Institutional Inferno: Addressing Wildfire Impacts in Greece

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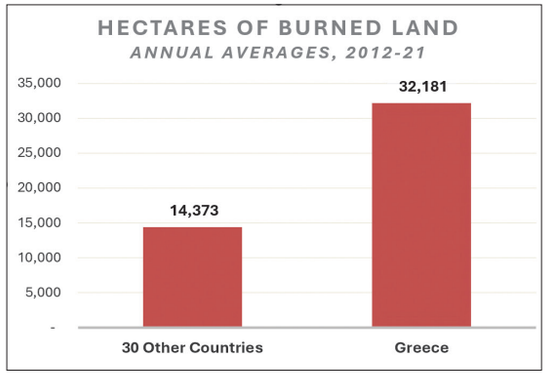
Abstract:

Chelsea Hall explores tradeoffs among two alternative policy approaches for mitigating wildfire impacts in Greece: creating a prescribed burn insurance program while leveraging the goat population, and partnering with the Greek Fire Service to fund community wildfire protection plans. Ultimately, she advocates for the establishment of community wildfire protection plans in order to foster community and interagency partnerships, arguing that these locality-specific adaptation policies constitute a more integrated and equitable approach to fire management.

Wildfires in Greece: exploring the problem

Human-caused climate change is exacerbating wildfires in Greece, ravaging the land, displacing residents, and claiming lives. Studies show that climate change has extended wildfire seasons and increased the number and intensity of wildfires as landscapes dry out and ineffective fire management practices continue.[1] Few countries have faced such intense global attention in these areas as Greece.

Data shows that Greece's wildfires are especially numerous and intense. Last year's wildfires numbered in the hundreds. In July 2023 alone, fires burned 190,200 hectares of land.[2] In August, a blaze that broke out in the northeast of the country quickly became "the largest single wildfire recorded in the EU."[3] These fires are merely a continuation of a stark trend: the summer months of 2021 saw an immense heatwave, resulting in a high of 47.1°C that helped ignite 84 separate wildfires. These fires comprised the largest swath of burned land in Greece in over a decade.[4,5] Average hectares of burned land between 2012 and 2021 was about 2.2 times larger in Greece than the combined average of 30 other countries.[6]



Greece's catastrophic wildfires are razing the land and destroying native species. Between 2001 and 2022, wildfires destroyed 155,000 hectares of tree cover in Greece, representing 63% of total tree cover loss. Narrowing in on 2021, wildfires accounted for 93% of that year's tree cover loss.[7] In light of such drastic changes to the landscape, "species abundance and biodiversity are expected to decline." Particularly vulnerable are the abundant conifer forests of the Peloponnese region comprising native species that thrive in lower temperatures.[8]

Recent wildfires in Greece left a multifaceted human toll. The aforementioned August 2023 blaze in the northeast destroyed several homes and claimed 20 lives, including 18 asylum seekers who are believed to have been trapped by the flames.[3] Rural subsistence communities are disproportionately affected: a community whose main industry is the harvesting of pine resin lost its livelihood after the 2021 fires, while an elderly farmer lost his entire flock of sheep.[9] Olive trees, fig trees, and other species upon which local agriculture depend are also severely impacted with each wildfire season.[8] The Rhodes fire in July 2023 spurred the evacuation of over 20,000 people, the "largest wildfire evacuation Greece has seen." Roughly 10,000 British tourists were among the evacuees[10], highlighting a central aspect of Greece's economy: tourism. The "crucial resource" of tourism is expected to take massive hits from worsening wildfire seasons.[8] To further illustrate the socio-economic impacts, research prior to the 2021 fires predicted a roughly 2% lapse in overall Greek GDP due to climate change, a projection that will have only worsened after the unprecedented fires of 2021 and 2023.[11]

Greece's current approach

Climate change is the main driver of the severity of Greece's wildfire problem.[12,13] However, this article focuses on what the Greek Forest Service could do to adapt to

and mitigate the impacts. Compared to similarly situated countries in the Southern European Union, "Greece emerges as ineffective in coping with forest fires,"[14] primarily due to inadequate forest and fuel management practices and deficient use of available funding.

Governmental emphasis on prevention of fires is sparse. Mitigatory policies in Greece are weak and focus mainly on "influencing behaviors so as to reduce negligence and deter arsons,"[14] rather than more prevalent sources and causes of ignition such as poor vegetation management. Greek Law 998/1979 remains the most influential regulation for fire management, but it was passed over 40 years ago and includes outdated and restrictive measures.[15] In the EU more broadly, there is a marked "lack of exchange between key stakeholders in forest fire management," causing regulatory stagnation.[16] For Greece specifically, the national budget completely deprioritizes fire prevention.[15]

Further, the Greek government is not making full use of the *external* funding available for forest management and climate adaptation. Under its National Strategic Reference Framework for 2021-2027, the EU has allocated €336 million to Greece, "earmarked particularly for the prevention and management of fire risk."[17] This presents an excellent opportunity for the country to enhance its wildfire risk mitigation strategies. However, Greece has historically struggled to spend down EU funds for such purposes: through the Greek Rural Development Program for 2014-2022, €148 million was set aside for sustainable forest management. As of May 2023, only €63.9 million, or 43%, had been spent.[17]

Greek government must intervene

The Greek Forest Service has the social and legal responsibility to help the nation and region adapt to ever-escalating wildfire risk. Vulnerable populations such as rural, low-income, and migrant communities will continue to be disproportionately impacted by catastrophic fires, representing an environmental justice crisis. Legally, Greece is obligated as a signatory of the 2015 Paris Agreement to make good on its commitment to "[increase] the ability to adapt to the adverse impacts of climate change and foster climate resilience" (Article 2).[18] Finally, three-quarters of forested land in Greece is publicly owned, either entirely by the State or under mixed public-private ownership,[15] presenting an opportunity for the Greek Forest Service to leverage recent funding and showcase innovative, large-scale wildfire prevention strategies.

Criteria for an effective policy solution

Given the inherent urgency of climate adaptation, potential policy solutions should be effective, equitable, and politically feasible. In assessing effectiveness, I ask whether the proposed solution would decrease the number and severity of climate-related wildfires in Greece. In assessing equity, I ask whether the proposed solution would benefit the populations most impacted by the climate crisis in Greece. And in assessing political feasibility, I ask whether the proposed solution would achieve passage by the Greek government given current political and social conditions in the country.

Analysis

The status quo: reactive fire suppression

Current wildfire prevention and adaptation measures are minimal in Greece, as "fire management… is generally focused on fire suppression" after a blaze begins.[19] National law bans all intentional fire use, including prescribed burns. Instead of instituting meaningful wildland-urban interface (WUI) vegetation management programs such as prescribed burning or clearing of low-lying vegetation, recent policy changes embrace punishment-oriented, after-the-fact approaches such as escalating arson fines.[20] The Greek Forest Service is small and deals mainly with violations of forestry law, such as complaints of illegal logging and hunting.[21] Despite its name, it currently "has little involvement" in wildfire planning, adaptation, or community engagement efforts.[15]

There are two EU-sponsored initiatives that had potential for fostering improvement, but upon closer inspection, fall flat against the immediacy of Greece's climate emergency: 1) the ARCFUEL project of 2014 created maps of fuel types for the Mediterranean region, which would enable "production of reliable and accurate estimations of wildfire spread and behaviour for improved decision-making"[16], but the datasets do not appear to be publicly available online and outcomes are unclear; and 2) despite its ambitions, the LIFE-IP AdaptInGreece project, which would implement various national strategic plans for "adapting Greece to climate change" and is in effect for the 2016-2025 policy cycle, does not yet have specific, actionable objectives for climate change adaptation on its website.[22]

Existing wildfire management practices in Greece are incredibly deficient. Its fire suppression policies have led to dangerous fuel buildup, but Greece lacks meaningful WUI vegetation management programs.[23] The Greek Forest Service, Greek Fire Service, and local communities are siloed in their approaches to wildfire, if approaches exist. Meanwhile, fires are only getting worse: scientists predict that climate change will widen the annual period of extremely high fire risk in Greece to an additional 20 days between 2021 and 2050 and 40 days between 2071 and 2100.[8] Without policy changes, Greece will continue to see record-breaking wildfires, and therefore the status quo is ineffective.

The status quo contributes to an inequitable distribution of climate impacts among residents of Greece. Migrants, asylum seekers,[24] and rural and low-income residents[9] are bearing the brunt. The consequences of worsening wildfires for nations "beyond Europe's borders, in countries with less capacity to prepare, respond and adapt, will be even greater."[25] Unfortunately, climate justice in Europe is still a long way off from being properly quantifiable[26], but the current rate of catastrophic wildfires in Greece carries an inequitable human toll.

Status quo policies are already in effect, ordinarily deeming them highly politically feasible. However, existing conditions are becoming less and less palatable for Greeks. A storm of criticisms against the Greek Forest Service and Fire Service followed the 2021 blazes, and in 2023 environmentalists called for government investments in prevention with renewed vigor.[27,28] These considerations reduce long-term feasibility.

Policy alternative 1: Create prescribed burn insurance program and leverage goat population

This alternative entails legalizing prescribed burns in Greece, conducting prescribed burns on State-owned land, incentivizing private participation by establishing an insurance program to lighten liabilities for prescribed burns, and utilizing herds of grazing goats to supplement the effects of prescribed burns. The insurance program would mimic California's SB 926, signed into law by Governor Gavin Newsom in September 2022.[29] Private landowners in California had long balked at prescribed burning for fear of neighbor lawsuits. In response, SB 926 funds $20 million in "prescribed fire

damages" in the event of claims. According to Michael Wara, director of Stanford's Climate and Energy Policy Program, risks remain "really low," and the main driver for the insurance program is to alleviate public apprehension.[30] For greatest impact, Greece's prescribed burn legalization and insurance program would be heavily marketed in border-urban areas.[31] Targeted grazing "works best when it's used in combination with other wildfire reduction measures, especially prescribed burning," according to Lynn Huntsinger, professor of rangeland ecology and management at UC Berkeley.[32] Conveniently, Greece has the largest goat population of any country in Europe, an asset that the Greek Forest Service could leverage in its wildfire adaptation approach.[33]

Research is favorable to implementing fuel reduction practices such as prescribed burning in Europe.[34] Evidence suggests that prescribed burning in the U.S. has been tremendously successful, especially "if conducted before an area is impacted by wildfire."[35] A study of wildfires in Oregon and Arizona discovered a correlation between sizeable prescribed burns administered between 2015-2020 and fewer wildfires in 2020, "[suggesting] that prescribed burns may help reduce fuel load in future large wildfires."[36]

Although data is not yet available on the effects of California's prescribed burn insurance program, communications to Greek residents should emphasize that 99.84% of prescribed burns in the U.S. go exactly to plan. When they do not, consequences are typically minimal.[35] This rhetoric, coupled with the insurance program, could increase private participation in the prescribed burn program.

The use of grazing goats in tandem with the above efforts augments this alternative's effectiveness. A goat grazing program yielded immense benefits to fire risk reduction in Portugal. Since implementing the program in 2018 following catastrophic wildfires in 2017, the number of annual wildfires has decreased by 50%.[37]

By effectively reducing the number and severity of wildfires, evidence suggests that this alternative would also lessen the unequal social and economic impacts.[34] The prescribed burn insurance program would lower potential costs for low-income Greeks, equalizing risk across income groups. To further increase equity, the Greek Forest Service should consider generous compensation amounts for participating goat farmers. However, because Forest Services resources would be devoted largely to its own prescribed burns, it is assumed that farmer compensation would be somewhat limited, rendering this alternative moderately equitable.

With increasing pressure from citizens, the Greek legislature may be primed for changes to existing fire management law. However, the legalization of prescribed burning would be a lengthy and fraught process due to persistent political and social apprehensions. A U.S. Forest Service survey of 106 wildfire-impacted or -knowledgeable Greeks bodes ill for the political feasibility of this alternative. Over 75% of survey respondents rejected the idea that there is a "fire deficit in Greek landscapes." Only 9% of respondents expressed that fuel reduction "can play a major role" in mitigating wildfires.[15] As a result, political feasibility appears to be a dim prospect.

Policy alternative 2: Partner with Greek Fire Service to fund Community Wildfire Protection Plans

This alternative entails establishing closer working relationships with the Greek Fire Service and local officials to deliver funding for the development of Community Wildfire Protection Plans (CWPPs). "Collaborative planning" in wildfire adaptation strategies is central to successful implementation.[38] In direct consultation with residents and fire management experts, localities would each develop their own CWPP complete with a community map, establishment of WUI boundaries, risk assessment, and proposed projects unique to proximate conditions. Authorizing legislation would need to be somewhat vague, as case studies indicate that the presence of few parameters "[encourages] communities to develop CWPPs that reflect their local social and ecological contexts."[39] However, there would need to be provisions stipulating early and intense inclusion of residents to ensure their long-term buy-in.[40] The CWPP funds would be concentrated in urban-border and rural areas, as a study published last year found that funding for fire prevention needs to be concentrated in high fire-risk areas rather than distributed evenly.[41]

CWPPs have been part of a long-standing federal program in the U.S.[42], but citizen involvement in wildfire adaptation was slow to earn scholarly attention in the European context.[43] However, new evidence suggests that fire-related initiatives in Southern Europe are especially effective when approached from the "bottom up."[44]

In the U.S., the CWPP program has achieved impressive geographic scope: "the vast majority of the land base of the fire-prone western U.S." is covered by the programs.[45] However, existing literature fails to establish a direct link between CWPPs and fewer or less severe wildfires, instead principally highlighting the benefits of community cohesion.[46] Further, a 2021 analysis notes issues with "implementation, plan updates, effective communication, engagement strategies and more" over time.[47] This alternative would necessitate thoughtful and iterative programming on the part of the Greek Forest Service.

Despite the lack of direct empirical evidence for this alternative's effectiveness, individual success stories abound. For example, the community of Montecito lost only seven buildings to the 2017 Thomas Fire out of the 1,000 buildings destroyed in total. Montecito's CWPP and community buy-in were paramount to its successful mitigation of structural impacts.[48] Because of accounts like this, this alternative achieves moderate effectiveness.

This alternative is the most transformative in terms of agency approaches to collaboration and societal engagement. Truly effective disaster risk reduction requires such bold changes: "challenging existing structures, power relations, vested interests, and dominant narratives that persist within systems and… perpetuate poverty, inequality, and vulnerability."[49] Targeting fire-prone rural areas with funding and resources ensures equitable distribution to localities that need it most, such as low-income farming communities. Scholarly work finds that the same influences both affect climate vulnerability and restrict "access to power and resources, thus perpetuating social inequities."[42] This alternative does the most to address these social phenomena through integrated community engagement and resource distribution, rendering it highly equitable.

Enhanced collaboration and partnership with the Greek Fire Service and local communities, especially in cases of joint public-private land ownership, would alleviate the uncertainties around "fuzzy boundaries" that currently stifle fire prevention efforts.[15] In addition, this alternative does not depend upon legislative changes, although legaliza-

tion of prescribed burns would undoubtedly aid in building robust CWPPs on the community level. Importantly, the United States Forest Service survey of Greek residents indicated a strong majority who believed that "improved collaboration among the fire management agencies" will be the most effective policy strategy for mitigating wildfire risk, and that the Greek Forest Service specifically "should become more engaged on all stages of wildfire planning and suppression."[15] Therefore, this alternative is highly feasible.

Policy recommendation

Ultimately, I recommend that the Greek Forest Service pursue Alternative 2: Partner with the Greek Fire Service to Fund Community Wildfire Protection Plans. Alternative 2 is highly equitable and politically feasible because of its community-level emphasis and presence of few structural constraints, which outweigh its relatively moderate effectiveness. As disaster researcher Janne Parviainen points out, "natural hazards become disasters only when they exceed the capacities of those affected to cope with their impacts."[50] The Greek Forest Service must expand its capacity by establishing enduring community and agency partnerships that will combat the catastrophic and inequitable impacts of wildfire, thereby ensuring the longevity of Greece's rich environmental and social landscapes.

Endnotes

1. "What Is Climate Change?" United Nations, United Nations, www.un.org/en/climatechange/what-is-climate-change. Accessed 7 Dec. 2023.

2. "How Damaging Were Greek Wildfires? Experts Explain How Heatwave Fanned the Flames." EuroNews, 2 Aug. 2023, www.euronews.com/green/2023/08/02/greek-wildfires-have-unleashed-the-same-co2-emissions-in-july-as-over-222000-cars-in-a-yea.

3. Olorenshaw, Alex. "A Visual Guide to Greece's Deadly Wildfires." The Guardian, Guardian News and Media, 1 Sept. 2023, www.theguardian.com/world/2023/sep/01/greek-wildfires-a-visual-guide.

4. Masoom, Akriti, et al. "Investigation of the effects of the Greek extreme wildfires of August 2021 on air quality and spectral solar irradiance." Atmospheric Chemistry and Physics, vol. 23, no. 14, 2023, pp. 8487–8514, https://doi.org/10.5194/acp-23-8487-2023.

5. Kokkinidis, Tasos. "2021 Fires in Greece Burned Almost Double the Area of NYC." Greek Reporter, 4 Jan. 2022, https://greekreporter.com/2022/01/04/2021-fires-greece-burned-double-nyc/.

6. European Commission, Joint Research Centre, San-Miguel-Ayanz, J., Durrant, T., Boca, R. et al., "Forest fires in Europe, Middle East and North Africa 2022," Publications Office of the European Union, 2023, https://data.europa.eu/doi/10.2760/348120.

7. "Greece Deforestation Rates & Statistics." Forest Monitoring, Land Use & Deforestation Trends, Global Forest Watch, www.globalforestwatch.org/dashboards/country/GRC/?category=fires&map=eyJjYW5Cb3VuZCI6dHJ1ZX0%3D. Accessed 8 Dec. 2023.

8. "Greece 8th National Communication." United Nations Framework Convention on Climate Change, Dec. 2022, https://unfccc.int/sites/default/files/resource/NC8_BR5_Greece.pdf

9. Kakissis, Joanna. "Climate Change Destroyed a Way of Life on the Once-Idyllic Greek Island of Evia." NPR, NPR, 11 Sept. 2021, https://www.npr.org/2021/09/11/1033718496/climate-change-forest-fires-greek-island-evia-greece.

10. "Europe Heatwave 2023: Extreme Heat Spirals into Wildfires." British Red Cross, 27 July 2023, www.redcross.org.uk/stories/disasters-and-emergencies/world/europe-heatwave-2023.

11. Menegaki, A.N., Tsounis, N. & Agiomirgianakis, G.M. "The economic impact of climate change (CC) on the Greek economy." Environment, Development, and Sustainability 24, 8145–8161 (2022). https://doi.org/10.1007/s10668-021-01776-4.

12. Kalabokidis, Kostas, et al. "Effect of climate change projections on forest fire behavior and values-at-risk in southwestern Greece." MDPI, vol. 6, no. 12, 19 June 2015, pp. 2214–2240, https://doi.org/10.3390/f6062214.

13. Karali, A., et al. "Sensitivity and evaluation of current fire risk and future projections due to climate change: The case study of Greece." Natural Hazards and Earth System Sciences, vol. 14, no. 1, 23 Jan. 2014, pp. 143–153, https://doi.org/10.5194/nhess-14-143-2014.

14. Liami, Olympia. "Fire Protection in Greece: What Is Missing?" PwC, www.pwc.com/gr/en/publications/greek-thought-leadership/fire-protection-in-greece.html. Accessed 7 Dec. 2023.

15. Palaiologou, Palaiologos et al. 2020. "Obstacles to improving wildfire risk governance in Greece." In: Hood, Sharon M.; Drury, Stacy; Steelman, Toddi; Steffens, Ron, eds. . Proceedings of the Fire Continuum-Preparing for the future of wildland fire; 2018 May 21-24; Missoula, MT. Proceedings RMRS-P-78. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 318-324. https://www.fs.usda.gov/research/treesearch/63236.

16. European Commission, Directorate-General for Research and Innovation, Vallejo Calzada, V., Faivre, N., Cardoso Castro Rego, F. et al., "Forest fires – Sparking firesmart policies in the EU," Faivre, N.(editor), Publications Office, 2018, https://data.europa.eu/doi/10.2777/181450.

17. Parliamentary Question: Answer for Question E-000986/23: E-000986/2023(ASW), European Parliament, 24 May 2023, www.europarl.europa.eu/doceo/document/E-9-2023-000986-ASW_EN.html.

18. Paris Agreement, United Nations Framework Convention on Climate Change, 2015, https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf.

19. "Greece: An Innovative Forest Fire Prevention Effort." International Forest Fire News (IFFN) No. 43, 2013, https://gfmc.online/wp-content/uploads/07-IFFN-43-Greece-2-1.pdf.

20. "Greece Plans Tougher Penalties for Arson Following Spate of Wildfires." PBS, Associated Press, 1 Aug. 2023, www.pbs.org/newshour/world/greece-plans-tougher-penalties-for-arson-following-spate-of-wildfires.

21. "Information on National Adaptation Actions Reported under the Governance Regulation: Greece." Climate Adapt, 31 Mar. 2023, https://climate-adapt.eea.europa.eu/en/countries-regions/countries/greece.

22. "Overview and Objectives." Adaptive Greece, The Ministry of Environment & Energy, www.adaptivegreece.gr/en-us/the-project/overview-objectives. Accessed 7 Dec. 2023. https://www.adaptivegreece.gr/en-us/the-project/overview-objectives.

23. Ganteaume, Anne, et al. "Understanding future changes to fires in southern Europe and their impacts on the wildland-urban interface." Journal of Safety Science and Resilience, vol. 2, no. 1, 2021, pp. 20–29, https://doi.org/10.1016/j.jnlssr.2021.01.001.

24. "Greece Wildfire Kills 18 Suspected Asylum Seekers in Dadia Region." Al Jazeera, Al Jazeera, 22 Aug. 2023, www.aljazeera.com/news/2023/8/22/greek-forest-fire-kills-18-suspected-asylum-seekers-in-dadia.

25. Townend, R., Aylett, C., & Benzie, M. "Cascading climate risks: strategic recommendations for European resilience." CASCADES report, 2023, https://www.cascades.eu/publication/cascading-climate-risks-strategic-recommendations-for-european-resilience/.

26. Lager, Frida, and Ana Calvo. "Q&A: Towards Just Resilience in Climate Adaptation in Europe: Can We Measure Progress?" SEI, 1 June 2023, www.sei.org/features/qa-towards-just-resilience-in-climate-adaptation-in-europe/.

27. Papadimas, Lefteris. "Angry Greeks Criticise Government Response after Wildfire Devastation." Reuters, Thomson Reuters, 9 Aug. 2021, www.reuters.com/world/europe/angry-greeks-criticise-government-response-after-wildfire-devastation-2021-08-09/.

28. Elton, Charlotte. "Greece Is Launching Drones to Tackle Future Wildfires." EuroNews, 1 Sept. 2023, www.euronews.com/green/2023/09/01/greece-turns-to-tech-to-tackle-wildfires-as-largest-ever-blaze-in-eu-continues-to-burn.

29. "California SB 926." LegiScan, Sept. 2022, www.legiscan.com/CA/text/SB926/id/2609473.

30. Jordan, Rob. "Empowering Private Landowners to Prevent Wildfires." Stanford News, Stanford University, 26 Sept. 2022, https://news.stanford.edu/2022/09/26/empowering-private-landowners-prevent-wildfires/.

31. Wills, Jennifer. "Battling Wildfires from behind the Scenes." Horizon Magazine, European Commission, 28 Oct. 2021, https://ec.europa.eu/research-and-innovation/en/horizon-magazine/battling-wildfires-behind-scenes.

32. Romo, Vanessa. "In California, Wildfires Are Prevented by Crews of Unlikely Firefighters: Goats." NPR, NPR, 10 Aug. 2023, https://www.npr.org/2023/08/10/1192905277/goat-grazing-california-wildfire-prevention.

33. Kampouris, Nick. "Greece Has the Largest Number of Goats in Europe." Greek Reporter, 28 Apr. 2022, https://greekreporter.com/2022/04/28/greece-has-largest-number-goats-per-capita-europe/.

34. Corona, P. et al. (2015). Integrated forest management to prevent wildfires under Mediterranean environments. Annals of Silvicultural Research, 39(1), 1–22. https://doi.org/10.12899/asr-946.

35. Butikofer, Abby, et al. "Taking the 'Wild' Out of Wildfire." The Center for Growth and Opportunity, Utah State University, 8 Nov. 2023, www.thecgo.org/benchmark/taking-the-wild-out-of-wildfire/.

36. Kelp, Makoto M., et al. "Prescribed Burns as a tool to mitigate future wildfire smoke exposure: Lessons for states and Rural Environmental Justice Communities." Earth's Future, vol. 11, no. 6, 2023, https://doi.org/10.1029/2022ef003468.

37. "Life Projects Aim to Reduce Deadly Forest Fires across Europe." European Climate, Infrastructure and Environment Executive Agency, European Commission, 22 Aug. 2023, https://cinea.ec.europa.eu/news-events/news/life-projects-aim-reduce-deadly-forest-fires-across-europe-2023-08-22_en.

38. Paveglio, Travis B., et al. "Understanding support for regulatory approaches to wildfire management

and performance of property mitigations on private lands." Land Use Policy, vol. 100, 2021, p. 104893, https://doi.org/10.1016/j.landusepol.2020.104893.

39. Jakes, Pamela et al. J. "Community wildfire protection planning: Is The Healthy Forests Restoration Act's vagueness genius?" International Journal of Wildland Fire, vol. 20, no. 3, 2011, p. 350, https://doi.org/10.1071/wf10038.

40. Paveglio, Travis, and Emma Kelly. "Influences on the adoption and implementation of a wildfire mitigation program in an Idaho City." Journal of Forestry, 2017, https://doi.org/10.5849/jof-2017-006.

41. Colonico, Mario, et al. "Rural Development Funding and wildfire prevention: Evidences of spatial mismatches with fire activity." Land Use Policy, vol. 117, 2022, p. 106079, https://doi.org/10.1016/j.landusepol.2022.106079.

42. Ojerio, Ryan, et al. "Limited involvement of socially vulnerable populations in federal programs to mitigate wildfire risk in Arizona." Natural Hazards Review, vol. 12, no. 1, 2011, pp. 28–36, https://doi.org/10.1061/(asce)nh.1527-6996.0000027.

43. "€10m European Funding Success for Wildfire Management Project." The James Hutton Institute, 17 May 2021, www.hutton.ac.uk/news/%E2%82%AC10m-european-funding-success-wildfire-management-project.

44. Ascoli, Davide, et al. "Fire-smart solutions for sustainable wildfire risk prevention: Bottom-up initiatives meet top-down policies under EU Green deal." International Journal of Disaster Risk Reduction, vol. 92, 2023, p. 103715, https://doi.org/10.1016/j.ijdrr.2023.103715.

45. Varela, Elsa, et al. "Targeted policy proposals for managing spontaneous forest expansion in the Mediterranean." Journal of Applied Ecology, vol. 57, no. 12, 2020, pp. 2373–2380, https://doi.org/10.1111/1365-2664.13779.

46. Palsa, Emily, et al. "Engagement in local and collaborative wildfire risk mitigation planning across the western u.s.—Evaluating participation and diversity in Community Wildfire Protection plans." PLOS ONE, vol. 17, no. 2, 2022, https://doi.org/10.1371/journal.pone.0263757.

47. Schmidt, Annie. "Re-Visiting Community Wildfire Protection Plans." Fire Adapted Communities Learning Network, 15 Mar. 2023, https://fireadaptednetwork.org/re-visiting-community-wildfire-protection-plans/.

48. "Mitigating Wildfire Vulnerability: A Community Success Story." U.S. Fire Administration, 16 July 2019, www.usfa.fema.gov/blog/ci-071619.html.

49. Boyland, M. et al. "A Framework for Transforming the Relationship Between Development and Disaster Risk." IRDR Working Paper Series, 2019, https://www.sei.org/publications/a-framework-for-transforming-the-relationship-between-development-and-disaster-risk/.

50. Parviainen, Janne. "Reimagining Disaster Risk Reduction to Cope with the New European Summer." SEI, 15 Aug. 2023, www.sei.org/perspectives/reimagining-disaster-risk-reduction/.