

Environmental Justice Issues Surrounding California Wildfires

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I. INTRODUCTION

Recent wildfires in California and the American West need little introduction. Massive wildfires have leveled forests, destroyed homes, and taken many lives. Although many of California’s ecosystems have evolved under frequent, low severity fire regimes, fires today are often both frequent and severe. The human toll of this increase in large, catastrophic fires is compounded by significant urban migration to the Wildland Urban Interface (“WUI”); those areas where human development intermingles with undeveloped wildland.¹ Like all natural disasters, wildfires have a greater impact on disadvantaged communities (“DACs”).² This essay addresses five of these environmental justice issues surrounding wildfires, both to illuminate less apparent harms and injustices caused by wildfire and to determine who should bear responsibility for these harms to inform public policy. These environmental justice issues are: (1) the disproportionate harm wildfire smoke inflicts on DACs; (2) the obstacles DACs face in wildfire preparation and recovery; (3) equitably sharing the risk of delivering electricity to the WUI; (4)

¹ LINDA MAZUR ET AL., INDICATORS OF CLIMATE CHANGE IN CALIFORNIA: ENVIRONMENTAL JUSTICE IMPACTS 31 (2010).

² Ian Davies et al., *The Unequal Vulnerability of Communities of Color to Wildfire*, 13 PLOS ONE 1, 1 (2018).

using prisoners to fight wildfire; and (5) diverting firefighting resources away from rural communities when more populated areas are threatened.

A. Causes of Wildfire in California

Today's frequent, catastrophic wildfires are caused by the convergence of three factors: climate change, forest management practices, and ignition sources.³ Each of these operates on a different geographic and time scale, with climate change being the broadest of these factors. Wildfire size, as well as the length of the fire season, are both increasing with rising global temperatures.⁴ Climate change increases the risk of wildfire by drying out vegetation in dry years and increasing the vegetative fuel load in wet years, thereby creating more dry fuel when drought returns.⁵ According to the 2019 United Nations Emissions Gap Report, even if countries meet their commitments under the 2015 Paris Agreement, the world is still on track for a 3.2 degree Celsius global temperature rise by the end of the century.⁶ This is well above the 2 degree threshold that has long been cited as the limit beyond which the global effects of climate change would be catastrophic.⁷

Unfortunately, solving California's wildfire crisis by addressing climate change is difficult. First, climate change is caused by global emissions of greenhouse gases which would require a global effort to curb. Indeed, the most notable global effort towards this goal is the Paris Climate Agreement,⁸ which appears significantly inadequate to stop the worse impacts of climate change. Furthermore, even if the world ceased emitting greenhouse gases today, temperatures would continue to rise, as the warming effects of climate change lag behind global emissions.⁹ Wildfires are causing devastation now. There is little hope that addressing climate change will reduce catastrophic wildfires both because of inevitable temperature increases due to this time lag and because the global reality is that emissions will continue to rise in the near term.

Catastrophic wildfires in California can also be traced to forest management practices. Following a series of devastating wildfires in 1910, the US Forest Service began a strict policy of total fire suppression, both preventing fires from

³ Kendra Pierre-Louis and John Schwartz, *Why Does California Have So Many Wildfires?*, N.Y. TIMES (Dec. 3, 2020), <https://www.nytimes.com/article/why-does-california-have-wildfires.html>.

⁴ MAZUR, *supra* note 1, at 30.

⁵ *Id.*

⁶ U.N. Env't Programme, Emissions Gap Report 9 (Nov. 26, 2019).

⁷ *Two degrees: The history of climate change's speed limit*, CARBON BRIEF (Dec. 8, 2014) <https://www.carbonbrief.org/two-degrees-the-history-of-climate-changes-speed-limit>.

⁸ Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104.

⁹ Muryshev et al., *A Lag Between Temperature and Atmospheric CO₂ Concentration Based on a Simple Coupled Model of Climate and the Carbon Cycle*, 463 DOKLADY EARTH SCI. 863, 863 (2015).

starting and putting them out immediately.¹⁰ The Forest Service opposed controlled, low intensity burns that had been common practice among Native American Tribes as well as among ranchers, farmers, and timbermen.¹¹ The Forest Service simply had no understanding of the ecological importance of fire at the time.¹² Today, there is clear consensus among fire ecologists that dry, western pine forests depend on frequent, low severity fires to prevent understory development (the vegetation on and near the forest floor) and maintain the open, park-like conditions with low tree density that these ecosystems evolved under.¹³ Without these fires, understory vegetation increases and eventually becomes “ladder fuel” which allows understory fires to spread into tree canopies that cause high severity fires.¹⁴ After decades of fire suppression, California forests have become significantly denser and prone to larger, high severity fires.¹⁵

The remedy for overly dense forests is not simply to reintroduce fire. Because of abundant ladder fuels, it is often difficult to implement controlled burns without them getting out of control.¹⁶ Instead, forests must often be thinned first, to remove small trees and reduce understory vegetation before they can be burned.¹⁷ This process is expensive and any revenue made from selling small diameter timber is usually not enough to compensate for the costs of treatment.¹⁸ Furthermore, since thinning alone mainly reduces crown fuels, thinning must be accompanied by surface fuel treatments to reduce non-tree understory vegetation such as mastication or prescribed burning to prevent buildup of fuels on the forest floor.¹⁹ Although these treatments are expensive, they are perhaps the most effective way to reduce the risk of catastrophic wildfires in the coming decades, especially when compared to addressing climate change.²⁰

¹⁰ U.S. Forest Service Fire Suppression, FOREST HIST. SOC’Y, <https://foresthistory.org/research-explore/us-forest-service-history/policy-and-law/fire-u-s-forest-service/u-s-forest-service-fire-suppression/> (last visited May 11, 2021).

¹¹ *Id.*; Carol Raish et al., *The Importance of Traditional Fire Use and Management Practices for Contemporary Land Managers in the American Southwest*, 6 ENVTL. HAZARDS 115, 115-117 (2005).

¹² *Id.*

¹³ Erin Hanan, *Megafires: Climate Change or Land Management?*, NISKEN CENTER (Sep. 15, 2020), <https://www.niskanencenter.org/megafires-climate-change-or-land-management/>.

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ Nicole Vaillant et al., *Effect of Fuel Treatments on Fuels and Potential Fire Behavior in California, USA, National Forests*, 5 FIRE ECOLOGY 14, 14 (2009) <https://doi.org/10.4996/fireecology.0502014>.

¹⁷ *Id.*; Carl Skinner et al., *Effects of Thinning and Prescribed Fire on Wildlife Severity*, 25 FOREST VEGETATION MGMT. CONFERENCE 80, 88-89 (2005).

¹⁸ James Agee & Carl Skinner, *Basic Principles of Forest Fuel Reduction Treatments*, 211 FOREST ECOLOGY AND MGMT. 83, 87 (2005).

¹⁹ Susan Prichard et al., *Adapting Western North American Forests to Climate Change and Wildfires: 10 common questions*, 31 ECOLOGICAL APPLICATIONS 8 (2021) available at: <https://esajournals.onlinelibrary.wiley.com/doi/10.1002/eap.2433>.

²⁰ *See id.*

It is important to note that not all California wildfires are occurring in forests. Many large fires are occurring in chaparral landscapes, like the Mendocino Complex fire in 2018. Fire in these ecosystems is wind driven and is not caused by mismanaging these ecosystems.²¹ Here, fuel treatments must focus on clearing vegetation around structures and communities,²² which suggests that the best way to protect against these fires is to avoid building in WUI of these ecosystems in the first place.

The final and most direct cause of wildfire is the ignition. Ignition sources vary from natural events such as lightning strikes to human carelessness like gender reveal party fireworks to infrastructure maintenance failures like downed electrical lines. Natural ignition sources cannot easily be addressed because of their random nature, but human ignition sources can be. Notably, vegetation surrounding electrical lines can be removed to reduce the chance that a downed line will cause a fire.²³ Reducing ignition sources can help decrease the likelihood that a large fire starts. However, the underlying problem is that dry, dense forests still cover much of the California landscape. Even under a significant electrical line maintenance and public outreach program, there are still a multitude of random events that can lead to igniting a large fire.

B. Environmental Justice

During the first People of Color Environmental Leadership Summit in 1991, attendees drafted the Principles of Environmental Justice (“Principles”), which have become the defining principals of Environmental Justice today.²⁴ Included in the first principal was the “right to be free from ecological destruction.”²⁵ In contrast, the US Environmental Protection Agency (“EPA”) defines environmental justice as:

[T]he fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Fair treatment means no group of people should bear a

²¹ Hanan, *supra* note 13.

²² *Id.*

²³ *Tree Trimming Safety Information*, CAL. PUB. UTIL. COMM’N <https://www.cpuc.ca.gov/regulatory-services/safety/electric-safety-and-reliability-branch/electric-and-cip-audits-introduction/tree-trimming-and-vegetation-management-information> (last visited May 11, 2021).

²⁴ *The Principals of Environmental Justice (EJ)*, FIRST NATIONAL PEOPLE OF COLOR LEADERSHIP SUMMIT (1991). See *The Principles of Environmental Justice (EJ)*, NRDC (Mar. 16, 2016) <http://www.ejnet.org/ej/principles.pdf>.

²⁵ *Id.*

disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies.²⁶

These definitions differ because the EPA definition presumes that negative environmental consequences are inevitable while the Principles' does not. The Principles' definition is an idealist statement of human rights, as no group should be expected to bear any "negative environmental consequences resulting from industrial, governmental and commercial operations or policies" because these entities should conduct themselves as to not harm the environment in the first place. However, the EPA definition is more realistic and is more easily applied to the problem of wildfire because negative environmental effects are, indeed, inevitable.

Wildfires have negative impacts on health, housing, personal wealth, and community cohesiveness. DACs will be less able to cope with these harms because of underlying health conditions and lack of financial resources (themselves caused by many historic injustices).²⁷ Moreover, those who have lived in rural areas for generations are not meaningfully responsible for the unsafe forest conditions that have slowly escalated and are now compounded by climate change. However, wealthy individuals who have recently moved to the WUI have moved to fire prone areas in full knowledge of the fire danger, but do not bear a fair share of the risk that living in the WUI entails.²⁸ Large utilities that supply power to new, risky development in the WUI do not charge those customers more for the risk that their transmission lines represent.²⁹ Nor do these communities pay extra for the firefighting services under multiple jurisdictions that are required to protect their homes. In addition, California State firefighting crews are significantly augmented through prison labor with meager compensation for a job that is both highly dangerous and of great value to society.³⁰

The environmental justice issues surrounding wildfire in California can be divided into five specific areas: (1) the greater harm that wildfire smoke causes DACs who already have a high air pollution burden; (2) the obstacles DACs face in both preparing for and recovering from wildfire; (3) the difficulties of equitably sharing the risk of delivering electricity to the WUI and rural communities; (4) the injustice of employing prisoners to fight fires for little pay; and (5) the justice issues of diverting firefighting resources away from rural communities when more populated areas are threatened.

²⁶ *Environmental Justice*, U.S. E.P.A., <https://www.epa.gov/environmentaljustice/learn-about-environmental-justice> (last visited May 11, 2021).

²⁷ See MAZUR, *supra* note 1, at 30-31.

²⁸ Myana Dellinger, *Electric Utility Wildfire Liability Reform in California*, 49 ENV'T L. INST. 11003, 11013 (2019).

²⁹ *Id.* at 11004, 11013.

³⁰ Joseph Winters, *California Inmates Fight Fires for Pennies. Now They Have a Path to Turn Pro.*, GRIST (Sep. 15, 2020), <https://grist.org/justice/california-inmates-fight-fires-for-pennies-now-they-have-a-path-to-turn-pro/>.

II. WILDFIRE SMOKE

Anyone who has lived in California recently has probably experienced significant air pollution from wildfire smoke from mid-summer through early winter. Because wildfires occur statewide and winds can transport smoke great distances (up to 300 miles), all communities in California are susceptible to unhealthy air pollution.³¹ The most significant pollutant in wildfire smoke is particulate matter, specifically PM_{2.5} (particles 2.5 micrometers in diameter or smaller).³² Particulate matter exposure can cause a multitude of health impacts including eye and respiratory tract irritation, reduced lung function, bronchitis, exacerbated asthma, heart failure, and premature death.³³ Even short exposures ranging from days to weeks are associated with an increased risk of premature death and can aggravate pre-existing respiratory conditions.³⁴ Although smoke can harm healthy people, “[c]hildren, older adults, and persons with underlying respiratory and cardiovascular conditions are thought to be particularly vulnerable.”³⁵

These health impacts are not shared equally. Frontline and essential workers are often required to spend more time outdoors for their work and are therefore exposed to much more smoke than those who work in offices.³⁶ First responders, firefighters, and cleanup crews must work longer hours outdoors to combat the direct impact of wildfires.³⁷ Farmworkers continue to work outdoors out of economic necessity, often without the benefit of health insurance or even access to health care at all.³⁸ California has between 500,000 and 800,000 farmworkers, almost all Latinx, and as many as 75% of whom are undocumented and without access to healthcare.³⁹ Although some farms will stop work during smoky periods, this prevents farmworkers from getting paid.⁴⁰ Because summer is the peak harvest season, many farmworkers make most of their annual income during this time and have no choice but to continue working through the hottest and smokiest

³¹ Davies, *supra* note 2, at 11.

³² *Wildfire Smoke: A Guide for Public Health Officials*, AIR NOW (2019), <https://www.airnow.gov/publications/wildfire-smoke-guide/wildfire-smoke-a-guide-for-public-health-officials/>.

³³ *Id.*

³⁴ *Id.*

³⁵ Justine Hutchinson et al., *The San Diego 2007 Wildfires and Medi-Cal Emergency Department Presentations, inpatient hospitalizations, and outpatient visits: An observational study of smoke exposure periods and a Bidirectional Case-Crossover Analysis*, 15 PLOS MED 1, 1, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6038982/>.

³⁶ Jamie Pang, *Climate Change, Economic Justice and Wildfires Collide*, OR. ENV'T. COUNCIL (Sep. 10, 2020), <https://oeonline.org/climate-change-economic-justice-and-wildfires-collide/>.

³⁷ *Id.*

³⁸ Sarah Mizes-Tan, *With Smoke Overhead, Farmworkers Hit By COVID-19 Work Through Compounding Crises*, CAP RADIO (Aug. 21, 2020), <https://www.capradio.org/articles/2020/08/21/with-smoke-overhead-farmworkers-hit-by-covid-19-work-through-compounding-crises/>.

³⁹ *Id.*

⁴⁰ *Id.*

months.⁴¹ This is compounded by the fact that many farmworkers have preexisting health conditions from significant exposure to pesticides, working without shade, and lacking safe drinking water.⁴²

Indeed, disparities in preexisting health conditions mean that wildfire smoke impacts racial minorities the most. Nation-wide, African Americans are 40% more likely to have asthma than Whites.⁴³ Black children are almost twice as likely to have asthma, are five times more likely to be admitted to the hospital for asthma, and are nine times more likely to die from asthma when compared to White children.⁴⁴ The reasons for these shocking disparities are complex, but can often be traced to poverty, racialized zoning practices, and redlining.⁴⁵ For decades, city planners have explicitly and implicitly zoned minority communities to allow industrial facilities, while protecting single family neighborhoods where Whites were more likely to live.⁴⁶ Because of this, African-Americans are 75% more likely to live in “fence-line” communities, defined as areas near polluting facilities.⁴⁷ Asthma trends are related to exposure to air pollution, and so it is no surprise that minority communities often have higher levels of asthma.

There aren’t comprehensive studies on the effects of long-term exposure to wildfire smoke, however, it is likely that the effects are cumulative.⁴⁸ Kids who have been exposed to wildfire smoke can have lasting damage to their immune systems.⁴⁹ Effects can also be delayed. ER visits for lung and heart problems peaked three to five months after the Tubbs fire in Sonoma County in 2017.⁵⁰

Besides having a greater likelihood of having preexisting medical conditions that are exacerbated by wildfire smoke, DACs are less able to escape poor air quality by sheltering indoors. Older buildings with drafty windows and doors can

⁴¹ *Id.*

⁴² *Id.*

⁴³ *Asthma and African Americans*, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES OFFICE OF MINORITY HEALTH, <https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=15> (last updated, Feb. 11, 2021).

⁴⁴ *Id.*

⁴⁵ *Id.*; Linda Villarosa, *Pollution Is Killing Black Americans. This Community Fought Back.*, N.Y. TIMES (Jul. 28, 2020), <https://www.nytimes.com/2020/07/28/magazine/pollution-philadelphia-black-americans.html>.

⁴⁶ See RICHARD ROTHSTEIN, *THE COLOR OF LAW* (2020).

⁴⁷ See LESLEY FLEISCHMA & MARCUS FRANKLIN, *FUMES ACROSS THE FENCE-LINE* (Katherine Taylor & Sarah Uhi eds., 2017).

⁴⁸ Crosscurrents, *Wildfire Smoke and Environmental Justice: One Little Girl’s Story*, KALW (Aug. 4, 2020), <https://www.kalw.org/show/crosscurrents/2020-08-04/wildfire-smoke-and-environmental-justice-one-little-girls-story>.

⁴⁹ Michele Marill, *The Health Effects of Wildfire Smoke May Last a Lifetime*, WIRED (June 27, 2019), <https://www.wired.com/story/the-health-effects-of-wildfire-smoke-may-last-a-lifetime/>.

⁵⁰ Arron Glantz & Susie Neilson, *The Smoke’s Gone, but Hearts and Lungs Still may be in Danger Months after Wildfires*, REVEAL (Nov. 28, 2018), <https://revealnews.org/article/the-smokes-gone-but-hearts-and-lungs-still-may-be-in-danger-months-after-wildfires/>.

lead to unhealthy levels of air pollution indoors.⁵¹ Landlords in poor communities are unlikely to replace leaky windows or install expensive air filtration systems. This has led some communities to establish “Clean Air Centers” for residents to escape wildfire smoke.⁵² However, considering the duration of smoke events, these are impractical solutions for people who must work during the day and sleep at home at night.⁵³

Unfortunately, there are no easy solutions to give DACs relief from wildfire smoke. A stopgap measure would be to focus on improving indoor air quality for DACs, so residents can at least have a respite from smoke in their homes. One method of achieving this could be a state grant program to individuals or organizations to identify and address leaky homes. One such program was established with the passage of AB 617 in 2017, whereby the California Air Resources Board distributed funds to community organizations for technical assistance and to support communities severely impacted by poor air quality.⁵⁴ However, of the 29 applicants proposed to receive grants from the \$5 million appropriated in 2019, only one group’s application summary mentioned addressing indoor air quality.⁵⁵ Without additional funding or a focus on community groups addressing indoor air pollution, AB 617 will be insufficient to address indoor air quality. Likely, a new, well-funded program specifically focused on improving indoor air quality would be needed to address this problem.

Another way the legislature might improve indoor air quality is to require landlords to implement solutions themselves. A bill could establish a renter’s right to be free from air pollution within their home, require landlords to address the issue without raising rent, and establish an audit system to enforce the right. However, compared to a grant program, pursuing such a regulatory effort would likely face significant political and enforcement hurdles. The appeal of this option is that it mirrors other requirements that landlords provide safe premises, because having clean air indoors is indeed a safety issue. Building upgrades that reduce drafts also make buildings more energy efficient which would be an additional benefit of this requirement.

Unfortunately, addressing indoor air pollution only solves part of the problem of wildfire smoke because outdoor air quality would still harm anyone who has to go outside. As discussed in the introduction, the solutions to reducing wildfire are

⁵¹ *Wildfires and Indoor Air Quality (IAQ)*, U.S. E.P.A., <https://www.epa.gov/indoor-air-quality-iaq/wildfires-and-indoor-air-quality-iaq> (last visited May 11, 2021).

⁵² See CAL. AIR RES. BD., *Wildfire Smoke Clean Air Center Grant*, <https://ww2.arb.ca.gov/our-work/programs/wildfire-smoke-clean-air-center-grant> (last visited Mar. 13, 2022).

⁵³ *Clean Air Centers Are Available to Get Away from Wildfire Smoke and Air Pollution*, BUENA VISTA NEIGHBORHOOD ASSOCIATION (Nov. 16, 2018), <https://www.bvnasj.org/post/clean-air-centers-are-available-to-get-away-from-wildfire-smoke-and-air-pollution>.

⁵⁴ *Community Air Grants*, CAL. AIR RES. BD., <https://ww2.arb.ca.gov/capp-cag> (last visited May 11, 2021).

⁵⁵ *2019 Community Air Grants Awardees*, CAL. AIR RES. BD., https://ww2.arb.ca.gov/AB617_2019CommunityAirGrantsAwardees (last visited May 11, 2021).

generally fuels treatments, consisting mainly of forest thinning and controlled burns. These are expensive, especially because they are needed on such a large scale.⁵⁶ While relocation and smarter land development may address other wildfire environmental justice issues, it is almost impossible to escape wildfire smoke by moving, simply because of the great distances smoke can be transported. The only solution to reducing smoke exposure relies on reducing wildfires generally, which will require a significant investment in strategic fuels treatments statewide.

III. DEFENDING AGAINST AND RECOVERING FROM WILDFIRE

In general, poor people tend to suffer disproportionately from natural disasters.⁵⁷ In the last two decades worldwide, people in low-income communities were three times more likely to die from natural disasters than those in affluent communities.⁵⁸ Because of this disparity, many scholars have reframed natural disasters by arguing they are not “natural;” the disaster is more dependent on the socioeconomics of the affected population rather than the natural event itself.⁵⁹

In addition to the harmful effects of smoke, those who live in fire prone areas are exposed to the dangers of fire itself: property damage and loss, stress from evacuations, serious health effects, and death. A community’s vulnerability to wildfire is influenced by its wealth.⁶⁰ Rural, low-income households are generally less able to protect themselves and recover from fires than wealthy households.⁶¹ Low-income housing tends to be older and less likely to meet building codes designed to protect against fires such as having non-flammable roofs.⁶² Low-income homeowners are less likely to be able to maintain their defensible space, the 100-foot vegetation free buffer required by California Public Resources code section 4291 surrounding buildings in fire prone areas.⁶³ In 2001, the National Fire Plan was established to offer grants to communities to help with fire education, preparedness, and prevention, but many DACs either did not know how to access these grants or have the matching funds sometimes required.⁶⁴ Affluent individuals and communities, on the other hand, can sometimes even afford to hire their own private firefighting crews; financing a niche but growing industry.⁶⁵ Because DACs are less able to prepare for wildfire, they are more

⁵⁶ Agee & Skinner, *supra* note 18, at 94.

⁵⁷ Davies et al., *supra* note 2, at 1.

⁵⁸ *Id.*

⁵⁹ *Id.* at 2.

⁶⁰ MAZUR ET AL., *supra* note 1, at 31.

⁶¹ *Id.*

⁶² *Id.*

⁶³ *Id.*

⁶⁴ *Id.* at 32.

⁶⁵ Ethan Varian, *While California Fires Rage, the Rich Hire Private Firefighters*, N.Y. TIMES (Oct. 31, 2019), <https://www.nytimes.com/2019/10/26/style/private-firefighters-california.html>.

likely to lose more of their assets during a fire than those who could afford these protections.⁶⁶

One's ability to evacuate is also correlated with socioeconomic factors.⁶⁷ Those with low-incomes, the disabled, and the elderly are less likely to own or use technologies that can help alert them to an oncoming fire, when cell phones may not have service or an internet connection in rural areas.⁶⁸ This was an important factor contributing to the fact that the average age of those who died in the 2018 Camp Fire, the deadliest fire in California's history, was 71.⁶⁹ In addition, multi-unit housing complexes can make evacuation more difficult because escape routes can be more crowded and building owners are less likely to implement fire mitigation.⁷⁰ The ability to evacuate is also correlated with race. A 2006 Harvard School of Public Health study showed that African-Americans and Latinx-Americans were 2-3 times more likely to need help evacuating than Whites.⁷¹ Language barriers can also affect one's ability to evacuate if fire authorities don't translate evacuation notices or distribute them over mediums like radio stations which are more able to reach those in DACs.⁷² Those without insurance may be more likely to remain in place during an evacuation order to try to defend their property.⁷³

After a fire, recovery is often more difficult for poorer families. Low-income households are less likely to have adequate insurance to cover the immense losses sustained from a wildfire.⁷⁴ After an evacuation or loss of a home, low-income individuals are less able to afford gas and hotel rooms and are often unable to take time off work to address the pressing needs of their family or community.⁷⁵ After the 2017 Sonoma County wildfires in California, rental price gouging exacerbated the housing crisis for refugee families.⁷⁶ Education level also influences one's ability to recover. "In general, education improves access to relevant information, enlarging social networks that can facilitate recovery, and aiding in the navigation of bureaucratic hurdles."⁷⁷ Access to both private and public aid also favors wealthier families, perhaps because they are better able to navigate government

⁶⁶ MAZUR ET AL., *supra* note 1, at 31-32.

⁶⁷ Annie Lowrey, *What the Camp Fire Revealed*, ATLANTIC (Jan. 21, 2019), <https://www.theatlantic.com/ideas/archive/2019/01/why-natural-disasters-are-worse-poor/580846/>.

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ Davies et al., *supra* note 2, at 5.

⁷¹ See MAZUR ET AL., *supra* note 1, at 32.

⁷² Davies et al., *supra* note 2, at 9.

⁷³ See, e.g., Dale Kasler, California's Wildfire Insurance Crisis is Easing. Why Some Carriers are Returning, SAC. BEE, (Nov. 13, 2021) <https://www.sacbee.com/news/california/fires/article255272796.html>.

⁷⁴ MAZUR ET AL., *supra* note 1, at 32.

⁷⁵ Lowrey, *supra* note 67.

⁷⁶ Davies et al., *supra* note 2, at 2.

⁷⁷ *Id.* at 5.

bureaucracies.⁷⁸ Indeed, families who rent are often ineligible for federal assistance available to homeowners to recover after a fire.⁷⁹

Solutions to community vulnerability generally center on education, community organizing, and grants to help with the costs of fireproofing buildings. For example, California Department of Forestry and Fire Protection (“CAL FIRE”) awards grants to fire prevention projects statewide.⁸⁰ Last year the program awarded \$43.5 million dollars to projects ranging from fuel reduction and maintaining fire breaks to fire education.⁸¹ Although the program has a particular focus on DACs, accessing the funds requires submitting a detailed application, including a thorough project description.⁸² CAL FIRE offers online workshops to help communities draft their applications,⁸³ but these may not be accessible enough to facilitate DACs submitting applications because rural communities often do not have reliable internet access.⁸⁴

Federal disaster relief, meanwhile, primarily focuses on aid after a natural disaster has occurred. The Federal Emergency Management Agency (“FEMA”) typically works by responding immediately to a disaster, and spends the next 18 months cleaning up, helping victims, and starting the rebuilding process.⁸⁵ After the Camp Fire in 2018, FEMA spent \$85 million in emergency aid and gave out an additional \$370 in loans.⁸⁶ One estimate by a reinsurance company put the total losses of the Camp fire at \$16.5 billion.⁸⁷ Compared to the \$43.5 million given out state wide in 2020 by CAL FIRE for fire prevention,⁸⁸ the funding of costs to recover from a wildfire are an order of magnitude larger. This disparity between preparation and recovery expenditures are also exemplified in the Forest Service’s annual budget.⁸⁹ In 2020, the Forest Service spent \$2.4 billion on firefighting,

⁷⁸ See Lowrey, *supra* note 67.

⁷⁹ Davies et al., *supra* note 2, at 2.

⁸⁰ *Wildfire Prevention Grants Program*, CAL FIRE, <https://www.fire.ca.gov/grants/fire-prevention-grants/> (last visited May 11, 2021).

⁸¹ CAL FIRE News Release: CAL FIRE Awards \$43.5 million in Local Fire Prevention Grants, CAL FIRE (Mar. 10, 2020).

⁸² CAL FIRE, *supra* note 80.

⁸³ *Id.*

⁸⁴ *Bridging the Digital Divide for all Americans*, FED. COMM’N COMM’N., <https://www.fcc.gov/about-fcc/fcc-initiatives/bridging-digital-divide-all-americans> (last visited May 11, 2021).

⁸⁵ Kirk Siegler, *Rethinking Disaster Recovery After a California Town is Leveled by Wildfire*, NAT’L PUB. RADIO (May 28, 2019), <https://www.npr.org/2019/05/28/724404528/rethinking-disaster-recovery-after-a-california-town-is-leveled-by-wildfire>.

⁸⁶ *Id.*

⁸⁷ Associated Press, *California Wildfire was World’s Costliest Natural Disaster in 2018, Insurer Says*, NBC NEWS (Jan. 8, 2019), <https://www.nbcnews.com/news/us-news/california-wildfire-was-world-s-costliest-natural-disaster-2018-insurer-n956376>.

⁸⁸ CAL FIRE, *supra* note 81.

⁸⁹ FY 2020 BUDGET JUSTIFICATION, U.S. FOREST SERV. (Mar. 2019), https://www.fs.usda.gov/sites/default/files/media_wysiwyg/usfs-fy-2020-budget-justification.pdf.

almost half of its \$5.14 billion total budget.⁹⁰ Of the \$1.9 billion spent on forest management, only \$450 million was spent to directly address hazardous fuel conditions in the national forests.⁹¹

Not only is the focus on recovery spending over preparedness an imprudent way to address wildfire, it is poor fiscal policy. It should not come as a surprise that disaster spending is increasing with climate change.⁹² On the current trajectory, wildfires will continue to worsen in the short term.⁹³ Disaster experts advise that we should be spending billions of dollars up front to prepare for disasters rather than simple spending money to recover and returning to our usual practices.⁹⁴ Bob Fenton, a current FEMA administrator, put it succinctly in an interview with NPR: “We’ve done a lot of work over the years to help people respond or rebuild. But how do we get them to plan better, prepare better and mitigate against future disasters?”⁹⁵

While more money must be spent preparing communities for fire, such as CAL FIRE’s grant program, we must allocate more money to reduce fuel loads in forests so that high severity fires don’t start in the first place. While fuel treatment at a level that would make a meaningful difference statewide would be expensive, leaving communities fire prone and paying the costs in recovery and lives is far more costly.

Another way to address the costs of wildfire is to reduce the number of California residents living in fire prone areas. While this would not reduce the number or severity of wildfires themselves, preventing development in the WUI and encouraging relocation of communities in these areas would go a long way to preventing both property damage and loss of life when fires do burn. However, encouraging relocation raises significant ethical questions about who deserves to live in fire prone areas.

IV. DELIVERING ELECTRICITY TO THE WUI AS A CASE STUDY FOR ALLOCATING RISK EQUITABLY

Electrical transmission lines represent a significant ignition source for wildfire. In three and a half years, California’s three largest utilities ignited more than 2,000 fires through their equipment.⁹⁶ After the resulting liability determinations, these ignitions led to Pacific Gas and Electric (“PG&E”) filing for bankruptcy in 2019.⁹⁷

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² Siegler, *supra* note 85.

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ *Id.*

⁹⁶ Taryn Luna, *California Utility Equipment Sparked More Than 2,000 Fires in Over Three Years*, L.A. TIMES (Jan. 28, 2019), <https://www.latimes.com/politics/la-pol-ca-california-utilities-wildfires-regulators-20190128-story.html>.

⁹⁷ Dellinger, *supra* note 28, at 11003.

However, in the past decade, the state's largest electricity companies have resisted regulations and infrastructure changes that would have addressed fire risk.⁹⁸ For example, in 2011 PG&E fought a proposal that would have required it to report every fire its electrical equipment caused and opposed a plan requiring it to have a formal fire prevention plan.⁹⁹ Because PG&E could have made necessary infrastructure improvements to lessen the risk of fire ignition and then simply charged its customers,¹⁰⁰ it is unclear why the company was so resistant to implementing necessary improvements. Perhaps it feared that raising rates would anger customers or believed that the risk of catastrophic fires was not high. Whatever the internal rationale, it was neither a responsible decision in terms of the safety of its customers, nor a shrewd business decision. The Camp Fire killed at least 86 people with another 50 deaths linked to the fire as well.¹⁰¹ After filing for bankruptcy, PG&E is \$38 billion in debt including \$13.5 billion owed to compensate fire victims after pleading guilty to 84 manslaughter counts.¹⁰² With lives of Californians at stake, as well as billions of dollars in property damage, utilities and legislatures have a duty to reform the way these massive risks are allocated to share these costs more equitably among those most responsible for creating the risks.

California's three biggest energy companies are investor-owned utilities ("IOU"), meaning that they are private corporations, but they do not profit off energy sales.¹⁰³ They are, however, allowed a regulated profit when they invest in infrastructure such as transmission lines and electric car charging stations.¹⁰⁴ In California, when a public entity damages private property for the public's good, that property owner may bring an inverse condemnation suit against the public entity for compensation.¹⁰⁵ Although they are private companies, California

⁹⁸ Katie Worth et al., "*Deflect, Delay, Defer*": *Decade of Pacific Gas & Electric Wildfire Safety Pushback Preceded Disasters*, PBS FRONTLINE (Aug. 18, 2020), <https://www.pbs.org/wgbh/frontline/article/pge-california-wildfire-safety-pushback/>.

⁹⁹ *Id.*

¹⁰⁰ *Id.*

¹⁰¹ Associated Press, *Death Toll in Camp Fire Probably Includes 50 More People, Report Says*, L.A. TIMES (Feb. 11, 2020), <https://www.latimes.com/california/story/2020-02-11/death-toll-in-camp-fire-probably-includes-50-more-people-report-says>.

¹⁰² J.D. Morris, *PG&E, a 'Killer Company,' Admits to 85 Felony Counts. Now What?*, S.F. CHRONICLE (last updated Mar. 29, 2020) <https://www.sfchronicle.com/business/article/PG-E-a-killer-company-admits-to-85-felony-15163078.php>; George Avalos, *PG&E Emerges From Bankruptcy, Pays \$5 Billion into Wildfire Fund*, MERCURY NEWS (Jul. 1, 2020), <https://www.mercurynews.com/2020/07/01/pge-emerges-from-bankruptcy-5-billion-wildfire-fund-fire/>.

¹⁰³ Sammy Roth, *California's Biggest Utilities are Losing Their Monopolies. Is that a Good Thing?*, L.A. TIMES (Feb. 7, 2019), <https://www.latimes.com/business/la-fi-monopoly-utilities-california-20190207-story.html>.

¹⁰⁴ *Id.*

¹⁰⁵ CAROLYN KOUSKY ET AL., UNIVERSITY OF PENNSYLVANIA WHARTON RISK MANAGEMENT AND DECISION PROCESSES CENTER, *WILDFIRE COSTS IN CALIFORNIA: THE ROLE OF ELECTRIC*

courts treat IOUs as if they were public entities for inverse condemnation suits because the State has granted them a monopoly, they provide a public service, and are they able to raise rates to spread the costs of the damage among beneficiaries.¹⁰⁶ Because inverse condemnation suits have a strict liability standard, electric utilities must pay for property damage caused wildfire sparked by their equipment even if they were not negligent in maintaining that equipment.¹⁰⁷ This creates a legal mechanism whereby an IOU (and therefore all of its customers) must pay for all property damage after a wildfire ignited by its equipment, even if the utility was following all existing fire safety regulations.¹⁰⁸

After the Camp Fire, the California legislature passed AB 1054 to reform utility regulations to incentivize utilities to invest in fire safety measures. The bill establishes a \$21 billion Wildfire Fund which utilities can access to more quickly pay claims arising from wildfire damage.¹⁰⁹ To access the fund, utilities must spend a combined \$5 million over three years to reduce wildfire risk as well as tie executive compensation to the utility's fire safety record.¹¹⁰ Utilities may charge customers for the mitigation measures though they won't be able to earn a profit on these improvements.¹¹¹ The fund itself will be paid for by an extension of an existing \$2.50 monthly charge to utility customers.¹¹²

The benefits of AB 1054 are that it incentivizes utilities to spend money preventing wildfire rather than the inevitably larger sums in paying out inverse condemnation claims after one. This benefits ratepayers because they are ultimately responsible for paying for the costs of wildfire, and, allocating more money to prevention rather than response will, in theory, save them money. Indeed, it is customers that are harmed when a utility like PG&E goes bankrupt or has such poor credit worthiness that borrowing money necessary to run the business costs substantially more, because these costs are passed on to customers in their rates.¹¹³ Although current PG&E customers have been significantly harmed by its poor management decisions in failing to recognize the significant risk of its equipment starting a wildfire, allowing it to fail only hurts them more.¹¹⁴ AB 1054 is expensive; however, in attempting to incentivize fire prevention rather than fire response, it will hopefully reduce customer costs in the long term.

UTILITIES (2018), <https://riskcenter.wharton.upenn.edu/wp-content/uploads/2018/08/Wildfire-Cost-in-CA-Role-of-Utilities-1.pdf>.

¹⁰⁶ *Pac. Bell Tel. Co. v. S. Cal. Edison Co.*, 208 Cal. App. 4th 1400, 1406-07 (2012); *Barham v. S. Cal. Edison Co.*, 74 Cal. App. 4th 744, 753-54 (1999); *see also* Margaret Peloso & Kristen Miller, *Unnatural Disaster*, ENV'T. F., May-June 2018, at 27.

¹⁰⁷ *Dellinger*, *supra* note 28, at 11007.

¹⁰⁸ *Id.*

¹⁰⁹ *Id.* at 11003.

¹¹⁰ *Id.*

¹¹¹ *Id.* at 11008.

¹¹² *Id.*

¹¹³ *Id.* at 11009.

¹¹⁴ *Id.*

AB 1054 fails, however, to distribute these costs fairly. While AB 1054 may reduce costs in the long term by prioritizing fire prevention, it still leaves the strict liability standard for inverse condemnation suits in place. This continues the scheme whereby all utility customers end up sharing the risk of delivering electricity to fire prone areas, by making it easy for property owners to seek compensation.¹¹⁵ This situation is an environmental justice issue because those living in urban and other non-fire prone areas are paying a higher energy bill so that electricity can be delivered to those living in the WUI, who are incurring the fire risk.¹¹⁶ These additional costs hurt DACs and the urban poor the most because their livelihoods depend on smaller financial margins. If this strict liability standard were changed to a negligence standard (as it is in almost every other state besides California),¹¹⁷ it would make it more difficult for property owners to seek compensation from the utility and therefore have to bear or insure these costs themselves.¹¹⁸ In a comment in the *Environmental Law Reporter*, Myanna Dellinger highlights this environmental justice issue.¹¹⁹ “In the context of wildfires and their resulting costs, this has become an issue of some people imposing lifestyle costs—in this context, life in the WUI—on people who do not have the means, ability, or desire to live in parts of the country that present very well-known wildfire risks and costs.”¹²⁰

However, the issue of poorer urbanites subsidizing the costs of electricity delivery to wealthy WUI residents may not be a complete picture. Not all those who live in fire prone areas are wealthy or recent transplants. There are many disadvantaged rural communities inhabited by those who are suffering economically from shifting jobs markets, especially with the decline of the timber industry in the West. As many of these people have lived in rural areas for generations, well before wildfire risk had escalated to 21st century levels, they have not been in a position to make the same informed choice to incur fire risk as those more wealthy, recent transplants.

For these communities, there is a different environmental justice story. Their predecessors moved to rural areas for farming, ranching, or logging jobs at a time when fire danger was not as high. After decades of fire suppression by relatively uninformed public agencies, the landscapes surrounding their communities have become much more fire prone. Meanwhile, responsibility for climate change that has created longer, dryer fire seasons lies with wealthy societies worldwide. Perhaps it is justified that these communities have their electricity delivery subsidized by Californians and Americans generally, because our society as a

¹¹⁵ *Id.* at 11012.

¹¹⁶ *Id.*

¹¹⁷ *Id.* at 11011.

¹¹⁸ *Id.* at 11012.

¹¹⁹ *Id.* at 11013-14.

¹²⁰ *Id.*

whole is responsible for both the climate and forest conditions that created this high fire risk.

Understanding the relative weight of these two opposing environmental justice issues requires an understanding of the demographics of the WUI and other wildland areas. In general, “[w]hile fire-prone places in the U.S. are more likely to be populated by higher-income groups, this fact threatens to overshadow the thousands of low-income individuals who also live in fire-prone places but lack the resources to prepare or recover from fire.”¹²¹ In their study comparing social vulnerability factors with wildfire vulnerability, Ian Davies et al. found that while there are no clear large scale geographic patterns, smaller patterns show where DACs are particularly vulnerable to wildfire.¹²² For example, while exurban communities east of California’s San Francisco Bay Area have similar wildfire potential as rural eastern California and Nevada’s Sierra Nevada mountain communities, the poorer economic conditions of the eastern Sierra Nevada mountains mean that these communities are far more vulnerable to wildfire.¹²³ There are racial disparities as well. The more a community is made up of Whites or Asians/Pacific Islanders, the lower the probability that this community is vulnerable to wildfire.¹²⁴ Conversely, higher proportions of Blacks, Hispanics, or Native Americans correspond to higher vulnerability scores.¹²⁵ These patterns are not only explained by lower real-estate prices in fire-prone areas, they are often due to historical patterns of displacement.¹²⁶ For example, Native Americans are particularly vulnerable to wildfire after their forced relocation to federal Indian reservations where high fire potential is compounded by high social vulnerability.¹²⁷

Overall, the majority of the estimated 29 million people living in fire prone areas across the US are white and socioeconomically secure.¹²⁸ However, a focus on this majority misses a significant portion of Americans (roughly 12 million) who are particularly vulnerable to wildfire because of socioeconomic factors.¹²⁹ Indeed, “inhabitants with the lowest adaptability even in these moderately fire-prone landscapes are particularly vulnerable to wildfire and should be central to our understanding of fire disasters.”¹³⁰ In other words, while there may be fewer individuals socially vulnerable to wildfire living in the WUI, the relative impacts on them are greater.

¹²¹ Davies et al., *supra* note 2, at 2.

¹²² *Id.* at 6.

¹²³ *Id.*

¹²⁴ *Id.* at 8-9.

¹²⁵ *Id.*

¹²⁶ *Id.* at 8.

¹²⁷ *Id.* at 8-9.

¹²⁸ *Id.* at 8.

¹²⁹ *Id.*

¹³⁰ *Id.*

Consequently, removing the strict liability standard for utilities would make it more difficult for these DACs to recover from wildfires, especially because they are less likely to have insurance.¹³¹ While this would help address the environmental justice issue where poor urban communities subsidize the fire risk of wealthy WUI communities, it would exacerbate an environmental justice issue for socially vulnerable WUI communities. A legislative solution to this may be to establish an insurance system for low income WUI communities as part of our social safety net. This could be tailored such that wealthier Californian's living in the WUI are taxed to help bear the insurance costs for their more vulnerable neighbors. This could be justified because recent, affluent WUI transplants have spread fire resources thinner, by increasing the number of structures that need to be protected during a wildfire. Helping bear this increased risk on disadvantaged rural communities by subsidizing their fire insurance could be an equitable way to allocate increased wildfire risk.

V. PRISONERS FIGHTING FIRE

Another environmental justice issue surrounding wildfire is California's use of prison labor to fight fire. The 13th Amendment abolished slavery in the US except as a punishment for a crime.¹³² The use of prison labor has long been a low cost way for governments and private entities to expand infrastructure (including bigger prisons), manufacture commodities (everything from license plates to the office furniture at the state capital), and respond to natural disasters.¹³³ California has had inmate firefighting crews for 80 years, at times making up to 25 percent of California's wildland firefighting force.¹³⁴ As of May, 2021, there were approximately 900 inmates qualified to fight fires, a decrease from 2,200 in 2020, perhaps due to COVID 19 safety issues.¹³⁵

Inmate firefighting crews are jointly operated by California Department of Corrections and Rehabilitation ("CDCR"), CAL FIRE, and Los Angeles County Fire Department.¹³⁶ There are 35 fire camps located in 25 counties across the state, all minimum security facilities.¹³⁷ Inmates must volunteer to work for the fire

¹³¹ MAZUR ET AL., *supra* note 1, at 31-32.

¹³² U.S. CONST. amend. XIII.

¹³³ *Dignity for Incarcerated Workers*, DREAM CORPS JUSTICE, <https://www.thedreamcorps.org/our-programs/justice/campaigns/california-policy/dignity-for-incarcerated-workers/> (last visited Mar. 17, 2022).

¹³⁴ *Conservation (Fire) Camps*, CAL. DEP'T. CORR. AND REHAB., <https://www.cdcr.ca.gov/facility-locator/conservation-camps/>; Amy Goodman & Denis Moynihan, *Prisoners fighting California wildfires face climate injustice*, RABBLE (Sept. 18, 2018), <https://rabble.ca/columnists/2018/09/prisoners-fighting-california-wildfires-face-climate-injustice>.

¹³⁵ CAL. DEP'T. CORR. AND REHAB., *supra* note 134; Ryan Sabalow & Jason Pohl, *California Severely Short on Firefighting Crews After COVID-19 Lockdown at Prison Camps*, SAC. BEE (July 4, 2020), <https://amp.sacbee.com/news/california/fires/article243977827.html>.

¹³⁶ CAL. DEP'T. CORR. AND REHAB., *supra* note 134.

¹³⁷ *Id.*

program which requires inmates to have “minimum custody” status, which is the lowest classification reached through good behavior, abiding by prison rules, and participating in rehabilitation programs.¹³⁸ Inmates convicted of sexual offenses, arson, or have a history of escape by force or violence are ineligible.¹³⁹ Despite these requirements, there are occasional prisoner escapes from fire camps. Most notably, in 2005, Marlon Ruff walked away from a fire conservation camp in Humboldt County and ended up killing a San Francisco police officer before killing himself.¹⁴⁰ Because Ruff had been convicted of beating and robbing an armored car guard, he should not have been allowed to participate in the firefighting program.¹⁴¹ High profile fire camp escapes such as Ruff’s are often cited by critics of the program that argue that CDCR is not taking fire camp safety seriously enough.¹⁴²

However, the inmate fire program has helped many prisoners find purpose during their time incarcerated.¹⁴³ Fire camps help prisoners gain valuable life skills, give back to the community, and help them transition back into society.¹⁴⁴ Inmates usually staff hand crews, one of the toughest jobs in wildfire response.¹⁴⁵ These jobs can entail working 24 hour shifts clearing trees and vegetation to create fire breaks, in temperatures up to 110 degrees, while wearing two layers of clothing and carrying 40 pounds of gear.¹⁴⁶

Unfortunately, compensation for this grueling and dangerous work is abysmal. Inmates are paid between \$2 and \$5 dollars a day plus \$1 dollar an hour when they’re on a fire.¹⁴⁷ That’s approximately 1/27th the wages paid to non-inmate crewmembers.¹⁴⁸ While inmate crews receive the same training as other fire crews, they don’t receive a red card certification for fighting wildfires.¹⁴⁹ The biggest incentive for inmates to volunteer for fire crews is the “2 for 1 credits,”

¹³⁸ *Id.*

¹³⁹ *Id.*

¹⁴⁰ Sabalow & Pohl, *supra* note 135.

¹⁴¹ *Id.*

¹⁴² Ryan Sabalow, *Lawmakers at Sacramento Forum Hear Concerns About Violent Fire Camp Inmates*, THE UNION (Aug. 29, 2011), <https://www.theunion.com/news/lawmakers-at-sacramento-forum-hear-concerns-about-violent-fire-camp-inmates/>.

¹⁴³ Christie Thompson, *The Former Prisoners Fighting California’s Wildfires*, MARSHALL PROJECT (Sept. 2, 2020), <https://www.themarshallproject.org/2020/09/02/the-former-prisoners-fighting-california-s-wildfires>.

¹⁴⁴ Sabalow & Pohl, *supra* note 135.

¹⁴⁵ Goodman & Moynihan, *supra* note 134.

¹⁴⁶ *Id.*

¹⁴⁷ The Times Editorial Board, *Editorial, Inmates Risking Their Lives to Fight California’s Wildfires Deserve a Chance at Full-time Jobs*, L.A. TIMES (Nov. 1, 2019), <https://www.latimes.com/opinion/story/2019-11-01/california-inmate-firefighters>.

¹⁴⁸ DREAM CORPS JUSTICE, *supra* note 133.

¹⁴⁹ The Times Editorial Board, *supra* note 147.

which takes two days off their sentence for every day they serve as a firefighter.¹⁵⁰ Until recently, inmates who worked fire crews and were eventually released from prison could not qualify for municipal firefighting jobs because, as ex-felons, they could not get the necessary Emergency Medical Technician (“EMT”) certification.¹⁵¹

However, this changed with Governor Newsom’s signing of AB 2147 in September 2020. This bill allows firefighters who have been released from custody to petition a judge to withdraw their guilty or nolo contendere plea and enter a not guilty plea or set aside a guilty verdict after a conviction on a not guilty plea.¹⁵² This clean record enables former inmates to get EMT certified, which qualifies them to work at municipal fire departments.¹⁵³ In addition, state programs and groups like the Forestry and Fire Recruitment programs are helping recently released prisoners obtain wildland firefighting jobs while navigating probation or parole.¹⁵⁴

While these are important steps to addressing the justice issue of fairly compensating prisoners who work a dangerous and noble job protecting communities across the state, more is still needed. The programs that currently exist to help former inmates obtain wildland firefighting jobs should be expanded, and prisoners should earn an official red card certification during their wildfire training while incarcerated. Even though the 2 for 1 sentence credits are a big incentive to attract volunteer firefighters, pay should be increased to more fairly compensate for the danger and rigor of firefighting. In addition, with worsening fire seasons almost yearly, California needs more firefighters. Increasing incentives for prisoners to fight fires would not only fill this demand for firefighters, but it would also enable more inmates to learn valuable skills that will help them reintegrate into society when they are released. In addition to firefighting programs, CDCR could establish other forestry programs to allow inmates to work to prepare communities for fire such as clearing defensible space and thinning operations. Significantly, this could provide inmates with many similar skills to those learned on fire crews without the added danger of working a fire line, while allocating resources more efficiently to prepare for, rather than respond to, wildfire.

¹⁵⁰ Matt Clarke, *California’s Firefighting Prisoners in Short Supply*, PRISON LEGAL NEWS (Jan. 8, 2020), <https://www.prisonlegalnews.org/news/2020/jan/8/californias-firefighting-prisoners-short-supply/>.

¹⁵¹ Winters, *supra* note 30.

¹⁵² Cal. Penal Code § 1203.4.

¹⁵³ Winters, *supra* note 30.

¹⁵⁴ *Ventura Training Center*, CAL. DEPT. CORR. REHAB., <https://www.cdcr.ca.gov/facility-locator/conservation-camps/ventura/> (last visited Mar. 17, 2022); FORESTRY AND FIRE RECRUITMENT PROGRAM, <https://www.forestryfirep.org/> (last visited Mar. 17, 2022).

VI. WILDFIRE RESPONSE DISPARITY: LESSONS FROM THE DIXIE AND CALDOR FIRES

The Dixie fire started on July 13, 2021 in the Feather River Canyon in Plumas County, California and within two weeks became the largest fire of the season.¹⁵⁵ By the time it was 100 percent contained on October 25th, it had become the largest non-complex fire in California history (2nd largest overall), having burned over 960,000 acres, destroyed the towns of Greenville and Canyondam (totaling 1329 structures), and displaced countless families.¹⁵⁶ In Greenville, the fire destroyed an estimated seventy-five percent of the structures, including more than 100 homes, and many historic buildings from the Gold Rush era.¹⁵⁷ The firefighting response was immense: 89 hand crews, 596 engines, 194 water trucks, 78 helicopters, and 77 planes worked around the clock dropping fire retardant, digging trenches, backburning, and clearing fire lines.¹⁵⁸ Still the weather conditions made the fire difficult to fight, as it jumped fire lines and *created* winds that would throw embers a mile or more and even form fire tornados, making the fire response difficult despite the large number of resources, and prompting many residents to ignore evacuation orders to stay and protect their properties themselves.¹⁵⁹

One month into the Dixie Fire, in the midst of some of the worse of the spread and about a week after the destruction of Greenville, the Caldor fire started in Eldorado County, California.¹⁶⁰ While it started slowly, high winds quickly pushed the fire to Echo Summit by August 30th, the edge of the Tahoe Basin and

¹⁵⁵ Amy Graff & Katie Dowd, *Dixie Fire Rips Through 18,000 Acres in a Day, Hits 181289 Acres*, S.F. GATE (Jul. 23, 2021), <https://www.sfgate.com/california-wildfires/article/Dixie-Fire-Fly-Quincy-California-wildfire-16335342.php>.

¹⁵⁶ USDA FOREST SERVICE, *Dixie Fire Update* (Oct. 25, 2021), <https://inciweb.nwcg.gov/incident/article/7690/67496>; CAL FIRE, *Top 20 California Wildfires*. (Jan. 13, 2022), https://www.fire.ca.gov/media/4jandlhh/top20_acres.pdf.

¹⁵⁷ Livia Albeck-Ripka & Annie Correal, *'We Lost Everything': Residents are Left in Shock by the Dixie Fire's Destruction*, N.Y. TIMES (Aug. 6, 2021), <https://www.nytimes.com/2021/08/06/us/dixie-fire-greenville.html>.

¹⁵⁸ Brent McDonald et al., *Inside the Massive and Costly Fight to Contain the Dixie Fire*, N.Y. TIMES (Oct. 11, 2021), <https://www.nytimes.com/interactive/2021/10/11/us/california-wildfires-dixie.html>.

¹⁵⁹ The Daily, *One Family's Fight Against the Dixie Fire* (Sept. 20, 2021), <https://www.nytimes.com/2021/09/20/podcasts/the-daily/dixie-fire-wildfires-california.html?searchResultPosition=2>; Lila Seidman, *Dixie fire generates fire whirl, pyrocumulonimbus cloud at 40,000 feet*, L.A. TIMES (Aug. 10, 2021), <https://www.latimes.com/california/story/2021-08-10/dixie-fire-generates-fire-whirl-pyrocumulonimbus-cloud-at-40-000-feet>.

¹⁶⁰ CAL FIRE, *Caldor Fire Incident*, <https://www.fire.ca.gov/incidents/2021/8/14/caldor-fire/>, (last visited Mar. 17, 2022); Associated Press, *The Dixie Fire Has Destroyed Most of a Historic Northern California Town*, N.P.R. (Aug. 5, 2021), <https://www.npr.org/2021/08/05/1025087402/the-dixie-fire-has-destroyed-most-of-a-historic-northern-california-town>.

a mere 5 miles southwest of the tourist mecca of South Lake Tahoe.¹⁶¹ As the fast moving fire was beginning to threaten the densely populated South Lake Tahoe area, CAL FIRE began diverting resources from the Dixie Fire to the Caldor Fire.¹⁶² The effort to save South Lake Tahoe was largely successful: while the fire did burn over 800 structures outside of the Tahoe basin, no structures were lost in South Lake Tahoe.¹⁶³

There are many reasons why the fire response was more successful for the Caldor Fire surrounding South Lake Tahoe than the Dixie Fire. One of the biggest was forest thinning: the forests around South Lake had undergone extensive fuels treatments, both from mechanical thinning and prescribed fire.¹⁶⁴ This stopped the fire from rushing through the canopies and created a slower fire on the forest floor.¹⁶⁵ As stated above, while fuel treatments aren't always effective and a combination of forest thinning and surface fuel treatments are the best option, the slowing of the Caldor Fire around South Lake Tahoe certainly shows that they are one of the most effective tools land managers have before a fire starts.¹⁶⁶

It is difficult to compare the physical conditions including weather, topography, and forest health that led the Caldor Fire response to be more successful than the Dixie Fire response. However, one metric that can more easily be compared is the firefighting response itself, specifically the decision to redirect resources to the Caldor Fire while the Dixie Fire still raged. While there were likely many considerations that went into the strategic and fraught decision to move resources from the Dixie Fire to the Caldor Fire, one of these considerations must have been the human resources at risk of being lost, from commerce to physical structures to human lives.¹⁶⁷

Of course, if containing the Dixie Fire was truly futile and there was the opportunity to save South Lake Tahoe, the decision to reallocate resources is entirely defensible. The Department of the Interior's policy states that the primary objective of wildfire response is protecting human life.¹⁶⁸ After that, "[s]etting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resource will be based on human health and safety, the values to be protected, and the costs of

¹⁶¹ Andrew Avitt, *Caldor Fire: Defending the Lake Tahoe Basin*, USDA FOREST SERVICE (Oct. 28, 2021), <https://www.fs.usda.gov/features/caldor-fire-defending-lake-tahoe-basin>; USDA Forest Service, *Progression Map Caldor Incident* (Aug. 30, 2021) <https://inciweb.nwccg.gov/incident/map/7801/160/123444>.

¹⁶² McDonald et al., *supra* note 158.

¹⁶³ Avitt, *supra* note 161.

¹⁶⁴ *Id.*

¹⁶⁵ *Id.*

¹⁶⁶ *Id.*; See Prichard et al., *supra* note 19.

¹⁶⁷ Wildfire Response Dep't Manual, Dep't of the Interior (Jan. 18, 2017), https://www.doi.gov/sites/doi.gov/files/uploads/chapter_4_wildfire_response.pdf. See The Daily, *One Family's Fight Against the Dixie Fire* (Sep. 20, 2021), <https://www.nytimes.com/2021/09/20/podcasts/the-daily/dixie-fire-wildfires-california.html?searchResultPosition=2>.

¹⁶⁸ *Id.*

protection.”¹⁶⁹ This policy gives wildfire response managers some leeway in their decision making. While there are many decision-making models for managers, one common way to characterize the decision-making process is economic: “resources should be invested in wildfire management until the marginal benefits equal the marginal costs.”¹⁷⁰ Applying this model to the Dixie and Caldor fires, the decision to reallocate resources is straightforward. The Dixie Fire raged despite an enormous expenditure of resources, and while it threatened the homes and livelihoods of many rural residents, in purely economic terms, the rising costs of suppression began to surpass the marginal benefits. As the Caldor Fire began to threaten South Lake Tahoe, the calculation was different. The risk to such a densely populated was high, therefore the benefits of saving it were immense. This easily justified a major fire suppression response, and one of the potential places to draw resources from was the Dixie Fire.

While unfortunate for those in the path of the Dixie Fire, this seems fair. However, the success in fighting the Caldor and Dixie fire really began in the decade prior to either fire starting. The fact that the land around South Lake had been fuel treated was cited by the Forest Service as one of the main reasons that South Lake Tahoe was saved.¹⁷¹ Conversely, while some of the areas surrounding Greenville had had fuel reduction treatments, many of the immediately surrounding forested area had not, partly because many of these areas are private land.¹⁷² In general, as the Tahoe basin is an immense economic engine, it has seen substantial investment in forest conservation and health. The region has numerous Forest Service offices, environmental nonprofits, and a state land conservancy, thus attracting many forestry and conservation professionals as well as grant funding to restore forest health and prepare for wildfire.

The region hit by the Dixie fire simply does not have the same capacity to maintain healthy forests, with poorer communities and less governmental and nonprofit investment. These are small timber, ranching, and farming communities, with few second homeowners and vacation rentals. While the pulling of resources to the Caldor Fire might be a brutal reality of risk management in wildfire decision making, it also revealed a striking disparity in fire preparedness that contributed to the Dixie Fire becoming so out of control in the first place. While these communities certainly have less economic output than do mountain communities with significant tourist attractions, they deserve more

¹⁶⁹ *Id.*

¹⁷⁰ MATTHEW J. WIBBENMYER ET AL., *Risk Preferences in Strategic Wildfire Decision Making: A Choice Experiment with U.S. Wildfire Managers*, 33 RISK ANALYSIS 6 (2013).

¹⁷¹ Avitt, *supra* note 161.

¹⁷² Haley Smith & Alex Wigglesworth, *As California Burns, Some Ecologists say it's Time to Rethink Forest Management*, L.A. TIMES (Aug. 21, 2021), <https://www.latimes.com/california/story/2021-08-21/california-burning-is-it-time-to-rethink-forest-management> (While this article does include some important factors for why the Dixie Fire was difficult to suppress, it also presents the opinion that forest fuel treatments are not effective at slowing wildfire, a minority view in the fire ecologist community; see Prichard et al., *supra* note 19).

resources to help them prepare for wildfire than they have been getting. Since an unabated large fire can move across a landscape, at one point threatening rural communities and the next highly populated cities, it is in everyone's interest to spend our resources restoring forest health by promoting fuel treatments across the landscape, and not just adjacent to our tourist attractions.

With the Biden Administration's announcement of massive new federal investment in forest fuel treatments,¹⁷³ it will be critical for managers to not just focus on highly populated areas, but landscape level approaches. Not only do our rural citizens deserve better protection, but there is significant evidence that conducting fuel treatments away from the WUI can indirectly protect those more populated areas as well by reducing crown fires, smoke impacts, and creating defensible positions for fire suppression personnel.¹⁷⁴

Rural communities today lack many of the advances twenty-first century living has brought the rest of America, from internet access,¹⁷⁵ to medical care,¹⁷⁶ to grocery stores.¹⁷⁷ While rural communities may have different lifestyles than those of city dwellers, they have an undeniably intimate connection with the natural landscape that surrounds them and are more susceptible to the effects of climate change and poor forest health than most. As a society, we should not let protection from wildfires be yet another urban-rural divide, both because protecting rural areas from wildfire also protects nearby cities, but also because rural Americans deserve it.

VII. CONCLUSION

Forest fires damage property, destroy livelihoods, and take lives. They are one of the most visceral illustrations of climate change. The risks and harms associated with wildfire are not distributed in an equitable manner. I argue these risks and harms should align with those who have more personal responsibility for the risk or who are more able to prevent or recover from the harm. However, equitably distributing these risks is complicated because of the diversity of groups and individuals living in fire prone areas as well as those living away from fires, but still physically or financially affected by them.

In analyzing five specific environmental justice issues caused by wildfire, this essay suggests ways to improve how California shares the harms caused by

¹⁷³ Alyssa Lukpat, *Biden Administration Announces Plan to Spend Billions to Prevent Wildfires*, N.Y. TIMES (Jan. 19, 2022), <https://www.nytimes.com/2022/01/19/climate/biden-administration-wildfire-plan.html>.

¹⁷⁴ Prichard et al., *supra* note 19.

¹⁷⁵ Daniel Wilmoth, *Accessing the Internet in Rural America*, SMALL BUSINESS ADMINISTRATION OFFICE OF ADVOCACY, Issue Brief 15 (2019).

¹⁷⁶ David Levine, *Addressing Disparities in Rural Health Care*, U.S. NEWS (Jun. 23, 2021), <https://www.usnews.com/news/national-news/articles/2021-06-23/addressing-disparities-in-rural-health-care>.

¹⁷⁷ Metin Çakır et al., *Rural Food Retailing and Independent Grocery Retailer Exits*, 102 AM. J. AGRIC. ECON. 15 (2020).

wildfire. To address harms caused by wildfire smoke on communities with a high background pollution level, we must invest in programs and legislative solutions to make sure people have clean air to breath within their homes. To help DACs prepare for fire, we must invest in education as well as programs that pay for the necessary vegetation clearing and building updates to improve their safety. In sharing the risk of delivering electricity to wildfire prone communities, we must ensure these risks are born by those who chose to live in dangerous areas, while helping those rural communities unable to cope with the financial burden imposed on them after decades of poor forest management and climate change. We must fully compensate inmate firefighters for their dangerous and important work and help them transition to firefighting and other forestry jobs when released. Finally, the forest managers receiving newly announced funding from the Biden Administration for fuel reduction must ensure that the funding is allocated fairly to better protect rural America just as it does around population centers. While these proposals are neither exhaustive nor likely sufficient to address all the injustices surrounding wildfire, they are hopefully a good first step. Still, the best solution to each of these problems is to reduce the likelihood of large, high severity fires in the first place. This essay argues that reducing wildfires by addressing climate change is not a feasible solution in the near term. As climate change is a global phenomenon, there is little hope of slowing it in the anytime soon. Even if this were possible, the lag in time between stopping carbon dioxide release and slowing temperature increases is too great to reduce wildfires in the next decade or more.

Wildfire prevention must focus on forest conditions. California needs a massive investment in forest treatments like thinning and prescribed burns to help return forests to historical, park-like conditions where fires burn more often, but less intensely. These investments must come from individuals living in the WUI as well as from every level of government, including a significant federal investment, considering the amount of timberland it owns in California. While an appropriate fire prevention program would be expensive, it is the only responsible option because dealing with fires after they happen incurs exponentially greater costs, measured in dollars, ecosystems, and lives.