessary. There are many other hazards that may be present in the WUI – including power lines, hazardous or explosive materials, pets and livestock, and propane tanks – all of which can pose significant risks to firefighters without proper training, resources, and PPE.

From 2010 to 2020, the Department of Labor’s (DOL) Office of Workers’ Compensation Programs (OWCP) received an annual average of 2,600 workplace compensation claims from federal wildland firefighters, 93% of which were classified as traumatic injuries.¹¹⁴ According to a survey conducted by Grassroots Wildland Firefighters (GWF), two-thirds of wildland firefighters had sought help for an injury or illness from a workplace compensation program, and 50% of claims were filed by temporary or seasonal employees with little firefighting experience.¹¹⁵ Though the DOL reports

108 Rachel Granberg et al., *Survey of Federal Wildland Firefighters: Working Conditions, Safety, Morale, & Barriers to Recruitment & Retention*, 19, June 1, 2022, https://drive.google.com/file/d/12WozvjGHR1Bt9gsmq_QraqAAJhAD_W03/view (last visited July 26, 2023).

109 Government Accountability Office, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters*, 22, November 2022.

110 Telephone interview with a behavioral health clinician who wishes to remain anonymous.

111 For more information of the health impacts of work task-related occupational hazard exposures facing wildland firefighters, see Kathleen M Navarro et al., *The Wildland Firefighter Exposure and Health Effect (WFFEHE) Study: Rationale, Design, and Methods of a Repeated-Measures Study*, *Ann Work Expo Health* 66(6):714-727, July 2, 2022.

112 *Wildfire in a Warming World: Opportunities to Improve Community Collaboration, Climate Resilience, and Workforce Capacity: Hearing Before the Subcomm. on Nat’l Parks, Forests, & Pub. Lands of the H. Nat. Res. Comm.*, 117th Cong. 12 (2021) (statement of Riva Duncan, Executive Director, Grassroots Wildland Firefighters).

113 The Montana Forest Action Advisory Council, *Montana Forest Action Plan*, 41, December 2020.

114 Grassroots Wildland Firefighters, *Federal Wildland Firefighter Request for Presumptive Health Coverage for Exposure to Environmental Hazards*, <https://www.grassrootswildlandfirefighters.com/presumptive-coverage>, (last visited June 15, 2023).

115 Grassroots Wildland Firefighters, *Federal Wildland Firefighter Request for Presumptive Health Coverage for Exposure to Environmental Hazards*, <https://www.grassrootswildlandfirefighters.com/presumptive-coverage>, (last visited June 15, 2023).

accepting roughly 86% of the annual claims it receives from firefighters,¹¹⁶ unfortunately more than 40% of GWF survey respondents said they did not get the care or benefits they needed from OWCP.¹¹⁷

Even when OWCP accepts federal firefighters claims, it can take months for them to be processed – causing firefighters to either delay receiving care or to pay for care out of pocket.¹¹⁸ One cause of the slow response to firefighter injury and death claims has been a reduction in the number of OWCP claims examiners, due to declining budgets over the last few years.¹¹⁹ OWCP must be appropriately funded and staffed in order to quickly and effectively handle claims and support firefighters who are injured on the job.

In 2022, the Department of Labor announced reforms to OWCP in order to better assist federal firefighters with certain occupational illnesses by making it easier for claimants to file certain claims.¹²⁰ These changes ease the evidentiary requirements needed to support claims for certain cancers, heart conditions and lung conditions: there is now a list of cancers and medical conditions for which a firefighter claimant does not have to submit proof that their disease was caused by an on-the-job injury.¹²¹ According to the new policy, qualifying claims must include a doctor's diagnosis, the person must have been engaged in fire protection activities for more than five years, and the diagnosis must have occurred no more than ten years after employment.¹²² A special claims unit has been implemented that is specifically training to handle federal firefighter claims. Prior to the establishment of this new claims unit, only 29% of compensation claims for conditions including cancer, heart and lung diseases were being approved.¹²³ Since the change, the agency reports having accepted more than 90% of this type of claim.¹²⁴

Providing comprehensive services to improve the health and wellbeing of wildland firefighters is critical to sustaining a workforce that can safely and effectively complete their mission, without causing undue mental and physical burdens or high attrition rates. As with all the recommendations provided in this paper, the best way to improve firefighter health outcomes is by investing in the proactive land stewardship efforts necessary to reduce the severity of wildfire seasons. Through active forest management and the restoration of traditional fire regimes, wildfires will be able to burn at a lower severity and smaller scale and without posing significant threat to communities or natural resources. This will allow agencies to use different wildfire management tactics – for example relying less on direct attack suppression strategies

116 Avi Asher-Schapiro and David Sherfinski, Context News, *U.S. Firefighters on Climate Frontline Face 'Broken' Health System*, Nov 10, 2021.

117 Grassroots Wildland Firefighters, *Federal Wildland Firefighter Request for Presumptive Health Coverage for Exposure to Environmental Hazards*, <https://www.grassrootswildlandfirefighters.com/presumptive-coverage>, (last visited June 15, 2023).

118 Grassroots Wildland Firefighters, *Federal Wildland Firefighter Request for Presumptive Health Coverage for Exposure to Environmental Hazards*, <https://www.grassrootswildlandfirefighters.com/presumptive-coverage>, (last visited June 15, 2023).

119 Grassroots Wildland Firefighters, *Injuries*, <https://www.grassrootswildlandfirefighters.com/owcp>, (last visited June 15, 2023).

120 Grassroots Wildland Firefighters, *Federal Wildland Firefighter Request for Presumptive Health Coverage for Exposure to Environmental Hazards*, <https://www.grassrootswildlandfirefighters.com/presumptive-coverage>, (last visited June 15, 2023).

121 Grassroots Wildland Firefighters, *Federal Wildland Firefighter Request for Presumptive Health Coverage for Exposure to Environmental Hazards*, <https://www.grassrootswildlandfirefighters.com/presumptive-coverage>, (last visited June 15, 2023).

122 Grassroots Wildland Firefighters, *Federal Wildland Firefighter Request for Presumptive Health Coverage for Exposure to Environmental Hazards*, <https://www.grassrootswildlandfirefighters.com/presumptive-coverage>, (last visited June 15, 2023).

123 Grassroots Wildland Firefighters, *Federal Wildland Firefighter Request for Presumptive Health Coverage for Exposure to Environmental Hazards*, <https://www.grassrootswildlandfirefighters.com/presumptive-coverage>, (last visited June 15, 2023).

124 Grassroots Wildland Firefighters, *Federal Wildland Firefighter Request for Presumptive Health Coverage for Exposure to Environmental Hazards*, <https://www.grassrootswildlandfirefighters.com/presumptive-coverage>, (last visited June 15, 2023).

– that will ultimately reduce the duration that wildland firefighters are exposed to smoke, reduce the likelihood of traumatic events on the fireline, and reduce the need for an aggressive, suppression-oriented response to incidents. By improving landscape and community resilience to wildfire, we can allow fire to play its natural role in ecosystems without significant intervention that places the lives, health and safety of firefighters at risk.

RRR11: Grant presumptive health coverage to permanent and temporary federal wildland firefighters for acute and chronic illness due to environmental job-related exposure, including, but not limited to, smoke and silica inhalation and firefighting chemical exposure.

Many non-federal firefighting entities, including the state of Colorado, provide presumptive health coverage to wildland firefighters for conditions caused by job-related exposure. This kind of change would help ensure that firefighters have access to the health coverage they need without having to work through cumbersome processes to prove that their conditions are related to on-the-job exposure. Behavioral health conditions including Post-Traumatic Stress Disorder should be included in the list of conditions presumed to be caused by employment. This will also help ensure that firefighters are able to successfully file claims using accurate diagnoses, allowing for proper accounting and attribution of the health causes and costs related to firefighting.

RRR12: Establish wildland firefighter time-in-service exposure time frames for coverage.

This will establish the minimum amount of time someone will have to serve as a wildland firefighter in order to be eligible for presumptive health coverage, therefore reducing the strain on firefighters to prove their conditions are related to on-the-job exposure.

RRR13: Create a National Federal Wildland Firefighter Cancer and Cardiovascular Disease Database.

Doing so will allow Congress and land management agencies to track acute and chronic diseases throughout the lives of current and past wildland firefighters. Currently, federal agencies have not fully acknowledged the proven relationship between exposure to particulate matter and increased rates of cancer and cardiovascular disease. Such a database would improve agency knowledge of the association and causes of these diseases.

RRR14: Develop and adhere to recommendations to minimize the duration and severity of wildland firefighter smoke exposure.

Congress should mandate and fund research into the health impacts of smoke exposure on wildland firefighters. Best practices should be developed from this research to recommend maximum exposure windows or number of shifts that firefighters should be limited to working in order to mitigate adverse effects of exposure to smoke. These best practices should be created in alignment with the disease database in order to reduce the occurrence of acute and chronic illness or injury in the workplace. Congress should ensure compliance with these mitigation strategies, and appropriately fund safety and training programs, as well as the personal protective equipment to help minimize smoke exposure.

RRR15: Provide opportunities for firefighters who are no longer able to perform service as a wildland firefighter (for reasons including, but not limited to, physical injury, mental health challenge, or family responsibility) to be appointed to another supervisory or administrative position related to the former firefighting position.

A firefighter appointed to a different position will continue to receive firefighter retirement and also retain creditable service already earned. This will ensure that firefighters are able to maintain employment and develop in their careers with federal land management agencies even if they are no longer able to perform the duties required by employees in primary firefighting positions. A process to move firefighters into these positions should be created, but this process should be easy to navigate and should not place undue burden on firefighters to prove their need for such a transition.

RRR16: Provide unpaid mental health leave to all permanent and seasonal federal wildland firefighters.

All firefighters in both primary and secondary firefighting positions should be eligible for at least seven days of mental health leave, to be reset each year. In the event that a firefighter experiences a traumatic event while on the job, additional leave should be made available.

RRR17: Develop and fund a mental health program with expanded mental health services specific to wildland firefighters and their families.

This mental health program should provide trauma-trained clinicians able to offer long-term care to help firefighters who suffer from PTSD. All firefighters, including temporary-seasonals, should be made eligible for this program, even during the off-season, and for up to two years after employment has ended.

By improving federal wildland firefighter compensation and classification, providing comprehensive health and wellbeing programs, and promoting opportunities for work/life balance, Congress can help federal wildland fire management agencies recruit and retain a diverse, competent, and engaged workforce able to operate safely and effectively. Taking the actions outlined above will help demonstrate a commitment to the wellbeing of all federal wildland firefighters, and in turn we believe that this investment will contribute to the development of a sustainable workforce able to steward and conserve our landscapes, communities and natural resources for generations to come.



III. RETHINKING OUR APPROACH TO WILDFIRE POLICY: PRIORITIZING STEWARDSHIP THROUGH THE WORKFORCE

The recommendations outlined in Part II would go a long way toward better recruiting, supporting, and retaining our nation's federal wildland firefighters. But as Lenya Quinn-Davidson, wildfire policy expert and Director of University of California Agriculture and Natural Resources' Fire Network, explains, "[t]he assumption that we need more people to do more of the same thing is flawed. There may not be a reality in which we have enough people to make a suppression-focused system work."¹²⁵ Successful policy in this area depends not only on changing the way we support our federal wildland firefighters, but also on changing the big-picture strategic priorities they work toward in combating the wildfire crisis: our federal wildland firefighter workforce policy must begin making a longer-term shift in institutional priorities toward proactive, stewardship-oriented wildfire governance.

The two sets of changes—changes to our federal wildland firefighters' support systems, on the one hand, and strategic changes in focus from suppression to proactive wildfire management work, on the other—form a mutually reinforcing set of positive feedback loops. See Figure 1.

In the second half of this Report, therefore, we zoom out to analyze opportunities for the federal government to better embrace a forward-looking, stewardship-oriented approach to wildfire governance *through* changes to workforce policy. First, we identify the problem: despite a groundswell of support for more proactive wildfire governance, stewardship practices have yet to be prioritized. Then, we make several policy proposals modeling how the federal government might make the necessary shift to a more stewardship-oriented federal wildland firefighter workforce.



¹²⁵ Telephone Interview with Lenya Quinn-Davidson, Director, U.C. Agric. & Nat. Res. Fire Network (June 7, 2023).



Figure 1: Double Positive Feedback Loop Relationship Between Workforce Support and Stewardship Prioritization

A. Stewardship Widely Accepted as Best Practice, but Yet to Be Implemented

The efficacy of forest stewardship activities like prescribed and cultural burns, fuels management, and landscape resilience-building, amongst others, has been widely acknowledged. Though we lack strong regional- and national-level statistics, smaller-scale research has demonstrated that active forest management can significantly reduce the risk of property loss, limit harmful exposure to smoke from extreme wildfire events, and save money in the long run in comparison to costly suppression efforts.¹²⁶ Advocates, policymakers, and federal and state agencies have all joined the call for increased use of prescribed fire and fuels management measures. In Congress, there is bipartisan support for proactive forest management from Senate Energy Committee Members like Senators Mike Lee (R-UT), Maria Cantwell (D-WA), James Risch (R-ID), and Lisa Murkowski (R-AK), to name a few.¹²⁷

Yet stewardship seems to always end up an afterthought: as some Senators themselves point out, Congress has given agencies billions of dollars, has heard ambitious rhetoric, has seen lines drawn on maps, but has not seen enough action.¹²⁸ For example:

The United States Forest Service attempts to hire and enlist 10,000 Forestry Technicians mostly on a seasonal basis to meet its stated objectives and goals. This is a failed model that does not promote resiliency in its workforce or the landscape. Fire suppression and land management are directly opposing forces for most of the fire year, due to a limited number of employees with a limited amount of time who are asked to meet the objectives of both.¹²⁹

Barriers to proactive forest management include, amongst others:

- **Limited funding**, historically because of federal government diversion from prevention to suppression.¹³⁰ While the wildfire funding fix has largely put an end to this practice of fire borrowing by ensuring adequate funding is appropriated to cover the costs of fighting wildfire, the same level of investment in wildfire resilience has not materialized;

¹²⁶ See, e.g., Samuel G. Evans et al., *Modeling the Risk Reduction Benefit of Forest Management Using a Case Study in the Lake Tahoe Basin*, 27 *ECOLOGY & SOC'Y*, no. 2, 2022, at 1, 7 (estimating a 45-76% reduction in risk of property loss through more active forest management). This study also calculated \$8-14 million per year in benefits from active forest management in the Lake Tahoe Basin, compared to \$3.6-5.4 million in costs. *Id.* Another study found that prescribed burning reduces future suppression costs, while both prescribed burning and mechanical fuel treatments reduce future property damages. José J. Sánchez et al., *Do Fuel Treatments in U.S. National Forests Reduce Wildfire Suppression Costs and Property Damage?*, 9 *J. NAT. RES. POL'Y RSCH.* 42, 69 (2019).

¹²⁷ See *Hearing to Examine the Federal Response to Escalating Wildfires and to Evaluate Reforms to Land Management and Wildland Fighter Recruitment and Retention: Hearing Before the S. Comm. on Energy & Nat. Res.*, 118th Cong. (2023).

¹²⁸ *Id.* (statement of Sen. John Barrasso, Ranking Member, S. Comm. on Energy & Nat. Res.).

¹²⁹ *Wildfire in a Warming World: Opportunities to Improve Community Collaboration, Climate Resilience, and Workforce Capacity: Hearing Before the Subcomm. on Nat'l Parks, Forests, & Pub. Lands of the H. Nat. Res. Comm.*, 117th Cong. 12 (2021) (statement of Riva Duncan, Executive Director, Grassroots Wildland Firefighters).

¹³⁰ Rebecca K. Miller, Christopher B. Field & Katherine J. Mach, *Barriers and Enablers for Prescribed Burns for Wildfire Management in California*, 3 *NATURE SUSTAINABILITY* 101, 104 (2020).

- **Limited prior experience in the workforce**, compounded by limited training or certification programs; for example, Californian active burn programs “have ended when experienced burn managers retired”;¹³¹
- **Inadequate firefighter availability**, given the near-constant demand for suppression work in the face of ever-lengthening and intensifying fire seasons;¹³²
- **Disjointedness and lack of collaboration**—often exacerbated by conflicting agency priorities—both among federal agencies themselves and among federal, state, and local agencies;¹³³ and
- **Low firefighter morale**: stewardship work like prescribed burning requires commitment that firefighters may not be willing to make when they feel unsupported in those endeavors—as might be the case following, for example, the Forest Service’s response to the 2022 escaped prescribed fires in New Mexico that mandated further administrative oversight and limited on-the-ground firefighter discretion.¹³⁴

The result is that, despite increased vocal support for risk mitigation activities, a commensurate increase in action has not materialized. Critics of the Forest Service’s recent 2022 Wildfire Crisis Strategy Report note that it lacks any meaningful explanation of operationalization and implementation plans, particularly from a workforce standpoint, to reach the ambitious goals set.¹³⁵ If the Forest Service does have detailed, data-supported operations plans for the next ten years, the public would benefit from easy access to this information in an approachable format alongside big-picture documents like the Strategy Report.

B. Solving Our Stewardship Problem: Address Wildfire Risk and Forest Health Challenges by Creating a Workforce Dedicated to Proactive Stewardship and Sustainability Goals

“The workforce needs to be doubled at a minimum. Half of this workforce needs to be directly responsible for land management activities....”¹³⁶

In other words, addressing our stewardship deficit through our federal wildland firefighter workforce is critical to abating the current wildfire crisis, and will require significant increases in workforce size. Despite recently increased hiring in the Forest Service and other major federal government wildland firefighting agencies, the fact that the workforce has not yet been scaled to the extent necessary—and with an eye toward prioritizing stewardship—is why the current workforce remains plagued with grueling, long assignments, few in-season rest days, more overtime hours than ever before, and

¹³¹ *Id.*

¹³² *Id.* at 105.

¹³³ Laurie Yung et al., *New Types of Investments Needed to Address Barriers to Scaling Up Wildfire Risk Mitigation*, 18 FIRE ECOLOGY, no. 30, 2022, at 9; see also Telephone Interview with Kelly Martin, (Ret.) Chief of Fire and Aviation, Yosemite Nat’l Park (May 26, 2023).

¹³⁴ Telephone Interview with Lenya Quinn-Davidson, *supra* note 122.

¹³⁵ See, e.g., *id.*

¹³⁶ *Wildfire in a Warming World: Opportunities to Improve Community Collaboration, Climate Resilience, and Workforce Capacity: Hearing Before the Subcomm. on Nat’l Parks, Forests, & Pub. Lands of the H. Nat. Res. Comm.*, 117th Cong. 13 (2021) (statement of Riva Duncan, Executive Director, Grassroots Wildland Firefighters).

significant health issues both physical and mental. Below, our policy proposals provide several possible models for building a stewardship-focused federal wildland firefighting workforce.

1. Federal Wildland Firefighting Agency (FWFA)

Stewardship Recommendation (SR) 1: Establish a federal entity—with funding and staffing streams separated from suppression-focused elements of fire management—dedicated to stewardship efforts including, amongst others, forest resilience, prescribed burns, and co-management collaborations.

We propose a federal wildland fire organization that consolidates the wildfire management functions and personnel of the five federal wildfire-managing agencies in order to reduce the limitations and duplications of effort across those two departments and five agencies.¹³⁷ This model would “wipe the slate clean,” unifying and simplifying the federal government’s efforts in combating the wildfire crisis. From a workforce perspective, it would create two overarching teams of personnel: a front-end group dedicated to education, planning and zoning, community resilience, landscape treatments, prescribed burns, and the like; and a back-end group dedicated to hazard response and post-fire recovery.¹³⁸

Why would a federal wildland firefighting agency help ameliorate the wildfire crisis? Strategic consolidation has been a major organizational management method, including at the federal government level, for at least a century. Consolidation is most common in the private sector, with some researchers coining a “consolidation curve” whereby “new industries are fragmented and consolidate as they mature.”¹³⁹ (To wit: wildfire policy has existed since the early 1900s, but one might label the newly exploding wildfire crisis a “new industry” by analogy.) But it occurs in public administration as well. A famous early example is Congress’s Transportation Act of 1920, which provided for the Interstate Commerce Commission to “adopt a plan for the consolidation of the railway properties in this country into a limited number of systems, and . . . authorize consolidations in harmony with such a plan”;¹⁴⁰ inspiration may very well have been found in the famous British railway consolidation project, which was said to have led to greater standardization, strengthened finances, and increased efficiency, amongst other advantages.¹⁴¹ Applied here, “A federal fire service could reduce cost and increase efficiency by maintaining a highly skilled workforce dedicated to the task of managing wildfires. Having multiple agencies with redundant administrative positions is inefficient and wasteful.”¹⁴²

137 See Telephone Interview with Kelly Martin, *supra* note 130 (proposing the “unified federal wildland fire organization” model).

138 *Id.*

139 Graeme K. Deans, Fritz Kroeger & Stefan Zeisel, *The Consolidation Curve*, HARV. BUS. REV., Dec. 2002, at 20, 20.

140 Walker D. Hines, *The Relationship of the Burlington-Great Northern-Northern Pacific Group to the Federal Railroad Consolidation Law*, HARV. BUS. REV., July 1923, at 398, 398.

141 See C.E.R. Sherrington, *The Economic and Financial Results of British Railway Consolidation—Their Guide to American Policy*, HARV. BUS. REV., July 1929, at 395, 404-05.

142 *Wildfire in a Warming World: Opportunities to Improve Community Collaboration, Climate Resilience, and Workforce Capacity: Hearing Before the Subcomm. on Nat’l Parks, Forests, & Pub. Lands of the H. Nat. Res. Comm.*, 117th Cong. 11 (2021) (statement of Riva Duncan, Executive Director, Grassroots Wildland Firefighters).

a) FWFA Mission(s)

We recommend the organizational structure of a Federal Wildland Firefighting Agency be guided by a foundational “mission statement” similar to those traditionally found in enabling legislation.¹⁴³ The following (nonexhaustive) list of wildfire management missions might serve as a starting point:

1. **Promote forest and grasslands stewardship** through proactive, pre-suppression wildfire risk reduction activities reflective of the fire ecology needs of a landscape, including, but not limited to, prescribed burns by dedicated controlled burn crews, fuels treatments, and managed wildfire;
2. **Strengthen community preparedness and resilience** through neighborhood hardening, planning and zoning, and wildfire prevention education;
3. **Protect the public and their homes** through prompt and appropriate wildfire suppression, hazard response, and, where necessary, evacuation;
4. **Lead community-informed post-fire recovery efforts** centered on resilience and adaptation approaches;
5. **Foster cross-pollination** among pre-suppression, suppression, and post-fire recovery functions to promote the holistic education and career development of agency personnel and take advantage of accumulated knowledge,¹⁴⁴ *while ensuring* that all pre-suppression appropriations remain protected from diversion to hazard response actions; and
6. **Collaborate** with other federal and state agencies, local and nonprofit entities, tribes, and the private sector on information-sharing, mitigation interventions analysis, and monitoring and evaluation programs.¹⁴⁵

As outlined, the missions contemplate a tripartite structure: a pre-suppression division encompassing Missions 1 and 2; a suppression and hazard response division for Mission 3; a post-fire recovery division for Mission 4; and one or multiple cross-divisional teams dedicated to carrying out Missions 5 and 6. In particular, we envision the separation of dedicated pre-suppression and suppression divisions as crucial to ensuring that stewardship funding and goals do not become deprioritized even in the face of justifiably urgent hazard response matters.

143 See, e.g., Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 393 (establishing the Food and Drug Administration within the Department of Health and Human Services and outlining that “[t]he Administration shall” work toward four discrete food and drug safety-related goals); WILLIAM L. PAINTER, CONG. RSCH. SERV., R47446, THE DEPARTMENT OF HOMELAND SECURITY: A PRIMER 16 (2023) (listing the “six...mission areas” DHS identifies as its own per its enabling legislation).

144 Insights into intra-agency coordination, i.e., “cross-pollination,” offered by a federal employee who wishes to remain anonymous.

145 In addition to the hoped-for stream of collaborative activity on stewardship efforts and prospective cooperation with nontraditional partners such as FEMA, we envision information-sharing and analytical collaborations such as, for example:

- Scientific analysis of past targeted mitigation interventions to determine highest-efficiency prescribed burn and fuels management activities; and
- Creation of fire management plans, produced in collaborative and localized environments, which are placed into spatial template or GIS to monitor landscape change over time and assess maintenance burn readiness.

For an example of a fire management plan combining on-the-ground knowledge with federal guidance, see Yosemite Nat’l Park, *Fire Management Plan*, U.S. DEPT OF THE INTERIOR NAT’L PARK SERV., <https://www.nps.gov/yose/getinvolved/fireplan.htm> (last updated Aug. 17, 2021).

b) FWFA Personnel

SR2: Significantly increase the amount of stewardship personnel in the new FWFA.

This personnel-focused recommendation follows logically from Agency Missions 1 and 2 (promoting forest and grasslands stewardship, and strengthening community preparedness and resilience, respectively). It is deceptively simple, yet it addresses the national wildfire crisis through several mechanisms.

First, increasing the personnel dedicated to stewardship work harnesses the mutually-reinforcing interaction between supporting the workforce and increasing stewardship, identified in Figure 1, to combat the current wildland firefighter shortage. The recommendations in Part II should improve recruitment on the front end. Answering recruitment and retention challenges—like burnout and irregular work schedules, to name a few—with more full-time, hire-to-retire personnel will result in fewer firefighters leaving the workforce. And with a greater prioritization of more proactively managed forests, the ever-growing deficit of suppression firefighters should begin to wane, thereby lessening the overall burden on firefighters across the workforce—a virtuous cycle.

Second, it addresses one of the largest barriers to growing stewardship activity: lack of available personnel for risk mitigation work given the near-constant need for firefighters to address more-urgent hazard responses. For example, Quinn-Davidson explains that we miss many promising prescribed burn “windows” because we rely on the same personnel that *would* conduct prescribed burns to do other (often, suppression-focused) work.¹⁴⁶ When a good burn window opens, those personnel are often unavailable.¹⁴⁷ Having dedicated prescribed burn crews would allow the agency to capitalize on ideal burning conditions. That said, in keeping with our recommendations relating to workforce pay, those prescribed burn crews must be compensated comparably to suppression firefighters such that switching to suppression work is not incentivized.

The Forest Service has noted the growing need to hire more dedicated stewardship personnel to achieve its long-term plans for addressing the wildfire crisis (see the recently released “National Prescribed Fire Resource Mobilization Strategy,”¹⁴⁸ for example). But even this document is reflective of deeper structural issues in the federal wildfire agencies’ human capital management: “[w]hile authorities exist to hire AD personnel and to establish contracts and agreements for prescribed fire projects, significant restrictions and extended timeframes for implementation have historically made the processes less effective and efficient when compared to the authorities available to acquire suppression resources.”¹⁴⁹ Simply put, we haven’t incentivized *enough* federal wildland firefighters to seek out stewardship work, and we also aren’t effectively and efficiently deploying those who do.

¹⁴⁶ Telephone Interview with Lenya Quinn-Davidson, *supra* note 122.

¹⁴⁷ *Id.*

¹⁴⁸ U.S. Dep’t Agric., Forest Serv., Fs-1216, *National Prescribed Fire Resource Mobilization Strategy* (2023).

¹⁴⁹ *Id.* at 11.

SR3: Restructure wildland fire management occupational series and career paths from scratch, including through completely revamped position classifications and creation of entirely new positions, to create accessible and attractive stewardship-related career advancement opportunities within the new FWFA.

Since the early 1970s, federal wildland firefighters have lacked clear job series, position descriptions, and career paths; wildland firefighting was placed alongside a variety of other positions into a broad and relatively incoherent federal job series called the Forestry Technician GS-0462 Series.¹⁵⁰ This lack of clarity contributed in part to siloing of the suppression and stewardship functions within each federal wildland fire management agency.¹⁵¹ A prototypical firefighter might start on a ground crew in the GS-0462 Series, firefighting in the field on various deployments.¹⁵² Yet in this series, there is little opportunity for career advancement beyond a GS-9 technician.¹⁵³ To advance their careers, they must exit the GS-0462 Series and apply to higher forestry-related leadership and management positions scattered across the GS-0460, GS-0401, and GS-0301 Series.¹⁵⁴ (As of 2000, the GS-0401 Series appears to be the agencies' preferred classification.)¹⁵⁵ GS-0401, for example, contains the commonly filled "Fire Management Officer" position.¹⁵⁶ Positions like these typically contain less-hazardous, and often stewardship-oriented, work—and are filled by prescribed burn bosses, for example, or modeling experts that help ground crews plan to execute their deployments.¹⁵⁷

But in addition to having to re-apply to progress to a GS-0401 management-level position, the Forestry Technician must also jump through a series of training and certification hoops that includes, amongst other qualification requirements, "a minimum educational requirement of either (a) an undergraduate degree in biological sciences, natural resources, or related fields, or (b) a combination of education and experience that includes at least 24 credit hours of coursework in related fields."¹⁵⁸ Bafflingly, it is reported that those applying to a 0401 position from a 0462 position have traditionally been routinely told that "technician experience of any type or degree does not count as professional experience[.]" which, following that logic, "allows qualification through experience only by those with time in the 0401 series or experience outside the federal government. In effect, USFS employees are penalized for obtaining their experience with the agency."¹⁵⁹

150 U.S. Dep't of Agric., U.S. Dep't of the Interior & U.S. Off. of Pers. Mgmt, Frequently Asked Questions: Implementation of Section 40803 of the Bipartisan Infrastructure Law (Public Law 117-58) 8 (2022), <https://www.opm.gov/policy-data-oversight/classification-qualifications/reference-materials/Wildland-Fire-Management-Occupational-Series-FAQs.pdf>.

151 Insight offered by a federal employee who wishes to remain anonymous.

152 *Id.*

153 Kelly Martin, *Federal Wildland Firefighter Classification Without Compensation—Wait, What??*, Wildfire Today (June 16, 2022), <https://wildfiretoday.com/2022/06/16/federal-wildland-firefighter-classification-without-compensation-wait-what/>.

154 Riva Duncan, *We Don't Need Another Forestry Technician Hero (Part 2)*, One Foot in the Office (Oct. 17, 2020), <https://www.rivaduncan.com/tag/wildland-firefighters/> (to locate, search page for title).

155 *Attachment A: Chronology on the Use of the GS-0401 Series for Fire Management Specialists Positions*, Nat'l Wildfire Coordinating GRP., <https://www.nwccg.gov/sites/default/files/docs/eb-fmb-m-16-001a.pdf> (last visited June 16, 2023).

156 See *DOI Standard Fire & Law Enforcement Position Descriptions*, U.S. Dep't of the Interior, https://www.doi.gov/flert/DOI_std_pds (last visited June 16, 2023).

157 Insight offered by a federal employee who wishes to remain anonymous.

158 Leda N. Kobziar et al., *Challenges to Educating the Next Generation of Wildland Fire Professionals in the United States*, J. Forestry, Oct.-Nov. 2009, at 339, 342.

159 Justin Preisendorfer, Kevin Hood, Ken Straley & David Finnan, Wilderness Advisory Group, *The Forest Service Wilderness Career Ladder: In Search of the Missing Rungs* 5 (rev. 2013).

Various academic programs, private and public, exist to meet the educational needs of federal wildland firefighters seeking to advance their careers.¹⁶⁰ However, even *before* the wildfire crisis began building to its most pronounced state in recent years, midcareer professionals were reporting that they might not pursue the programs “because of a lack of agency support for both time and costs incurred [in doing so], particularly if they are not currently in[,] but aspire to[,] GS-0401 positions.”¹⁶¹ Indeed, “many senior-level federal employees have expressed...demoralization, and even plan to retire early rather than meet the requirements of the GS-0401 series.”¹⁶² Now, with the wildfire crisis more worrisome than ever before, ground crews are effectively “maxed out” across the duration of ever-expanding fire seasons.¹⁶³ Most firefighters never have the opportunity to complete the education, trainings, and certifications required to climb (or switch) career ladders toward stewardship.¹⁶⁴

As noted in the preceding subpart supporting Stewardship Recommendation 2, the Forest Service has begun to hire more stewardship personnel. But the question remains whether the agency has appropriately extended those opportunities to line-level personnel by building stewardship into the career ladders of those who start out in suppression.

The GS-0456 Position Classification Standard for Wildland Fire Management—long dormant but revived and revised by OPM in June 2022 in response to Congress’s statutory directive in the 2021 Bipartisan Infrastructure Law to “develop a distinct ‘wildland firefighter’ occupational series”¹⁶⁵—purports to redress the myriad afflictions plaguing the scattered wildland firefighter classification series. It isn’t clear that it does. Following the revised classification standards publication in June 2022, the agencies were tasked with developing position descriptions (PDs) “that accurately reflect the jobs being performed in 2022.”¹⁶⁶ And yet:

The old GS-0462 PDs were basically copied and pasted into the new GS-0456 series with a few additional duties added.

.....

“Over the new few meetings we learned that the process was basically a crosswalk,” Mr. Elkind [National Federation of Federal Employees union representative] said....

.....

¹⁶⁰ For examples of some of the programs, see Kobziar et al., *supra* note 156, at 342.

¹⁶¹ *Id.* at 343.

¹⁶² *Id.*

¹⁶³ Insight offered by a federal employee who wishes to remain anonymous.

¹⁶⁴ *See id.*

¹⁶⁵ Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, § 40803, 135 Stat. 429, 1097-1105 (2021).

¹⁶⁶ Bill Gabbert, *Transition of Federal Wildland Firefighters to New Position Descriptions Encounters Difficulties*, Wildfire Today (Sept. 2, 2022), <https://wildfiretoday.com/2022/09/02/transition-of-federal-wildland-firefighters-to-new-position-descriptions-encounters-difficulties/>.

“My biggest concern and reticence to remain involved in this process, is that the Washington Office management...are choosing to use terms like ‘may’ in these PDs to willfully avoid any sort of meaningful classification,” Mr. Thomsen [another union representative] said.¹⁶⁷

Furthermore:

- Rather than adopting a “hire to retire” model, there are indications that GS-0456 will narrow career opportunities at the GS-9 level, as was the case with GS-0462.¹⁶⁸
- DOI is already implementing GS-0456, while USDA has requested a six-month extension prior to beginning implementation. At least one Congressperson—Representative Katie Porter (CA)—has expressed concern that the series may be implemented differently across federal agencies,¹⁶⁹ potentially leading to conflicting agency hiring practices and even wildland firefighter “poaching.”
- It doesn’t appear as though GS-0456 will move toward exempting certain stewardship assignments, like prescribed burns, from overtime pay caps in a manner similar to the one traditionally employed for emergency suppression assignments.

In short, GS-0456, and its implementation as currently anticipated, build on top of a personnel structure that was not working and that will continue to obstruct and disincentivize stewardship-oriented careers. From a human capital perspective, the foreseeable result is a federal wildland firefighting workforce that remains unable to sufficiently prioritize pre-suppression work.

Instead, OPM and the agencies involved in forest management must embrace the spirit of Congress’s directive by building an entirely new occupational series and returning to the drawing board on position descriptions. The new series should create hire-to-retire career paths—some of which are exclusively dedicated to stewardship work *and others* that incentivize career advancement from entry-level suppression to stewardship work. It should remove barriers to career progression by adequately accrediting valid on-the-ground experience. It should exhibit parity in compensation and benefits across stewardship and suppression functions. And it should incorporate the recommendations for improving current employees’ pay, benefits, and other supports outlined in Part II above.

167 *Id.*; see also Letter from Lucas Mayfield, President, Grassroots Wildland Firefighters & Randy Erwin, National President, National Federation of Federal Employees to Cardell Johnson, Acting Director, Natural Resources and Environment, Government Accountability Office & Gene Dodaro, Comptroller General of the United States, Government Accountability Office (Jan. 25, 2023), <https://static1.squarespace.com/static/5f6ced5b8d33bb20b5c97c0b/t/63d800fb6a35620a518bc098/1675100412318/GAO+Letter.pdf> (“Reports from the field indicate, however, that the agencies did not adhere to the new series standard that OPM issued.”).

168 Gabbert, *supra* note 164.

169 See *Oversight of Our Nation’s Largest Employer: Reviewing the U.S. Office of Personnel Management: Hearing Before the H. Comm. on Oversight & Accountability*, 118th Cong. (2023) (questioning OPM Director Kiran Ahuja on OPM involvement in agencies’ implementation of the GS-0456 series).

c) FWFA Funding

SR4: Keep fully separate the new FWFA's wildland fire stewardship appropriations from diversion toward suppression-focused goals.

Prior to 2018's wildfire funding fix, it was often the case that the funding dedicated toward stewardship activities like fuels treatment and controlled burning was diverted to wildfire suppression. Through the funding fix, Congress was able to increase the overall wildfire management budget by 15% while keeping appropriations level for all other Forest Service programs.¹⁷⁰ Bring an end to fire borrowing has helped restore the 28%, or \$1.3 billion, of the Forest Service's annual budget that had previously been redirected to pay for firefighting.¹⁷¹ However, appropriations for wildfire suppression operations still far outpace funding allocated for wildfire resilience efforts. Regarding fuels treatment, for example, "federal agencies received almost \$5.5 billion (almost \$550 million per year on average) during FYs 2011-2020 to reduce overgrown vegetation.... However, there are significantly more high-risk acres—about 100 million—than agencies can treat each year (which was about 3 million [acres with \$550 million in funding] in FY 2018)."¹⁷² Suppression-related funding has grown over 400% in the past ten years while stewardship-related funding has remained flat.¹⁷³ Annual controlled burning has remained stable or decreased in the western U.S. over the past two decades, with limited funding cited as one of the main barriers.¹⁷⁴

For the first time, legislation like the Infrastructure Investment and Jobs Act and the Inflation Reduction Act has appropriated funding for fuels treatment, prescribed fire, and other pre-suppression activities at the scale necessary to initiate a paradigm shift.¹⁷⁵ To truly turn the corner, however, the new FWFA must ensure that funding of this sort stays dedicated to stewardship work well beyond the point when the funding from those two acts dries up. At the state level, for example, researchers have hypothesized that dedicated fuel treatment funding could prevent the funding fluctuations commonly cited as a major barrier to prescribed burning as a wildfire management tool.¹⁷⁶ Securing durable and predictable funding for pre-suppression activities is at least equally important at the federal level, as the scale of pre-suppression projects must expand to encompass larger geographic footprints that cut across various public, private, and tribal jurisdictions.¹⁷⁷

170 Farm Bill Law Enterprise, Forestry, 11, https://www.farmbilllaw.org/wp-content/uploads/2020/12/2018-Update_Title-8-Forestry.pdf (last visited July 26, 2023).

171 Peter Taylor, *The Good, the Bad, and the Unnecessary: Forest Fire Suppression Funding and Forest Management Provisions of the Consolidated Appropriations Act of 2018*, Public Land and Resources Law Review, 41, 7, 2019.

172 *Wildland Fire Management*, U.S. Gov't Accountability Off., *supra* note 11.

173 Nature Conservancy, Funding for Wildfire Resilience: Strategies for a Paradigm Shift 1, https://foreststewardsguild.org/wp-content/uploads/2021/09/FireResilience_FactSheet_09-01-2021.pdf.

174 Crystal A. Kolden, *We're Not Doing Enough Prescribed Fire in the Western United States to Mitigate Wildfire Risk*, 2 Fire, no. 2 (2019).

175 The Nature Conservancy, *supra* note 67, at 8 (2021).

176 Miller, Field & Mach, *supra* note 144, at 106.

177 See The Nature Conservancy, *supra* note 67, at 10, 14.

2. Aggressively Scaling Collaborative Stewardship Activities

With regard to suppression operations, agencies in the United States employ a collaborative model capable of high levels of efficacy. Recognizing that a single firefighting entity may not be able to handle all hazard incidents that might strike within its jurisdiction at any given time:

[A]gencies...use an interagency incident management system that depends on the close cooperation and coordination of federal, state, tribal, and local fire protection agencies.... [F]ederal and nonfederal entities generally share their firefighting personnel, equipment, and supplies and work together to fight fires, regardless of who has jurisdiction over the burning lands. To enable firefighters from federal and nonfederal entities to work together, fire protection agencies have the same minimum position qualification standards for training, experience, and physical fitness for all wildland firefighters.¹⁷⁸

Two of the most important coordinating players in this space are the National Wildfire Coordinating Group (NWCG), which focuses on guidelines, qualifications, and other interoperability standards,¹⁷⁹ and the National Interagency Fire Center (NIFC), which focuses on incident response and sets priorities for equipment, supplies, and personnel sharing during emergency hazard situations.¹⁸⁰

But what about interagency collaboration when there *is not* an active fire? NIFC has worked with Congress on both the recent proposals to increase wildland firefighter pay beyond the temporary supplements set to expire in late 2023 and with the agencies on implementation of position descriptions pursuant to the GS-0456 Series.¹⁸¹ NWCG, the National Wildland Fire Leadership Council, and the National Cohesive Wildland Fire Management Strategy all exhibit some level of non-suppression-focused collaborative programming. The federal government collaborates on non-suppression work with state, local, and tribal entities through initiatives like the Good Neighbor Authority,¹⁸² the Toward Shared Stewardship Across Landscapes investment strategy, and the Collaborative Forest Landscape Restoration Program, to name several.

However, in general, cross-entity collaboration on stewardship pales in comparison to emergency response collaboration.

At the highest “mission” level, the five federal agencies responsible for wildfire governance experience both intra- and inter-agency tension. The dual mandates of USFS and BLM are each inherently conflicting. For example, under the Federal Land Policy and Management Act, DOI and BLM famously must grapple with the oft-diverging principles of “multiple use” and “sustained yield,” the former of which envisions actively utilizing natural resources on public lands to benefit Americans *now*, and the latter of which emphasizes preservation of those very resources for future generations of Americans. This tension between resource conservation and resource use is perhaps most clearly demonstrated in the

178 U.S. Gov’t Accountability Off., GAO-23-105517, *Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters* 8 (2022).

179 *Id.* at 8 n.18.

180 *What Is NIFC?*, Nat’l Interagency Fire Ctr., <https://www.nifc.gov/about-us/what-is-nifc> (last visited June 16, 2023). As noted in Part II above, NIFC has been increasingly unable to fill crew mobilization orders as the wildfire crisis has deepened in recent years. *See supra* note 34 and accompanying text. That said, the collaborative model, when properly funded and resourced, is proven to have worked.

181 Insight offered by a federal employee who wishes to remain anonymous.

182 The Good Neighbor Authority was recently highlighted in a Senate hearing as an important tool for helping towns carry out timber work and small prescribed burns. *See Hearing to Examine the Federal Response to Escalating Wildfires and to Evaluate Reforms to Land Management and Wildland Fighter Recruitment and Retention: Hearing Before the S. Comm. on Energy & Nat. Res.*, 118th Cong. (2023) (statement of Kelly Norris, Interim State Forester, State of Wyoming).

1897 Forest Service Organic Act, which reads, “[n]o national forest shall be established, except to improve and *protect the forest* within the boundaries, or for the purpose of securing favorable conditions of water flows, and to *furnish a continuous supply of timber* for the use and necessities of the citizens of the United States.”¹⁸³ For close to a century, the Forest Service interpreted this mission statement by falsely equating forest protection with the need for fire exclusion,¹⁸⁴ all the while engaging in mechanical treatments that were more economically motivated than ecologically-oriented. The Agency has now recognized the need for a paradigm shift that dramatically increases investment in and coordination around fuels and forest health treatments at a pace and scale commensurate with the need.¹⁸⁵ While the commitment to leading this paradigm shift is both welcome and necessary, it will likely require mission clarity as well as focus on agency culture to drive this change.

Additionally, surveys reveal statistically significant perceptions of “mission misalignment” between, on the one hand, USFS and BLM, and on the other, single-mandate agencies like the National Park Service and the Fish and Wildlife Service.¹⁸⁶ The mission-level tensions are particularly problematic when considering that groups like NWCG, while very effective facilitators of intergovernmental dialogue and inclusivity, have no true statutorily granted authority to bind agencies—they make recommendations, but simply cannot “enforce” compliance or acceptance of those recommendations.¹⁸⁷

But even at less abstracted levels, agencies don’t always coordinate with each other particularly well. Agency staff have “indicated that they were focused on their own lands and reluctant to tell each other how to operate”;¹⁸⁸ for example: interviewees have noted that the “incident command structure” works well for collaboration in fire *response*, but can be counterproductive in risk mitigation situations, where strictly following superiors’ orders is less crucial and may even stifle collaborative innovation.¹⁸⁹

Federal agency coordination with non-federal-agency entities, such as state and local governments and tribes, could also be greatly improved. For example, state and local agencies have expressed that building relationships with federal agencies has not been a priority, particularly because they have sensed a lack of participation, commitment, and “federal agency leadership” “at the table.”¹⁹⁰ Furthermore, federal and state agencies alike have yet to comprehensively engage with tribes on fostering co-management best practices—including by acknowledging traditional ecological knowledge-based management—and removing barriers to cultural burning. USFS, the Bureau of Indian Affairs, and Cal Fire are

183 See Adam Vann, Cong. Rsch. Serv., LSB10982, *Federal Land Management: When “Multiple Use” and “Sustained Yield” Diverge* 1 (2020); Martin Nie, *Administrative Rulemaking and Public Lands Conflict: The Forest Service’s Roadless Rule*, 44 Nat. Res. J. 687, 689 (2004).

184 USDA Forest Service, *Confronting the Wildfire Crisis: A Strategy for Protecting Communities and Improving Resilience in America’s Forests*, 14, January 2022.

185 USDA Forest Service, *Confronting the Wildfire Crisis: A Strategy for Protecting Communities and Improving Resilience in America’s Forests*, 4, January 2022.

186 See Casey J. Fleming, Emily B. McCartha & Toddi A. Steelman, *Conflict and Collaboration in Wildfire Management: The Role of Mission Alignment*, 75 Pub. Admin. Rev. 445, 448, 451 (2015). For historical background on the Forest Service and National Park Service’s conflicting mandates, for example, see generally Federico Cheever, *The United States Forest Service and National Park Service: Paradoxical Mandates, Powerful Founders, and the Rise and Fall of Agency Discretion*, 74 Denver L. Rev. 625 (1997).

187 Insight explaining the limitations of coordinating entities like NWCG and the National Wildland Fire Leadership Council offered by a fire specialist who wishes to remain anonymous.

188 Laurie Yung et al., *New Types of Investments Needed to Address Barriers to Scaling Up Wildfire Risk Mitigation*, 18 Fire Ecology, no. 30, 2022, at 1, 8.

189 *Id.* Other noted barriers to coordination include staff turnover within agencies and lack of time and capacity to build inter-agency relationships. See, e.g., *id.* at 8-9.

190 See, e.g., *id.* at 8 (describing state and local government agencies’ frustrations attempting to build collaborative relationships with USFS).

said to each assert that the responsibility and blame for failing to address tribal concerns fall on the other agencies, for example.¹⁹¹ And Bureau of Indian Affairs staff, though well versed in Indian law, is reported to have “little knowledge or comfort with cultural fire.”¹⁹²

Even when governing bodies do coordinate, it is not clear how well they are resourced, how long-lasting the coordination is, and how effective their coordinated activities are. Consider, for example, the Cohesive Wildfire Management Strategy and the Toward Shared Stewardship Across Landscapes investment strategy. The former is meant to be a collaborative effort, spearheaded by the Secretaries of the Departments of Agriculture and the Interior, to “build[] the foundation for a fuller, more inclusive approach to assist the Nation in achieving meaningful reductions in wildfire risk; [and ensure] healthy, resilient landscapes.”¹⁹³ The latter is meant to be a USFS-led initiative to collaborate “with [s]tates to set landscape-scale priorities for targeted treatments in areas with the highest payoffs.”¹⁹⁴ Yet, many programs designed to further these two initiatives don’t achieve true collaboration because they: ignore power imbalances between the collaborating entities, thereby perpetuating the federal agency’s priorities above all; rely on competitive grant processes that shut out many would-be partners; and rely on federal agency teams operating within agency cultures that treat such collaborative initiatives as “nice-to-haves” rather than as priorities.¹⁹⁵

The implicit rationale may be one of federalism and specialization. In the face of a big, diffuse problem, each agency works to tackle challenges according to their respective guidelines. DOI has its say over non-urgent policy matters on its lands; NPS works on its conservation priorities; Fish and Wildlife focuses on its wildlife-related priorities. Even within agencies, stewardship approaches might vary by region as vegetation and wildlife varies by forest.¹⁹⁶

We do not find this rationale to be mutually exclusive with a vastly upgraded and exponentially scaled system of collaboration on stewardship activities. On the one hand, the adoption of *Stewardship Recommendation 1* (creating a new Federal Wildland Firefighting Agency) would likely reduce the friction and activation energy barriers currently impeding stewardship-focused collaboration efforts. Yet note that, regardless of whether the new agency is created, each of the other *Stewardship Recommendations* suggested thus far—*SR2* (increased stewardship-related personnel), *SR3* (restructured, stewardship-incentivizing career paths), and *SR4* (protection of stewardship funding from diversion to suppression activities)—remains implementable on a per-agency basis. Furthermore, all are highly compatible with the below series of recommendations for significantly upgrading stewardship-focused collaboration efforts.

191 Sara A. Clark, Andrew Millar & Don L. Hankins, *Good Fire: Current Barriers to the Expansion of Cultural Burning and Prescribed Fire in California and Recommended Solutions* 7.

192 *Id.*

193 Letter from Sally Jewell, Secretary, Department of the Interior, and Thomas J. Vilsack, Secretary, U.S. Department of Agriculture, to Ken Calvert, Chairman, U.S. House of Representatives Committee on Appropriations, Subcommittee on Interior, Environment, and Related Agencies (Apr. 7, 2014).

194 U.S. Dep’t Agric., Forest Serv., *Toward Shared Stewardship Across Landscapes: An Outcome-Based Investment Strategy* 2 (2018).

195 See Brett Alan Miller et al., *Re-Envisioning Wildland Fire Governance: Addressing the Transboundary, Uncertain, and Contested Aspects of Wildfire*, 5 *Fire*, no. 49, 2022, at 1, 2 (describing how initiatives like the Good Neighbor Authority and the Reserved Treaty Land Rights program “often perpetuate the management priorities of federal agencies rather than the interests of states and tribes”); *id.* (explaining that the Collaborative Forest Landscape Restoration Program has limited funding and therefore must rely on competitive application processes that often end up shutting out communities with fewer resources); Yung et al., *supra* note 130, at 9 (relating a Utah state agency employee’s characterization of USFS’s Shared Stewardship Strategy as “kind of [a] forced collaboration that I don’t think they [the Forest Service] have time for right now”).

196 Insight offered by a federal employee who wishes to remain anonymous.

SR5: Failing the establishment of a new Federal Wildland Firefighting Agency, employ a NIFC-style coordination and resource-sharing model to transformationally increase collaboration on stewardship activities among federal agencies and with state, local, and tribal partners.

Under this collaborative model, all suppression-related resources would also be made available to, for example, conducting prescribed fires—*without* having to enter into any new agreements or worry about cross-billing. Prescribed fire managers and burn bosses would be more likely to carry out controlled burns with greater frequency if they knew they had the proper backing to quickly order resources whenever a burn window opened at a moment's notice.¹⁹⁷ As a federal employee involved in fire management has noted to the authors, we would likely see significantly improved forest health if we treated fuels management coordination like we treat hazard incident response coordination.¹⁹⁸ Successful implementation of this model need not take away from suppression-related funding; all resource orders could be filled via the same funding sources currently used for prescribed fire and fuels treatment.¹⁹⁹ The overriding positive impact of a “NIFC Stewardship” model would come from lowering the “activation energy” required to make prescribed burns and fuels treatments happen.

SR6: Formulate a targeted, long-term strategic plan to rebuild lasting trust between the federal wildland fire governance agencies and the local communities they serve.

Nearly every expert interviewed in the preparation of this Report cited tense community relations as a major impediment to scaled and improved collaboration between the federal government and local entities on stewardship projects. At the same time, these experts noted that the quality and effectiveness of fuels management and prescribed burn projects would increase significantly if federal agencies solicited and made better use of local expertise about the very landscapes they live and work in.

A successful trust-building plan would, first and foremost, directly counteract the perception that some local communities have toward several federal agencies as “swooping in” from above rather than listening to and incorporating local expertise in collaborative stewardship projects.²⁰⁰ The plan might also consider, among other possibilities, developing qualification systems’ “interoperability” with other state, local, and tribal level wildland firefighter units (such as, for example, Cal Fire, whose qualifications do not overlap particularly well with federal-level qualification standards).²⁰¹

197 See Telephone Interview with Kelly Martin, *supra* note 130, for further explanation of the prescribed burn incentives strengthened through a “NIFC Stewardship” model.

198 Insight offered by a federal employee who wishes to remain anonymous.

199 Telephone Interview with Kelly Martin, *supra* note 130.

200 See, e.g., Telephone Interview with Lenya Quinn-Davidson, *supra* note 122.

201 Telephone Interview with Lenya Quinn-Davidson, *supra* note 122.

SR7: Develop effective and accessible Monitoring and Evaluation programs to allow progress to be easily gauged by both non-expert members of government and the general public.

Many of our expert interviewees noted that the wildfire-interested public generally characterizes the federal agencies' relationship with all non-suppression activities as "lip service." While we have not found this to be the case, we empathize with the sentiment. Strong Monitoring and Evaluation programs could be built directly into the FWFA, the individual agencies themselves, or as a wildfire-specialized standalone entity. The programs' findings, if communicated both transparently and approachably, could go a long way toward overcoming the perceived "lip service" problem.

SR8: Expand stewardship collaborations with tribes, particularly through initiatives affording greater co-management rights and respect for tribal autonomy for tribes to perform cultural burns on federal lands.

The academic literature widely suggests that the federal government is sorely "under-partnering" with tribes in combating the wildfire crisis. But cooperating with tribes is not just about "integrating" Indigenous knowledge—it is about including Indigenous leaders as partners and even granting tribes the authority and funding to drive discrete stewardship projects entirely on their own.²⁰² Additionally, partnership and cooperation means dismantling federal barriers to tribal sovereign rights to conduct cultural burning. Input from tribal members themselves should be sought, but some preliminary suggestions include:

- Expanding Tribal Forest Protection Act / 638 Project Authority and Reserved Treaty Rights Lands collaborations, as well as using these programs as models to expand authority for further cross-jurisdiction stewardship work;²⁰³
- Exploring opportunities for co-management of wildfire with Indigenous Peoples on federal lands;²⁰⁴ and
- Soliciting input from tribal governments on other desired opportunities for Indigenous participation in combating the wildfire crisis (such as, for example, direct employment of Indigenous Cultural Burners in National Parks).

202 See Amy Cardinal Christianson et al., *Centering Indigenous Voices: The Role of Fire in the Boreal Forest of North America*, 8 *Current Forestry Reports* 257, 271 (2022) (advocating for involvement of "indigenous people and their perspectives in future fire management decision making").

203 Insight offered by a fire specialist who wishes to remain anonymous. See, e.g., *Hearing to Examine the Federal Response to Escalating Wildfires and to Evaluate Reforms to Land Management and Wildland Fighter Recruitment and Retention: Hearing Before the S. Comm. on Energy & Nat. Res.*, 118th Cong. (2023). For more on Reserved Treaty Rights Lands Collaborations, see generally Gregory Russell et al., *Doing Work on the Land of Our Ancestors: Reserved Treaty Rights Lands Collaborations in the American Southwest*, 4 *Fire*, no. 1, 2021.

204 See, e.g., Elijah Blumenkranz & Sasha Gilmore, *The Co-Managing of Wildfire with Indigenous Peoples on Public Land* (May 5, 2022).

3. State Funding to Encourage Stewardship in the Absence of Major Federal Agency Reform

SR9: Should both the creation of a new federal wildland firefighting agency and sweeping changes to agency-level strategic priorities in favor of stewardship prove infeasible, allow forward-looking state stewardship policies to lead the way with dramatically expanded federal funding.

Recent federal funding to California could serve as a model example in providing federal funding to effective and proactive state stewardship policies. In 2020, the state signed an agreement with the Forest Service guaranteeing \$1 billion in funding over the next ten years to “match California’s goal of reducing wildfire risks on 500,000 acres of forest per year.”²⁰⁵ Southeastern states known for strong prescribed burn policies, like Florida and Georgia, would also be prime candidates for funding.²⁰⁶

This mechanism for wildfire policy change would incentivize states to design and implement their own stewardship-oriented wildfire strategies. Moreover, it would address another challenge currently plaguing the federal agencies: the relative dearth of cooperation between federal agencies, on the one hand, and prospective state- and local-level collaborators, on the other.²⁰⁷ As Quinn-Davidson explains, most of the agencies are only doing work on their own lands. There simply aren’t many programs wherein BLM or USFS give grants for prescribed fire programs, for example; counties, tribes, and private entities in California seeking prescribed fire funding end up turning to CAL FIRE grant programs.²⁰⁸

In adopting this recommendation, we would advise the federal agencies to look to Congress’s famous use of its Spending Clause power in incentivizing state-level policy change through highway funding. A complementary framework of systems thinking would adopt adaptive co-management, a governance approach that emphasizes distributed decisionmaking and continuous learning through dialogue among multiple actors and multiple levels.²⁰⁹ This governance theory has gained prominence in recent years as experts seek out more flexible ways to respond to complex natural resource systems like wildfire;²¹⁰ most recently, it was featured as a core theme at the 8th International Wildland Fire Conference.²¹¹

205 Press Release, Office of Governor Gavin Newsom, California, U.S. Forest Service Establish Shared Long-Term Strategy to Manage Forests and Rangelands (Aug. 13, 2020), <https://www.gov.ca.gov/2020/08/13/california-u-s-forest-service-establish-shared-long-term-strategy-to-manage-forests-and-rangelands/>.

206 Insight offered by a federal employee who wishes to remain anonymous.

207 Telephone Interview with Lenya Quinn-Davidson, *supra* note 122.

208 *Id.*

209 *See generally, e.g.*, Guilherme Saad Ximenes, Social Network Analysis (SNA) and Adaptive Co-Management to Forest Fires in Portugal: A Case Study of the Serra de Monchique, Algarve (Oct. 2022) (M.S. thesis, University of Lisbon) (conducting a literature review of adaptive co-management theory as applied to natural resources management and applying the adaptive co-management lens to a case study in Portugal).

210 *Id.*

211 *Main Themes*, 8th Int’l Wildland Fire Conf., <https://www.wildfire2023.pt/program/main-themes> (last visited July 3, 2023).



IV. CONCLUSION

Progress is being made on the issue of bolstering the federal wildland fire workforce: the Infrastructure Investment and Jobs Act, as well as the Inflation Reduction Act, each contained historically unprecedented increases in support of our federal wildland firefighters. Encouragingly, we are also witnessing the introduction and reintroduction of other forward-looking wildland fire policy legislation in Congress, including: the FIRESHEDS Act, which would triage Forest Service mapping data to identify highest-risk “firesheds” and expedite fuels treatment projects on those landscapes;²¹² and Tim’s Act, which would implement many of the recruitment and retention supports, including increased pay and benefits, recommended above.²¹³

But there is much more work to be done. Advisable next steps include:

- The establishment of a Congressional commission to create a monitoring & evaluation study aimed at producing general public-friendly findings to inform policymakers, researchers, collaborators, and other interested parties where appropriations are going and whether such funding is being used effectively for proactive, stewardship-focused policies, programs, and personnel.
- Commissioning a study that would elucidate the structure of federal wildfire management activity and responsibilities across all agencies with the goal of synthesizing this patchwork system in a way that makes each governing body’s role in forest management more clear. The study could be used to identify redundancies, to consolidate otherwise-disparate programs and activities, and to design better collaborations.
- Commissioning a study of federal agencies’ efforts to address workplace culture challenges in wildland fire management, including but not limited to a lack of gender and racial diversity. This study could be used to identify opportunities for reducing incidents of harm or harassment in the workplace; improving the efficacy of agencies’ offices of accountability and reporting systems; strengthening a positive workplace climate; and promoting the recruitment and retention of individuals from groups who have been historically unrepresented in the fields of forestry and fire management.

212 Press Release, James E. Risch Senator for Idaho, Risch Introduces Wildfire Prevention Bill Ahead of Wildfire Season (May 18, 2023), <https://www.risch.senate.gov/public/index.cfm/pressreleases?ID=AA245A97-2905-4EA8-B9EC-2D749DC82665>.

213 Press Release, National Federation of Federal Employees, NFFE Praises Reintroduction of the Tim Hart Act to Reform Federal Wildland Firefighter Pay and Working Conditions (May 9, 2023), <https://nffe.org/press-release/hart-23/>.



REFERENCES

- Adetona AM, Adetona O, Gogal RM Jr et al. (2017) Impact of work task-related acute occupational smoke exposures on select proinflammatory immune parameters in wildland firefighters. *J Occup Environ Med*; 59: 679–90.
- Adetona O, Reinhardt TE, Domitrovich J et al. (2016) Review of the health effects of wildland fire smoke on wildland firefighters and the public. *Inhal Toxicol*; 28: 95–139.
- Britton C, Lynch CF, Ramirez M et al. (2013) Epidemiology of injuries to wildland firefighters. *Am J Emerg Med*; 31: 339–45.
- Congressional Budget Office (2022). Wildfires. <https://www.cbo.gov/publication/58212>
- Congressional Research Service (2022). Wildfire Statistics. <https://sgp.fas.org/crs/misc/IF10244.pdf>
- FEMA (June 2022). Wildland Urban Interface: A Look at Issues and Resolutions. <https://www.usfa.fema.gov/downloads/pdf/publications/wui-issues-resolutions-report.pdf>
- Government Accountability Office (2022). Wildland Fire: Barriers to Recruitment and Retention of Federal Wildland Firefighters. <https://www.gao.gov/products/gao-23-105517#:~:text=The%20federal%20wildland%20firefighting%20workforce,the%20Department%20of%20the%20Interior.>
- Grassroots Wildland Firefighters. Critical Issues/Unintended Outcomes Regarding New Wildland Firefighter Classification (Accessed June 15, 2023).
- Grassroots Wildland Firefighters. Federal Wildland Firefighter Request for Presumptive Health Coverage for Exposure to Environmental Hazards, (Accessed June 15, 2023). <https://static1.squarespace.com/static/5f6ced5b8d33bb20b5c97c0b/t/614e88110b504a6b08bae0c5/1632536593665/GRWFF+Presumptive+Healthcare+Coverage+Briefing+Paper+2021.pdf>
- Karuk Department of Natural Resources (2021). Good Fire: Current Barriers to the Expansion of Cultural Burning and Prescribed Fire in California and Recommended Solutions." <https://karuktribeclimatechangeprojects.com/good-fire/>
- Karuk Tribe Department of Natural Resources (2019). Karuk Climate Adaptation Plan. <https://karuktribeclimatechangeprojects.com/climate-adaptation-plan/>
- Michael Wara (2021). A New Strategy for Addressing the Wildfire Epidemic in California, Stanford Woods Institute Climate and Energy Policy Program White Paper.

- O'Brien, P., & Campbell, D. (2021, May 26). Wildland Firefighter Psychological and Behavioral Health: Preliminary Data from a National Sample of Current and Former Wildland Firefighters in the United States [Conference session]. International Association of Wildland Fire 6th Annual Human Dimensions Conference. <https://firesafety-humandimensions2021.com/>
- Riva Duncan (April 2021). "Testimony to the House Natural Resource Committee," <https://static1.squarespace.com/static/5f6ced5b8d33bb20b5c97c0b/t/608add2225a81a767f45e1dd/1619713314637/Duncan%2C+Riva+-+Testimony+-+NPFPL+Ov+Hrg+04.29.21.pdf>
- The Nature Conservancy (June 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
- USDA Forest Service (2023). FY'24 Budget Justification. <https://www.fs.usda.gov/sites/default/files/FS-FY24-Congressional-Budget-Justification.pdf>
- USDA Forest Service (2015). The Rising Cost of Wildfire Operations: Effects on the Forest Service's Non-Fire Work. <https://www.fs.usda.gov/sites/default/files/2015-Fire-Budget-Report.pdf>



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