



Executing Ecological Forest Restoration in California

Casey Rockman

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Abstract

Without action, the California forests will continue burning until there is nothing left for people to save. The threat of fires on the forests will continue to get worse as years go on. The wildland urban interface, the political and legal lens, and the environmental lens will all be explored in this article. These each contribute a cause to the California wildfires and have a potential solution. The best solution to the issues of wildfires in California is ecological forest restoration. The effect of ecological forest restoration is a positive implication on the forests of California. This solution will reduce the amount of fuel loads, combat effects of drought and climate, and it will restore ecosystem health.

Keywords: forests, ecological forest restoration, natural disasters

Introduction

Challenges are prominent in everyday lives and people need to overcome them when they arise. Overcoming adversity in natural environments is a main theme in the stimulus materials "Migrant Mother" and the TED talk by Julia Watson. Dorothea Lange's picture "Migrant Mother" shows a struggling family. This struggle was due to the Dust Bowl, a natural disaster caused by climate change and drought. In the TED talk it states that desert droughts and frequent flooding has been occurring for generations (Watson). Natural

disasters have been present for a long time, and will continue to be unless people do something to reduce it. The drought and flooding talked about in the TED talk are examples similar to the wildfires because they create many issues that have to be overcome by people living where it occurs. The wildfires are detrimental in California, and harm so many. Jacob Stern, a staff writer at The Atlantic, says that after a wildfire firefighters are 40% more likely to commit suicide and firefighters are heavily affected by PTSD (1). Alejandra Borunda, a former

climate scientist writes in an article that a megafire burned more than a million acres, all at a high severity (1). Looking at the severity of this issue, the question, What is the most effective way to address wildfires in California?, is brought into discussion. The stakeholder that will be explored is the wildland urban interface, the WUI, and the two lenses that will be explored are the political-legal lens and the environmental lens. Executing ecological forest restoration is the best way to address wildfires in California by reducing fuel loads, combating effects of drought and climate, and restoring ecosystem health.

Wildland Urban Interface

Experts have a multitude of knowledge on the WUI, and agree that there can be a handful done to reduce the amount of wildfires in these areas. The WUI is the zone between human development and unoccupied land. Experts firmly believe that humans are a main cause of wildfires. MacKenzie Thurman, who works at Wachtell Lipton's Corporate Department, thinks that humans are such a large factor of the wildfires, and they ignite most of the fires in California (1061). She also says that the houses are "stacked so close together, they are like sticks in a fireplace" (Thurman 1063). The close proximity of these houses create a pathway for wildfires to expand. Annie Rosenthal, an associate director of CARE, agrees with Thurman's ideas. She provides that there is an expansion of the wildland urban interface and it contributes to the severity of the fires (Rosenthal 2). Michael L. Mann, who works at the Faculty of Biology at the University of Barcelona and is a postdoctoral researcher, promotes the solution of anthropogenic influences. Anthropogenic influences are derived from human activities. He says that fire frequency is decreasing due to anthropogenic influences (Mann 17). If anthropogenic influences are not put in place, the fires will continue to damage people and places in the WUI. All together, anthropogenic influences will

not end or effectively reduce the wildfires that brew in California.

Political Interference in California

Experts feel that the government and organizations are putting themselves out there to try and figure out how to move forward and reduce the fires. Kelsey Rodd, an environmental scientist, concludes that much harm is done from wildfires. She thinks that when the fire is observed it is unlike any experience (Rodd 1). From the government, assembly bills have been put into place to help the issue. Thurman says the Assembly Bill 1054 can help, and it mandates safety protocols in the electrical grid (1057). However, this bill does "miss that older homes stand in the path of wildfires that the electric utilities ignite" (Thurman 1057). Tyler O'Connell, a Law Student at University of the Pacific adds that the Assembly Bill 1516 was also created to reduce the wildfires effect. Just like Assembly bill 1054, this one failed, due to a subsequent veto (O'Connell 351). Despite these bills being unsuccessful, agencies are getting involved in the issue of the California wildfires. O'Connell says "Federal agencies own, manage, and regulate about 48 million acres" (347). The federal agencies cover a large amount of land, and the state government administers the rest (O'Connell 347). Experts believe that the government is a large factor when dealing with the issue of wildfires. The government could do so much more to help with the wildfires.

Environmental Connections to Wildfires

Experts have a lot to say when discussing the environmental factors of wildfires because the environment is where they happen. Kirk Siegler, a correspondent on NPR's national desk, thinks that the climate encourages wildfires. He says "climate change created an extreme drought" (Siegler 1). Rosenthal agrees with Siegler, saying that climate change has increased the length of the fire season

and created drier conditions in California (3). Niki Frantzeskaki, a Chair Professor of Regional and Metropolitan Governance and Planning, believes that nature based solutions would be the best way to solve the effects of issues in the environment. Frantzeskaki says "nature-based solutions have shown potential for mitigating climate driven extreme events and contributing to adaptation and resilience in the context of human settlements" (455). However, there are some limitations that come with natural based solutions, such as cities. The interest of this solution is steadily increasing, but incorporating nature based solutions in cities appears to bring great challenges (Frantzeskaki 456). Agreeing with Frantzeskaki, Xu Yue, a researcher and scientist, feels that nature based solutions would play a key role in the environment (1410). There is no possible way to make sure this solution would work because of all the other factors that are happening around it. Nature based solutions have many limitations making them not the best solution to wildfires in California.

Ecological Forest Restoration

Many experts believe that ecological forest restoration is the best way to reduce the harshness of wildfires in California. Ecological forest restoration is a combination of ecological thinning, as well as prescribed and managed fires. Ecological thinning is the act of cutting down trees to allow more room for others. Prescribed and managed fires are fires that are strategically placed to allow vegetation to grow a tolerance to fire. Robert A. York, who is knowledgeable in forest science and management, prescribed fires, and forest ecology concludes that prescribed fires are extremely helpful when dealing with the issue of wildfires. York says "forest managers intentionally set controlled, or prescribed, fires in forests adapted to frequent fire" (104). Michael C. Vasey, a professor of Biology and Former Director, emphasizes how well ecological forest restoration would affect California. He says

that ecological restoration is defined as an "intentional activity that initiates or accelerates the recovery of an ecosystem" (Vasey and Holl 216). This solution would help to decrease the impacts that are caused by wildfires. After a fire burns, ecological thinning will allow the plants and vegetation to revive themselves faster. Executing ecological forest restoration is the best way to address wildfires in California by reducing fuel loads, combating effects of drought and climate, and restoring ecosystem health.

Reducing Fuel Loads

Experts agree that ecological forest restoration is the best solution to the California wildfires that are destroying the forests and peoples lives because it reduces fuel loads. Scott L. Stephens, a Professor of Environmental Science, argues that the reduction of fuel loads is important when discussing the wildfires. He says "fall and spring prescribed burns were implemented to compare differences in burn seasonality" (Stephens 307). These burns made the amount of fuel loads decrease, also decreasing the frequency of the wildfires. He continues to say, "fire used in the spring significantly reduced...surface fuels at one of two FFS sites" (Stephens 309). Matthew D. Hurteau, a forest ecologist working at the interface of ecology, economics, and policy on issues of climate change, notes that the reduction of fuel loads increases the health of the forests. Hurteau states "management reduced mean fire severity over the simulation period" (12). Contributing to this, John L. Campbell, who works at the Department of Forest Ecosystems and Society adds to the evidence of how ecological forest restoration is the best solution, due to the reduction of fuel loads. He says "fuel-reduction treatments are more than made up for by the reduction of future wildfire emissions" (Campbell et al. 83). Campbell continues with his evidence, saying that "fuel-reduction is generally designed to reduce subsequent wildfire severity"

(84). Experts prove that the reduction of fuels adds to the decline of wildfires in California.

Combating Effects of Drought and Climate

Experts conclude that ecological forest restoration is the best solution to wildfires in California because it combats effects of drought and climate. Siegler writes that since climate change is a main cause, if it is reduced, there will be less wildfires. He says "climate change created an extreme drought," which then led to the McKinney fire, which destroyed so much of California (Siegler 1). Experts agree that ecological forest restoration is the best solution to the California wildfires that are destroying the forests and peoples lives because it reduces fuel loads. Scott L. Stephens, a Professor of Environmental Science, argues that the reduction of fuel loads is important when discussing the wildfires. He says "fall and spring prescribed burns were implemented to compare differences in burn seasonality" (Stephens 307). These burns made the amount of fuel loads decrease, also decreasing the frequency of the wildfires. He continues to say, "fire used in the spring significantly reduced...surface fuels at one of two FFS sites" (Stephens 309). Matthew D. Hurteau, a forest ecologist working at the interface of ecology, economics, and policy on issues of climate change, notes that the reduction of fuel loads increases the health of the forests. Hurteau states "management reduced mean fire severity over the simulation period" (12). Contributing to this, John L. Campbell, who works at the Department of Forest Ecosystems and Society adds to the evidence of how ecological forest restoration is the best solution, due to the reduction of fuel loads. He says "fuel-reduction treatments are more than made up for by the reduction of future wildfire emissions" (Campbell et al. 83). Campbell continues with his evidence, saying that "fuel-reduction is generally designed to reduce subsequent wildfire severity" (84). Experts prove

that the reduction of fuels adds to the decline of wildfires in California. Frantzeskaki provides evidence that climate change will be affected. She says that there is a "potential for mitigating climate driven extreme events" (Frantzeskaki 455). Ecological forest restoration has the strength to decrease the wildfires from the perspective of climate change. Frantzeskaki continues to say that ecological forest restoration is a "solution to both mitigate and adapt to the negative effects of global climate change ranging from coastal and inland flooding, to drought, heat waves, and storms" (456). Ecological forest restoration can do a lot to improve wildfires so that the wildfires will cause less harm. California Forward, (CAFWD) a statewide non-profit, expands on this, saying that ecological forest restoration will reduce the effects of climate change that help to create the wildfires. They say it will "protect against the harmful effects of climate change" (California Forward 3). A reduction in climate change will mean a huge difference in how the wildfires are created.

Restoring Ecosystem Health

Experts believe that ecological forest restoration will be the best solution because it will restore ecosystem health in the forests that are getting burnt by the wildfires. California Forward states that ecological forest restoration focuses on "healthy trees", and how they can increase the health of these trees (3). The healthier the trees and other vegetation is, the stronger the forests will be when hit with a harsh wildfire. K. J. Vaughn, who works in the Department of Plant Sciences, adds onto what Calson is saying. Vaughn says that ecological forest restoration helps to enhance the habitat (1). The goal of ecological forest restoration is to speed up the recovery after a wildfire occurs (Vaughn et al. 1). California Forward says that the trees are healthier after ecological forest restoration has happened in that area. They say ecological forest restoration is good at "protecting

environmental resources” (California Forward 3). Watson, who did the TED talk, says that when there is a flood, people have to work together to survive with what nature is giving them. Just like these floods, when there is a wildfire in the forests of California, people have to contribute and help the forests regain their strength. Experts firmly feel that ecological forest restoration is the best way to reduce wildfires in California.

Limitations and Implications

Ecological forest restoration is the best solution to the wildfires in California because it helps out many people in California. Kerry L. Metlen, a forest ecologist, agrees with this statement, saying “reduced risk by an additional 52%” (1302). This proves that ecological forest restoration makes life in California safer for the people and animals there. Firefighters in California will also suffer less mentally. Stern says that if wildfires are reduced, there is a lesser chance that firefighters will be suicidal (1). Vasey says that “provide important ecosystem services” (216) Although ecological forest restoration is the best solution, there are some limitations. Ecological forest restoration would work really well if everyone understood and worked with it. Mann says that humans are responsible for 95% of the wildfires, and if people will not stop igniting these fires, the wildfires will not decrease (2). The cost of ecological forest restoration is another limitation. Metlen says that California would “require an investment of \$611 million” to be able to actually put ecological forest restoration into action (1301). Dorothea Lange’s picture “Migrant Mother” also contributes to the limitations. The picture shows that there is no real, true, and easy way to stop climate change from creating natural disasters that affect people around it.

Conclusion

Ecological forest restoration is the best way to reduce wildfires in California. Even with its

limitations, it would be a good thing to try to help the people and the forests. The implications are greater than its limitations, and reducing the wildfires would make many people feel safer where they live. Thurman says a fire in 2018 killed 85 people, burned over 153,000 acres, and destroyed 18,800 structures in 17 days (1059). Using ecological forest restoration, people in California can overcome adversities in natural environments, and stop the frequency of wildfires and all the hurt and damage that comes along with them.

References

- Borunda, Alejandra. “Wildfires in the West Are Inevitable, but This Strategy Can Help Control Them.” *Environment*, National Geographic, 28 Jan. 2022, <https://www.nationalgeographic.com/environment/article/wildfires-in-the-west-are-inevitable-but-this-strategy-can-help-control-them>
- California Forward. “California’s Wildfire Crisis: A Call to Action.” *California Forward*, California Summit Economic, 24 Mar. 2022, <https://cafwd.org/resources/californias-wildfire-crisis-a-call-to-action/>.
- Frantzeskaki, Niki, et al. “Nature-Based Solutions for Urban Climate Change Adaptation: Linking Science, Policy, and Practice Communities for Evidence-Based Decision-Making.” *BioScience*, vol. 69, no. 6, June 2019, pp. 455–66. EBSCOhost, <https://doi.org/10.1093/biosci/biz042>.
- Hurteau, Matthew D. “Quantifying the Carbon Balance of Forest Restoration and Wildfire under Projected Climate in the Fire-Prone Southwestern US.” *PLoS ONE*, vol. 12, no. 1, Jan. 2017, pp. 1–18. EBSCOhost, <https://doi.org/10.1371/journal.pone.0169275>.
- Lange, Dorothea. “Migrant Mother.” AP Seminar Performance Task 2: Individual Research-Based Essay and Presentation, College Board, 2023, p. 16. Originally published in “Destitute Pea Pickers in California. Mother of Seven Children. Age Thirty-Two. Nipomo, California,” *The Library of Congress*, <https://www.loc.gov/item/2017762891>.
- Metlen, Kerry L., et al. “Integrating Forest Restoration, Adaptation, and Proactive Fire Management: Rogue River Basin Case Study.” *Canadian Journal of Forest Research*, vol. 51, no. 9, Sept. 2021, pp. 1292–306. EBSCOhost, <https://doi.org/10.1139/cjfr-2020-0480>.
- Mann, Michael L., et al. “Incorporating Anthropogenic Influences into Fire Probability Models: Effects of Human Activity and Climate Change on Fire Activity in California.” *PLoS ONE*, vol. 11, no. 4, Apr. 2016, pp. 1–21. EBSCOhost, <https://doi.org/10.1371/journal.pone.015358>
- O’Connell, Tyler. “Prohibition Over Prevention: How California’s Land Development Ban Will Hinder Solutions to the Wildfire Crisis.” *University of the*

- Pacific Law Review, vol. 52, no. 2, Apr. 2021, pp. 343–66. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=asn&AN=150462545&site=ehost-live.
- Rodd, Kelsey. 2019. *Wildfires and Forest Resilience: the case for ecological forestry in the Sierra Nevada*. Unpublished report of The Nature Conservancy, Sacramento, California. 12 pp. https://www.scienceforconservation.org/assets/downloads/WildfireForestResilience_2019_Kelsey_2.pdf
 - Siegler, Kirk. “Why Suppressing Wildfires May Be Making the Western Fire Crisis Worse.” NPR, NPR, 27 Aug. 2022, <https://www.npr.org/2022/08/27/1119428879/why-suppressing-wildfires-may-be-making-the-western-fire-crisis-worse>.
 - Stephens, Scott L., et al. “Fire Treatment Effects on Vegetation Structure, Fuels, and Potential Fire Severity in Western U.S. Forests.” *Ecological Applications*, vol. 19, no. 2, 2009, pp. 305–20. JSTOR, <http://www.jstor.org/stable/27645972>. Accessed 10 Feb. 2023.
 - Stern, Jacob. “A Mental-Health Crisis Is Burning across the American West.” *The Atlantic*, Atlantic Media Company, 15 Oct. 2020, <https://www.theatlantic.com/health/archive/2020/07/mental-health-aftermath-california-wildfires/608656/>.
 - Thurman, MacKenzie. “Fighting Fire with Fire-Hardened Homes: The Role of Electric Utilities in Residential Wildfire Mitigation.” *Columbia Law Review*, vol. 122, no. 4, May 2022, pp. 1055–96. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=asn&AN=157173437&site=ehost-live.
 - Vasey, Michael C., and Karen D. Holl. “ECOLOGICAL RESTORATION IN CALIFORNIA: CHALLENGES AND PROSPECTS.” *Madroño*, vol. 54, no. 3, 2007, pp. 215–24. JSTOR, <http://www.jstor.org/stable/41425710>. Accessed 9 Feb. 2023.
 - Vaughn, K. J., Porensky, L. M., Wilkerson, M. L., Balachowski, J., Pepper, E., Riginos, C. & Young, T. P. (2010) *Restoration Ecology*. *Nature Education Knowledge* 3(10):66 <https://www.nature.com/scitable/knowledge/library/restoration-ecology-13339059/>
 - Watson, Julia. “How to Build a Resilient Future Using Ancient Wisdom.” TED Talk, 21 August 2020, https://www.ted.com/talks/julia_watson_how_to_build_a_resilient_future_using_ancient_wisdom.
 - York, Robert A., et al. “Silviculture Can Facilitate Repeat Prescribed Burn Programs with Long-Term Strategies: Burn Programs to Reduce Fuel Loads in California Forests Are Most Effective When Stand Characteristics and Forest Structure Are Considered.” *California Agriculture*, vol. 75, no. 3, July 2021, pp. 104–11. EBSCOhost, <https://doi.org/10.3733/ca.2021a0016>.
 - Yue, Xu, et al. “Projection of Wildfire Activity in Southern California in the Mid-Twenty-First Century.” *Climate Dynamics*, vol. 43, no. 7/8, Oct. 2014, pp. 1973–91. EBSCOhost, <https://doi.org/10.1007/s00382-013-2022-3>.
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