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Review

Green Firebreaks: Potential to Proactively Complement Wildfire Management

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Abstract

With increased wildfire risks and reduced suppression effectiveness, Green Firebreaks (GFBs) provide a proactive approach to fuel management. This literature review revealed diverse approaches to GFB design that generally involve establishing strips of low-flammability vegetation to slow fire spread and reduce fireline intensity. While GFB approaches may reduce fire spread and intensity by creating fuel discontinuities, empirical studies validating their effectiveness remain scarce. Comparing GFB techniques is challenging due to spatial and temporal complexity combined with inconsistent methods and terminology. Several researchers note that GFB effectiveness requires matching design with site conditions; they are not a stand-alone solution to the wildfire problem, and they are not suitable in all settings. A lack of consideration for trade offs may undermine the effectiveness of green firebreaks, particularly under extreme weather conditions. As climate change intensifies drought and heat, vegetation moisture content, which is critical to flammability, must be a key design factor, since even low flammability species can become fuel under extreme drought conditions. In addition, poorly designed GFB structures may unintentionally alter wind dynamics, increasing ember transport and fire spread rather than reducing it. There is a broad consensus in the literature that appropriately designed GFBs can complement wildfire management, while also providing additional benefits. To achieve their potential, research is required for GFB designs to be site-specific, responsive to trade-offs, and effective in providing multiple benefits under different climate change scenarios.

Keywords: wildfire management; wildland urban interface; green firebreaks

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1. Introduction

Climate change, particularly the warming and drying trends, is increasing fire weather and fire season length [1–3]. While fires play an important ecological role [4], ecosystem alterations induced by people often increase fire in the landscape [5], and the urban sprawl into fire-prone areas increases the disaster risk [6]. Emergency management seeks to mitigate, prepare for, respond to, and recover from disasters [7], including wildfires, which are considered any unplanned fires in wildland areas [8]. Wildfire management historically relied on proactive approaches, including the cultural and prescribed burns, but reactive firefighting approaches have recently received more attention and investment [9–11]. Given the intensification of fire weather and legacy challenges in fuel management, current wildfire response strategies may be inadequate for future large-scale fire events [12,13]. There is growing recognition of the need to shift from a predominantly reactive firefighting model toward more ecological and proactive wildfire management approaches [14,15].

Contemporary wildfire management is about finding a balance between the protection of people and ecosystems[16], where management interventions involve complex trade-offs that are difficult to comprehend [17]. Clearing vegetation in fuel breaks alters ecosystems and affects biodiversity, aesthetics, property values, and privacy [18] while incurring high maintenance costs, disturbing soils

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and increasing the risk of soil erosion [19–21]. The use of controlled burns for fuel reduction has a rich history [22,23] but requires stakeholder coordination and responsiveness to biodiversity and carbon emission concerns [24,25], and is constrained by financial costs and risks [26]. There are socio-political influences on wildfire management, with variable support for prescribed burning and firebreak clearing [27]. Consequently, alternative wildfire management strategies are needed [28], including integrated [29,30], systemic [31,32], and nature-based [33] approaches. Wildfire-resilient landscaping [34], and protection of riparian vegetation and rainforests are alternatives to clearing firebreaks [35], which can reduce wildfire risk.

Promoting bands of low-flammability vegetation as a green firebreak (GFB) may alleviate concerns and increase support, while enhancing landscape heterogeneity and reducing wildfire spread [36–39]. This paper reviews the literature on GFBs, which aim to proactively reduce wildfire risk by creating fuel discontinuities, and have been implemented in China for over seventy years [40]. The review emphasises the role of GFBs in complementing other approaches to wildfire management, especially in the Wildland Urban Interface (WUI), which are a high priority [41] due to increased vulnerability resulting from poor land use planning that has allowed development in fire-prone areas [42,43]. The goal of the review is to explore the potential for GFBs to complement wildfire management as they may also provide additional benefits, such as protecting food systems [44], improving air quality [45], and enhancing biodiversity, and carbon storage [46]. The review provides an overview of key GFB considerations for wildfire practitioners and decision-makers, particularly those considering proactive options to complement existing wildfire management practices.

2. Materials and Methods

This review of GFBs is based on peer-reviewed papers published between 2004 and 2024, as revealed by Google Scholar and Semantic Scholar. The literature search initially focused on the keywords Green Firebreaks, Green Fire Barriers, and Wildfire, which were combined using AND and OR search combinations. The initial review of titles and abstracts identified a few key publications, so search terms were broadened to include Green Barriers and Green Fuel Breaks. We also cross-checked citations in the identified literature to capture other relevant papers. Given the increased wildfire vulnerability of WUIs around the world, this setting was the primary focus, but, given the limited literature, all settings were included.

3. Results

GFBs are variously defined in the literature, representing a fuel management approach that typically involves the strategic placement of less flammable species [47–52], ecosystems [53–55] or land uses [44,56,57] to reduce fire spread and increase suppressibility. Rather than removing vegetation entirely, they alter vegetation flammability, thereby producing fuel discontinuities [58].

The 22 identified publications display the diversity of GFB approaches relevant to wildfire management as implemented in eight countries across four continents (Table 1). In general, GFBs are considered a complementary, rather than a stand-alone approach. The literature builds on and extends existing wildfire research, comprising ten literature reviews (L), ten field studies (F), and two studies that used simulation modelling (M). There is substantial overlap in the focus of these studies, with 14 of the 22 focusing on the flammability of different species, and 16 of the 22 focusing on fire behaviour and ecology. Spatially, the country setting is considered, with reference to both rural and urban landscape settings.

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Table 1. Overview of the 22 papers on green fire breaks (GFBs) reviewed in this study, ordered by year of publication. Each paper's location and approach (F for field experiment, L for literature study, and M for modelling study) are summarised.

Year 2004-24	Title (Citation)	Location	Approach (Field/ Model/Literature)	Species Flammability	Fire Behaviour & Ecology
2005	New technology for fuel breaks and **Green Strips** in urban interface and wildland areas. [59]	USA	S	X	X
2012	Forest hydrology, soil conservation and **green barriers** in Canary Islands.[53]	Canary Islands, Spain	L	X	X
2013	Evaluation of the flammability of trees and shrubs used in the implementation of **green barriers** in Southern Brazil [47]	Brazil	F	X	
2014	Implementation of the " cypress system " as a **green firewall**. Project CypFire. [54]	Spain	F, L	X	X
2015	Possible **land management** uses of common cypress to reduce wildfire initiation risk: a laboratory study. [56]	Spain	F	X	
2018	Managing fire and biodiversity in the Wildland Urban Interface: A role for **Green Firebreaks**. [44]	Global	L		X
2018	Selecting low-flammability plants as **Green Firebreaks** within sustainable urban garden design. [48]	Australia	F	X	
2018	Can air quality management drive **sustainable fuels management** at the temperate Wildland Urban Interface? [45]	Australia & Canada	L		X
2019	**Green Firebreaks** as a management tool for wildfires: Lessons from China. [40]	China	L	X	X
2019	Relationship among leaf flammability attributes and identifying **low-leaf flammability species** in the Wildland Urban Interface. [49]	Australia	F	X	
2020	An integrated approach to identify low-flammability plant species for **Green Firebreaks**. [50]	Australia	F	X	X
2020	**Fire & biodiversity** in the Anthropocene **[5]**	Global - China	L		X
2020	**Pyrophysiology** and wildfire management. [58]	Europe	L		X
2020	Low flammability plants of the Cerrado for **Green Fire Break**. [51]	Brazil	F	X	
2021	Flammability of urban ornamental species for use in **Green Firebreaks**. [52]	Brazil	F	X	
2021	Ecological techniques for wildfire mitigation: Two distinct **fuelbreak approaches** and their fusion.	China	L		X
2021	The design of **green firebreaks** in Portugese forest: a case study of Alferce, Monchique. [60]	Portugal	L		X

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2022	Fighting fire with food: Assessing the flammability of crop plant species for building **fire resilient agro-forestry systems**. [57]	Australia	F	X	X
2024	Refining **ecological techniques for forest fire prevention** and evaluating their diverse benefits. [61]	USA & China	L		X
2024	Measuring flammability of crops, pastures, fruit trees, and weeds: A **novel tool to fight wildfires** in agricultural landscapes. [62]	New Zealand	F	X	X
2024	Predicting the **integrated fire resistance** of Wildland Urban Interface plant communities by spatial structure analysis for Shanghai, China. [63]	China	F	X	X
2024	Can **green firebreaks** help balance biodiversity, carbon storage and wildfire risk? [46]	Australia	S		X
Summary	Twenty-two papers	8 countries – 4 continents	F=11 L=10 M=2	14	16

GFBs are generally considered a fuel management approach designed to contribute to the development of fire-resistant landscapes[46]. The GFB literature emphasises strips of low-flammability species planted at strategic locations to reduce fire spread, extinguish embers, or block radiant heat [44,45]. There is an emphasis on strategic placement to decrease fire spread and enhance suppressibility [53,55]. GFBs can take diverse forms, including ecosystems dominated by less fire-prone vegetation [48], linear plantings of low-ignitability species, such as *Cupressus sempervirens* ,56], low-flammability crops [57,62], and even ornamental gardens [48,52]. China is a global leader, with 364,000 km of GFB planted for low-cost and biodiversity-friendly wildfire management [40]. The GFB literature identifies specific considerations around flammability, fire behaviour and ecology, which are outlined below.

3.1. Flammability

Much of the reviewed GFB literature identifies vegetation and species flammability as key considerations [47–49,62], including one variety of *Cupressus sempervirens* [56], two ornamental species [52], 47 mixed species [62], 60 native species [49], and 66 agricultural crops [57]. The literature draws on a larger pool of existing flammability research, including approaches, such as fuel load [44], rate of spread, forest fuel ignitability [48], flammability values [47], critical heat flux [51] and a combustion index [53]. The flammability terminology includes ignitability, combustibility, sustainability, and consumability [52], with considerations for fuel volume, fire spread (vertical and horizontal), litter production, bark type, and ember production [44]. A leaf flammability index was also used to rank species [45]. Some of the literature also noted a lack of consistency in defining and measuring flammability [49] and a need for standardised measurement protocols to facilitate comparisons across species and regions [44].

Flammability is a highly complex trait influenced by multiple factors, including timing. The literature highlights the role of temporal variables, such as time to ignition [47], ignition duration, and fire frequency [52]. In some cases, ignition timing was prioritised over combustion intensity in flammability classification. For example, two ornamental species were classified as weakly flammable due to their slow ignition times, despite exhibiting high combustion intensity[52]. For agricultural species, flammability predictors include maximum temperature, burn time, biomass, and specific leaf traits [57]. In the context of GFBs, key indicators include both physical properties such as moisture content and total aboveground biomass, and chemical properties such as the emission of volatile organic compounds[51]. A case in point is *C. sempervirens*, a Mediterranean species noted for

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its low flammability, high leaf moisture content, compact growth habit, and low biomass [54]. However, the literature also notes trade offs among flammability traits. For example, species with leaves that ignite slowly may sustain combustion for longer periods, whereas those that ignite quickly often burn faster and for shorter durations [49].

Appropriate species for GFBs were described as needing to meet changing ecological, silvicultural, and economic requirements [40], with plantings responsive to reduced flammability traits, topography and changing climatic conditions [46]. Across the literature, fuel moisture content is consistently highlighted as a key factor influencing flammability. It is well established that both live and dead fuels become less flammable as moisture content increases [47]. Species with low moisture content and rapid moisture loss are generally considered unsuitable for GFBs [48,55,62]. However, under extreme conditions, even typically low flammability vegetation can become combustible [40], an observation, which raises questions and is worthy of further empirical research [44].

3.2. Fire Behaviour and Ecology of GFBs

Wildfire spread is reduced by GFBs with the appropriate design, species selection, installation, and management [55]. In the Canary Islands, for example, there is an emphasis on site planning for GFB [53], and a fire-resilient forest landscape design in Portugal incorporates the use of GFBs [60]. GFB effectiveness in slowing or stopping fire spread is also influenced by soil microorganisms and fungi that enhance decomposition, thereby reducing fuel loads [40]. Researchers note that mosaics of less flammable crops may serve as GFBs [62]. Field research on GFBs across 21 WUI sites near Shanghai, China, documents the fire resistance of plant communities [63]. PHOENIX RapidFire simulations from Australia indicate that GFBs can reduce wildfire risks in low to moderate fuel areas, but their effectiveness requires location-specific designs that consider climate, landscape contexts, and asset locations [46].

GFB location should reflect the effects of topography and associated winds on fire behaviour to alter fuel continuity, block wind, absorb heat, and stop flames [40]. Given that fires burn faster uphill than downhill, and that valleys can funnel winds, GFBs may work best on steeper slopes or narrow valleys [55], as well as on the tops and at the bottoms of ravines [53]. For example, GFBs with *C. sempervirens* in the Mediterranean utilise linear plantations with staggered spacing to create a dense screen effect in strategic locations such as valleys, ravines, and WUIs [54]. Low-flammability species can be planted in multiple rows [56] with variable height strata [48] to build up vegetation structures, mitigate fire spread [45], and promote horizontal and vertical fuel discontinuities [47,54]. Recommended distances between rows of dense vegetation range from 2-25 m [45,48] or 60 m, and evenas far as embers blow [40].

GFBs are reportedly also created through the manipulation of forest stands with cooler and moister understory microclimates, which decrease flammability by reducing surface fuels and understory branches [55]. Other vegetation adjustments can result in reduced wind and evaporation, creating more fire-resistant forests [63]. Researchers in China noted that although closed canopies foster less flammable understory microclimates, some canopy species are more flammable, and burn hotter, for longer, and more completely than some groundcover and shrub species [55]. Importantly, they observed that dense plantings can inadvertently increase wind speeds and thereby enhance ember transport [40], thus presenting a potential trade-off.

While wildfire management is the priority, GFBs can also have numerous other ecological, silvicultural, and economic effects [40], such as non-fire benefits for soil conservation [53] , agriculture [57], air quality [45], and biodiversity [46,48,51]. For example, GFBs in the Canary Islands are known to intercept fog, thereby enhancing their effectiveness as firebreaks and contributing to local hydrology [58]. Compared to other fuel treatments in China, GFBs with evergreen broad-leaved trees offer long-term ecological and environmental benefits by maintaining fire-resistant landscapes, which enhance forest health, promote biodiversity, and reduce firefighting costs [55]. Research in Australia, using a Bayesian Network (BN) analysis combined with fire simulations on the PHOENIX

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RapidFire platform, showed GFBs can increase biodiversity and carbon storage without substantially increasing fire risks; however, these results await field tests [46].

The diverse approaches to GFBs described in the literature indicate substantial complexity but often a lack of empirical data [44] and only limited consideration of trade-offs. A comparison of different ecological techniques for forest fire prevention, which included dense plantings, found no trade-offs [55]. Another paper specifically noted concerns that dense vegetation increases wind speeds and ember dispersal, and also raised concerns that under the right conditions, any vegetation can become fuel [40]. Most GFB research identifies the potential to complement wildfire management approaches, potentially reducing wildfire spread and intensity, while providing co-benefits [46]. While there is potential for trade-offs, GFBs are worth further consideration as a proactive approach to wildfire management.

4. Discussion

Wildfires are natural hazards that are often not considered disasters until they impact people and infrastructure [64]. There has been a reactive bias in disaster management, and the overreliance on suppression may only serve to defer wildfire risks [65], which may render them too intense to suppress when they do occur [66,67]. Within this context, there are growing concerns about the effectiveness of wildfire management and calls for innovation [12], including increased investment in proactive approaches [15]. People are especially vulnerable to wildfires in the WUI [68] where there are constraints on prescribed burning and clearing. In this context, a growing pool of literature identifies GFBs as a proactive approach to wildfire management. This review reveals that existing literature suffers from a lack of empirical evidence [44], and limited consideration of potential trade-offs [40]. While limitations are acknowledged, the existing literature does offer insights into the potential for GFB to complement wildfire mitigation, preparation, response and recovery.

4.1. Wildfire Mitigation:

GFBs utilise less flammable species, ecosystems, and land uses to mitigate wildfires by altering the continuity of fuel [44,47–58]. The WUI is noted as being vulnerable to wildfire [69], including a growing risk of infrastructure loss [70] . The strategic siting of GFBs can reduce fire spread and support fire suppression [48,60], providing a living barrier with increased shade and moisture that reduces radiant heat and the likelihood of ember ignition. As an innovative and emerging strategy for wildfire management [5], there is a growing body of guides, reports, and policies about GFBs [71–74]. Alarmingly, like the academic literature, this grey literature often overlooks the potential trade-offs associated with GFBs. Relying solely on lists of low-flammability species, without accounting for spatial layout, topography, and seasonal fire risk, may create a false sense of security regarding GFB effectiveness. In addition, the literature also highlighted that selecting species for low flammability may carry unintended trade offs, as these traits are also influenced by environmental variables [75]. Under climate change scenarios, droughts are predicted to increase [76], and this may alter flammability [77], so maintaining water for GFBs is an important consideration to ensure they enhance wildfire mitigation and prevent vegetation from becoming fuel [40,78–80].

4.2. Wildfire Preparation:

Community preparation, through the establishment and management of GFBs in the WUI, has the potential to mitigate wildfire risks and strengthen engagement in wildfire management, where it is typically limited [81]. While poor urban planning has induced increased wildfire risks in the WUI [42], green and adaptive designs [82], including GFBs, could reduce those risks, helping communities be better prepared. Providing options may better support responsiveness to different preferences for wildfire management between emergency responders and homeowners [83]. For example, while firebreak clearing and controlled burns may receive limited community support [27], GFBs may be preferred by the surrounding community because they promote biodiversity and landscape values

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that attract people [35], while still complementing the embedded reactive responses [84]. In any event, the implementation of GFBs can build on community engagement in urban revegetation, where revegetation managers work with fire managers [46], promoting shared responsibility for managing landscapes in ways that better prepare for and reduce wildfire risk [85].

4.3. Wildfire Response:

As wildfires become larger and more intense, the effectiveness and timeliness of existing response tools, including evacuation and shelter-in-place strategies, are increasingly being questioned [12,86]. The current emphasis on reactive disaster cycles of response and recovery [84] may be more effective with investments in mitigation [11]. Landscapes with intentional planning, placement, and ongoing maintenance of GFBs can alter fire behaviour and reduce fire spread [45] by establishing networks of firebreaks that reflect species traits, site-specific considerations and protection priorities [54]. In areas already vulnerable to wildfires, the choice often lies between retreating from high-risk zones or investing in effective wildfire management strategies [87]. Although GFBs are not suitable in all settings, they can extend the window for wildfire response by reducing or delaying fire spread, intensity, and ember attack [46]. The FireSmart work in Europe provides a vision for how more integrated wildfire management can complement wildfire response through suppression by building on various strengths and weaknesses [88]. In this context, GFB provides a proactive, nature-based option that, while not a stand alone response, can enhance and support existing wildfire response systems.

4.4. Wildfire Recovery:

Just as anthropogenic drivers such as climate change, land use, and invasive species create novel ecosystems that are more prone to fire [5], GFBs can engage people in the process of modifying ecosystems to become less fire-prone [43], and hazard resilient [89]. The GFB approach represents an opportunity to promote recovery through ecological communities by creating microclimates, supporting wildlife, and delivering soil benefits that contribute to reduced flammability [55]. They may also offer fire refugia [74] and serve as drought refuges, enhancing biodiversity resilience [90] and carbon storage [45,46]. In addition to the ecological benefits, GFBs can support a productive landscape through the integration of low-flammability crops [57,62] and place-based strategies that connect people, land use, and biodiversity [5]. Ecosystem-based GFB approaches to wildfire management may be a fire-regulating ecosystem service, a concept rarely considered in the wildfire literature [91], but one with the potential to enhance wildfire recovery and coexistence.

4.5. Future Research Directions:

Looking ahead, there may also be opportunities to integrate GFB actions with relevant proactive strategies for Cascading Hazards [92] and Urban Heat Islands [93], through Green Infrastructure [94] and adaptive water management [95], enhancing recovery and resilience. As a more integrated approach to wildfire mitigation in the WUI, GFBs can make use of urban wastewater for irrigation [96–98], potentially reducing drought intensity and fire risks while promoting water reuse and a multitude of co-benefits. Strategically placed GFBs may also support landscape heterogeneity, which in turn supports wildfire management.

5. Conclusion

Wildfires are complex hazards that call for a range of solutions. In the face of increasingly intense wildfires and reduced capacity to suppress them, it is timely to overcome reactionary biases. This paper reviewed literature on GFBs to consider them as a wildfire management option, and identified their site-specific potential to enhance wildfire mitigation, preparation, response and recovery. Appropriately designed and located GFBs can proactively complement wildfire management, increasing fuel discontinuity to reduce fire spread and intensity in the short term, while enhancing

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community engagement, biodiversity, and carbon storage for longer-term benefits. The existing literature offers limited discussion of potential trade-offs. For instance, while structural vegetation changes may reduce wind speed, inadequate attention to water availability could undermine GFB performance under future climate conditions. With predictions for hotter, drier conditions, irrigating GFBs may strengthen their effectiveness in complementing wildfire management. For the vulnerable WUI, GFBs may be a strategic wildfire management option, especially where it is possible to consistently irrigate through urban water reuse. We conclude from our literature review that GFB designs will be enhanced by acknowledging and mitigating trade-offs, while reflecting spatial, temporal, and socio-ecological conditions, including societal preferences. While not suitable in all settings, GFBs could play a strategic role in more integrated wildfire management, offering both direct and indirect benefits for the present and the future.

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References

1. Abram, N. J.; Henley, B. J.; Gupta, A. S.; Lippmann, T. J. R.; Clarke, H.; Dowdy, A. J.; Sharples, J. J.; Nolan, R. H.; Zhang, T.; Wooster, M. J.; et al. Connections of climate change and variability to large and extreme forest fires in southeast Australia. *Communications Earth & Environment* **2021**, *2* (8), 1-17. DOI: 10.1038/s43247-020-00065-8.
2. Halofsky, J. E.; Peterson, D. L.; Harvey, B. J. Changing wildfire, changing forests: the effects of climate change on fire regimes and vegetation in the Pacific Northwest, USA. *Fire Ecology* **2020**, *16* (4). DOI: 10.1186/s42408-019-0062-8.
3. Jan Van Oldenborgh, G.; Krikken, F.; Lewis, S.; Leach, N. J.; Lehner, F.; Saunders, K. R.; Van Weele, M.; Haustein, K.; Li, S.; Wallom, D.; et al. Attribution of the Australian bushfire risk to anthropogenic climate change. *Natural Hazards and Earth System Sciences* **2021**, *21* (3), 941-960. DOI: 10.5194/NHESS-21-941-2021.
4. Whelan, R. J. *The Ecology of Fire*; Cambridge University Press, 1995.
5. Kelly, L. T.; Giljohann, K. M.; Duane, A.; Aquilué, N.; Archibald, S.; Batllori, E.; Bennett, A. F.; Buckland, S. T.; Canelles, Q.; Clarke, M. F.; et al. Fire and biodiversity in the Anthropocene. *Science* **2020**, *370* (6519). DOI: 10.1126/science.abb0355.
6. Gonzalez-Mathiesen, C.; Ruane, S.; March, A. Integrating wildfire risk management and spatial planning – A historical review of two Australian planning systems. *International Journal of Disaster Risk Reduction* **2021**, *53*, 101984. DOI: 10.1016/j.ijdrr.2020.101984.
7. Daniel Suarez, C. G., Andrés L. Medaglia, Raha Akhavan-Tabatabaei, Sthefania Grajales. Integrated Decision Support for Disaster Risk Management: Aiding Preparedness and Response Decisions in Wildfire Management. *INFORMS - Information Systems Research* **2024**, *35*, 609-628. DOI: DOI: 10.1287/isre.2022.0118, .
8. Tedim, F.; Leone, V. The Dilemma of Wildfire Definition: What It Reveals and What It Implies. *Frontiers in Forest and Global Change* **2020**, *3*, Original Research. DOI: 10.3389/ffgc.2020.553116.
9. Pyne, S. J. *World Fire: The culture of fire on earth*; University of Washington Press, 1997.
10. Gammage, B. *The Biggest Estate on Earth: How Aborigines made Australia*; Allen & Unwin, 2012.
11. APC. Natural disaster funding arrangements: Productivity Commission inquiry report. Commission, P., Ed.; Australian Government: Canberra, 2015.
12. Nolan, R. H.; Bowman, D. M. J. S.; Clarke, H.; Haynes, K.; Ooi, M. K. J.; Price, O. F.; Williamson, G. J.; Whittaker, J.; Bedward, M.; Boer, M. M.; et al. What Do the Australian Black Summer Fires Signify for the Global Fire Crisis? *Fire* **2021**, *4* (4). DOI: 10.3390/fire4040097.

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13. Collins, K. M.; Price, O. F.; Penman, T. D. Suppression resource decisions are the dominant influence on containment of Australian forest and grass fires. *Journal of Environmental Management* **2018**, *228*, 373-382. DOI: 10.1016/j.jenvman.2018.09.031.
14. Ingalsbee, T. Whither the paradigm shift? Large wildland fires and the wildfire paradox offer opportunities for a new paradigm of ecological fire management. *International Journal of Wildland Fire* **2017**, *26*, 557-561. DOI: 10.1071/WF17062.
15. Lacey, L. M.; Suraci, J. P.; Littlefield, C. E.; Busse, B. S.; Dickson, B. G. Informing proactive wildfire management that benefits vulnerable communities and ecological values. *People and Nature* **2024**, *7* (1), 52-66. DOI: 10.1002/pan3.10733.
16. Moritz, M. A.; Batllori, E.; Bradstock, R. A.; Gill, A. M.; Handmer, J.; Hessburg, P. F.; Leonard, J.; McCaffrey, S.; Odion, D. C.; Schoennagel, T.; et al. Learning to coexist with wildfire. *Nature* **2014**, *515* (7525), 58-66. DOI: 10.1038/nature13946.
17. Hamilton, M.; Salerno, J.; Fischer, A. Cognition of complexity and trade-offs in a wildfire-prone social-ecological system. *Environmental Research Letters* **2019**, *14*. DOI: 10.1088/1748-9326/ab59c1.
18. Gibbons, P.; Gill, A. M.; Shore, N.; Moritz, M. A.; Dovers, S.; Cary, G. J. Options for reducing house-losses during wildfires without clearing trees and shrubs. *Landscape and Urban Planning* **2018**, *174*, 10-17. DOI: 10.1016/j.landurbplan.2018.02.010.
19. Venn, T. J.; Quiggin, J. Early evacuation is the best bushfire risk mitigation strategy for south-eastern Australia. *The Australian Journal of Agricultural and Resource Economics* **2017**, *61* (3), 481-497. DOI: 10.1111/1467-8489.12215.
20. Saco, P. M.; McDonough, K. R.; Rodriguez, J. F.; Rivera-Zayas, J.; Sandi, S. G. The role of soils in the regulation of hazards and extreme events. *Philosophical Transactions of the Royal Society B: Biological Sciences* **2021**, *376* (1834), 20200178. DOI: 10.1098/rstb.2020.0178 (acccessed 2023/08/19).
21. DETSI. Science Notes: Erosion control on fences and firebreaks. Department of Environment, T., Science and Innovation, Ed.; Queensland Government: Brisbane, 2018.
22. Smith, W.; Neale, T.; Weir, J. K. Persuasion without policies: The work of reviving Indigenous peoples' fire management in southern Australia. *Geoforum* **2021**, *120*, 82-92. DOI: 10.1016/J.GEOFORUM.2021.01.015.
23. Morgan, G. W.; Tolhurst, K. G.; Poynter, M. W.; Cooper, N.; McGuffog, T.; Ryan, R.; Wouters, M. A.; Stephens, N.; Black, P.; Sheehan, D.; et al. Prescribed burning in south-eastern Australia: history and future directions. *Australian Forestry* **2020**, *83* (1), 4-28. DOI: 10.1080/00049158.2020.1739883.
24. Altangerel, K.; Kull, C. A. The prescribed burning debate in Australia: conflicts and compatibilities. *Journal of Environmental Planning and Management* **2013**, *56* (1), 103-120. DOI: 10.1080/09640568.2011.652831.
25. Florec, V.; Burton, M.; Pannell, D.; Kelso, J.; Milne, G. Where to prescribe burn: the costs and benefits of prescribed burning close to houses. *International Journal of Wildland Fire* **2019**, *29* (5), 440-458. DOI: 10.1071/WF18192.
26. Bowman, D. M. J. S. Explainer: back burning and fuel reduction. *The Conversation* **2014**, *38*. DOI: 10.1111/J.1365-2699.2011.02524.X.
27. Thapa, S. B.; Jenkins, J. S.; Westerling, A. L. Perceptions of wildfire management practices in a California wildland-urban interface. *Environmental Advances* **2023**, *12*. DOI: 10.1016/j.envadv.2023.100382.
28. Penman, T. D.; Collins, L.; Price, O. F.; Bradstock, R. A.; Metcalf, S.; Chong, D. M. O. Examining the relative effects of fire weather, suppression and fuel treatment on fire behaviour - A simulation study. *Journal of Environmental Management* **2013**, *131*, 325-333. DOI: 10.1016/j.jenvman.2013.10.007.
29. Metlen, K.; Fairbanks, T.; Bennett, M.; Volpe, J.; Kuhn, B.; Thompson, M.; Thrailkill, J.; Schindel, M.; Helmbrecht, D. S.; Borgias, D. Integrating forest restoration, adaptation and proactive fire management: Rogue River Basin case study. *Canadian Journal of Forest Research* **2021**, *51* (9), 1292-1306. DOI: 10.1139/cjfr-2020-0480.
30. Oliveras Menor, I.; Prat-Guitart, N.; Spadoni, G. L.; Hsu, A.; Fernandes, P. M.; Puig-Gironès, R.; Ascoli, D.; Bilbao, B. A.; Bacciu, V.; Brotons, L.; et al. Integrated fire management as an adaptation and mitigation strategy to altered fire regimes. *Communications Earth & Environment* **2025**, *6* (1), 202. DOI: 10.1038/s43247-025-02165-9.

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31. Thompson, M. P.; MacGregor, D. G.; Dunn, C. J.; Calkin, D. E.; Phipps, J. Rethinking the Wildland Fire Management System. *Journal of Forestry* **2018**, *116* (4), 382-390. DOI: 10.1093/JOFORE/FVY020.
32. Kirschner, J. A.; Clark, J.; Boustras, G. Governing wildfires: toward a systematic analytical framework. *Ecology and Society* **2023**, *28* (2). DOI: 10.5751/ES-13920-280206.
33. Herbert, C.; Haya, B. K.; Stephens, S. L.; Butsic, V. Managing nature-based solutions in fire-prone ecosystems: Competing management objectives in California forests evaluated at a landscape scale. *Frontiers in Forest and Global Change* **2022**, *5*, 210. DOI: 10.3389/FFGC.2022.957189.
34. Blanchi, R., Warren, G., Opie, K., Leonard, J., March, A., Holland, M., Ollington, B. Best Practice Design for Building in Bushfire Prone areas in Victoria. CSIRO, Ed.; CSIRO: Australia, 2021; Vol. 2.
35. Ingalsbee, T. After the Greenfire Revolution: Reimagining Collective Identities of the Future Wildland Fire Workforce in a Paradigm Shift for Ecological Fire Management. *Fire* **2024**, *7* (7). DOI: 10.3390/fire7070211.
36. Hand, M. S.; Thompson, M. P.; Calkin, D. E. Examining heterogeneity and wildfire management expenditures using spatially and temporally descriptive data. *Journal of Forest Economics* **2016**, *22*, 80-102. DOI: 10.1016/j.jfe.2016.01.001.
37. Burrows, N.; Stephens, C.; Wills, A.; Densmore, V. Fire mosaics in south-west Australian forest landscapes. *International Journal of Wildland Fire* **2021**, *30* (12), 933-945. DOI: 10.1071/WF20160.
38. Murray, B. R.; Hawthorne, T.; Curran, T. J.; Krix, D. W.; Wallace, M. I.; Young, K.; Murray, M. L.; Morley, E.; Huber-Smith, N.; Webb, J. K. Shoot flammability patterns among plant species of the wildland–urban interface in the fire-prone Greater Blue Mountains World Heritage Area. *International Journal of Wildland Fire* **2023**, *32* (7), 1119-1134. DOI: 10.1071/WF22192.
39. Calviño-Cancela, M.; Chas-Amil, M. L.; García-Martínez, E. D.; Touza, J. Wildfire risk associated with different vegetation types within and outside wildland-urban interfaces. *Forest Ecology and Management* **2016**, *372*, 1-9. DOI: 10.1016/j.foreco.2016.04.002.
40. Cui, X.; Alam, M. A.; Perry, G. L. W.; Paterson, A. M.; Wyse, S. V.; Curran, T. J. Green firebreaks as a management tool for wildfires: Lessons from China. *Journal of Environmental Management* **2019**, *233*, 329-336. DOI: 10.1016/J.JENVMAN.2018.12.043.
41. Mell, W. E.; Manzello, S. L.; Maranghides, A.; Butry, D.; Rehm, R. G. The wildland-urban interface fire problem - Current approaches and research needs. *International Journal of Wildland Fire* **2010**, *19*, 238-251. DOI: 10.1071/WF07131.
42. Lohm, D.; Davis, M. Between bushfire risk and love of environment: preparedness, precariousness and survival in the narratives of urban fringe dwellers in Australia. *Health, Risk and Society* **2015**, *17* (5-6). DOI: 10.1080/13698575.2015.1109614.
43. Cova, T. J.; . Public Safety in the Urban–Wildland Interface: Should Fire-Prone Communities Have a Maximum Occupancy? **2005**, *6*, 99-108. DOI: 10.1061/(ASCE)1527-6988(2005)6:3(99).
44. Curran, T. J.; Perry, G. L. W.; Wyse, S. V.; Alam, M. A. Managing fire and biodiversity in the wildland-urban interface: A role for green firebreaks. *Fire* **2018**, *1*, 1-3. DOI: 10.3390/FIRE1010003.
45. Bowman, D. M. J. S.; Daniels, L. D.; Johnston, F. H.; Williamson, G. J.; Jolly, W. M.; Magzamen, S.; Rappold, A. G.; Brauer, M.; Henderson, S. B. Can Air Quality Management Drive Sustainable Fuels Management at the Temperate Wildland–Urban Interface? *Fire* **2018**, *1* (2), 27. DOI: 10.3390/fire1020027.
46. Marshall, E.; Holyland, B.; Parkins, K.; Raulings, E.; Good, M. K.; Swan, M.; Bennett, L. T.; Penman, T. D. Can green firebreaks help balance biodiversity, carbon storage and wildfire risk? *Journal of Environmental Management* **2024**, *369*, 122183. DOI: 10.1016/j.jenvman.2024.122183.
47. Batista, A. C.; Biondi, D.; França, A.; Tetto, R. d. A.; Tres, A.; Costa, R.; Travenisk, C.; Kovalsyki, B. Evaluation of the flammability of trees and shrubs used in the implementation of green barriers in southern Brazil. In *Proceedings of the Fourth International Symposium on Fire Economics, Planning, and Policy: Climate Change and Wildfires. Gen. Tech. Rep. PSW-GTR-245. González-Cabán, Armando, tech. coord*, 2013; Vol. 245, pp 256-264.
48. Murray, B. R.; Martin, L. J.; Brown, C.; Krix, D. W.; Phillips, M. L. Selecting Low-Flammability Plants as Green Firebreaks within Sustainable Urban Garden Design. *Fire* **2018**, *1* (1). DOI: 10.3390/FIRE1010015.

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Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 21 July 2025 doi:10.20944/preprints202507.1674.v1

49. Krix, D. W.; Phillips, M. L.; Murray, B. R. Relationships among leaf flammability attributes and identifying low-leaf-flammability species at the wildland-urban interface. *International Journal of Wildland Fire* **2019**, *28*, 295-297. DOI: 10.1071/WF18167.
50. Murray, B. R.; Brown, C.; Murray, M. L.; Krix, D. W.; Martin, L. J.; Hawthorne, T.; Wallace, M. I.; Potvin, S. A.; Webb, J. K. J. F. An Integrated Approach to Identify Low-Flammability Plant Species for Green Firebreaks. *Fire* **2020**, *3* (2). DOI: 10.3390/fire3020009.
51. Souza, M. L. A. Low Flammability Plants Of The Cerrado For Green Fire Break. *BioBrasil* **2020**, *10* (Special Issue: 7th International Wildland Conference). DOI: 10.37002/biodiversidadebrasileira.v10i1.1502.
52. Lucas, F.; Kovalsyki, B.; Jacobs, R.; Tetto, A.; Batista, A. Flammability of urban ornamental species for use in green firebreaks. *Biodiversidade Brasileira - BioBrasil* **2020**, 65. DOI: 10.37002/biobrasil.v10i1.1548.
53. Santamarta-Cerezal, J. C.; Guzmán, J.; Neris, J.; Arraiza, M. P.; Ioraș, F. Forest Hydrology, Soil Conservation and Green Barriers in Canary Islands. *Notulae Botanicae Horti Agrobotanici Cluj-napoca* **2013**, *40* (2), 09-13. DOI: 10.15835/nbha4028310.
54. Della Rocca, G.; Danti, R.; Raddi, P.; Moya, B.; Moya, J. J. F. M. Implementation of the «cypress system» as a green firewall. Project CypFire. *Foret Mediterraneenne* **2014**, *35* (3), 275-280.
55. Wang, H. H.; Finney, M. A.; Song, Z. L.; Wang, Z. S.; Li, X. C. Ecological techniques for wildfire mitigation: Two distinct fuelbreak approaches and their fusion. *Forest Ecology and Management* **2021**, *495*. DOI: 10.1016/j.foreco.2021.119376.
56. Della Rocca, G.; Hernando, C.; Madrigal, J.; Danti, R.; Moya, J.; Guijarro, M.; Pecchioli, A.; Moya, B. Possible land management uses of common cypress to reduce wildfire initiation risk: a laboratory study. *Journal of Environmental Management* **2015**, *159*, 68-77. DOI: 10.1016/j.jenvman.2015.05.020.
57. Pacheco, A. S.; Goodman, H. D.; Hankenson, L.; Fisk, J. J.; Ortiz, A.; Marinace, H. M.; Bischoff, E. A.; Holman, V. F.; Love, S. M.; Apgaua, D. M. G.; et al. Fighting fire with food: Assessing the flammability of crop plant species for building fire resilient agroforestry systems. *Research Square* **2022**. DOI: 10.21203/rs.3.rs-2357569/v1.
58. Dios, V. R. d. Pyrophysiology and Wildfire Management. In *Plant-Fire Interactions: Applying Ecophysiology to Wildfire Management*, Springer Nature Link, 2020; pp 155-175.
59. Vollmer, J. L. New Technology for Fuel Breaks and Green Strips in Urban Interface and Wildland Areas. In *Eighth International Wildland Firefighter Safety Summit- Human Factors - 10 Years Later;*, Missoula, MT, 26-28 April 2005, 2005; Butler, B. W., Alexander, M. E., Eds.; The International Association of Wildland Fire.
60. Chifa, D. The design of green firebreaks in Portuguese forest: a case study of Alferce, Monchique. **2021**.
61. Wang, H.; Zhang, K.; Qin, Z.; Gao, W.; Wang, Z. Refining Ecological Techniques for Forest Fire Prevention and Evaluating Their Diverse Benefits. *Fire* **2024**, *7* (4), 129. DOI: 10.3390/fire7040129.
62. Pagadala, T.; Alam, M. A.; Maxwell, T. M.; Curran, T. J. J. S. o. t. t. e. Measuring flammability of crops, pastures, fruit trees, and weeds: A novel tool to fight wildfires in agricultural landscapes. *Science of The Total Environment* **2024**, *906*, 167489. DOI: 10.1016/j.scitotenv.2023.167489.
63. Yao, M.; Zhang, D.; Zhu, R.; Zhang, Z.; Elsadek, M. Predicting the Integrated Fire Resistance of Wildland–Urban Interface Plant Communities by Spatial Structure Analysis Learning for Shanghai, China. *Forests* **2024**, *15* (7), 1266. DOI: 10.3390/f15071266.
64. Blaikie, P., Cannon, T., Davis, I., & Wisner, B. . *At Risk: Natural Hazards, People's Vulnerability and Disasters*; Routledge., 2004.
65. Kreider, M. R.; Higuera, P. E.; Parks, S. A.; Rice, W. L.; White, N.; Larson, A. J. Fire suppression makes wildfires more severe and accentuates impacts of climate change and fuel accumulation. *Nature Communications* **2024**, *15* (1), 2412. DOI: 10.1038/s41467-024-46702-0.
66. Wotton, B. M.; Flannigan, M. D.; Marshall, G. A. Potential climate change impacts on fire intensity and key wildfire suppression thresholds in Canada. *Environmental Research Letters* **2017**, *12*. DOI: 10.1088/1748-9326/AA7E6E.
67. Plucinski, M. *Review of aerial suppression effectiveness research literature: Why fly? How do we know that aerial firefighting operations are effective and efficient*; 45; Natural Hazards Research Australia, 2025.

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Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 21 July 2025 doi:10.20944/preprints202507.1674.v1

68. Guo, Y.; Wang, J.; Ge, Y.; Zhou, C. Global expansion of wildland-urban interface intensifies human exposure to wildfire risk in the 21st century. *Science Advances* **2024**, *10* (45). DOI: 10.1126/sciadv.ado9587 From NLM.
69. Mutch, R. W.; Rogers, M. J.; Stephens, S. L.; Gill, A. M. Protecting Lives and Property in the Wildland-Urban Interface: Communities in Montana and Southern California Adopt Australian Paradigm. *Fire Technology* **2011**, *47*, 357-377. DOI: 10.1007/S10694-010-0171-Z/FIGURES/4.
70. Naser, M. Z.; Kodur, V. Vulnerability of structures and infrastructure to wildfires: a perspective into assessment and mitigation strategies. *Natural Hazards* **2025**, *121* (8), 9995-10015. DOI: 10.1007/s11069-025-07168-5.
71. Lucas, C.; Williamson, G.; Bowman, D. Bushfire Preparedness and Risk Reduction in Hobart Pilot Study 2019 Final Report. **2019**.
72. CSIRO. Bushfire Resilient Building Guidance for Queensland Homes. Queensland Government: Brisbane, 2020.
73. Warnell, K., Mason, S., Siegle, A., Merritt, M., & Olander, L. *Green Firebreaks: A DOI Nature-based Solutions Roadmap Fact Sheet*; Nicholas Institute for Energy, Environment & Sustainability, Duke University, Durham, NC, 2023.
74. Maxwell, T.; Curran, T.; Carpenter, L.; Alam, A.; Pagadala, T.; Mason, N.; Wyse, S.; Perry, G.; Cui, X. Nature-based Solutions for Fire Suppression: Green firebreaks, low-flammability foods and planting fire micro-refugia. In *9th International Fire Ecology and Management Congress*, Virtual, 2021; Lincoln University.
75. Krix, D. W.; Murray, B. R. Landscape variation in plant leaf flammability is driven by leaf traits responding to environmental gradients:. *Ecosphere* **2018**, *9*. DOI: 10.1002/ECS2.2093.
76. Dai, A. Increasing drought under global warming in observations and models. *Nature Climate Change* **2013**, *3*, 52-58. DOI: 10.1038/NCLIMATE1633.
77. Alessio, G. A.; Peñuelas, J.; De Lillis, M.; Llusià, J. Implications of foliar terpene content and hydration on leaf flammability of Quercus ilex and Pinus halepensis. *International Journal of Wildland Fire* **2008**, *10*, 123-128. DOI: 10.1111/J.1438-8677.2007.00011.X.
78. Grootemaat, S.; Wright, I. J.; van Bodegom, P. M.; Cornelissen, J. H. C.; Cornwell, W. K. Burn or rot: Leaf traits explain why flammability and decomposability are decoupled across species. *Functional Ecology* **2015**, *29* (11), 1486-1497. DOI: 10.1111/1365-2435.12449.
79. Cui, X.; Alam, M. A.; Perry, G. L.; Paterson, A. M.; Wyse, S. V.; Curran, T. J. Green firebreaks as a management tool for wildfires: Lessons from China. *Journal of Environmental Management* **2019**, *233*, 329-336. DOI: 10.1016/J.JENVMAN.2018.12.043.
80. Grootemaat, S.; ; Wright, I. J.; ; van Bodegom, P. M.; ; Cornelissen, J. H. C.; ; Cornwell, W. K.; . Burn or rot: leaf traits explain why flammability and decomposability are decoupled across species. **2015**, *29*, 1486-1497. DOI: 10.1111/1365-2435.12449.
81. Copes-Gerbitz, K.; Dickson-Hoyle, S.; Ravensbergen, S. L.; Hagerman, S. M.; Daniels, L. D.; Coutu, J. Community Engagement With Proactive Wildfire Management in British Columbia, Canada: Perceptions, Preferences, and Barriers to Action. *Frontiers for Global Change* **2022**, *5*. DOI: 10.3389/ffgc.2022.829125.
82. Lambrou, N.; Kolden, C.; Loukaitou-Sideris, A.; Anjum, E.; Acey, C. Social drivers of vulnerability to wildfire disasters: A review of the literature. *Landscape and Urban Planning* **2023**, *237*, 104797. DOI: 10.1016/j.landurbplan.2023.104797.
83. McCaffrey, S.; McGee, T. K.; Coughlan, M.; Tedim, F. 8 - Understanding wildfire mitigation and preparedness in the context of extreme wildfires and disasters: Social science contributions to understanding human response to wildfire. In *Extreme Wildfire Events and Disasters*, Tedim, F., Leone, V., McGee, T. K. Eds.; Elsevier, 2020; pp 155-174.
84. Mourao, P. R.; Martinho, V. D. Forest fire legislation: Reactive or proactive? *Ecological Indicators* **2019**, *104*, 137-144. DOI: 10.1016/j.ecolind.2019.04.080.
85. McLennan, B. J.; Handmer, J. Reframing responsibility-sharing for bushfire risk management in Australia after Black Saturday. *Environmental Hazards* **2012**, *11* (1), 1-15. DOI: 10.1080/17477891.2011.608835.

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86. McCaffrey, S.; Rhodes, A.; Stidham, M. Wildfire evacuation and its alternatives: perspectives from four United States' communities. *International Journal of Wildland Fire* **2014**, *24* (2), 170-178. DOI: 10.1071/WF13050.
87. McConnell, K.; Koslov, L. Critically assessing the idea of wildfire managed retreat. *Environmental Research Letters* **2024**, *19* (4), 041005. DOI: 10.1088/1748-9326/ad31d9 From NLM.
88. Regos, A.; Campos, J. C.; Lecina-Diaz, J.; Pais, S.; Sil, Â.; Cánibe-Iglesias, M.; Freitas, T.; Aquilué, N.; Gonçalves, J.; Carvalho-Santos, C.; et al. Final Report of the FirESmart -Nature-based solutions for preventive fire management and sustained supply of ecosystem services. **2023**. DOI: 10.5281/ZENODO.7829308.
89. Burby, R. J.; Deyle, R. E.; Godschalk, D. R.; Olshansky, R. B. Creating hazard resilient communities through land-use planning. *Natural hazards review* **2000**, *1* (2), 99-106. DOI: 10.1061/(ASCE)1527-6988(2000)1:2(99.
90. Driscoll, D. A.; Macdonald, K. J.; Gibson, R. K.; Doherty, T. S.; Nimmo, D. G.; Nolan, R. H.; Ritchie, E. G.; Williamson, G. J.; Heard, G. W.; Tasker, E. M.; et al. Biodiversity impacts of the 2019–2020 Australian megafires. *Nature* **2024**. DOI: 10.1038/s41586-024-08174-6.
91. Depietri, Y.; Orenstein, D. E. Fire-Regulating Services and Disservices With an Application to the Haifa-Carmel Region in Israel. *Frontiers in Environmental Science* **2019**, *7*, 107. DOI: 10.3389/FENVS.2019.00107/BIBTEX.
92. Kemter, M.; Fischer, M.; Luna, L. V.; Schönfeldt, E.; Vogel, J.; Banerjee, A.; Korup, O.; Thonicke, K. Cascading Hazards in the Aftermath of Australia's 2019/2020 Black Summer Wildfires. *Earth's Future* **2021**, *9*. DOI: 10.1029/2020EF001884.
93. Yenneti, K.; Ding, L.; Prasad, D.; Ulpiani, G.; Paolini, R.; Haddad, S.; Santamouris, M. Urban Overheating and Cooling Potential in Australia: An Evidence-Based Review. *Climate* **2020**, *8*, 126. DOI: 10.3390/CLI8110126.
94. Ying, J.; Xiaojing, Z.; Yiqi, Z.; and Bilan, S. Green infrastructure: systematic literature review. *Economic Research-Ekonomska Istraživanja* **2022**, *35* (1), 343-366. DOI: 10.1080/1331677X.2021.1893202.
95. Gawne, B.; and Thompson, R. Adaptive water management in response to climate change: the case of the southern Murray-Darling Basin. *Australasian Journal of Water Resources* **2023**, *27* (2), 271-288. DOI: 10.1080/13241583.2023.2181844.
96. Lee, K.; Jepson, W. Drivers and barriers to urban water reuse: A systematic review. *Water Security* **2020**, *11*. DOI: 10.1016/J.WASEC.2020.100073.
97. Chung, P.-W.; Livesley, S. J.; Rayner, J. P.; Farrell, C. Greywater irrigation can support climbing plant growth on building green façades. *Urban Forestry & Urban Greening* **2021**, *62*, 127119. DOI: 10.1016/j.ufug.2021.127119.
98. Filali, H.; Barsan, N.; Souguir, D.; Nedeff, V.; Tomozei, C.; Hachicha, M. Greywater as an Alternative Solution for a Sustainable Management of Water Resources—A Review. *Sustainability* **2022**, *14* (2), 665.

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