

The Effects of Past and Current U.S. Wildfire Policy

A Research Paper submitted to the Department of Engineering and Society

Presented to the Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia

In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

Grace Vidlak
Spring, 2022

On my honor as a University Student, I have neither given nor received
unauthorized aid on this assignment as defined by the Honor Guidelines
for Thesis-Related Assignments

Signature: 
Grace Vidlak

STS Advisor: Joshua Earle, Department of Engineering and Society

The Effects of Past and Current U.S. Wildfire Policy

INTRODUCTION

This STS paper will investigate the research question: “What are the impacts of past and current U.S. wildfire policy?” Policy guides what action, or lack thereof, will be taken by the U.S. government which impacts lives, the environment, and more. As wildfires become an increasingly prominent issue in the U.S., it is imperative to study these impacts to guide future policy. In the effort to answer this question, I will demonstrate how past wildfire policy caused a rapid change to the U.S. fire regime which caused lasting damages to the environment and marginalization of Indigenous peoples. I will then explore current policy which seeks to right these wrongs and potential future policy’s different approaches to the problem. I will conclude with recommendations for effective and beneficial future policies guided by experienced and knowledgeable groups such as Indigenous peoples, experienced members of organizations such as the U.S. Forest Service, and scientists.

This STS paper topic was chosen to align with UVA’s aircraft design capstone project: “American Institute of Aeronautics and Astronautics: Aerial Firefighting Design Competition.” As discussed in Langdon Winner’s “Do Artifacts Have Politics?” (Winner, 1980) and Philip Brey’s “Theories of Technology as Extension of Human Faculties” (Brey, 2000), technology innately has politics and are the means by which human intentions are realized. Firefighting aircraft are a key technology which enforce wildfire firefighting policy. If policy is insufficient or damaging, these aircraft will fail to achieve their objective of reducing the negative impacts of wildfires. It is crucial UVA aircraft design students understand the effects of U.S. wildfire policy to determine potential ramifications of this technology unforeseen during the conceptual design stage.

METHODS

This paper implements three STS methods: history, public policy, and ethnography. I reviewed literature regarding past wildfires and wildfire policy as well as additional texts focused on Indigenous stewardship and history, employing texts such as “An Indigenous Peoples’ History of the United States” by Roxanne Dunbar-Ortiz (Dunbar-Ortiz, 2014) and “Tending the Wild: Native American Knowledge and the Management of California’s Natural Resources” by M. Kat Anderson (Anderson, 2005).

Public policy implementation included research on current and future wildfire policy. Public policy information was gathered from the California State government and the U.S. government. Additional information was gathered from a paper (Williams, 2013) written by retired policymaker Jerry Williams, Former National Director of Fire & Aviation Management, U.S. Forest Service, stating lessons learned from previous policies, observations of policymakers’ viewpoints surrounding wildfire management, and recommendations for future policy.

Ethnography implementation included the gathering of past interviews from groups of interest. Interviews with fire stewards (e.g. the Yurok and Karuk Tribes) focused on the fire stewardship in their culture and marginalization of these groups due to wildfire policy. The statements reviewed were gathered by Freelance Journalist Page Buono, who spoke with many key figures: Elizabeth Azzuz, Yurok Tribe member and Cultural Fire Management Council (CFMC) Member; Margo Robbins, Yurok Tribe member and Executive Director of the CFMC; Bill Tripp, Yurok Tribe member and Director of Natural Resources and Environmental Policy for the Karuk Tribe; Jeremy Bailey, Fire Training and Network Coordinator for The Nature

Conservancy (TNC); Frank Kanawha Lake, Karuk tribal descendant and Research Ecologist for the U.S. Forest Service Fire and Fuels Program; and Mary Huffman, TNC Fire Ecologist and Director of the Indigenous Peoples Burning Network (IPBN). Buono gathered statements focusing on the significance of fire stewardship in Indigenous culture, the negative effects of living without fire, the regulatory problems Indigenous peoples face when trying to conduct controlled burns, and the progress they've made trying to solve these problems (Buono, 2020a; Buono 2020b). Accompanying Buono's interviews, Photographer Kiliiii Yüyan gathered photos depicting interviewees Elizabeth Azzuz, Frank Kanawha Lake, and Margo Robbins conducting important cultural acts during an Indigenous prescribed fire (Buono, 2020a; Buono, 2020b).

RESULTS

Historical Context of Wildfires in CA

In the 21st century, the burning of 2 million ha (hectare) annually in California is viewed as extreme. A study of "prehistoric" California (before Euro-American settlement) found that an average of 1.8 million ha burned annually during this period (Stephens, Martin, et al., 2007). This reveals that the current perspective is misaligned with what has historically occurred and needs reevaluation.

Indigenous Stewardship

Indigenous peoples used fire to shape and maintain their ecosystems over millennia as stewards of the land (Anderson, 2005). They adapted nature to suit their needs and "help it along" (Anderson, 2005; Dunbar-Ortiz, 2014). The Yurok, located in modern day Northwestern California, executed controlled burns (intentional, controlled fires) at varying time intervals depending on the task and its cultural purpose: "burning of hazelnut for basketry occurred every two years; burning under the tan oaks to keep the brush down took place every three years...

burning in the redwoods for brush and downed fuel control occurred every three to five years” (Anderson, 2005, p. 126). These burns had significant positive effects on the environment which were only “discovered” later by scientists in the 1960s: they nourished the soil, increased sunlight exposure, and killed diseased plants, allowing for healthier forests (Forest History Society, n.d.; Cal Fire, n.d.). Additionally, the “fuel control” by burning brush prevented the ability for large wildfires to spread out of control and destroy large swaths of forest (Cal Fire, n.d.).

Past Policy: Fire Exclusion and Suppression

After millennia of wildfires and fire stewardship, a large change came to the fire regimes of California and the rest of the United States. First, Indigenous fire stewardship was forcefully stopped as thousands were driven from their lands and/or killed in the mid-1800s (Dunbar-Ortiz, 2014). U.S. policy further changed the regime with the enactment of fire exclusion and suppression policy in the early 1900s. This policy had two main goals: the prevention of wildfires and suppression of wildfires as fast as possible, effectively outlawing any attempts to reinstate Indigenous fire stewardship (Dunbar-Ortiz, 2014). The fire exclusion and suppression policy held fast until research conducted in the 1960s on the positive effects of fire in forest ecology influenced policy shifts in the 1970s from total suppression to the “let-burn” policy, allowing natural-caused fires to burn “when and where appropriate” (Forest History Society, n.d.).

Past Policy: Environmental Effects and Marginalization of Indigenous Peoples

The extended exclusion and active suppression of wildfires caused many negative effects. Over a 100-year period, the fire regimes of California and the U.S. shifted from low intensity burns mainly affecting the small trees and shrubs of the understory to high-intensity stand

replacing fires which kill most of or all the large trees which make up a forest's overstory (Williams, 2013). Fire suppression and exclusion lead to the buildup of plant material, called biomass, in forests which in turn fueled large, damaging wildfires called high-impact mega-fires (Williams, 2013).

When the Yurok and Karuk Tribes were unable to perform their tradition of controlled burns, they lost key resources and important aspects of their culture. Hazel bushes, usually growing in a tangled fashion, grows in straight stems through the use of fire. These straight stems are then used to weave baby baskets. Fire is also used to promote the growth of acorns and huckleberries, and even affects salmon lifecycles. Without fire, "we lose our salmon, we lose our acorns, we lose all those things, and we don't have a culture. We just slowly disappear" (Buono, 2020a).

Current Policy: Reinstatement of Controlled Burns

As of now, some states have taken steps towards increasing Indigenous peoples' rights to controlled burns. In October 2021, California passed a bill titled: California Senate Bill No. 332, Dodd. Civil liability: prescribed burning operations: gross negligence (California Senate, 2021). This bill builds upon existing laws to address issues regarding properly conducted controlled burns and liability, granting a burn boss (someone qualified to conduct controlled burns) and private landowner immunity from liability for damages, etc. resulting from a controlled burn unless the burn was conducted in a grossly negligent manner. This bill helps protect Indigenous peoples' right to conduct controlled burns, addressing how even properly controlled burns have some risk.

Bills such as California Bill No. 332 are part of the process to allow Indigenous people to conduct controlled burns again, reconnecting with their culture, regaining key resources, and

benefiting their environment. Despite progress, there are still many lasting problems Indigenous peoples face which bar them from completing controlled burns. Mary Huffman, Director of the Indigenous Peoples Burning Network (IPBN) summed up the problem neatly: “We have a shared fire problem, and clashing systems” (Buono, 2020b). The U.S.’s regulatory systems (e.g. the National Wildfire Coordinating Group) set burn windows and use protocols that are often misaligned with Indigenous values and practices. This turns many Indigenous people away from becoming burn bosses, leaving them without the proper “qualifications” to conduct burns themselves (Buono, 2020b). Bill Tripp, Director of Natural Resources and Environmental Policy for the Karuk Tribe, stated that they often don’t have proper environmental clearance for burning under the National Environmental Policy Act or don’t have enough personnel available to supervise the burn (Tripp, 2020).

Potential Future Policy

Currently, the House of Representatives and the Senate are considering multiple bills that could affect future U.S. wildfire policy. We will consider bills backed by both major parties in the U.S.

The National Prescribed Fire Act of 2021, sponsored by Democrat Representative Kim Schrier and Senator Ron Wyden, would “direct the Secretary of the Interior and the Secretary of Agriculture to encourage and expand the use of prescribed fire on land managed by the Department of the Interior or the Forest Service, with an emphasis on units of the National Forest System in the western United States, and for other purposes” (U.S. Congress, 2021b).

The Wildland Fire Mitigation and Management Commission Act of 2021, sponsored by Republican Representative John R. Curtis and Senator Mitt Romney, would direct “the Departments of the Interior and Agriculture and the Federal Emergency Management Agency

(FEMA) to jointly establish a commission to study and make recommendations to improve federal policies relating to wildland fire prevention, mitigation, suppression, management, and rehabilitation. The Department of Defense and other relevant federal departments and agencies must submit to the commission an inventory of surplus cargo and passenger aircraft and excess common-use aircraft parts that may be used for wildland firefighting purposes” (U.S. Congress, 2021a).

The first bill takes an active pro-fire role, seeking to increase the implementation of prescribed fires to reduce biomass levels in forests. The second bill takes a more pro-suppression role, seeking to make a wildfire prevention, suppression, etc. focused commission and inventory parts to be used in potential firefighting aircraft.

DISCUSSION

The Importance of This Study

The study of the impacts of U.S. wildfire policy is important because these policies have greatly affected people and the environment and will continue to do so in the future. As shown in the results section, U.S. policy has marginalized Indigenous peoples and has lasting effects on them today. Expanding to the broader U.S. populace, there is great risk to people’s lives and livelihoods if wildfires are not handled properly. Improper policy can and has led to high-intensity, destructive wildfires. In addition to affecting human lives and property, these fires cause loss of wildlife habitat. Finally, these fires cause great monetary costs to handle damages.

Suggestions for Change

I suggest that the U.S. populace and U.S. policymakers heed the advice of experienced and knowledgeable people. Three examples of groups to be heeded are Indigenous peoples, experienced folk within organizations such as the U.S. Forest Service, and scientists.

Holding millennia of experience and knowledge, Indigenous peoples already know key strategies for maintaining the landscapes of wildfire prone locations (Anderson, 2005; Dunbar-Ortiz, 2014). First and foremost, the issues barring them from practicing controlled burns must be addressed. Some of these issues include taking the proper steps to get these groups cleared for conducting controlled burns under the National Environmental Policy Act and ensuring sufficient amounts of personnel to be available so controlled burns can be conducted. With permission, I suggest we learn from Indigenous peoples' practices to allow for better implementation of controlled burns. The Prescribed Fire Training Exchanges (TREX) program has already hosted several training exchanges between fire practitioners, firefighters, the Yurok, and other tribes, demonstrating on a small scale how listening to and learning from a diverse set of perspectives can benefit both groups (Buono, 2020a). These exchanges need to expand to include policy makers to greater influence a shift in wildland fire management in the U.S.

Many experienced folk within the U.S. government actively share their future recommendations and lessons learned. For example, Jerry Williams, Former National Director of Fire & Aviation Management, U.S. Forest Service, wrote a paper (Williams, 2013) in which he listed key recommendations he learned from experience. First, Williams addresses that there is a “growing awareness that suppression-centric wildfire protection programs have clear limits under severe burning conditions, but the view is not yet fully acknowledged within the fire management community, nor widely believed among the public” (Williams, 2013). He suggests that rather than applying “greater suppression force,” we shift to “more comprehensive fire protection strategies – working in concert” with fires, which could prove more effective (Williams, 2013). Williams also addresses how the “rigorous analysis of social, economic, and environment effects” controlled burns are subject to often discourages action, leading to “no-

action” being a common choice land managers perceive as having no consequence. He warns that that the longer this “no-action” option is chosen, the greater risks natural made wildfires will pose (Williams, 2013). These are only some of the many recommendations from Williams that policy makers should heed.

Finally, scientists who have dedicated their careers to understanding wildfires often share key recommendations based on the findings of their research. The group of scientists who wrote a paper on prehistoric California’s fire regime (Stephens, Martin, et al., 2007) concluded their paper with a list of recommendations for future policymakers. As previously stated in the “Historical Context” section, the current viewpoint on what amount of fire should be allowed to burn in California is misaligned with the fire regime that occurred for millennia and needs to be reevaluated. The scientists wrote that counter to the current common viewpoint, a key land management objective should be to increase the amount of fire in California (Stephens, Martin, et al., 2007). By allowing more less-dangerous fires to burn across the state, fewer harder hitting fires (i.e., high-impact mega-fires) will occur. There are various strategies they recommend which can be implemented to safely increase the amount of fire in CA. In the case that a naturally starting wildfire occurs, the current wildfire system tends to favor management strategies that implement greater fire suppression versus those with less suppression. They suggest a more balanced consideration of each, so that less suppression is used on fires small enough that it isn’t needed.

Overall, these recommendations have many overlapping points, and when combined, form a strong strategy for future policymakers to consider. This summary of recommendations is as follows. Past wildfire policy led to a shift in the U.S. fire regime, with suppression-heavy strategies inadvertently causing the perfect conditions for destructive wildfires to form. We need

to act decisively to reverse this shift in a safe manner. The longer “no-action” is implemented, the greater chance for worse fires to form in the future. Changing the U.S. fire regime to increase the number of smaller fires will remove the fuel necessary for high-impact mega-fires to form. One way to increase smaller fires is to conduct controlled burns, another way is to reduce the suppression of smaller naturally starting wildfires. Additionally, the marginalization of Indigenous peoples, a direct result of past wildfire policy, must be actively addressed.

Informed Future Policy: What Should Be Done

Applying the above recommendations means that wildfire policy needs to shift towards encouraging the implementation of fire either through controlled burns or the reduced suppression of smaller wildfires. Reviewing the potential future policies previously listed, the National Prescribed Fire Act of 2021 follows these recommendations as it actively directs for an increase in the use of prescribed fires (AKA controlled burns). On the other hand, the Wildland Fire Mitigation and Management Commission Act of 2021 is shifting focus in the wrong direction, moving us closer to repeating the mistakes of the fire exclusion and suppression policy from the 1900s. Reacting to the growing wildfire threats in the U.S. with greater suppression may seem effective in the short-term, but it instead causes greater risk for more damaging wildfires.

Despite potential promising policies being introduced, additional policy needs to be made in order to properly shift the U.S. to a more beneficial fire regime. While the National Prescribed Fire Act of 2021 takes a step in the right direction, it only increases the number of controlled burns, one recommendation out of the many previously covered. The federal agencies in charge of wildfire management (i.e., the Forest Service, the Bureau of Indian Affairs, Bureau of Land Management, the National Park Service, etc.) need to reevaluate their management strategies.

With respect to naturally starting fires, they need to reduce the bias towards suppression-heavy responses, choosing to more equally consider allowing smaller wildfires to burn. Additionally, the problems Indigenous peoples face getting clearance to conduct controlled burns need to be addressed. The expansion of programs such as TREX is one way to help bridge this gap between Indigenous peoples and fire management while increasing the number of tribal members listed as properly trained.

Finally, I suggest that steps be made so the U.S. public gains better common knowledge about wildfires. Increasing our common understanding of wildfires will have many benefits. First, increased knowledge will combat the common fear, concern, and despair that comes with every wildfire season as of recent. As previously mentioned, the current viewpoint of the U.S. fire regime is overly wary of wildfires. When we shift our understanding of what the fire regime should look like, we realize wildfires themselves aren't the problem, the shift in our fire regime that helped instigate high-impact mega-fires is. Gaining this knowledge will also promote people to take beneficial actions, such as making knowledgeable choices when reviewing what policymaker to vote for and when answering questions on the ballot if the situation arises.

References

- Anderson, M. K. (2005). *Tending the wild: Native american knowledge and the management of california's natural resources*. University of California Press. <https://ebookcentral-proquest-com.proxy01.its.virginia.edu/lib/uva/detail.action?docID=239718>.
- Benefits of Fire. (n.d.). *Cal Fire*. <https://www.fire.ca.gov/media/5425/benifitsoffire.pdf>
- Buono, P. (2020a). Quiet Fire. *The Nature Conservancy*. <https://www.nature.org/en-us/magazine/magazine-articles/indigenous-controlled-burns-california/>
- Buono, P. (2020b). The fire we need. *High Country News*. <https://www.hcn.org/articles/south-wildfire-the-fire-we-need>
- Brey, P. (2000). Technology as Extension of Human Faculties. *Metaphysics, Epistemology, and Technology. Research in Philosophy and Technology, vol 19*. Ed. C. Mitcham. London: Elsevier/JAI Press.
- California Senate. (2021). Senate Bill No. 332. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB332
- Dunbar-Ortiz, R. (2014). *An indigenous peoples' history of the united states*. Beacon Press. <https://ebookcentral-proquest-com.proxy01.its.virginia.edu/lib/uva/detail.action?docID=5337859>.
- Stephens, S. L., Martin, R. E., & Clinton, N. E. (2007). Prehistoric fire area and emissions from California's forests, woodlands, shrublands, and grasslands. <https://www-webofscience-com.proxy01.its.virginia.edu/wos/woscc/full-record/WOS:000250743000008>
- Tripp, B. (2020). Our land was taken. But we still hold the knowledge of how to stop mega-fires. <https://www.theguardian.com/commentisfree/2020/sep/16/california-wildfires-cultural-burns-indigenous-people>
- U.S. Congress. (2021a). H.R.4082 Wildland Fire Mitigation and Management Commission Act of 2021. <https://www.congress.gov/bill/117th-congress/house-bill/4082?q=%7B%22search%22%3A%5B%22fire%22%2C%22fire%22%5D%7D&s=2&r=6>
- U.S. Congress. (2021b). S. 1734 National Prescribed Fire Act of 2021. <https://www.congress.gov/bill/117th-congress/senate-bill/1734/titles>.
- U.S Forest Service Fire Suppression. (n.d.). *Forest History Society*. <https://foresthistor.org/research-explore/us-forest-service-history/policy-and-law/fire-u-s-forest-service/u-s-forest-service-fire-suppression/>

Williams, J. (2013). Exploring the onset of high-impact mega-fires through a forest land management prism. <https://www-webofscience-com.proxy01.its.virginia.edu/wos/woscc/full-record/WOS:000317544900002>

Winner, L. (1980). Do Artifacts Have Politics? *Daedalus*, 109(1), 121–136.
<http://www.jstor.org/stable/20024652>