Care in a Flammable World: Wildfire Risk Management and Learning to Live (better) with Fire

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Declaration

I declare that this thesis has been composed by myself and that the work has not been submitted for any other degree or professional qualification. I confirm that the work presented is my own, except where work that formed part of jointly authored publications has been included. In such cases, my individual contribution and those of the co-authors have been clearly indicated below.

The paper presented in Chapter 3, titled ’Paper One: Critical geographies of disaster, and the geographical imagination’ was previously published as Donovan, A., Hall, T.E., Morin, J., Smith, C. and Walshe, R. (2024), Critical geographies of disaster, and the geographical imagination, Progress in Environmental Geography, doi: 10.1177/27539687241276540. I was a co-author of this article. The following co-authors contributed to this publication: Professor Amy Donovan, Dr Julie Morin, Carolyn Smith and Dr Rory Walshe. My primary contribution included the conceptualisation and writing on care, while the other authors contributed to the conceptualisation and writing on geographical imaginations. All authors reviewed, improved and approved the final manuscript. All authors gave written permission for the paper to be included within this thesis.

Tilly E. Hall
June 2025

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Abstract

This thesis explores the kinds of care that make life possible in an increasingly flammable world. Focusing on Sonoma County, California – an epicentre of the intensifying wildfire crisis in the Western United States – it asks: What does it mean to approach wildfire risk management through care? What forms does care take in wildfire risk management? How is care being mobilised, sustained, or withheld as people learn to live (better) with fire and fire-prone landscapes? And what happens when we take care seriously as a way of navigating and enduring such unsettled conditions?

Building on feminist and post-humanist care theorists, I move beyond associations of care as feminised, domestic, unpaid, or low-paid labour, or as confined to moments of disaster response or recovery. Across six research papers, I examine how care surfaces in wildfire risk management activities, everyday rhythms, and long-term efforts to coexist with fire and landscapes that burn. I show how care emerges through varied temporalities, materialities, participants, affects, and practices – many of which are not (always) visible, proximate, remunerated, human, or emotionally expressive. While these surfacings of care are not without complexity, tension, or ambivalence, I argue that care is central to how life is navigated, sustained, and held onto amid the uncertainties of an increasingly flammable world.

This thesis is grounded in six months of ethnographic fieldwork in Sonoma County. I employed a methodology combining participant observation, storytelling interviews, photo go-alongs and document analysis to attune to the mundane, ordinary, and often overlooked relations of care. Throughout, I approached research as an act of care in itself – rejecting detachment in favour of being entangled, implicated, and at stake in the fiery world I was researching. I listened, observed, participated, questioned, responded, and remained attuned and responsible in ways shaped by care. Recognising that caring research does not end in the field, I also analyse, write, and present this thesis – with care – opening space for visual data, narrative experimentation, and the centring of participant voice.

Ultimately, this thesis argues for care not as a moral or sentimental ideal, but as a vital, contested, and often under-recognised force shaping how people live (better) with fire and landscapes that burn. Care is central to making communities safer, reducing wildfire risk, minimising disruption to everyday life, and building toward more liveable, flourishing futures in the face of the wildfire crisis.

Acknowledgments

This research was conducted in Sonoma County, on the unceded ancestral lands of the Southern Pomo and Coast Miwok peoples, who are today united as the Federated Indians of Graton Rancheria. I acknowledge the ongoing presence, knowledge, and contributions of Native and Indigenous peoples – not only in the past, but in the present and future. Many Southern Pomo and Coast Miwok people continue to live within their ancestral lands, carrying forward their culture, knowledge and traditions for generations to come.

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Contents

Prologue

Figure 1. Smokey Bear Poster circulated by the United States Forest Service circa 1944. Source: U.S. National Archives and Records Administration / Wikimedia Commons

I begin with a circa 1944 United States Forest Service poster. A bear, clad in trousers and wearing a ranger's hat, pours a bucket of water onto a fire. His eyes are soft with concern, and his gesture is calm and corrective. The bear knows what to do. The flames shrink beneath his hand, smoke curling upward as the fire surrenders. Below, bold orange letters declare: **Care <u>will</u> prevent 9 out of 10 woods fires!** The message is clear, commanding, and hopeful.

This is Smokey Bear, the enduring icon of American wildfire risk management. Created in the 1940s from a confluence of wartime propaganda, conservationist ambition, and the expanding ideology of fire control, he embodies a particular vision of care: fire is a threat, the forest is a resource to protect, and every individual in the United States must take responsibility. In Smokey's world, care is straightforward: see the fire, suppress the fire.

But today, I argue, this world looks very different.

Wildfire has returned – ferocious, frequent, and unruly – across the Western United States. They have swept through neighbourhoods and wildlands alike, bringing catastrophic loss, ecological transformation, and profound disruptions to everyday life. The idea that fire can simply be prevented, controlled, or extinguished has frayed. In this new reality, fire is not only a catastrophe to be managed but a force to be lived with. And care is not just a bucket of water. It is something slower, stranger and still unfolding.

To begin this thesis with Smokey Bear, then, is not to affirm his message but to trouble it – it is to ask, what other kinds of care are being taken as we navigate life in an increasingly flammable world?

1. Introduction

In this thesis, I explore the care involved in navigating, sustaining and holding onto life in an increasingly flammable world. I approach this through ethnographic research in Sonoma County, California, a region at the epicentre of the escalating wildfire crisis across the Western United States. While care is often associated with the feminine, the private, and face-to-face encounters that typically emerge in disaster response and recovery, my research seeks to move beyond these associations. It traces the diverse and often unexpected ways that care surfaces: in the movement of grazing sheep, in the ping of an emergency alert, in the clearing of vegetation, and in the first seasonal downpour of rain. These moments demonstrate how care underpins the ways communities in fire-prone regions understand, manage, and live with wildfire. This thesis stays with these surfacings of care, attending to their entanglement with different temporalities, materialities, participants, affects, and practices, and exploring how they sustain life in an already burning region.

As this thesis explores what kinds of care is taken to navigate an increasingly flammable world, it focuses on wildfire risk management as a critical site where care unfolds. Wildfire risk management encompasses a wide array of strategies, activities, and phenomena aimed at reducing the likelihood, severity, and impacts of wildfire. Guided by the recognition that wherever there is relation, there must be care (Puig de la Bellacasa, 2012, 2017; Tronto, 1993), this thesis approaches wildfire risk management as a more-than-human entanglement in which care circulates. Rather than recognising wildfire risk management as solely a securitisation, techno-managerial endeavour, I reclaim it as a world where care is produced, mediated, and encountered. I ask: who and what cares and is cared for? How does care take form? When is care enacted? And how is care encountered? Through engaging with these questions, I demonstrate how care weaves through the many relations and activities that constitute wildfire risk management, making life in a fire-prone landscape feel possible.

Recognising care "holds the possibility...of facilitating new ways of being together" (Conradson, 2011, p. 454), this thesis also explores the care being taken in efforts to live with fire and flammable landscapes. I focus, first, on how individuals and communities in Sonoma County live seasonally, and second, on the practice of prescribed burning, where people intentionally set fires to support ecological health and reduce wildfire risk. By tracing these responses, this thesis demonstrates how care is being mobilised to cultivate new relationships with more-than-humans, sustain everyday coordination, and navigate the ongoing uncertainties of wildfire and the wider climate crisis. While this care is not without tension, it nonetheless signals a vital commitment to living better with fire and landscapes that burn.

Throughout this thesis, I experiment with what it means to do caring and care-full research. From the outset of this research, I drew on feminist ethics of care, asking why I cared about fire, risk management, and California and what responsibilities that care demands of me. I sought to research (with) care, developing a methodology that combines participant observation, storytelling interviews, go-alongs, and document analysis, all designed to remain close to the textures of everyday life with care. Each method created space for me, as a

researcher, to be drawn into this caring world – to be entangled in it, implicated, and at stake. Being attuned to care required observation and participation: to attend, to listen, to be responsible, to move, to respond, and to be accountable to those involved in the research. I also approached analysis and research communication with care, considering how to represent the research ethically and meaningfully, while attending to its potential legacies and how to conclude research well. At the same time, I recognise that care is neither straightforward nor innocent – it can be messy, partial, and fraught with tensions. This thesis, therefore, illustrates that caring research is an ongoing, co-constituted, and imperfect practice that warrants our commitment.

This thesis by papers comprises six research papers, each written for different journals across human geography and disaster studies. While each paper can be read independently, collectively they form a cohesive argument about care in an increasingly fiery world. In this introductory chapter, I demonstrate how these papers connect and complement one another to create a unified thesis. First, I summarise four overarching areas of scholarship that this thesis departs from yet continually engages with. I then outline my research aim and objectives, which guide and structure the entire thesis and its exploration of care within wildfire risk management. Next, I situate the research within the societal context of Sonoma County, California, a region that has faced multiple catastrophic wildfires in the past decade. Building on this, I describe my methodological approach to researching care in wildfire risk management, which was also guided by a commitment to researching *with* care and understanding research *as* care. Finally, I provide an overview of the thesis structure through summaries of each of the six research papers, followed by a brief outline of the concluding chapter, where I argue that care is essential to sustaining wildfire risk management and life in an increasingly flammable world.

1.1. Fiery, disaster, care(ing) research

As the world becomes increasingly flammable and dominated by disasters – and risk management struggles to keep pace – scholars across the social sciences have sought to make sense of life amid uncertainty, tension, and ongoing crises. Yet within this rich and diverse body of work, care has rarely been placed at the centre. In this thesis, I draw together insights from various strands of scholarship to think differently about care, wildfire risk management, and what it means to live in increasingly fire-prone landscapes. Four distinct but overlapping areas of scholarship have been particularly significant in shaping my approach: fire geographies, critical geographies of disaster, feminist and post-humanist theories of care and scholarship on caring research. What follows is a snapshot of how these bodies of literature inform the trajectory of this thesis, each engaged with, taken up, and at times departed from across the six research papers presented subsequently.

1.1.1. Fire geographies

Within this thesis, my understanding of fire as a more-than-human force entwined with ecological, social, cultural and historical trajectories, and the ways it is managed and lived with draws heavily on insights from fire geographies. This body of scholarship has been

instrumental in evidencing the profound ways fire shapes our everyday lives. This includes our reliance on fire-powered technologies, such as combustion engines, which compress time and space (Pyne, 2001, 2021); the harnessing of fire to shape and transform urban environments (Clark and Yusoff, 2014; Pyne, 2001); fire's role as a powerful symbol and tool in acts of protest and social resistance (Kuhlken, 1999; Kull, 2002); Indigenous peoples' centring of fire as sacred through their burning practices (Martinez *et al.*, 2023; Tynan, 2021); and fire's vital ecological function in regenerating and sustaining landscapes (Lake and Christianson, 2019; Pyne, 2015). I argue that through this scholarship, we can begin to grasp the extent to which fire is deeply embedded in our worlds. As Pyne (2009, p. 443) wrote "we are a uniquely fire creature on a uniquely fire planet" so intertwined with fire that he proposes the current geological epoch might best be termed the Pyrocene (Pyne, 2022).

Within fire geographies, the increasing frequency of destructive wildfires, the complexities of wildfire risk management, and fire's essential role in ecosystem processes have emerged as central topics of intense debate. These discussions are further complicated by the increasingly pressing relationship between fire and accelerating climate change (Ayres *et al.*, 2016). Scholars have emphasised that the wildfire crisis – also referred to as "the worldwide wildfire problem" by Gill et al. (2013, p. 438) and "the continued wildfire dilemma" by Essen et al. (2023, p. 909) – cannot be (re)solved through dominant techno-managerialist approaches that seek simple answers to complex problems (Asiyanbi and Davidsen, 2023; Beggs and Dalley, 2023; Essen *et al.*, 2023; Neale, 2016, 2018; Sutherland, 2019). At the centre of this debate lies a vexed question regarding wildfire risk management approaches, particularly concerning the effectiveness, complexities, and tensions of fire suppression, Indigenous fire practices, and prescribed burning in reducing the risk and impacts of future wildfires (e.g., Beggs and Dalley, 2023; Eriksen and Hankins, 2014; Sloan Morgan and Burr, 2024; Sutherland, 2019). Collectively, scholars engaged in these debates highlight wildfire risk management as a politically and ethically charged endeavour, deeply entangled with ongoing socio-cultural tensions (e.g., ibid; Buizer and Kurz, 2016; Sloan Morgan and Burr, 2024; Vinyeta, 2022; Williams, 2014). This thesis situates itself within scholarship that makes clear wildfire risk management remains embedded in histories of colonialism, ecological transformation, and social struggle. Drawing also on O'Grady's (2018) analysis of fire governance within the UK Fire and Rescue Service, this thesis build upon an understanding that fire management is co-constituted through entanglements with more-than-humans (e.g., digital technologies, materials) and shaped by practices and logics that are lived, negotiated, and continually reworked in the everyday operations of risk management organisations responding to both routine and emerging emergencies.

Research in fire geographies has also increasingly focused on efforts to live (better) with fire and landscapes that burn (Eriksen, 2024; Howitt, 2014; Moritz *et al.*, 2014; Williams, 2014). For example, scholars have examined the reintroduction of Indigenous fire stewardship practices (Adlam *et al.*, 2022), adaptations in workforce strategies to address extended fire seasons (Eriksen, 2024) and a shift in emphasis from emergency response and recovery towards proactive preparedness and resilience (de Vet *et al.*, 2019). Together, this work underscores that knowing and learning to coexist with fire relies equally on experiential insights and

embodied practices as on intellectual knowledge (Eriksen, 2024; Williams, 2014). Recognising that living with fire demands tacit knowledges and bodily engagement, this thesis foregrounds care as central to such efforts: sustaining, nurturing, and repairing vital relationships between humans and more-than-human forces like fire. Drawing from and further developing this research, this thesis considers how care is enacted as a vital component of learning to live (better) with fire and fire-prone landscapes.

1.1.2. Critical geographies of disaster

This thesis also builds upon previous work at the intersection of critical disaster studies and human geography – what others have termed critical geographies of disaster. This work advocates for a critical geography of disasters that foregrounds the relationships, power dynamics and value systems that shape how disasters are produced, perceived, or managed in specific places (e.g., Donovan, 2017; Gaillard and Mercer, 2013; Grove, 2014a; McGowran and Donovan, 2021; O'Grady, 2018; O'Grady and Shaw, 2023; Sou, 2022; Sou and Howarth, 2023). To advance this critical perspective, some scholars have drawn on assemblage theory to conceptualise disaster and risk management (Angell, 2014; Donovan, 2017; Grove, 2012; McGowran, 2024; McGowran and Donovan, 2021). Within assemblage theory, disasters and their management are understood as the actualisation of one possible future among many, emerging through the dynamic interplay of expressive and material components (McGowran and Donovan, 2021). As Donovan (2017, p. 51) explains, disaster (risk management) assemblages are "characterised by complex ideas, physical processes, physical-human interactions (e.g. via affect and imagination), human cultures and technologies" all shaped by historically and spatially uneven distributions of power. While this research has richly conceptualised disaster risk management assemblages as objects of study and begun to explore how research itself must adapt within such dynamic, relational settings, this thesis considers how researchers can more fully implement assemblage thinking into practice by grounding such work through feminist ethics of care scholarship.

A small number of critical disaster scholars have begun attending to care in disaster contexts. As Alburo-Cañete (2024, p. 16) notes, care in these settings is often expressed through "acts of maintaining community life, ensuring the well-being of populations, and sustaining or repairing nature and the environment." Most of this scholarship focuses on disaster response and recovery efforts, including mutual aid collectives (Hobart and Kneese, 2020; Spade, 2020), grassroots initiatives like 'Tradies for Fire Affected Communities' (Carr, 2023), land stewardship practices (West *et al.*, 2018) and cultural traditions like "Bayanihan" in the Philippines, which foster communal solidarity during times of crisis (Ramalho, 2021, p. 856). While practices of care have been celebrated for their transformative potential, "allow[ing] communities to live through hardship" (Hobart and Kneese, 2020, p. 10), critical disaster geographers have also been attentive to the complexities, ambivalences, and uneven burdens that often accompany such practices. For example, de Vet et al. (2021) examine how the loss of home contents after the 2013 Blue Mountains bushfires disrupted daily routines and strained parents' capacity to care, intensifying emotional labour and impacting their well-being. Moreover, care in disaster settings is frequently framed as a "feminized gendered practice"

(Ramalho, 2021, p. 859) that "most often falls to women" (Sims et al., 2009, p. 312). As documented in post-Yolanda recovery, the instrumentalisation of women's care work can intensify their productive, reproductive, and emotional labour without improving their social status, economic security, or shifting gendered power relations. Rather, this "feminization of responsibility" in community recovery often depletes women's time and well-being while reinforcing structural inequalities (Alburo-Cañete, 2024, p. 11).

Building on Alburo-Cañete (2024, p. 13) call to challenge "the confinement of care to women" in disaster contexts and my own concerns about how care is often narrowly associated with the feminine, the private, and face-to-face encounters in disaster response and recovery, this thesis opens up space to consider how disasters and their management generate multiple, entangled matters of concern that invite care in diverse and distributed forms. If, as Anderson (2017, p. 465) suggests, an event is named a disaster when "urgent, time-limited action is deemed necessary to forestall, stop or otherwise affect some kind of undesired future," then perhaps central to the very notion of disaster is the idea that something cared about is under threat. Without care, would an event even register as a disaster, or might it pass without generating affective or practical response? In this light, care may be understood not as peripheral but as foundational to any attempt to act in relation to disaster. This framing, I suggest, opens fertile ground for rethinking the relations, temporalities, materialities, participants, affects, and practices that constitute disaster risk management. Critical disaster (and emergency) geographers offer valuable resources to anchor this rethinking. For example, Anderson's (2010) work on logics of anticipatory action – pre-emption, precaution and preparedness – provides a useful framework to consider how different forms of care for the future operate in disaster settings. Similarly, key concepts from critical geographies of disaster – such as, vulnerability, resilience, and resistance (Donovan, 2017; Grove, 2012; Sou, 2022) – not only support inquiry into care but may themselves be transformed when viewed through a care-centred lens. Building on this foundation, this thesis explores how people live with, and sometimes flourish amid, uncertainty and ongoing crises through care.

1.1.3. Feminist and post-humanist theories of care

Care is a slippery concept. As Martin et al. (2015, p. 625) warn, "any attempt to define it will be exceeded by its multivocality in everyday and scholarly use." Care is vital but also vexed, essential to the everyday sustainability of life, yet notoriously difficult to pin-down, grasp, or clearly define (Martin *et al.*, 2015; Murphy, 2015; Puig de la Bellacasa, 2017; The Care Collective, 2020). For this reason, I draw upon feminist and post-humanist care theorists who centre care as a messy but necessary relational practice to develop a conceptual framework of care that weaves throughout much of this thesis.

Feminist and post-humanist care theorists have been foundational to my conceptualisation of care as an essential affective state, an ethico-political commitment and a material doing (Puig de la Bellacasa, 2012, 2017). As an affective state, care(ing) is embodied and involves "intellectual and emotional competencies" (van Dooren, 2014, p. 291). When someone says, *"I care,"* they express attentiveness and concern, and signal receptivity, vulnerability and

relational involvement (Puig de la Bellacasa, 2017). To care, then, is to be inquisitive and open to being affected by another; it is to be at stake with them in some way (van Dooren, 2014; Puig de la Bellacasa, 2017; Tronto, 1993). As an ethical obligation, care involves "becom[ing] subject to another" (van Dooren, 2014, p. 291), recognising others' claims on us and responding with accountability and responsibility. These obligations are not always freely chosen but arise from the conditions of interdependence and shared vulnerability (Puig de la Bellacasa, 2017; The Care Collective, 2020; Tronto, 1993). As a practical labour, care(ing) demands more than recognising a need ("caring about", attentiveness) or being willing to respond ("taking care", responsibility); it requires concrete acts of "care giving" (competence) (Tronto, 1993, p. 127). These actions may not always stem from ethical or affective dispositions (Puig de la Bellacasa, 2017), but what matters is that they that "maintain, continue, and repair 'the world' so that all can live in it as well as possible" (Puig de la Bellacasa, 2017, p. 161, modifying Tronto, 1993, p. 103). This understanding of care as the concrete work of maintenance, with ethical and affective implications, and as a vital politics in entangled, interdependent worlds is central to the conception of care this thesis engages. It is by holding together this "triptych notion of care" (Puig de la Bellacasa, 2017, p. 218) that this thesis can explore the "as well as possible" (Puig de la Bellacasa, 2017, p. 161; Tronto, 1993, p. 103) relations that sustain life and more-than-human entanglements.

While feminist care theorists have primarily focused on human-to-human relations – importantly emphasising women's undervalued and invisible care work (Gilligan, 1884; Tronto, 1993) – recent scholarship has begun to challenge this anthropocentric framing and the "reductionist notions of care as exclusively women's work or (emotional) labour in the service of needy others" (Buser and Boyer, 2021, p. 74). Post-humanist scholars, notably in Science and Technology Studies but also increasingly in Geography, have drawn attention to "unnatural alliances" (Puig de la Bellacasa, 2017, p. 80) and more-than-human entanglements that constitute caring worlds (Buser *et al.*, 2020; Buser and Boyer, 2021; Conradson, 2003a; Lonkila, 2021; Schrader, 2015; Waight and Boyer, 2018). These scholars reframe care not as a uniquely human capacity but as a relational force that flows across human and more-than-human agencies and entities. For example, soil (Puig de la Bellacasa, 2015), baby things (Waight and Boyer, 2018), community drop-in centres (Conradson, 2003a), water (Buser *et al.*, 2020) and water infrastructure (Buser and Boyer, 2021) may lack ethical or affective intentions but are nonetheless part of the production, mediation, and circulation of care. Inspired by this small but growing body of scholarship, I seek to think of care beyond human exclusivity and to expand understandings of care as a relational practice involving a complex entanglement of humans and more-than-humans.

Throughout this thesis, I also draw on care scholars who have intensely worked to demonstrate that caring is a complex, compromised, and deeply political practice (e.g., Martin *et al.*, 2015; Murphy, 2015; The Care Collective, 2020). Collectively, this body of work highlights how care can exhaust, exploit, and entrap, especially when its burdens disproportionately fall on marginalised bodies: those who are gendered, racialised, or precariously employed, and whose labour often goes unrecognised or unsupported (Conradson, 2003b; Cox, 2013; Power and Hall, 2018; Power and Williams, 2020). Care harms, coerces and reproduces inequalities by

reinforcing existing power relations (Martin *et al.*, 2015; Murphy, 2015). This perpetuation of power relations is also evident in how care operates as "a selective mode of attention" (Martin *et al.*, 2015, p. 627), where caring cherishes certain lives, needs, and phenomena, while others are neglected or excluded. Yet care remains vital. Not because it is pleasant or innocent – indeed, as Puig de la Bellacasa (2012, p. 197) cautions, caring cannot guarantee a "smooth harmonious world" – but because it opens up spaces of action and reflection for "a quenching of parched relationalities, a cultivating of fertile futurities, [and] healing through radical vulnerability" (Sultana, 2022, p. 2). Care foregrounds the often-invisible conditions of life: maintenance, vulnerability, interdependence, and responsibility (Cook and Trundle, 2020; Held, 2006; The Care Collective, 2020; Tronto, 1993). This thesis, then, aims to stay with care: acknowledging not only its potential and possibilities but also reclaiming it from idealised meanings by attending to its ambivalences, tensions, and burdens. I do this by asking, who cares, and who doesn't? What is cared for, and what isn't? When is care being mobilised, withheld, or denied? What counts as care, and what gets excluded? And how else might care be practiced?

1.1.4. Scholarship on caring research

Feminist ethics of care has provided a guiding thread throughout this research, shaping not only its focus, but also how I think about and carry out the research itself. Building on scholarship that recognises care does not begin and end in the field, feminist ethics of care has served as an anchor throughout this research and thesis: grounding my choices in what to study, how I became connected to the research, the manner in which I conducted fieldwork, analysed and represented findings, considered the potential legacies of the research, and approached its conclusion in a carefully considered way (Brannelly *et al.*, 2022a; Brannelly and Barnes, 2022a; Puig de la Bellacasa, 2012).

Feminist ethics of care emphasises reflexivity in research practice and a critical attentiveness to the relationships, power dynamics, and responsibilities that arise between those involved (Brannelly and Barnes, 2022b; Edwards and Mauthner, 2012; Lonkila, 2021). This work rejects the notion of 'value-free' research, positioning the researcher not as a neutral observer or interpreter but as an active and accountable participant (Lonkila, 2021; Puig de la Bellacasa, 2012). Care, as a research practice, has been seen to include, attending to voice (Brannelly *et al.*, 2022b; Gilligan, 1884), acknowledging responsibilities to others and ourselves (Edwards and Mauthner, 2012; Eriksen, 2017), responding to the needs and desires of others (Brannelly, 2018; Brannelly *et al.*, 2022c), and fostering ongoing relationships (Brannelly *et al.*, 2022b; Brannelly and Barnes, 2022a; Edwards and Mauthner, 2012). Much of this scholarship has focused on care within the researcher-researched relationship. While this provides an important foundation upon which this research builds, it also raises a concern: care is too often framed as a one-way offering from researcher to participant. Yet, as care scholars have emphasised, care is always a "shared accomplishment" (Conradson, 2003a, p. 508), inherently relational, co-produced, and multidirectional. Despite this, existing scholarship on caring research tends to give limited attention to how care flows from participants or how it is mutually constituted in practice. This thesis responds to

that gap by attending to care as something that emerges collaboratively within the research encounter, mutually developed and sustained through the relationships between those involved.

Acknowledging that those involved in or affected by research are not always human, I also found it valuable to draw on (predominantly geographical) scholarship that centres care in working with and alongside non- and more-than- humans (Adams-Hutcheson, 2019; Brice, 2014; Haraway, 2016; Lonkila, 2021; Phillips, 2020; Pitt, 2018; Puig de la Bellacasa, 2017). In this body of work, non- and more- than-human others are not treated as passive objects or mere backdrops to human action, but as agential participants in the worlds research engages. This scholarship calls for a decentring of the human subject and argues for making space for non- and more-than-human entities – such as cows (Adams-Hutcheson, 2019; Lonkila, 2021), pigeons (Haraway, 2016), bees (Phillips, 2020), and weather (Adams-Hutcheson, 2019) – to influence the research process and unsettle its assumptions. It encourages researchers to remain responsive to the rhythms, needs, and disruptions of these entities, allowing them to redirect research. While these accounts often resist prescriptive methods, they advocate for cultivating more-than-human "response-ability" (Haraway, 2016, p. 105) in attending and responding to others in research (Lonkila, 2021). As demonstrated throughout this thesis, I respond to this call by actively attending to and making space for more-than-human beings in my research. This has involved recognising their stake in both the research and the world, and developing my capacity to respond attentively and ethically to their presences, needs, and contributions (Haraway, 2016; Lonkila, 2021; Puig de la Bellacasa, 2017).

Feminist ethics of care also invites us to grapple with what Lonkila (2021, p. 484) calls "the non-innocence of care as a research practice" (see also, Puig de la Bellacasa, 2011, 2012, 2017). As Puig de la Bellacasa (2012, p. 204) reminds us, "*our cares* also perform disconnection. We cannot possibly care for everything, not everything can count in a world, not everything is relevant in a world." In other words, care is not a remedy for all the ethical, political, or methodological tensions that arise in research. Rather, these scholars frame care as a continuous, situated, and experimental practice, one with no fixed guidelines (Lonkila, 2021; Puig de la Bellacasa, 2017). Drawing on and extending this body of scholarship, I seek to develop a methodology that fosters mutual-care, attends to more-than-humans, and recognises care as an ongoing and unfolding process. In doing so, this thesis contributes to emerging conversations in critical disaster scholarship that advocate for greater attention to care, responsibility, and solidarity in research practice, design, practice, and dissemination (Alburo-Canete *et al.*, 2025; Chmutina *et al.*, 2025; Eriksen, 2017; RADIX, n.d.; Sou and Hall, 2023).

In sum, this thesis weaves together and builds upon four distinct bodies of scholarship – fire geographies, critical geographies of disaster, feminist and post-humanist theories of care and scholarship on caring research – to explore care, wildfire risk management, and what it means to live (well) with fire and landscapes that burn. Following Puig de la Bellacasa (2017, p. 67), who reminds us that care is "a vital necessity" in more-than-human entanglements – or put differently, that where there is relation, there must be care – I argue that care is being taken to navigate, sustain, and hold onto life (and sometimes flourish) in an increasingly fiery world. Building on this, the following section outlines the aim and objectives of this research,

which seeks to understand what kinds of care are being practiced and made possible in such a world.

1.2. Research aim and objectives

In this thesis, I examine the kinds of care being practiced to navigate, sustain and hold onto life in the already burning region of Sonoma County, California. I ask: what does it mean to approach wildfire risk management through care? What forms does care take in wildfire risk management when it struggles to keep pace with wildfire's recurring and intensifying presence? How is care mobilised, sustained, or withheld as people learn to live (better) with fire and fire-prone landscapes? And what happens when we take care seriously as a way of navigating and enduring an increasingly flammable world?

By exploring these questions, this thesis demonstrates that care is central to how fire is understood, managed, and lived with. Care is not limited to feminised, domestic, unpaid, or low-paid labour, nor restricted to moments of wildfire response or recovery. Instead, relations of care animate everyday wildfire risk management activities, seasonal rhythms, and long-term efforts to coexist with fire. By attending to these relations of care, I examine how life is navigated, sustained, and held onto in an increasingly flammable world. Thus, the aims and objectives of this thesis are as follows:

Aim: To examine what kinds of care are being taken in Sonoma County as communities navigate life in an increasingly flammable world.

Objectives:

1) To conceptualise the world of wildfire risk management as a more-than-human entanglement through which to critically examine care.

2) To develop a methodological approach that facilitates researching care in wildfire risk management, remains attentive to researching *with* care, and embraces research *as* care.

3) To document and analyse diverse forms of care and encounters with care circulating within the world of wildfire risk management.

4) To explore how care is enacted as part of learning to live (better) with fire and landscapes that burn.

In my first objective, I seek to build upon conceptualisations of risk management as a more-than-human entanglement: a web of relations, decisions, imaginaries, activities, human-environment interactions, participants, institutional geographies, affects, cultural and historical trajectories, and infrastructures. From this conceptual ground, I intend to unsettle dominant framings of risk management as a purely techno-managerial endeavour, and instead, examine its ethical, affective, and relational dimensions. Within this entanglement, I focus on care as a

relation that circulates within wildfire risk management, often coexisting with, challenging, or working alongside other relations, logics, and practices. I explore how care interacts with the temporalities, materialities, participants, affects, and activities that constitute wildfire risk management, asking what it means to examine care in a setting where it is rarely recognised. This objective is ultimately about making care visible as "a vital necessity" in more-than-human entanglements (Puig de la Bellacasa, 2017, p. 67), such as wildfire risk management, where it is frequently overlooked. It is about approaching wildfire risk management not merely as a matter of control, but as a matter of care concerned with sustaining life in an increasingly flammable world.

In my second objective, I experimented with methodologies for researching care in the world of wildfire risk management. I aimed to create a methodology that acknowledged and could account for the challenges of researching care: for example, the ways care unfolds through more-than-human relations and in practices so mundane, routine, or taken-for-granted that those enacting them may not recognise them as 'care' at all, but simply as part of the normal rhythms of everyday life. In this spirit, I sought to craft a methodology that is attuned to the subtle, entangled, and ongoing nature of care, without reducing it to conventional associations (e.g., as women's work, to domestic spaces) or rendering it overly neat, static, or legible. I asked how methodological choices might open space for multiplicity, ambiguity, and relational complexity, while also holding space for care's transformative possibilities, its tensions, and its non-innocence. Besides researching care, I also explored what it meant to research *with* care and to understand research *as* care by grounding my methodology in ethical responsiveness, relational accountability, and contextual sensitivity. Ultimately, my motivation lay not only in designing an approach suited to researching care, but also in demonstrating a sustained commitment to enacting care through(out) the research itself.

In my third objective, I am interested in the multiple ways care takes form and is encountered within the world of wildfire risk management. I explore how care circulates across a range of settings and activities, from the emergency operations centre and planning meetings to community outreach fairs, vegetation management workdays and alert and warning mobile apps. By attending to these diverse settings and activities, I aim to move beyond conventional associations of care with the feminine, the private sphere, or face-to-face human interactions, as well as beyond the notion that care is something that primarily takes place during moments of immediate disaster response or recovery. Instead, I consider how care takes form and is encountered by, in, and through various temporalities, materialities, participants, affects, and practices. In doing so, I aim to explore: What counts as care? Who performs it? Who receives it, and when? How is it experienced? And what effects does care as "a vital necessity" in more-than-human entanglements (Puig de la Bellacasa, 2017, p. 67) produce in the world of wildfire risk management?

In my fourth objective, I examine how care is enacted as part of learning to live (better) with fire and with landscapes that burn. I focus on the diverse ways people come to know, respond to, and coexist with fire amid intersecting and ongoing crises, such as the wildfire crisis and the climate crisis. This objective begins from the recognition that life in fire-prone landscapes

is marked by uncertainty, tension, and continual transformation. In this context, I am particularly interested in how care is mobilised not merely as reaction or recovery, but as an ongoing, situated practice of living amid volatility in an increasingly fiery world. This includes examining how people persist in wildfire risk management despite its physical and emotional toll; how they work to hold onto and maintain the seasonal framing of the fire season as a destabilised but meaningful form of coordination; and how new relations with fire are being forged through practices like prescribed burning. In this thesis, I explore care not as a static response, but as a relational and often improvised way of navigating change, sustaining life, and holding together fragile attachments in unsettled conditions.

From here, the following sections introduce the empirical case of wildfire risk management in Sonoma County and outline the research methodology employed in this thesis.

1.3. The empirical case of wildfire risk management in Sonoma County

Sonoma County, located in northwestern California, has "a rich and diverse landscape" (Sonoma County Ag + Open Space, 2018, p. 4). From mountain ranges lined with rolling vineyards to ancient redwood forests, the meandering Russian River, and the rugged Pacific coastline, the region offers its residents a "rural way of life" (Sonoma County Ag + Open Space, 2018, p. 4). Home to approximately 500,000 people, the county's population is concentrated mainly in and around the cities of Santa Rosa and Petaluma (United States Census Bureau, n.d.). Other communities are distributed across rural, forested, and coastal areas, each shaped by unique landscapes, livelihoods, settlement patterns, socio-economic conditions, and cultural traditions. Sonoma County's cultural identity is closely tied to its environment. Viticulture remains both a significant economic driver and a defining symbol of the region (Sonoma County Winegrowers, n.d.). Tourism is also sustained by the county's reputation for natural beauty, artisanal agriculture, and varied terrain (Sonoma County Tourism, n.d.).

Yet beneath this pastoral and picturesque exterior lies a landscape marked by multiple risks. Straddling the San Andreas Fault System, Sonoma County faces a high probability of experiencing damaging earthquakes (County of Sonoma, n.d.). Its Mediterranean climate characterised by hot, dry summers and cool, wet winters also creates conditions for cyclical hazards, such as wildfire, drought, extreme heat, and flooding. The accelerating climate crisis has intensified these hazards, leading to longer and more severe droughts, more frequent extreme heat events, and increasingly erratic rainfall patterns (Permit Sonoma, 2024). These shifting climatic conditions have made the environment more conducive to the ignition and rapid spread of wildfires. At the same time, ongoing residential and commercial development has pushed human settlements further into the wildland-urban interface zone, where homes and communities border highly flammable vegetation (Permit Sonoma Fire Prevention Division, 2023).

Over the past decade, Sonoma County has experienced eight federally declared disasters, including four catastrophic wildfires: the 2017 Nuns/Tubbs Fire, the 2019 Kincade Fire, the

2020 LNU Lightning Complex (Walbridge) Fire, and the 2020 Glass Fire (County of Sonoma, n.d.). At the time, the 2017 Nuns/Tubbs Fire was the most destructive wildfire in California's history, destroying over 8,900 structures and claiming 24 lives (California Department of Forestry and Fire Protection, n.d.) The October 2017 fires collectively caused an estimated $14.5 billion (USD) in damages, including $11 billion in insured losses and $1.5 billion in fire suppression costs (Artemis, n.d.; Associated Press, 2018). In 2020, the LNU Lightning Complex Fire burned more than 363,000 acres, making it one of the largest wildfires in the state's history (California Department of Forestry and Fire Protection, n.d.). These wildfires have had significant environmental impacts, including degraded air quality and pollution of soil and waterways (Permit Sonoma, 2024), as well as social consequences, such as widespread displacement and increased mental health-related emergency department visits (Jung *et al.*, 2025). As a result, Sonoma County has emerged as a critical frontline in the growing wildfire crisis across the Western United States.

To provide historical context, today's wildfire crisis and contemporary wildfire risk management is shaped by a complex political-economic triangle involving settler colonial institutions, commodified landscapes, and ongoing real estate development into the wildland-urban interface zone (Martinez *et al.*, 2023). At the foundation of this triangle lies a multi-century history of federally funded fire suppression, during which landscapes were appropriated for timber production, agriculture, and mining (Anderson, 2005). These suppression policies displaced Indigenous fire stewardship practices across California, where many Indigenous peoples – including the Southern Pomo and Coast Miwok in Sonoma County – intentionally set fires to enhance the quality and abundance of habitats and species vital to their cultures (Adlam *et al.*, 2022; Eriksen and Hankins, 2014; Martinez *et al.*, 2023). It is estimated that, prior to settler intervention, between 4.5 and 13 million acres burned annually in California through a combination of Indigenous and natural fire regimes (Anderson, 2005, 2018). These fires produced vital ecological, social, and cultural benefits; benefits that were lost mainly under settler colonial fire suppression policies (Martinez *et al.*, 2023; Roos, 2023).

Under settler colonial regimes, fire and those who used it were considered enemies to be controlled, extinguished, and eliminated from the landscape (Anderson, 2018; Martinez *et al.*, 2023). State and federal agencies, including the U.S. Forest Service and California Department of Forestry and Fire Protection (CAL-FIRE), invested heavily in aggressive suppression infrastructure and adopted a technocratic, militarised approach to fire control (Martinez *et al.*, 2023; Vinyeta, 2022). This approach was reinforced through public-facing campaigns and propaganda – most notably the Smokey Bear campaign – which sought to instil fear of fire and promote the belief that all fire was inherently destructive and must be prevented at all costs (Minor and Boyce, 2018). Over time, these fire suppression regimes cultivated a widespread cultural aversion to fire, eroding public understanding of its vital ecological role and delegitimising Indigenous burning practices (Vinyeta, 2022).

While fire suppression initially appeared effective in reducing wildfire events, it has since produced a range of unintended and compounding consequences (Essen *et al.*, 2023; Hudson, 2011; Ingalsbee, 2017; Kreider *et al.*, 2024). Decades of totalitarian fire suppression disrupted

natural fire cycles, leading to the accumulation of flammable vegetation and the development of increasingly homogenised forests, often overtaken by invasive plant species. This dynamic – widely known as the 'fire suppression paradox' or 'wildfire paradox' – has created landscapes that are more combustible and ecologically unstable than ever before (Hudson, 2011; Kreider *et al.*, 2024). When combined with the accelerating impacts of climate change and the rapid expansion and densification of residential development in the wildland-urban interface zone, this paradox has laid the foundation for the contemporary wildfire crisis now unfolding across the Western United States.

After centuries of the fire suppression paradigm in California and following the devastating wildfires of 2017, 2019, and 2020, perspectives on fire and approaches to its management have begun to shift. In what follows, I outline some of the major transformations in wildfire risk management that have taken place in Sonoma County over the past decade. While many of these shifts mirror broader trends across the Western United States, they provide essential context for understanding the shifting world of wildfire risk management today.

At the state level, legislation such as California Assembly Bill 38 (2019) signalled a shift away from reliance on fire suppression, instead calling for more comprehensive, collaborative, and place-specific wildfire risk management strategies, including vegetation management, emergency response planning, and home hardening (California State Legislature, 2019). At the county level, Sonoma County finalised and incorporated its Community Wildfire Protection Plan, which emphasises wildfire mitigation measures and community-driven risk reduction priorities (Permit of Sonoma, n.d.; Permit Sonoma Fire Prevention Division, 2023). New institutional structures have also emerged since the 2017, 2019 and 2020 wildfires. The Sonoma County Office of Recovery and Resiliency was established to coordinate action and build relationships among public agencies, emergency responders, community groups, and residents involved in wildfire preparedness and recovery (County of Sonoma, n.d.). These developments were accompanied by significant investment in the County's Department of Emergency Management, which has introduced updated emergency protocols, including enhancements to alert and warning systems, as well as improved evacuation and shelter plans. The department also appointed a Community Preparedness Manager, tasked with overseeing public education campaigns, community outreach, and preparedness initiatives aimed at strengthening residents' resilience to wildfire and other hazards (County of Sonoma, n.d.).

This shift away from reliance on fire suppression toward a broader emphasis on mitigation, preparedness, and recovery is also increasingly evident among others involved in wildfire risk management in Sonoma County. Fire agencies at both the state and local levels – including CAL-FIRE, the Sonoma County Fire District, and the Santa Rosa Fire Department – have expanded their fire prevention teams, which engage in public outreach, home inspections, and education on defensible space and home hardening (Permit Sonoma, n.d.). The wildfire mitigation practices of defensible space and home hardening gained particular attention following the 2020 LNU Lightning Complex Fire, which revealed that flying embers, rather than direct flame contact or radiant heat, were the primary cause of structure ignition (Frontline

Wildfire Defense, n.d.). Alongside these efforts, fire agencies have shown growing support for prescribed fire, increasingly recognising it as a vital ecological process and a tool for wildfire risk reduction rather than simply a threat to be extinguished (CAL-FIRE Sonoma Lake Napa Unit, 2024). Fire agencies now assist private landowners and organisations such as the Sonoma County Prescribed Burn Association 'Good Fire Alliance' in conducting prescribed burns, reflecting a broader rethinking of fire's role in the landscape (CAL FIRE, n.d.; California PBA, n.d.; Sonoma Land Trust, n.d.).

Following the 2017, 2019 and 2020 wildfires experienced in Sonoma County, a diverse entanglement of community-based organisations rapidly expanded in both scope and influence. These include Communities Organised to Prepare for Emergencies, Fire Safe Councils, FireWise® Communities, Community Organisations Active in Disaster, Community Emergency Response Teams, Map Your Neighbourhood and the Sonoma Community Animal Response Team. Together, they reflect a broader turn toward decentralised and participatory approaches to wildfire risk management, grounded in local relationships, mutual aid, and community-based knowledge. This shift signals a growing recognition that risk management must be socially embedded and locally adaptive, not just technocratic and top-down (Gaillard and Mercer, 2013).

This grassroots mobilisation has reshaped relationships between community members, fire agencies, risk management institutions, and elected officials. As one community leader shared with me: *"After 2017, everything changed. Like before this, I didn't know who my fire people were. If I wanted to speak to my supervisor, would I ever be able to talk to that person? But now, James Gore's [Sonoma County Supervisor, District 4] been to my house. Chief Tuberville [Fire Chief at Northern Sonoma County Fire] is like a member of my family. He spent so many hours at our dining room table, going over maps and thinking about things. It's very different. The community realised they had to engage, and they've remained engaged."* While jurisdictional fragmentation, resource disparities, bureaucratic constraints, and conflicting values around fire continue to complicate wildfire risk management, this account illustrates how, in the aftermath of the 2017 Nuns/Tubbs Fire, new entanglements of diverse actors and shared practices of engagement have emerged. In this transformed landscape, wildfire risk management is increasingly a collective endeavour, shaped not only by formal agencies, but also by grassroots networks, community participation, and everyday collaboration.

Since the 2017 Nuns/Tubbs Fire, fire seasons have grown more prolonged and more intense, and as Permit Sonoma (n.d.) notes, "wildfire has become a day-to-day reality for County residents." Fire now shapes everyday routines, relations, and rhythms; it is no longer a question of *if* wildfire will return, but *when*. In this increasingly flammable world, there is growing recognition that fire cannot be eliminated. Instead, communities are having to learn to live better with fire and landscapes that burn. I argue that the world of wildfire risk management in Sonoma County offers a compelling site for research on care. As an epicentre of loss, survival, and transformation (County of Sonoma, n.d.), it exemplifies how the urgency of wildfire not only demands new approaches to risk management but also continually reconfigures what it means to care. In other words, the question of "how to care" is insistent in such worlds but not

easily answerable (Puig de la Bellacasa, 2017, p. 7). Thus, I approach the world of wildfire risk management in Sonoma County as a crucial and generative entanglement for examining how care is produced, negotiated, and circulated amid uncertainty and the shifting tensions of life in an increasingly fiery world.

1.4. Methodology

In this section, I outline the research methodology and methods used in this thesis. I note that Paper Two, 'Researching care, *with* care, *as* care...', offers a more in-depth reflection on photo go-alongs as a method to research care, research *with* care, and approach research *as* care. As such, the following section provides a concise overview of my research approach, including the specific methods I used – how, where, when, and why.

1.4.1. The approach: multi-sited ethnography

Ethnography offers a vital methodological approach for researching disasters and the complexities of risk management. While much disaster scholarship remains dominated by technocratic and quantitative studies focused on models, metrics, and institutional frameworks, my research instead embraces ethnography. Drawing on Grove (2014a), I understand ethnography not simply as a method, but as an orientation that attunes the researcher to the contingent, affective, and contextual details of everyday life in disaster settings. Grove argues that "only after the researcher muddies her proverbial boots" – through ethnographic methods such as interviews, focus groups, participatory mapping, and go-alongs with community members – can one begin to grasp both the "adaptive practices that people use in their everyday lives to cope with risk, uncertainty and insecurity" and the "wider social, cultural, and institutional constraints that limit these capacities" (2014a, p. 203). In my research, then, I use ethnography as a means to engage deeply with the lived experiences, practices, and relationships that shape how people live in an increasingly flammable world.

While my approach was grounded in conventional ethnographic sensibilities, spending six months embedded in the world of wildfire risk management in Sonoma County, I was also drawn to the methodological orientation of multi-sited ethnography (Marcus, 1995). Classical ethnography often involves long-term immersion in a single site, but Marcus's (1995, p. 97) approach emphasises "following connections, associations, and putative relationships." Rather than anchoring my research to one location (e.g., Santa Rosa) or agency (e.g., Santa Rosa Fire Department), my research moved fluidly across multiple sites and agencies, tracing how care(ing) unfolds across diverse spaces, temporalities, materialities, scales, and relations. This involved following wildfire risk management activities through physical sites, online platforms, and their wider worlds. Although Sonoma County remained the central empirical focus, my methodological commitment was to the dynamic and dispersed world of wildfire risk management rather than to a fixed location. Below, having already introduced wildfire risk management in Sonoma County as the empirical case, I elaborate on how this research unfolded.

Seeking to explore beyond its conventional associations with the feminine, the domestic, and face-to-face encounters, and recognising that the agencies and entities encompassed by care are neither fixed nor easily bounded (Puig de la Bellacasa, 2017), I followed care through a wide variety of sites. These included county offices, wildland areas, homes, emergency operations centres, warehouses, fire stations, airfields, community parks, conference centres, and shops. I also traced care online, meeting participants via digital platforms and following care practices on social media. By following care in this way, I engaged with a more diverse range of wildfire risk management activities and participants than I had initially anticipated. Wherever, however, and with whomever care unfolded, I remained committed to tracing its presences within the world of wildfire risk management – over the six months of fieldwork, this process often felt like following a moving and mobile object. Thinking with feminist care scholars such as Brannelly and Barnes (2022a) and Letherby (2023), I stayed responsive and open to shifts in what care meant and what mattered in this field. As I deepened my relationships with participants and attuned myself to emerging concerns, this openness sometimes led me also to follow unexpected things, such as the fire season (see Paper Five, 'The Fire Season?') or fire itself (see Paper Six, 'Learning to live with fire...'), tracing how care became entangled with these shifting, more-than-human phenomena. In doing so, I drew on scholars who resist framing more-than-humans as passive or peripheral (e.g., Adams-Hutcheson, 2019; Dowling *et al.*, 2017; Haraway, 2007; Lange and Gillespie, 2023; Puig de la Bellacasa, 2011), instead approaching them as active participants and vital forces central to the unfolding of care in this world.

Multi-sited ethnography, however, lacks clear methodological guidelines or settled conventions (Candea, 2007; Coleman and von Hellermann, 2012; Van Duijn, 2020), making it necessary to reflect on how I navigated this approach in practice. Like others, I found multi-sited ethnography to be messy and entangled, often worrying that I was "everywhere and nowhere at once" (Van Duijn, 2020, p. 281; Falzon, 2009). Marcus (1995) provides useful concepts for multi-sited ethnography, such as "follow the people", "follow the thing" (Marcus, 1995, p. 106) and "follow the plot, story or allegory" (Marcus, 1995, p. 109), but offers little guidance on how or where to "make the cut" when following (Candea, 2007, p. 171). For example, I went along to a run club on a Tuesday evening without consciously thinking of myself as 'following' care, only to pass grazing animals involved in vegetation management and part of care's circulation in wildfire risk management (see Paper Three, 'Making care visible'). Similarly, when I returned to Sonoma County in January 2023, I arrived amid a winter storm disaster that was later declared a federal disaster. The emergency operations centre was activated, evacuation shelters and recovery centres were opened, and emergency communications were being disseminated widely. While my initial focus was on following care in the world of wildfire risk management, I found myself immersed in the broader world of disaster risk management.

Over the six months of fieldwork, I accepted that my research could neither be carefully planned nor methodologically rigid, and that "mak[ing] the cut" (Candea, 2007, p. 171) (i.e., deciding when, where, and how to stop following) was inherently fuzzy and could only be provisionally decided as the research unfolded (Van Duijn, 2020; Katz, 1994). Rather than

resisting this fuzziness, I learned to embrace it, especially since care itself is a messy and expansive practice (Puig de la Bellacasa, 2017; Tronto, 1993). I just had to keep following care, along with its relations, temporalities, materialities, participants, affects, and practices, as they emerged. As Falzon (2009, p. 9) reminds us, "understanding the shallow may itself be a form of depth." In my multi-sited approach, ethnographic insight does not come from immersion in a single site but from the "thick description of a network rather than its individual nodes" (Falzon, 2009, p. 16), or in my case the entanglement of people, practices, and more-than-human phenomena through which I explore care. Although this approach was sometimes disorienting, it enabled me to illuminate the diverse ways care circulates in wildfire risk management and sustains life in an increasingly flammable world.

It is also important to reflect on how I experienced my multi-sited ethnographic approach when I returned to my desk to analyse the data. I was confronted with a vast and fragmented collection of fieldnotes, photographs, transcripts, and audio recordings from a variety of sites, activities, and participants. At first, this material felt scattered and incoherent, much like the field itself. I was once again muddled: how could I possibly weave these many 'bits' into a coherent whole? However, as I immersed myself deeper into the analysis, the value of the multi-sited ethnographic approach became clear. It had allowed me to engage with the complexity and dynamism experienced by those entangled in wildfire risk management, and to trace when and how care connected (or failed to connect) across the entanglement of people, practices, and more-than-human phenomena. What initially seemed like a patchwork began to reveal patterns, tensions, and insights that a single-sited approach might have missed (Van Duijn, 2020). I came to realise that my ability to speak to the multiplicity of care in wildfire risk management and life in a flammable world depended on this ethnographic form. While multi-sited ethnography did not offer a tidy or fixed approach, it was what enabled me to follow, hold together and make sense of the messy, fragmented, and relational world I set out to research.

1.4.2. On care, ethics and positionality

"People who do research care about what they research. The topics they research matter to them, and how they impact on people matters too" (Brannelly and Barnes, 2022a, p. 17).

This statement captures how I came to understand care, ethics, and positionality in my research. To me, care is not something external to research or a quick add-on in university ethical review processes; it should be embedded in how research begins, unfolds, and ends. It starts with questions: What do I care about, and why? Why does this research matter to me, not just intellectually, but emotionally, politically, and ethically? What do I want this work to do, and what does it ask of me in return? How can I know if care is being practiced within the research? At what moments is care needed, and in what forms? What might care look like as reciprocity or solidarity? And how can I remain accountable to the effects, echoes, and afterlives of this research?

Throughout my research process, I did not approach these questions as a checklist, but rather as a way of orienting myself (again, again and again). They reminded me that I cared about this world I was trying to understand, and that I was part of it – ethically, emotionally, and politically implicated. They helped me navigate shifting relationships, ethical tensions, emotional entanglements, and the always-partial perspective I brought to the field. From this standpoint, care became both a methodological orientation and an ethical commitment, shaping how I built relationships, made decisions, and engaged with questions of representation, data, and impact. In what follows, I reflect on how care shaped my research practice and how positionality and ethics were not background concerns but active, ongoing responsibilities. As I explore my commitments to researching *with* care and approaching research *as* care more deeply in Paper Two 'Researching care, *with* care, *as* care...', here I stay closer to the surface, outlining how my care informed my approach and flagging some of the tensions surfaced along the way.

My position in this research is not incidental to it, shaping what I noticed, what I felt responsible to, and why I even cared in the first place. I began this PhD after completing an MSc in Risk, Disaster and Resilience in the wake of the COVID-19 pandemic, a moment when 'care' had become a widespread refrain. It was everywhere, spoken in political speeches, printed in email headers from food companies, and unfolding in my own home, family, and friendships. And yet, in much of the disaster literature I was engaging with, care was rarely at the centre. The dominant frameworks revolved around risk, fear, control, and technical fixes. I was unsettled by the absence of questions about care's complexities, its participants, its distributions and its effects. As that unease persisted, I began to ask different questions: What would it mean to approach disaster not just through the lens of risk, but through care? What does care look like in a world increasingly shaped by disasters?

I cared deeply about wildfires; unlike many hazards they offer little to no warning and their severity is increasing worldwide due to the escalating effects of climate change. At the same time, I recognised that fire is something we depend on and share a long, complex history with. I was drawn to California not only because of its increasingly severe wildfire events, but also because of its complex histories of settler colonial fire suppression, cultural aversion to fire, and environmental change. Yet amid these challenges, I recognised communities were engaged in deeply relational and imaginative responses to these unsettled conditions. However, arriving as a non-local researcher from outside the United States who had never experienced a wildfire meant confronting the position I occupied within this landscape. The distance I travelled was not only geographic but also political and ethical, entangled with issues of mobility, colonialism, privilege, carbon emissions, and the temporariness of academic research. These contradictions could not be resolved but needed to be taken seriously. Rather than trying to stand apart from them, I understood them as part of what this research asked of me: to recognise the uneven terrain I move through and to be accountable – imperfectly, but intentionally – to those I learned from along the way. What I hoped to contribute through this work was not something spectacular, but something modest and meaningful: a way of understanding care in disaster settings that extends beyond the human, beyond gendered assumptions, and beyond

immediate moments of disaster response. I hoped this research might open space to reimagine how we relate to risk, disasters, and one another in more caring ways.

Throughout my research, I approached ethics not only as a formal requirement set by my departmental research committee but as an ongoing practice of care. I met established protocols of gaining informed consent, protecting anonymity, and securing data, but I also attempted to understand these as minimum standards. Drawing on Tronto's (1993, p. 127) values of care – attentiveness, responsibility, competence and responsiveness – I tried to stay attuned to what needed care in each moment: noticing problems worth investigating, recognising unspoken dynamics, cultivating respectful, open-ended research spaces and responding with humility and flexibility to the unpredictable nature of researching. For example, participants sometimes shared painful fire stories that fell outside the formal scope of my research. Thinking with care, I did not treat these moments as tangents to be redirected, but as calls for presence, attentive listening, and ethical responsiveness. I did not treat them as data to be extracted, but as invitations to be with. As such, participation was not a one-way exchange, but a co-constituted process shaped by mutual responsiveness, relational accountability, and forms of solidarity.

I was not initially aware of the debates around collaboration within ethnography when I began following and (at times) intervening in the world of wildfire risk management. As Estalella and Criado (2018, p. 21) observe, collaboration is "a common practice, an ethnographic modality that despite its presence has rarely been noted or recounted in our tales of the field." I chose to acknowledge it here because my presence, participation, and collaboration, though sometimes small or informal, became part of how I tried to centre care in my research. I spoke about care, and over time, others began speaking about it as well. I provided input on projects, shared thoughts on social media posts, and offered my perspective on workplace dilemmas. I supported wildfire risk management activities throughout the process. At first, I worried I was crossing a line, committing some kind of ethnographic sin by stepping beyond observation and contaminating my research encounters (Tsing, 2015). But as Brannelly et al. (2022b, p. 119) remind us, "we have more roles in research than as investigators." I was not a detached researcher; I was an engaged participant, drawn into and entangled with the world I was researching. I did not set out to collaborate, but collaboration nonetheless emerged as part of how relationships formed, and my research unfolded. Even after the formal period of fieldwork ended, its traces remained. During the January 2025 Los Angeles fires, for example, I found myself unsure of what to say or how to respond from afar. I felt pulled back into the world I had come to know and care about. For me, such moments of collaboration again revealed how my care shaped this research, not only in terms of what I paid attention to, but in how I researched, responded, and remained involved.

1.4.3. Research design and methods

While the methods I outline here may appear orderly and roughly chronological, the research process itself was far from linear. Instead, it unfolded through a continual back-and-forth – between methods, between theory and fieldwork, and in response to evolving empirical and conceptual insights. I followed unexpected detours, encountered unanticipated tensions, and

was drawn in directions I hadn't initially foreseen. In sum, this thesis is grounded in six months of ethnographic fieldwork, which included extensive participant observation and fieldnotes, 33 storytelling interviews, 51 go-alongs, 3,045 photographs, and a substantial analysis of documents.

1.4.4. Participant observation

During my research, I conducted extensive participant observation, though quantifying the exact number of hours is difficult due to the often-fluid boundaries between methods and the blurred edges of 'the field' (Katz, 1994). Before arriving in Sonoma County, I had already established contact with a well-connected non-profit organisation that would prove central to both my research and the broader landscape of wildfire risk management. This relationship laid the groundwork for my initial immersion into the field.

Once in Sonoma County, I began by observing and gradually participating in the activities of this non-profit, embedding myself in the everyday rhythms of wildfire risk management. This early phase of fieldwork was not just about gathering data, but also about building trust, rapport, and relational context. Much of my initial involvement took place in meetings between the non-profit and its collaborators, including community groups, other non-profits, fire agencies, and county departments, where people coordinated wildfire mitigation projects, drafted reports, developed outreach strategies, and negotiated the allocation of resources. These meetings helped me map the actors and entities involved in wildfire risk management, while also revealing subtle, often-overlooked forms of care circulating through everyday exchanges, decisions, and practices.

Through this entry point, participant observation expanded into a diverse range of wildfire risk management sites and activities, including memorial services, conferences, community outreach events, prescribed burns, workdays, and office-based tasks. Participants included both formal actors, such as fire personnel, county officials, and staff from nonprofits, as well as informal ones, including wildfire survivors, homeowners, and local volunteers. My engagement with participant observation was non-linear and adaptive; it intertwined with go-alongs and storytelling interviews and was often shaped by unplanned detours or interruptions. For example, when the fire crew I was accompanying in the form of a go-along had to shift suddenly into emergency response.

Participant observation proved especially valuable for researching care within wildfire risk management: not only as a means of immersion, but as a way to attune to care as something that emerges "already in the middle of things" (Tronto, 2015, p. 4). It required attentiveness to embodied labour, caring language, affective atmospheres, and the relational undercurrents of everyday interactions (Martin *et al.*, 2015; Puig de la Bellacasa, 2017). This method enabled a grounded curiosity: a sensitivity to marginal, ephemeral, or easily overlooked moments that pointed to relations of care. It helped me speculate and ask questions about who or what is cared for, when, and by whom, even when such care is not institutionally recognised or easily

named. It enabled me to trace care in silences, more-than-human relations, gestures, or frictions not always obtainable through interviews or planned exchanges.

Throughout participant observation, I drew on Flora and Andersen (2019, p. 557) approach to fieldnotes, which emphasises that "the point fieldnoting... is not to capture, record, and register everything, but rather to create collections of fragments, that each hold its own perspective and analytical drive, as well as potential for writing stories and analyses." Therefore, my fieldnotes gathered fragments of what stood out, lingered, or unsettled: atmospheric shifts, brief encounters, bodily affects, or unexpected tensions. These fragments helped me recall and make sense of the affective texture of fieldwork, such as the atmosphere of alertness during the fire season or the cautious optimism of a prescribed burn. Later, these fragments became central to my writing, particularly in Papers 5 'The Fire Season?' and 6 'Learning to live with fire...', where I relied on them not only to recall events but also to craft stories and analyses that conveyed the complexity of care in wildfire risk management. For me, therefore, my fieldnotes provided not only a record but a resource for storytelling.

1.4.5. Storytelling interviews

I conducted 33 storytelling interviews during my fieldwork, comprising 21 in-person and 12 online sessions via online platforms such as Zoom. Each interview began with the prompt: *"Please could you tell me a story about wildfire risk management in Sonoma County that matters to you. Please do so however you wish, and then I will interject or follow up with some other questions. You don't have to answer any questions if you don't want to or don't feel comfortable doing so."* I recruited participants, both formally and informally involved in wildfire risk management, through ongoing participant observation and snowball sampling (Valentine, 1997), prioritising those open to engaging with the storytelling format. Most interviews took place after the peak fire season, beginning in late November. This timing was intentional: it allowed me time to build trust and attune to the rhythms, relationships, and pressures shaping wildfire risk management, while also avoiding overburdening participants during a period of high stress and possible wildfire response activities. Interview lengths varied, shaped by participants' availability, the depth of their stories, and the nature of my follow-up questions. All interviews were conducted with either written or oral informed consent and were subsequently anonymised. Each was transcribed in full and forms a key component of the material analysed in this thesis.

Throughout these storytelling interviews, I practiced what Sevenhuijsen (2014, pp. 5, 6) describes as "active, careful listening" and "thoughtful speaking." I adopted a listening stance: maintaining eye contact, accepting silences, and attending closely to the language I used (Bourgault, 2016; Brannelly, 2018; Sevenhuijsen, 2014). I acknowledged what participants shared through gestures (e.g., nodding, smiling, frowning, note-taking) and responded with follow-up questions that extended their narratives and connected to core research themes. Participants sometimes got visibly upset during storytelling interviews. In such moments, I held space with care and allowed them to decide whether to pause, elaborate,

or move on. I also occasionally disclosed my own emotional responses to their stories, not to shift focus but to foster recognition, reciprocity, and deepen trust.

Storytelling as a method involves both verbal and non-verbal modes of communication that help researchers understand how people experience and relate to their worlds (Cameron, 2012; Lorimer, 2003; Ratnam, 2019). As Lewis (2009) cited in Ratnam, (2019, p. 19) puts it, "we use the story form and the story forms us," underscoring the co-constitutive relationship between storyteller and narrative. Similarly, Cameron (2012, p. 575) argues that story is "an expressive method and an affective tool, designed both to demonstrate affective and emergent geographies and to move audiences toward new realms of thought and practice." This makes storytelling particularly valuable for care and disaster research, where it surfaces the emotional, relational, and ethical textures of everyday life that are often overlooked or difficult to articulate in traditional interviewing.

In my fieldwork, storytelling interviews surfaced a wide spectrum of narratives, ranging from long-form accounts of wildfire experiences and professional trajectories to brief yet poignant moments such as a solitary walk in the Mayacamas Mountains or a meaningful exchange during a community chipper day. I listened for how care did or did not circulate in these stories, for what was remembered, emphasised, or left unsaid (which, I found, was often care itself). Many participants offered what might be described as 'small stories': fragmented, informal, or momentary reflections that nonetheless illuminated subtle ways care is produced, withheld, or circulated in wildfire risk management. Storytelling also fostered a more caring research environment. It provided participants with a means to express themselves in their own terms, often through narratives they felt compelled to share. As one County employee, Nick, put it: *"Everyone's got a fire story, a story they just have to tell you. So, it's good you're asking for it, even though they'd probably still tell you anyway [laughs]."* This sense of storytelling as cathartic affirmed its value not just as a method, but as a relational practice of researching with care.

1.4.6. The photo go-along

As noted earlier, Paper Two, 'Researching care, *with* care, *as* care...' provides an in-depth discussion of this method. This section, therefore, offers only a brief overview. I conducted a total of 51 go-alongs, a hybrid method of participant observation, interviewing, and, in my case, photography (Kusenbach, 2003, 2016). These were participant-led encounters in which I accompanied individuals as they carried out everyday wildfire risk management activities. Again, I recruited participants, both formally and informally involved in wildfire risk management, through ongoing participant observation and snowball sampling (Valentine, 1997), prioritising those whose activities could be better understood through shared presence and embodied experience rather than through verbal accounts alone. Go-alongs varied widely in timing, format, and setting. For example, I rode along with fire personnel during home inspections; ran alongside wildfire survivors in state parks to revisit burn scars; walked with land stewards managing burn piles in wildland areas; and accompanied county employees into emergency operations centres, storage warehouses, and official meetings. These ranged in

duration from 42 minutes to over seven hours, depending on the activity and participant. During the go-alongs, I took notes, photographs, and audio recordings where appropriate and with the participant's consent.

Building on insights from participant observation and storytelling interviews, go-alongs proved especially valuable for researching care as a situated, relational, and more-than-human practice. They enabled me to observe not only what people said but also what they did, opening space for real-time questions, reflections, and contextual interpretations. These shared activities revealed tacit knowledge, habitual practices, and improvised responses often overlooked in structured interviews. Crucially, go-alongs surfaced everyday forms of care that might otherwise remain unnoticed – care enacted through routine tasks and embodied gestures. Participants narrated their actions in place, and the movement inherent to go-alongs fostered informal exchanges shaped by rhythm, terrain, and encounter. This method also attuned me to more-than-human entanglements of care: for example, engagements with fire engines, drip torches, datasheets, and defensible space tools, as well as with less tangible infrastructures, such as seasonal policies, insurance claims, and state regulations. These encounters made visible how care is produced, mediated, and constrained through a complex more-than-human entanglement. Go-alongs also illuminated the ambiguities and contradictions of care; for example, how care can be protective or coercive, recognised or dismissed, depending on one's position, history, or experience. For instance, state-led fire suppression measures were interpreted by some as essential, and by others as invasive. Go-alongs enabled me to remain with such tensions, tracing how care unfolds unevenly and imperfectly.

1.4.7. Documents

Documents formed a small but significant part of the data that informed this thesis. I engaged with a wide range of materials, including newspaper articles, social media posts, emergency plans, letters, emails, reports, and maps. Particular attention was given to documents embedded in the everyday practices of wildfire risk management and produced or shared by participants involved in my fieldwork. These included the Sonoma County Community Wildfire Protection Plan (see, Permit Sonoma Fire Prevention Division, 2023), After-Action Reports from the Department of Emergency Management (see, County of Sonoma Department of Emergency Management, n.d.), email exchanges between non-profit organisations and community members, locally relevant books (e.g., see Holbrook, 2019), and posts from social media forums. I also analysed my phone screen when using emergency apps, like Watch Duty, which provide real-time wildfire updates (Watch Duty, n.d.). Some of these documents were produced during the research period, while others predated or postdated it.

My approach to these materials was not to follow documents ethnographically (as suggested by Van Duijn, 2020; Marcus, 1995), nor to analyse how they constructed particular sites or participant realities (Jacobsson, 2022). Instead, I treated documents as contextually rich sources that helped situate the research within broader temporal, social, and institutional contexts. For instance, Brian Fies's graphic memoir *'A Fire Story'* and John Vaillant's '*Fire Weather: A*

True Story from a Hotter World' offered powerful accounts of recent fire events, deepening my understanding of the world of contemporary wildfire risk management.[1]

These documents also helped illuminate varied forms and expressions of care within wildfire risk management. For example, analysing wildfire risk maps allowed me to examine how risk profiles are constructed and how these constructions influence the distribution of resources and care across the county. I focused particularly on the documents participants themselves considered important to communicate, whether to me, one another, or to the wider public. These documents supplemented interviews and observations, providing additional insight into participants' experiences and perspectives on care in wildfire risk management and increasingly flammable landscapes. One example involves a day spent with land stewards who were eagerly awaiting the incoming rain. When it arrived, they shared celebratory posts on social media, deepening my understanding of the emotional weight tied to such seasonal cues. In another instance, a participant described a non-profit staff member as particularly caring and supportive. During a later observation, I watched that same staff member compose an email to a community member, an exchange that embodied the qualities the participant had earlier described. In sum, documents provided an important complementary pathway for exploring and understanding care, including how it is communicated, contested, and expressed in the everyday activities of wildfire risk management.

1.4.8. Reflections on limitations

Before expanding on the papers these methods yielded, I would like to reflect on the limitations of the data and methodological choices that shaped this research. These reflections are not only about gaps in data but also about the constraints and contingencies that influenced who and what came into view.

One notable absence in the dataset is the lack of direct engagement via go-alongs or storytelling interviews with vineyard workers or owners, despite the significance of viticulture in Sonoma County. This absence is particularly significant given the documented tensions surrounding vineyards and wildfire risk management, including instances where workers were pressured to continue working in evacuation zones during wildfires (see, Bridges and Venton, 2021; Brown, 2022; Chunga Pizarro *et al.*, 2024; Moe, 2021). Although I made several attempts to invite participation from both vineyard workers and owners, these invitations went unanswered. However, I was able to observe discussions involving vineyard representatives in formal settings, where I conducted participant observation and took fieldnotes. These observations, confined to structured meetings, inevitably shaped what was shared and how it was presented. Interestingly, several participants noted this absence as unsurprising, suggesting that opacity and closed practices are characteristic of the viticulture industry, particularly in light of increasing scrutiny over labour rights and wildfire-related working conditions. This silence must be read as politically significant, a reminder that research absences are not always

[1] I wrote a dual book review of '*A Fire Story'* by Brian Fies and '*Fire Weather: A True Story from a Hotter World'* by John Vaillant for the *Journal of Disaster Studies*. This review is included in Appendix 6. Readers interested in a more detailed engagement with these texts are encouraged to consult it.

methodological oversights but can reflect entrenched structures of power, marginalisation, and neglect (Puig de la Bellacasa, 2011, 2012).

I also engaged with Indigenous participants when observing prescribed burns. While these encounters were meaningful, I recognise that I could have done more to engage directly with Indigenous fire practitioners and to more fully attend to the ethics and politics of care embedded in cultural burning and Indigenous fire futures. I reflect, with some discomfort, on the limitations of my approach and the ways in which my research (despite good intentions) may have reproduced colonial dynamics by not centring Indigenous voices and epistemologies. The limited visibility of Indigenous perspectives, both in terms of participant representation and sustained methodological engagement, reflects not only ethical and practical complexities (e.g., trust-building, ethical protocols, risk of extraction), but also the structural marginalisation of Indigenous peoples within institutionalised wildfire risk management. While many land stewards and non-profit staff spoke with recognition and respect about Indigenous fire practices, they also acknowledged the limited presence of Indigenous leadership and knowledge in institutional wildfire risk management. The absence of Indigenous perspectives beyond these events, and my reliance on Indigenous scholarship rather than direct engagement, thus reflects both methodological limitations and broader systemic exclusions shaping the world of wildfire risk management.

Resource constraints and the lingering effects of COVID-19 significantly shaped this research. Although I received generous support from my doctoral programme, financial limitations meant I did not have access to a car during fieldwork. In a spatially dispersed and car-dependent region like Sonoma County, this significantly limited my mobility. I navigated the field through a patchwork of public transportation, rideshare services, running (which became methodologically generative – see Paper 2 'Researching care, *with* care, *as* care...'), and rides offered by friends and participants. The post-pandemic shift to remote and flexible working also meant that some storytelling interviews and participant observation took place online. While remote methods introduced challenges – such as the loss of shared atmospheres, flattened social cues, and diminished ease of building rapport (Weller, 2017) – they also enabled me to reach a geographically wider range of participants and reduced the financial and logistical burden of travel (Lo Iacono *et al.*, 2016). In sum, these financial and mobility constraints limited my flexibility, reach and may have led to missed opportunities to observe care in action; however, they also opened up unanticipated forms of engagement, such as slowing my movements, sharpening my attention to overlooked aspects of the everyday, and prompting more reflective encounters.

These reflections on limitation also highlight the commitments and complexities of researching *with* care (explored further in Paper Two 'Researching care, *with* care, *as* care...'). Researching *with* care is not simply about kindness or attentiveness, it involves grappling with questions of responsibility, accountability and competence. During fieldwork, there were moments when I missed cues, needed support, or reached the limits of what I could manage on my own. At times, I was able to address these constraints as they arose by adapting my methods, seeking advice, or drawing on the support of others. At other times, the challenges remained

unresolved, leaving traces of absence or ambiguity in the data. Yet these moments, rather than marking methodological failure, serve as reminders that care in research also means working within limitations, embracing uncertainty, and navigating the demands that research places on us. Attending to these dimensions, I argue, is integral to what it means to research *with* care.

1.5. Introducing the papers

This thesis comprises six research papers, each contributing to the overarching research aim and objectives outlined earlier. Designed to be read as a collection, the sequenced papers (somewhat) mirror the structure of a traditional thesis. Paper One serves as a literature review, mapping existing research that underpins the core approach and arguments of this thesis. Paper Two is a methods paper that reflects on researching care, researching *with* care, and approaching research *as* care. Papers Three, Four, Five and Six are empirical contributions, each examining different ways care is being taken in wildfire risk management and efforts to live with fire in Sonoma County. Together, the papers engage with the various relations, temporalities, materialities, participants, affects and practices of care in the world of wildfire risk management.

I now introduce each research paper, outlining its content, the research objectives it addresses, and the central arguments it advances.

Paper One: Critical geographies of disaster, and the geographical imagination

This paper lays the conceptual and theoretical groundwork for the thesis, serving as a replacement for a traditional literature review chapter. The paper begins by tracing the evolution of critical disaster scholarship and develops a conceptual framework that brings together Deleuzian assemblage theory, feminist theories of care, and decolonial thought. It introduces the concept of geosocial strata to trace the historical, spatial, and affective sedimentations that shape how disasters emerge and are lived. Central to this analysis is a critique of the Western imaginary of risk, which often marginalises or erases local ways of knowing. In its place, the paper argues for understanding disasters as disasters-in-the-making, emergent from complex, non-linear, and dynamic entanglements of power, values, affects, and material environments.

This paper, then, articulates care as a political, ethical, and affective orientation – one that resists objectification, reorients knowledge practices, and foregrounds interdependence across more-than-human entanglements (like disaster risk management). Conceptualising disasters and their risk management as 'matters of care' aligns with feminist and decolonial imperatives to stay with the trouble of interdependencies, complexity, and relationality. The paper also introduces geographical imaginaries as a theoretical concept to help disaster scholars interrogate and unravel the often taken-for-granted structural processes and dominant discourses that shape disaster risk, disaster events, and their management. By thinking through Deleuzian assemblage theory, feminist theories of care, and geographical imaginaries, we argue that scholars can more effectively engage with the tensions between globalising ideas and logics of disaster (such as, techno-managerial approaches, vulnerability metrics, and

probabilistic forecasting) and the lived experiences of communities on the ground, whose knowledges and lifeworlds may be fundamentally disconnected from those frameworks.

For this thesis, the paper provides a crucial conceptual and theoretical foundation for examining care in the world of wildfire risk management. Although its focus is on the wider world of disasters and their management, the critical disaster scholarship and theoretical concepts introduced here – assemblage, care, and geographical imaginaries – shape the approach taken throughout the subsequent papers By critiquing dominant techno-managerial and decontextualised approaches to disaster, the paper opens space to reimagine wildfire risk management as a complex, more-than-human entanglement through which care can be critically examined – supporting Objective One. This orientation enables the thesis to ask not only how wildfire risk is understood and managed, but how care is enacted, withheld, negotiated, and made meaningful within such entanglement. It also sets the stage for Objective Two by proposing that research itself can be a caring practice, one that unsettles extractive logics and enables critiques that foreground justice, accountability, and collective well-being. Throughout the thesis, this paper remained a vital point of reference. It informed my methodological decisions, shaped my analytical lens, and anchored my thinking – especially in moments of navigating the tensions between abstract concepts and lived experiences, critique and care, and institutional structures and relational practices. In this sense, the paper does not simply precede the empirical chapters, it underpins them.

Paper Two: Researching care, *with* care, *as* care: reflections on photo go-alongs as a method for all three

This second paper serves as a substitute for the methodology chapter of the thesis, although it focuses on only one of my research methods. This paper begins by exploring the possibilities and challenges of researching care, researching *with* care, and recognising research *as* care. In doing so, it advocates for methods that can attune to care as a messy, entangled, and non-innocent relation. It also evidences the value of thinking with feminist ethics of care, which foregrounds responsibility, relationship, vulnerability, solidarity, and interdependence in research. While acknowledging that there is no singular blueprint or checklist for how to research care or how to care in research, this paper develops photo go-alongs as one possible approach that opens up fertile ground for noticing, attuning to, and being implicated in everyday practices of care.

Go-alongs – a hybrid method of participant observation, interviewing, and, in my research, photography – enabled me to recognise, explore, and stay with the often-overlooked relations of care that surface in everyday wildfire risk management. This paper demonstrates how this method supported me in attuning to the more-than-human presences and affective atmospheres, as well as the ambivalences and tensions that accompany care in the world. I then demonstrate how I approached go-alongs *with* care, and *as* care, by foregrounding moments where I fostered attentiveness, responsibility, competence, responsiveness and solidarity – all of which are Tronto's (1993, p. 105, 2013) "phases of care." Drawing on my research encounters, I argue that research as a caring practice is always co-constituted, imperfect and unfinished: an ongoing negotiation of what it means to care in and through research. Ultimately, this paper

invites reflection not only on how we conduct (care) research (in risk management), but also on how we might do it differently (with care).

This paper makes a significant contribution to Objective Two, developing a method that facilitates researching care in wildfire risk management, remains attentive to researching *with* care, and embraces research *as* care. It grapples with the possibilities and tensions of researching care, while recognising that research itself can and should be approached as a caring practice. The paper develops one such method as an approach to engaging with these complexities and documents my experiences using it in the field.

Paper Three: Making care visible: a photo essay on wildfire risk management in California

This is the first of four papers that collectively serve as substitutes for the traditional results chapters of a PhD thesis, although this paper adopts a format not often found in academic scholarship. This paper explores how care surfaces in the ways wildfire risk is understood, managed, and lived with in California, but also asks: How might we as researchers make such care visible? To do so, it turns to the medium of the photo essay to render visible care that often escapes recognition in dominant narratives of disasters and their risk management.

As Mol et al. (2010, p. 10) caution, "writing about care... means that we need to juggle with our language and adapt it... The most difficult aspect of writing about care is not finding which words to use, but dealing with the limits of using words at all." Taking this seriously throughout this thesis, I recognise that relying solely on written expression risks obscuring the embodied, affective, and non-verbal dimensions of care. I also concede that some moments encountered in the field (such as, a goat quietly eating away at overgrown vegetation) may appear awkward or insufficient when described as care through text alone, even if they were encountered as care in the field. While Papers Four and Six take up the challenge of writing about care, this paper asks how else care might be communicated, turning to the photo essay as a form that can visualise and evoke care in ways that exceed the capacities of language alone. In doing so, it avoids mainstream journalistic aesthetics of disaster which often centre spectacle, destruction, and crisis, and instead opens analytical space for attending to mundane, ordinary, and more-than-human engagements with care in risk management settings.

This paper centres on 13 image-based vignettes, combining theoretical insights, field encounters, photographs, fieldnotes, and interview excerpts. These vignettes do not aim to be spectacular. Rather, they deliberately foreground the quiet, dispersed, and relational ways care surfaces in efforts to understand, manage and live with wildfire. This includes practices like brush clearing, compiling Go-Bags, and mapping workshops – care which is often overlooked, yet is central to inhabiting fire-prone landscapes in ways that feel liveable, familiar, and worthwhile.

The case made visual here contributes primarily to Objectives Three and Four by documenting how care emerges within wildfire risk management and how communities attempt to live (better) with fire. This paper (visually) demonstrates that care does not always unfold through

familiar tropes such as heroism, verbalised action, or gendered caregiving roles, but through mundane maintenance, more-than-human entanglements, and collective efforts to hold life together in fire-prone places. This paper also builds directly on Paper Two, which introduced the method of photo go-alongs. Here, I present data generated through this method and demonstrate how it can be visually represented. In doing so, this paper contributes further to Objective Two, by developing a methodological approach that both facilitates the study of care and embraces care as a research ethos. It demonstrates how visual methods can not only generate insight into care practices but also invite more caring forms of research communication and dissemination – those that remain ethically attentive, consider how best to present research data, and honour the communities and landscapes involved.

Paper Four: Stockpiled, standby, stamina: forms of care in disaster risk management
This is the second of four papers that stand in for what would traditionally be the results chapters of the thesis. This paper seeks to expand conventional understandings of care beyond feminised, domestic, unpaid, or low-paid labour, and to challenge the tendency in disaster settings to frame care solely in terms of response and recovery. To do so, I employ a broad conceptualisation of care as ”everything that *is* done… to maintain, continue, and repair “the world” so that *all…*can live in it as well as possible” (Puig de la Bellacasa, 2017, p. 161, modifying Tronto, 1993, p. 103). Yet, if care is “everything that *is* done” (ibid), I ask: where do its conceptual boundaries lie when thinking about care in disaster contexts? It goes on to delineate a grounded scope of care that better accounts for its complexity and contradictions in risk management.

This paper, then, identifies three distinct forms of care that circulate and are encountered within risk management: stockpiled care, care on standby, and care as stamina. *Stockpiled care* stores the potential for future care through accumulated caring materials and knowledge that promise sufficiency in crisis. *Care on standby* involves the ongoing maintenance of caring capacities held in suspension for an uncertain future. *Care as stamina* reflects the enduring, often exhausting work of sustaining and reconfiguring care relations amid uncertainty and crises. Drawing on diverse research encounters, the paper traces how these forms of care circulate through risk management – conflicting, and aligning with other relations and practices, care-related and otherwise.

Building on the conceptual groundwork laid out in Paper One, this chapter contributes to Objective One by further evidencing risk management as a more-than-human entanglement through which care can be critically examined. It also advances Objective Three, by documenting three diverse forms of and encounters with care in wildfire risk management. In fact, by analysing how stockpiled care, care on standby, and care as stamina unfold across different temporalities, materialities, affects, and actors, I argue that risk management is, at various moments, held together and sustained by care. Extending this analysis and argument beyond the world of wildfire risk management to the wider world of disaster risk management – where efforts address wildfire but also earthquakes, tsunamis, floods, and extreme weather, – this paper offers insight into how contemporary risk management configurations must simultaneously manage, resource and take care of multiple risks. In doing so, this paper further

contributes to the overall research aim by demonstrating that the forms of care emerging in response to an increasingly flammable world are not, and often cannot be, confined to fire alone. Rather, it shows that many kinds of care mobilised to navigate life (and flourish) in an increasingly fiery world are also being extended toward an increasingly disastrous world – one shaped by, for example, the climate crisis, prolonged drought and the looming threat of 'the Big One' earthquake.

Paper Five: The Fire Season?

This is the third of three empirically grounded papers that would traditionally comprise the thesis's results chapters. It explores how the changed and changing climate is destabilising once-familiar seasons and seasonal ways of life. Seasons have long provided a way to structure time, anticipate change, and coordinate rhythms between human and more-than-human worlds. In this paper, I demonstrate that the fire season in California has become a key site of temporal destabilisation, arriving unpredictably, intensifying, and slipping out of sync. Drawing on scholarship that understands seasons as rhythmic and relational phenomena, and that attends to more-than-human relations, I examine how individuals and communities navigate this destabilisation in two key ways: 1) By reasserting structure through official declarations and institutional calendars; and 2) By sensing and attuning to emerging, alternative seasonal cues through embodied and ecological knowledges. These practices reflect efforts to hold onto the fire season and to continue living seasonally, even as the changed and changing climate threatens the very possibility of doing so. In this sense, such efforts do not merely respond to destabilisation, they actively participate in the continued holding together of the fire season.

Importantly, this analysis challenges California Governor Gavin Newsom's (2025) claim that California no longer has a fire season, along with broader narratives of a 'seasonless' future. Instead, I argue that in California, the fire season increasingly dominates everyday life – bleeding into what were once considered off-season periods, sustained by constant reminders and preparations, and unsettling everyday life throughout the calendar year. Rather than vanishing, the fire season is becoming more pervasive. What may be emerging amid the climate crisis is not a seasonless future, but a *seasonfull* one – evolving, contested, and being recalibrated, reconfigured, and held together in new ways.

This paper makes a meaningful contribution to Objective Four, which explores how care is enacted as part of learning to live with fire and landscapes that burn. It steps back to ask broader, underexplored questions in geography: How do we coordinate ourselves through seasons? What happens when those seasons no longer hold? And what care is being taken to continue living seasonally? Although the paper does not explicitly engage with forms or encounters of care, nor directly draw on the conceptual framework woven through the rest of the thesis, care saturates its focus: care to rework temporal structures, to sustain everyday coordination, and to make time liveable amid the instabilities of a climate-altered world.

Paper Six: Learning to live with fire: relationships between humans and fire in prescribed burning

The final of these six papers functions as the fourth results chapter of the thesis. This paper focuses on the practice of prescribed burning – intentionally setting low-intensity, controlled fires to promote ecological health, reduce dangerous fuel loads and mitigate wildfire risk. In this paper, I demonstrate that prescribed burning cannot be neatly categorised as either a continuation of settler colonial fire suppression, where fire is cast as a threat or enemy to be eradicated, nor simply as a revival of Indigenous cultural burning practices, which understand fire as medicine and kin to be nurtured. Instead, prescribed burning emerges at the intersection of these histories, representing a contemporary and contested approach to wildfire risk management. It seeks to build a renewed relationship with fire – one shaped by urgency, uncertainty, and possibility, where fire is neither wholly enemy nor wholly ally, but a powerful force to be engaged with thoughtfully and carefully.

To make these arguments, I conceptualise four relations between humans and fire that emerge in the practice of prescribed burning: *prepping for fire, connecting to fire, caring through fire, and grappling with fire.* Rather than working with all my research encounters involving fire, I focus this paper on the story of a single event, the Grove of Old Trees prescribed burn. This choice allows me to present four extended "impressionistic vignettes" (Bissell, 2022, p. 482) that recount this burn as it unfolded chronologically. Each vignette is grounded in a combination of field encounters, photographs, notes, and storytelling interview transcripts, and is used to illuminate one of the four relations with fire identified above. Together, these relations with fire illuminate how prescribed burning draws on, but also diverges from, Indigenous cultural burning practices, while remaining in tension with enduring logics of settler colonial fire suppression.

Whilst this paper does not explicitly foreground the conceptual framework of care that weaves throughout much of this thesis, it is centrally concerned with how care is enacted as part of learning to live with fire and landscapes that burn – addressing Objective Four from a different angle than the previous paper on the fire season. Contributing to fire geographies, it argues that prescribed burning offers a meaningful, if partial, step toward living better with fire and fire-prone landscapes: a tentative reworking of more-than-human relationships amid the escalating wildfire crisis. In doing so, the paper engages with the ethics and politics of care that surround settler colonial fire suppression and Indigenous cultural burning, using care as an entry point to begin illustrating what is both novel and fraught about prescribed burning as a non-Indigenous practice. By experimenting with a more narrative and affective form of presentation, the paper also seeks to write with care – to attend closely to the textures of fiery encounters, to remain accountable to the long, complex history of relations with fire, and to navigate the tensions and responsibilities entangled in this work sensitively.

1.6. Summary of thesis conclusions

Drawing the six research papers together, I argue in my conclusion that care is the fabric of life in an increasingly flammable world, central to how fire is understood, managed, and lived with. I propose that wildfire risk management activities, everyday rhythms, and long-term efforts to coexist with fire are all animated by, and entangled in, relations of care. Here, care is not

confined to the feminine, domestic, unpaid and low-paid labour, nor limited to moments of wildfire response or recovery. Rather, it unfolds across a diverse relations, temporalities, materialities, participants (human and more-than-human), affects and practices, woven through moments in which life is navigated, sustained and held onto. While care is often marked by friction, ambivalence, and contestation, I argue that communities in Sonoma County rely on care not only for their survival, but also for cultivating more flourishing relationships, worlds, and futures amid landscapes already burning.

Throughout the conclusion, I show how the six research papers, when taken together, make novel contributions to the four bodies of scholarship introduced at the outset: fire geographies, critical geographies of disaster, feminist and post-humanist theories of care and scholarship on caring research. First, while acknowledging that relations with fire remain deeply entangled with the legacies of colonial fire suppression, I contribute to fire geographies by offering an account of the care being taken to live (better) with fire and landscapes that burn. Second, I disrupt dominant framings of wildfire risk management as purely techno-managerial and of care as merely feminised or invisible labour, pushing critical geographies of disaster to better account for entangled relations of care that animate, sustain and hold such world together. Third, building on feminist and post-humanist theories of care, I advance an expanded understanding of care, one that moves beyond traditional framings of feminised labour and challenges the notion of care as an exclusively human activity. In relation to both care and risk management scholarship, I also offer a methodological approach attuned to the mundane, more-than-human, and often-overlooked ways in which care surfaces. Fourth, and finally, I contribute to debates on caring research by offering an account of care in research as co-constituted, more-than-human, imperfect, and ongoing.

In articulating these contributions, I suggest pathways for future research, highlighting how scholars might extend this thesis in exciting new directions. I also offer interventions to those in disaster policy and practice, pointing to ways this research could inform their important work going forward. I close with a reminder to myself and to readers: the work of care is never finished.

2. The papers – one, two, three, four, five and six

Each paper offers a distinct fragment of the whole thesis; together, they form the foundation upon which the thesis's overarching arguments and conclusions are built. In the chapters that follow, I present each of the six papers individually, indicating their authorship and publication status.[2]

[2] Please note that references for each research paper are listed at the end of their respective chapters, while references for the thesis introduction and concluding chapter can be found at the end of the thesis.

3. Paper One: Critical geographies of disaster, and the geographical imagination

Authors: Professor Amy Donovan, Tilly E. Hall, Dr Julie Morin, Carolyn Smith and Dr Rory Walshe
Publication status: Published in Progress in Environmental Geography

Abstract: This paper combines assemblage theory, feminist ethics of care and decolonial theory to build on recent work in disaster studies that seeks to address the systematic and intersectional inequalities that underlie the emergence of disaster. We argue that Western logics of "risk" do not always have traction with communities, and so researchers must "stay with the trouble" in engaging with tensions between lifeworlds. We suggest that geographical imaginaries provide a means to analyse the diverse ways of being and knowing that are involved in this process.

Assemblage, disasters, environmental justice, ethic of care, imaginaries, geographical imagination

1. Introduction

This paper builds on previous work that has argued in favor of a critical geography of disasters that pays renewed attention to the power dynamics, value systems, and relationships that lead to or suppress the emergence of disaster in a particular geographical setting (Angell 2014; Donovan 2017; Grove 2013; Groves 2017; McGowran and Donovan 2021). We use an assemblage framework and focus on the methodological challenges that it implies, arguing that research can put this into practice by rooting it more firmly in an "ethic of care" (Brannelly 2018; de La Bellacasa 2017; Hobart and Kneese 2020; Martin, Myers and Viseu 2015). This is an important problem in disaster studies, because labelling a group as "vulnerable" or "not resilient" can have significant consequences when governments actively use that labelling to disempower groups and effectively stymie justice (Andreucci and Zografos 2022; Bankoff 2001; Grove 2014; Maru et al. 2014). Furthermore, it is part of a wider set of discourses that emerge from a specifically Western mindset of categorization and quantification (Gaillard 2023; Porter 1996). Methodologically, we argue for an approach that we frame in the context of geographical imaginations – understanding the diverse, place-specific and value-ridden imaginaries of different groups (including scientists, disaster managers, and affected people) in disaster contexts, and how those imaginaries empower and are empowered by existing structural inequalities and dominant ontologies. This includes the Western imaginary of risk itself: many communities, especially in the Global South, do not think of their environment as "risky."

We approach this argument through three concepts: desire, as it is described by Deleuze but then adapted by indigenous and feminist scholars; the ethic of care, which can enhance a feminist reading of Deleuze (Gilson 2011; Grosz 2018, 2008; Povinelli 2016; Sholtz 2022), and geographical imaginaries as a means of teasing out the interdependencies and affective complexities that are inherent in the production of "disasters-in-the-making." We chart recent evolution in disaster scholarship that has sought to decolonize the discipline and argue that feminist and Deleuzian scholarship helps to bring together these advances theoretically. This paper will initially and briefly review the emergence of critical geographies of disaster in recent years, building on earlier work. We then adopt the geological imagery of Deleuze and Guattari to illustrate the ways in which geosocial strata are shaken and eviscerated in disasters. We bring together their conceptualization of desire with the feminist ethic of care and feminist and decolonial readings of Deleuze to emphasize the affective nature of disaster research and its subjects. We then argue that, methodologically, geographical imaginaries pose an appropriate approach to the study of the disaster assemblage, because they enable an awareness of the clash of lifeworlds that produce disaster. We particularly focus on the Western imaginary of "risk," and the ways in which it has itself become a colonizing force – not only are disasters frequently colonial and revealing of colonial power relations (Atallah 2016; Bonilla 2020; García López 2020; Rivera 2022) but the apparatus that is used to conceptualize risk predisposes us to particular questions that may not reflect the concerns of communities in context. Gaillard (2021) argues for a local-focussed disaster research. This paper concurs with that and pays attention to the plural lifeworlds and imagined futures that are (often tacitly) in competition with each other in disaster contexts.

2. Background: critical geographies of disasters

Assemblage theory provides a useful way to conceptualize the emergence of disaster for several reasons – it encourages the combination of material and expressive components that arise in the socioenvironmental context (Briassoulis 2017; DeLanda 2006; Farías 2011); it accounts for the emergence of complex, nonlinear processes with plural endings; and it can incorporate "futures-in-the-making" (Adam 2005; Adam and Groves 2007) as an expressive component of an assemblage. McGowran and Donovan (2021) discuss "disasters-in-the-making" as a form of such a future: disasters emerge from particular sociomaterial and expressive assemblages in ways that may result from both planned and unplanned elements of *natureculture*s, strongly mediated by power dynamics and imbalances. The emergence of a disaster is likely exacerbated by an event – perhaps in combination with synchronous poor decisions or under resourcing – but it is also a form of slow violence: it derives from socioeconomic, cultural, and political conditions in complex dialogue with a dynamic physical environment (Atallah 2016; Bonilla 2020). Assemblage thinking differs from systems thinking, however (Farías 2017; Spies and Alff 2020): systems thinking is more readily quantitative and bounds its problems; assemblage is interested in entanglements and plurality of meaning, often seeking stories and narratives and enabling the incorporation of nuance (Deleuze and Guattari 1988).

Such approaches also engage with decolonial theory to understand the emergence of disasters: there is an increasing body of work that critiques the dominance of Western rationalism in disaster studies and international disaster paradigms (such as systemic risk) (Bonilla 2020; Gaillard 2021; García López 2020). The decolonial agenda has grown from regional discourses that make visible the ongoing (neo)colonial logics (obscured by modern capitalism and neoliberal governance) in postcolonial territories, seeking to deconstruct the "common sense" assumptions which allow them to persist (Mignolo and Walsh 2018; Quijano 2000; Said 1978; Siddiqi 2022). It is perhaps unsurprising that decolonial scholarship and disaster discourses have converged in their analysis of the underlying drivers of slow onset emergencies and the power dynamics which sustain inequalities, as disasters are felt disproportionately in the Global South (i.e., in "low income," often postcolonial territories, see UNDRR and CRED, 2020, 20–22).

At the same time, the significance of other ways of knowing the environment and its materiality has been widely discussed (Armijos Burneo and Ramirez Loaiza 2021; Atallah 2016; Blaser 2014; Escobar 2015, 2014; Latulippe and Klenk 2020; Pardo et al. 2015; Wilkinson et al. 2020). Alongside this literature sits recent theoretical developments in political geology, including the politics of the earth itself (Grosz 2008; Povinelli 2016); the politics of the geological sciences (Bobbette and Donovan 2019); geosocial strata (Clark 2016; Clark and Yusoff 2017; Palsson and Swanson 2016; Yusoff 2013); and the Anthropocene (Chandler 2018; Clark 2014; Savransky 2012). These literatures are significant for disaster studies because they require that scholars engage with the materiality of relationships and entanglements in *natureculture*s and point toward the applicability of assemblage as a means of conceptualizing the intertwining of diverse processes, some of which are controlled by humanity and others less so (Adey, Anderson and Guerrero 2011; Anderson et al., 2020; Donovan 2017; Grove and Pugh 2015).

We acknowledge here that we are building on a field of knowledge that is largely Western in its origins (such as assemblage theory, which has its roots in the French philosophy of Gilles Deleuze and Felix Guattari – and also vulnerability theory). Maldonado-Torres (2020) makes the point that critique may be decolonial where it is "pluriversal, intercultural and transdisciplinary" (p. 170) and takes on the form also of self-criticism (which may also be collective in nature). He traces the history of "critique" in Europe and warns against the Eurocentric philosophical arrogance that leads to the political arrogance of colonial oppression, noting that "critique" emerges in other philosophies too. We seek to use these ideas, then, to unpick the complex historical trajectories of disasters-in-the-making, using them as a means of making-visible the geographically distinct but also networked power imbalances that enhance disasters. Initially, we use this literature and its imagery to draw out the geontology of disasters, building on the work of Povinelli (2016) and Yusoff (2019, 2023). We take the image of strata, deployed by Clark and Yusoff (2017), to illustrate the complex and historically contingent emergence of disaster risk from Western logics of taxonomy and calculation. We frame this around Maria Puig de la Bellacasa's "matters of care": disasters are situated, contingent and fundamentally relational. They involve entangled *natureculture*s. We then explore geographical imaginaries as a methodological approach to lay bare the diverse imaginaries at work in the creation of disaster. "Imaginaries" have been referred to in Latin American decolonial literature, particularly around ideas of the coloniality of knowledge (e.g., Baquero et al., 2015; Gomez Moreno et al., 2015), where they serve as a useful means of unpicking the tensions and difference of diverse geopolitical viewpoints, among other things. Our focus in this paper is on theorizing the emergence of disaster and the ways in which we research it.

3. The stratigraphy of risk: a "matter of care"?

> Thinking in the world involves acknowledging our own involvements in perpetuating dominant values, rather than retreating into the secure position of an enlightened outsider who knows better. (Puig de la Bellacasa, 2012, 197)

Work in disaster studies has often focused on categories – taxonomies that might explain vulnerability; logics of calculation that reduce "hazard" to a probability. It frequently imposes cartesian analytical frameworks that enable a particular kind of Western analysis, with predefined priorities. It imposes a framework onto a context from the outset. Thinking with care, though, involves flipping this around and considering, first, the priorities and lifeworlds of the marginalized.

> "Adequate care requires knowledge and curiosity regarding the needs of an 'other' – human or not – and these become possible through relating, through refusing objectification." (Puig de la Bellacasa 2011, 98)

The imposition of metrics and categorization – whether vulnerability, probability, or risk itself – presupposes a particular kind of existence and particular kinds of relationship. Typically, this is the state trying to impose control on an uncertain future – to assert its own power and preferred imagined futures (Hajer and Versteeg 2019). By contrast, Deleuzian feminists have argued in favor of orienting critique around care (Bignall 2008; Puig de La Bellacasa

2017; Grosz 2008). In this section, we elucidate links between Deleuze's work on desire – the force that produces the subject – and the feminist ethic of care.

Deleuzian assemblage thinking emphasizes the importance of *desire* (Deleuze and Guattari 1988): a virtual force that drives much of what "is" (Bignall 2008). Bignall likens Deleuzian desire to Foucault's theory of power: desire can be productive, rather than representing a lack. Desire becomes embodied and realizes assemblages, but whether or not new desires can transform existing assemblages depends on the nature of the assemblage itself. In writing about the "liberation of desire" to effect change, Deleuze emphasizes encounters between entities and the significance of having ideas in common – "common notions," after Spinoza (Bignall 2008; Deleuze and Guattari 1983). Encounters can engender new desires and new knowledges: community experiences and affects are an important part of creating new configurations of assemblages – of capturing and mobilizing desire. Thus, while there are also commonalities between these approaches in their focus on relationships, complexity, and their attention to power dynamics, assemblage is also interested in the virtual-forces that influence both individually and collectively the choices and movements of entities within the assemblage. We suggest that this provides disaster research with an opportunity to engage *care*fully.

> "The question… lies in our receptivity to others, in what kinds of evidence we assemble and use – the voices to which we listen and the experiences we account for – and in how we craft our explanations." Biehl and Locke (2010, 318)

The choices that are made by powerful actors in an assemblage are hugely significant and may define for a community what is regarded as a "desirable future"; hence, there are many attempts to ensure that planning processes, for example, are made more equitable (Bai et al. 2016; Rumbach 2017; Thomalla et al. 2018). Such choices, though, are underlain by values, desires, and interests (Jones et al. 2016; Rawluk, Ford and Williams 2018), and subject to the influence of complex histories and political economies, including the history of colonialism and the forces of globalization (Atallah 2016; Bonilla and LeBrón 2019; Kronmüller et al. 2017). Feminist readings of Deleuze thus emphasize desire as a means of understanding the configuration of the world through affect and the interdependency of entities. This aligns well with the interests of feminist scholarship in demonstrating the forces that lie behind the unfolding of events as not purely masculinized reason, but much more embedded, situated, and sensory (Bignall 2010; Gilson 2011; Haraway 1988; Sholtz 2022).

Stratigraphy is a useful metaphor here, and one that has been widely used in the political geology literature in displaying the ways in which historical processes, affects, and movements continue to influence a wide range of socioeconomic and (onto)political conditions (Clark 2016; Yusoff 2018, 2017). Strata are spatially specific, but they are also subject to forces and can be folded or altered (Groves 2017). There are diverse uses of this image in sociology, however – ranging from the specific and ultimately essentialist approach of Deleuze and Guattari (for whom strata – geological, biological or alloplastic – are, like assemblages, combinations of the material, and expressive in space) to the more common use of "social strata" to refer very basically to demographic groupings (Fordham et al. 2013). Yusoff (2017) develops the notion of "geosocial strata," building on Deleuze and refocussing on geosocial relations, with an emphasis on the production of injustice through the use of the

geological to enforce social distinctions. It is here that we conceptualize the "stratigraphy of risk" (Figure 1): risk, as conceptualized in modernist science, not only encapsulates both earthly and environmental forces alongside and intermingled with social forces but it also encapsulates values deeply embedded within that stratigraphy. While the physical strata studied by geologists encapsulates the temporal history of hazard events – and may be accompanied by archaeological evidence of their impacts – the social strata that operate alongside, between and within them are more complex and subject to a range of forces that emerge from different forms of geopower and with complex historical contexts. For example, social strata also inform who gets to study geology and for whom geological science is primarily produced; and geologies may enhance the machinations of colonial powers (Donovan 2021; Yusoff 2018, 2015). The modernist imaginary of "risk" emerges only because of the deeply stratified and value-laden modern capitalist state, and the forces of desire that underlie the emergence of disaster.

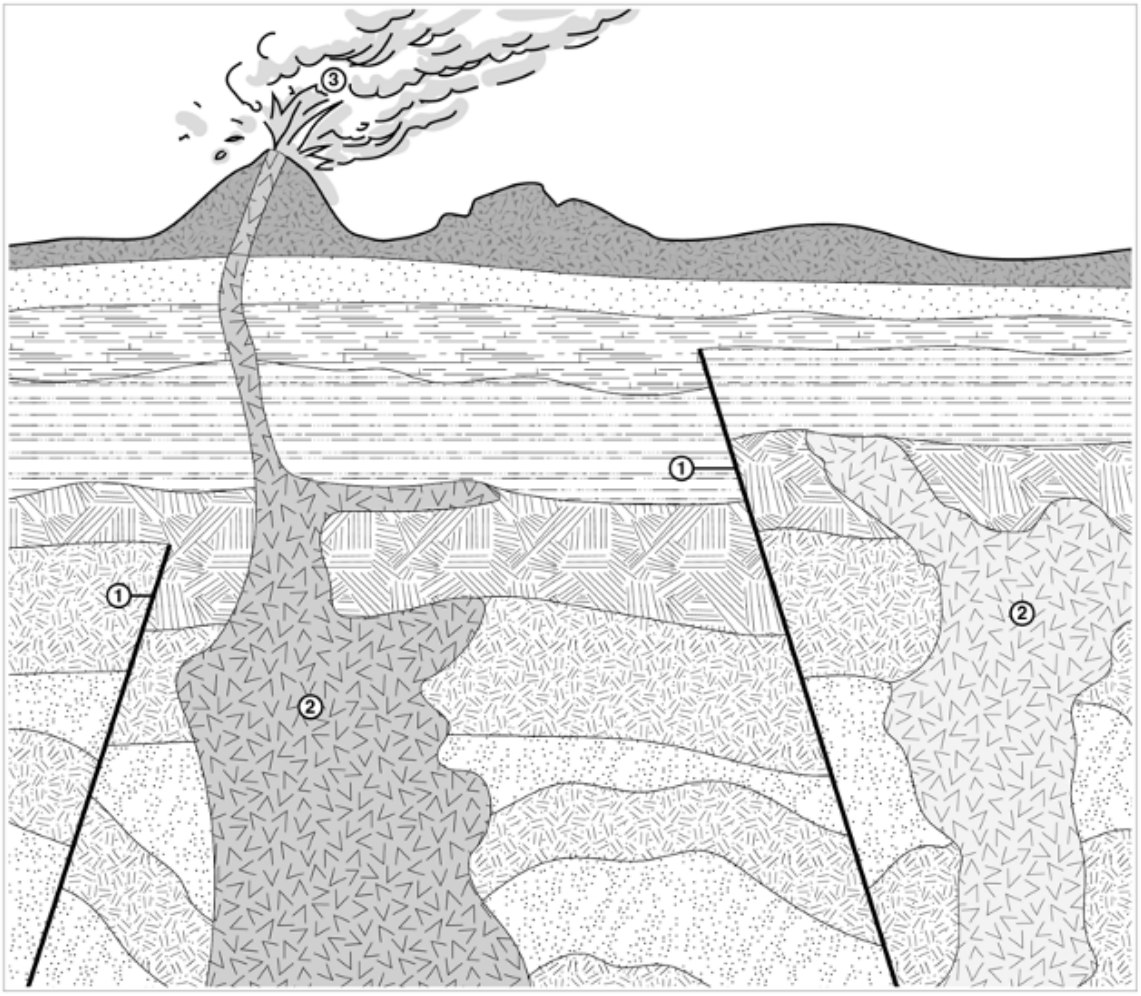

Figure 1. The stratigraphy of risk. This figure metaphorically shows sociogeological strata.

The whole system is under pressure, which is not distributed evenly (power dynamics, intermingled with earth processes that may or may not be readily forecast by and for particular groups), and strata interact with each other. The system is subject to rupture (1) which results in changes as power structures evolve, elements interact, and societal fabric shifts. The system is also subject to rapid changes in the form of intrusions (2) which, depending on the forces at

work, heat/interact with strata and may break through to the surface and cause dramatic changes to the social order (3). Values, like crustal fluids, permeate the strata. Figure drawn by C. Smith.

Knowledge production is underlain by values – both epistemic and non-epistemic (Dorato 2004; Douglas 2009, 2000). It is also inherently political (Hinchliffe 2001; Jasanoff 1996) and raises well-documented challenges for democratic governance in the "risk society" (Beck 1992; Brown 2009; Latour 2004). It involves the selection and navigation of affects – which may also be related to experiences of disasters in the past, to shared values and to relations with social and material worlds. As discussed above, geological and geographical institutions may have long histories of colonialism; and they function in the modern nation-state as neoliberal entities that are driven by market values (Millar and Mitchell 2017; Paudel and Le Billon 2020). In this context, the diverse values and lifeworlds of marginalized groups may be overlooked or even overridden by national and international priorities.

> Simone Bignall writes,
>
> In the context of postcolonization, we might then ask: how can we act in order to shift the strata of national values and destabilize the colonial basis of a given society, without simply becoming included in the strata? (2008, 134)

This is a key question in disaster studies, and one where action research has struggled: perturbing the neoliberal state to take action to reduce vulnerability has proved challenging. One reason for this is the frequent absence of *care*ful critique: stepping outside of the Western logic of risk and encountering and learning from other lifeworlds. Paying attention to the geosocial strata that have been emplaced in and still dominate the topography of such lifeworlds enables a decolonial analysis of the emergence of disasters.

4. Caring critique

> The politics of knowledge cannot be disarticulated from a politics of care… By casting care and its problems aside we might not only lose what is generative in care – what care makes possible – we would also elide the ways that care works to animate and activate inquiry and analysis. To bypass, curtail, or overlook care would work to obscure further the moral and affective economies that shape researchers' entanglements with the phenomena they describe. (Martin, Myers and Viseu 2015, 631)

Feminist geographers have applied ethics of care in their work extensively, seeking to pay attention to the significance of relationships, connectedness, and interdependency between humans, nonhumans, and more-than-humans (Aufseeser 2020; Puig de La Bellacasa 2017; Mason 2015; McEwan and Goodman 2010; Olson and Sayer 2009). Indeed, "thinking with care" has been advocated for as a way to direct attention to marginalized, hidden, and neglected entities and agencies, whereby care is demonstrated as "an active process of intervening in the count of whom and what is ratified as concerned" (Puig de la Bellacasa 2017, 52). In disaster research, this might entail a committed speculative sensitivity to discovering the traces of those (human, nonhuman, and more-than-human) less able to make their stakes in our research phenomena, or that are invisibly implicated in our processes. Values posited from

ethics of care – including attentiveness, responsibility, trust, and solidarity – encourage scholars to *stay with* the complexities that arise in research (e.g., plural, possibly contradictory lived experiences) and the phenomena it studies (Brannelly 2018; Martin, Myers and Viseu 2015). Values from ethics of care also represent the kind of care that is connected to collective action and positive change (Hobart and Kneese 2020).

Assemblage-based approaches to disasters are well placed for such an approach. Puig de la Bellacasa (2011, 2017) took critical inspiration from Latour's (2004, 2014) reorientation of "matters of fact" to "matters of concern" and proposed "matters of care": the affective entanglements within and between dynamic social, technical, and political assemblages. Such entanglements attend to marginalized, hidden, and neglected human, nonhuman, and more-than-human components. To do so, Puig de la Bellacasa (2017, 52) advocates "thinking with care" as "an active process of intervening in the count of whom and what is ratified as concerned." Here, then, "care" entails a committed, speculative sensitivity to discovering traces of those less able to make their stakes in disaster risk management apparent – or to the assembling relations within disaster risk management that are invisibly implicated, including assumptions about what constitutes "risk." It involves careful analysis of the geosocial strata.

In disaster studies, ethics of care have primarily been applied in literature about aid and the immediate care of disaster-affected people (Mena and Hilhorst 2022; Whittle et al. 2012), but are beginning to be used more broadly. For example, in their study of indigenous women in Colombia, Armijos Burneo, and Ramirez Loaiza propose:

> *un camino ético que se traza desde el cuidado entre los cuerpos como territorios y nuestros cuerpos como investigadoras, ubicados en el encuentro de la conversación; en este sentido, entendemos que este diálogo está atravesado por la figura de mutualidad, mutualidad de aprendizajes, historias y saberes, que terminan configurando espacios de cuidado del cuerpo-territorio. El cuidado, en este sentido, no solo se visibiliza desde un plano metodológico en términos de los vínculos tejidos entre co-investigadoras (investigadoras y participantes), también se retrata en el plano epistémico y ontológico de la forma como se habitan los territorios* (2021, 20–21).
>
> *An ethic that is traced from the care between bodies-as-territories and our bodies as researchers, located in the encounter of conversation; in this sense, we understand that this dialogue is traversed by mutuality, mutuality of learning, histories, and knowledge, which ultimately configure spaces of care in the body-territory. Care, in this sense, is not only seen in a methodological sense in terms of the links between coresearchers (researchers and participants) but is also seen in an epistemological and ontological sense, in the way in which the territories are inhabited.*

They argue that an ethic of care as decolonial practice involves not asking so much about integrating knowledges as about *experiencing new ways of making knowledge*. Indeed, Latin American studies of indigeneity make clear that the plural ways in which indigenous groups both live in and know their territories problematize Western separations of knowing and being, and of onto-epistemologies from territory (Armijos Burneo and Ramirez Loaiza 2021; De la Cadena 2010; Escobar 2001). Ethics of care scholarship also disrupts the norms and

expectations of individualism, neoliberalization, and universalism, which see individuals as autonomous, independent, and self-responsible (Askew 2009; Clayton, Donovan and Merchant 2015; Cloke, May and Williams 2017). "Matters of care" involves "dissenting within" as a means of effecting meaningful and positive critique.

There is no one-good-care-fits-all approach to a critical geography of disasters; rather questions like "how to care" in the context of disaster become insistent but not straightforward (Puig de la Bellacasa 2011, 100). A critical geography of disasters requires an ethic of care that is attentive to value systems, inequalities, and intersectionalities, but that creates spaces for experimentation and speculation about other ways of being-knowing, recognizing that care looks different in different places (Raghuram 2016). It should seek to think-with and benefit the communities from which it is learning (Gaillard 2019) and enable productive discussions ("dissenting within") around how Western logics of "risk," "vulnerability," and "hazard" interact with other ways of knowing the earth.

5. Imaginaries: making and unmaking the future

To develop these ideas further, we consider the concept of "imaginary," which has been widely used in geography. One helpful definition of imaginaries is that they are "socially transmitted representational assemblages that interact with people's personal imaginings and that are used as meaning-making and world-shaping devices" (Salazar and Graburn 2014, 1). In geography, imaginaries have typically been understood spatially: "spatial imaginaries are stories and ways of talking about places and spaces that transcend language as embodied performances by people in the material world" (Watkins 2015, 509). Imaginaries are thus both expressive and material: they are beyond-representational because of the ways that they are territorialized in the world, and they are influenced themselves by affects as they are performed in the world and changed through embodiment. They interact with individual imaginations and influence them – and they can circulate through objects too – texts, images, artifacts, and strata for example. Imaginaries are multiscalar and encompass multiple themes (Watkins 2015); they also exist through time, with visions of histories and trajectories that are linked to places but highly variable between different groups and cultures. Finally, there is also a strong component of "othering" encased within the concept of "imaginary" (Sharp 2009), and this is where it links with other related ideas such as Said's "imagined geographies": imaginaries may be imposed on places by external actors as well as held by multiple groups within a place (Gregory 2004, 1995; Said 2008). According to Howie and Lewis (2014, 132):

> "The idea of geographical 'imaginaries' is an attempt to capture not only that there are multiple geographical imaginations at large in the world, but that they do work in framing understandings of the world and in turn making our different worlds, and that particular imaginaries are wilfully put to work with political affect and effect."

Geographical imaginaries thus incorporate not only space but also place, scale, time, and knowledge – and they are vulnerable to power: the imaginaries of some groups may be more powerful than those of others, and therefore imposed onto one group by another. Imaginaries may be informed by narratives – specific stories or memories of an event or a certain

circumstance – and it is the power-laden processes of negotiation of different (competing or complementary) imaginaries with which we are concerned.

In this paper, we focus on the imaginaries of "risk" in specific places but also at multiple scales, and how those imaginaries – which typically originate in Western epistemology – interact with those of local peoples. Imaginaries often contain social anxieties with regard to the future (Gregory 1995, 456), and risk is a sociotechnical imaginary which uses ideas about the future to justify actions in the present – and one that takes many forms (Adams 1995; Beck 1992; Lupton 1999; Wisner, Gaillard and Kelman 2012). Particular imagined futures orientate the planning process, for example; these may come from scientific models, development decisions, or urban planning considerations. Imaginaries are not only made of (sometimes incomplete) knowledges but also interact with forms of knowledge production.

> "Imagination also operates at an intersubjective level, uniting members of a social community in shared perceptions of futures that should or should not be realised." (Jasanoff 2015, 5).

This is consistent with geographical understandings of imagination too: the value attributed to place and community by different groups is mediated by imaginaries about what the world should be like – and thus imaginations both contribute to and are defined by power dynamics (Daniels 2011).[1] This requires geographers to pay attention to the diverse imaginaries exhibited by different groups of people: disasters emerge out of assemblages of decisions, ideas, physical processes, human-environment interactions, institutional geographies, affects, cultures, and historical patterns in particular places, often territorialized by the dominant political imaginaries (Angell 2014; Donovan 2017; Marks 2019; McGowran and Donovan 2021; Ranganathan 2015). It also emphasizes the importance of positionality in research, as emphasized in feminist approaches: researchers bring their own imaginaries into the field, impacted by their past experiences, scientific training, and expectations.

Imaginaries survive and travel through engagement with social dynamics and affects – including the histories and trajectories of particular places: geosocial strata. They may also be dictated by scientific and technological means, such as models and forecasts (Jasanoff and Kim 2015; Mathews and Barnes 2016) – and they are also implicated in the production of those objects. However, such imaginaries come into contact with other forms of imaginary in the public and institutional spheres. This can create significant tensions between visions of the future in particular places, which may ultimately increase the risk of disasters emerging. Similarly, other scientific interpretations of risk encounter are challenged by local, embedded imaginaries. Anticipation of the future is increasingly a part of governmentality, particularly in developed contexts but increasingly also in the Global South (Anderson 2010; Groves 2017). Risk may be a scientific imaginary; it can also become a technology of government (Amoore 2013; Strakosch 2012).

Imaginaries provide a potential way to think-with diverse groups of people about their perceptions of the world and how they might see it changing – and what forms of change they can or will accept. This can provide a useful tool in identifying not "the view from nowhere" (Shapin 1998) or even "the view from everywhere" (Borie et al. 2021), but focussing instead

on “the view from within”: how do the shared attributes, experiences, and challenges of communities (including scientific ones) frame the ways that they think about their own stories in the face of disaster risk, and therefore the kinds of decisions they make or would like to make? Whose imaginaries dominate in the DRM assemblage? Methodologically, we follow Taylor (2004), in thinking of imaginaries as

> “…the ways people imagine their social existence, how they fit together with others, how things go on between them and their fellows, the expectations that are normally met, and the deeper normative notions and images that underlie these expectations” (Taylor 2004, 23)

For example, imaginaries of volcanoes may include stories based on past eruptive experiences, cultural beliefs, or scientific forecasts (Bankoff, Newhall and Schrikker 2021; Donovan 2022; Glynn and Cupples 2022; Walshe et al. 2023), and be a part of wider geographical imaginaries that help to forge identities in particular places. By focussing on imaginaries, researchers can engage critically with a range of different onto-epistemological worlds. Imaginaries incorporate and are underlain by values – including those aligned, or not, with dominant forces of politics and capitalism (Beckert 2016; Hajer and Versteeg 2019). They may also include epistemic values – preferences for particular forms of knowledge and knowledge-making over others. The scientists who work in contexts of disasters – and disaster researchers themselves – will hold particular sets of values and import imaginaries based on their own experiences and interests. Part of doing critical disaster research involves paying reflexive attention to those imaginaries and their values, alongside those of communities in situ – in effect, doing so *care*fully. Thus, grounding research in disaster imaginaries with “care” might assist scholars to ask questions of and unravel the often taken-for-granted structural processes and hegemonic discourses that interweave disaster risk.

6. Toward a critical geography of disasters

This paper has so far drawn on three theoretical concepts – Deleuzian desire in assemblage; the feminist ethic of care; and geographical imaginaries, using the metaphor of geosocial strata to think-with the earth in particular contexts. Its overall aim is in bringing these ideas together, drawing on the work of Maria Puig de la Bellacasa, Elizabeth Grosz, and Elisabeth Povinelli in its theory, and also building on the emergent decolonial literature on disasters. The materiality of disasters has received attention in the drive toward a critical geography that engages with disaster not through categorization or metrics but through an attention to the lived experiences and desired futures of people on the ground (Barbosa and Coates 2021; Bonilla 2020; Glynn and Cupples 2022; Rivera 2022; Sou 2022; Sou and Webber 2023). Assemblage enables us to sit with the tensions that arise in disasters between globalizing ideas and logics, such as humanitarian response, vulnerability assessments and probabilities, and the lived experiences of marginalized communities on the ground, whose lifeworlds may be completely detached from those wider logics. Such approaches force us to consider how and why we do research, and what the world-making effects of that research process may be: that is how we envision the operation of care in this context. Care involves care-full attention to the well-being

of the world – human and nonhuman – and reflexive awareness of our own positionalities. It involves situated practice that pays attention to the interdependence between entities, including to affective entanglements. It is, fundamentally, political – because it involves a commitment to challenging inequalities and injustice. It also involves resisting dichotomous, categorizing readings of the world (Puig de La Bellacasa 2017; Grosz 2018; Povinelli 2016; Puig de la Bellacasa, 2012, 2011), but attends instead to the layers of injustice and violence that have produced the context for disaster to emerge.

Emerging work in disaster studies is increasingly sensitive to the historical injustices of colonialism. It is also conscious of complexity: traditional approaches, such as "pressure and release," promote a linear framework that has shown itself powerful in some contexts – but has also been critiqued for its lack of attention to culture, for its deterministic language and for its simplicity, particularly in overlooking the complex interactions between humans and nonhumans among other things. It bears the hallmarks of its own sited production uncritically (Bankoff 2003, 2019; Malm, 2023; Turner et al., 2003). Recent work has therefore sought to enable a more comprehensive understanding of non-Western ontologies and diverge from the metrics and typologies that are inherent in traditional approaches – often highlighting similar results, but bringing to bear a more nuanced and complex understanding. For example, Bonilla (2020) unveils the "coloniality of disaster" in Puerto Rico, noting that disasters unveil the depth and pervasiveness of the colonial present – that vulnerability in this context was revealed in the waiting for assistance that never came. She writes that,

> …the search for a post-disaster future is thus about more than just repairing roofs and restoring streetlights. It is also a matter of attending to the deep inequities and long histories of dispossession that had already left certain populations disproportionately vulnerable to disaster (2020, 10).

She discusses in some detail the imagined repair of the island, which is not actualized because the powerful US "doesn't care." Instead, the lack of repair reveals the extent to which Puerto Rico is colonized: it reveals the layers of historical and present subjugation of the island.

We have used the image of stratigraphy to illustrate how risk is generated through temporal and spatial relations between elements of naturecultures and is arranged not only according to historical and colonial forcing but also through the values – the desires – that permeate the strata. Walshe et al. (2023) deploy imaginaries as an orienting concept in understanding the ways in which people around Lonquimay volcano in Chile conceptualize their life alongside the volcano. They describe the different imaginaries that different groups related, including differences between those who were from the Mapuche community, those dependent on tourism for their income and those for whom the area was long-term home but who had a modern, scientized view.

Other authors have used imaginaries as a means of analyzing environmental governance (Chhetri, Ghimire and Eisenhauer 2023), the socioecological futures of an urban river (Holifield and Schuelke 2015) and the ways in which geographical technologies are woven into tensions between settler colonialism and decolonial debates (Rivera 2023). Imaginaries may lead to deconstruction of existing assumptions, tacit knowledges, and ways of being and

knowing, but in doing so, they reveal historical injustices between groups. Maria Puig de la Bellacasa, like Latour and Stengers on whom she draws extensively, is interested in critique as positive – as something that can help to make a better world. Thus, critiques of vulnerability or even of risk are not intended to replace or reject those imaginaries but to sit alongside them. Just as "attention to affect helps us bring into view the ways in which each element acts on the other, to be moved, and even transformed" (Latimer and Miele 2013, 23), so careful critique can enable renewed awareness of the interdependencies between beings that may be transformative of knowledge systems and their politics. We suggest that key features of a geographical imaginations approach to disasters might include attention to affects, to relationships-in-place, to thinking-with places and communities, to the diverse imaginaries of experts and communities, to the limits of metrics and the pervasive power that they exercise.

7. Geographical imaginations and disaster risk

The radical disaster studies agenda highlights the importance of positionality and humility on the part of researchers and the privileging of local epistemologies (Gaillard 2019, 2021; Goodall, Khalid and Del Pinto 2022). These emerging approaches are underlain by *values* that prioritize equity – flat ontologies and also the flat epistemologies that are essential for real transdisciplinarity (flat referring to the rejection of hierarchical distinctions between types of entities) (Donovan, Morin and Walshe 2023; Pardo et al. 2021). This in turn means making visible the assumptions, worldviews, power dynamics, and inequalities that have emerged historically in particular places and between them – and those embedded in the research process itself (Bull 1997; Latulippe and Klenk 2020; Meriläinen and Koro 2021; Rose 1997; Sillitoe 1998; Simandan 2019). The visualizing of "disasters-in-the-making" is a first step. Mitigating those disasters requires interventions that make visible the trajectories that lead to them – and the dominant imaginaries that are taking part in those trajectories. In many respects, this involves combining technology and science but doing so in a culturally, historically, and socially sensitive way that empowers communities and explicitly acknowledges and explores the diverse imaginaries that they contain. That is the approach that is discussed in this paper, and to which we refer, imperfectly, as a "geographical imaginations" approach.

Care forces us to engage with injustice (Lynch, Kalaitzake and Crean 2021). The geosocial stratification that drives the production of vulnerability is fundamentally unjust (Fordham et al. 2013) and requires attention to intersectionality and decolonization (Armijos Burneo and Ramirez Loaiza 2021; Gaillard 2021; Ryder 2017; Vickery, Jean and Hall 2023). Injustice may also emerge from the unequal power dynamics around knowledge (Allen 2007) and so is also a function of how disasters are managed, modeled, and mitigated in any society. Furthermore, injustice is multiscalar: it occurs not only within geographically bounded communities but also between them at national and international scales.

Disaster research must engage with the absence of justice – and the *desire* for it – carefully, giving attention to historically produced entities, relationships, positionalities, and imaginaries. It must be explicit about the pervading value systems in places, too: whose desires are being

realized and at the expense of whom? What are the dominant imaginaries and how do they express these underlying value systems? Both of these questions inform an analysis of the emergence of disasters in specific contexts. Disaster risk ontologies and epistemologies have been the focus of a number of recent studies (Gaillard 2021; McGowran and Donovan 2021). The normative dimensions of risk, however, are much less studied (Roeser 2006). Nevertheless, moral geography has shown unequivocally the issues that arise from value judgments across a wide range of fields. We have refrained, in this paper, from referring to "disaster risk," preferring to reduce this to "disaster" in a shift away from equations, likelihoods, and metrics.

Approaching disaster studies through geographical imaginaries begins with the community in question. It does not begin with "risk," but rather recognizes that "risk" is one of many potential ways of viewing the world. It is in the divergences between the imaginaries of neoliberal governance, of globalization, of local communities and marginalized groups that there exists the possibility space for transformation in an assemblage (Puig de la Bellacasa 2012). In his 2007 essay, "On the coloniality of Being," Maldonado Torres (Maldonado-Torres 2007) puts forward proposals for decolonial research that accepts concepts "as invitations to dialogue and not as impositions": we suggest that Western logics – such as calculation, quantification and categorization – when used uncritically, shut down to the transmodernity that Maldonado Torres describes.

The multiscalar nature of environmental and social justice issues points toward the globalized elements of disaster risk that a systems approach seeks to capture, but critical approaches also recognize the coexistence of strongly geographical and expressive forces in the production of risk. Risk is not objective; it is embodied and experienced. Thus, understanding the experience of environmental hazards requires paying attention to the "minor" (Katz 2017, 1996; Temenos 2017): to those experiences that are rarely voiced and receive little attention, yet produce interstitial forms of knowledge. This parallels the arguments by those in disaster studies seeking a refocusing on the local, but it goes beyond the "local" to emphasize marginality and its emotions, affect, and relations:

Working in a minor theoretical mode is to recognize that those subjectivities, spatialities, temporalities are embodied, situated, and fluid; their productions of knowledge inseparable from – if not completely absorbed in – the mess of everyday life. Minor theory is not a distinct body of theory, but rather a way of doing theory differently, of working inside out, of fugitive moves and emergent practices interstitial with "major" productions of knowledge. Katz (2017, 598).

The fact that such approaches are "interstitial" is important. The Western imaginaries of "risk" that dominate in disaster studies can produce useful critiques and insights, but they have to be reflexive about their origins and their assumptions.

The affective relations to which Deleuze calls our attention have often been ignored in disaster studies. Here, we draw on recent literature to suggest that critical geographies of disaster must think-with, and think carefully about, communities – and in doing so, must pay particular attention to other ways of being (Maldonado-Torres 2007). We argue that, methodologically,

examining the diverse and sometimes overlapping geographical imaginaries of different groups may provide a means of understanding these issues that encompasses their ontological and epistemological politics and values. Disaster research across Human and Physical Geography has to engage with the power dynamics that operate at multiple scales but that are also place-specific. As we seek to understand more about the chains of disaster impacts and the systemic risks that are faced globally, we must not lose sight of the local and its complexity. Indeed, there are significant risks in a systemic view: such a view can itself marginalize those who are not already in positions of power and, in some territories, risks further entrenching (neo)colonial logics. Systemic risk itself "risks" being a colonial logic. Imaginaries are, perhaps, one methodological approach that can help to make visible the complex dynamics of "risk," threat, uncertainty – as it is experienced in particular places – and the imaginaries of the dominant political and scientific actors. By grounding these diverse and multiscalar imaginaries in feminist ethics of care, researchers may be able to decenter themselves and produce historically and geographically sensitive and useful narratives that contribute toward environmental justice and the reduction of disaster risk.

Note:

The difference between "imagination" and "imaginary" in this paper is, at first order, semantic: "imagination" is a process of the mind (usually individual) while "imaginary" is something created by imaginations of a collective. The "geographical imagination," though, refers to a broader idea. As Daniels (2011), notes, "As a concept, the geographical imagination varies in scope. It may denote specific techniques of knowledge, often forms of visual media and image-making, or overarching, theoretical modes of comprehension and experience. In this bigger picture, imagination is a way of encompassing the condition of both the known world and the horizons of possible worlds." (183)

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4. Paper Two: Researching care, *with* care, *as* care: reflections on photo go-alongs as a method for all three

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Abstract: A growing interest in care has emerged across disciplines, positioning care both as a subject of research and as an orientation guiding research practice. Yet relatively little attention has been given to methods that support researching care, researching *with* care, and recognising research itself *as* care. Drawing on fieldwork in wildfire risk management in California, this paper reflects on photo go-alongs as one such method. Go-alongs create space to attune to the subtle, relational, and more-than-human dimensions of care as they unfold in everyday life. Using Tronto's (1993; 2013) phases of care, I demonstrate how go-alongs fostered attentiveness, responsibility, competence, responsiveness and solidarity to emerge within research encounters. I argue caring in research is co-constituted, imperfect, and always unfinished. Ultimately, care and caring research are crucial not only for understanding the world but for helping to make it more liveable.

Care, go-alongs, fieldwork, more-than-human, research ethics

Prologue

I drag the branch towards the chipper, its weight pulling against my grip. As the day wears on and the heat builds, each branch feels heavier than the last. I pause to catch my breath, glancing past the two men working carefully with the chipper machine. Across the valley, the hills remain blackened from the last wildfire, their burn scars a stark reminder of what is at stake. Rowan, one of the community members, steps up beside me, glances toward the ridge, and exhales deeply. *"Come on, you're doing great,"* she says, gently patting my shoulder. *"At this rate, we might actually see the bottom of these piles before the fire season."* Before I get moving again, I quickly pull out my camera to capture the moment. *Click.*

1. Introduction

Multiple, overlapping crises – including climate change, deepening inequalities, and rising political instability – are reshaping the conditions of life (Corwin and Gidwani, 2021; Puig de la Bellacasa, 2017; The Care Collective, 2020). In this context, care, understood as "a vital necessity" (Puig de la Bellacasa, 2017, p. 67), has taken on new urgency. Scholars across the social sciences increasingly centre care in their work, recognising it as fundamental to how communities endure, adapt, and sometimes flourish amid ongoing uncertainty (Corwin and Gidwani, 2021; van Dooren, 2014; Puig de la Bellacasa, 2017). Yet under such conditions, care often surfaces in mundane, fleeting, or unfamiliar forms that can be difficult to recognise, name, or apprehend through conventional research practices.

At the same time, there is growing interdisciplinary interest in what it might mean to take care seriously as a way of doing research – not only as a topic of inquiry, but also as an ethical and methodological research orientation (Brannelly, 2018; Brannelly and Barnes, 2022a; Edwards and Mauthner, 2012). Informed by feminist ethics of care, this scholarship foregrounds how research is always entangled in relationships of responsibility and interdependence, calling for attentiveness, reciprocity, and competence in our engagements with participants, landscapes, and more-than-human others (Brannelly and Barnes, 2022a; Lonkila, 2021). Collectively, this body of work shows how research can be approached as a practice of care, especially when it sustains or repairs relationships (Brannelly, 2018; Brannelly and Barnes, 2022a; Edwards and Brannelly, 2017; Edwards and Mauthner, 2012). Yet while this literature powerfully advocates for care-full research, it often offers limited reflection on how care might emerge through, and be encountered within, different methods.

In light of growing recognition of the need to research (with) care – amid intersecting crises persistent tensions around how care is recognised, practiced, and sustained – this paper asks: How might we research care in the world? How do our research methods become entangled in relations of care, and how might we more intentionally approach research itself as a caring practice? In response, I explore the potential of photo go-alongs – a mobile, observational, and participatory method – as one approach to researching care, researching *with* care, and approaching research *as* care. While grounded in care-focused research, this approach may also be valuable to scholars interested in relational, affective, or more-than-human methods more broadly, as well as those who seek to engage with thinking about how research is conducted. Indeed, I do not present go-alongs as a methodological blueprint, nor do I claim their universal relevance. Rather, I offer them as a generative site for reflecting on the possibilities and tensions of care and caring research in precarious times. Drawing on fieldwork in Sonoma County, California, focused on the wildfire crisis, I reflect on how go-alongs enabled me to recognise, respond to, and become entangled within care. Ultimately, I contribute to ongoing conversations about what it means to research (with) care by arguing that care in such contexts is always relational, co-constituted, imperfect, and unfinished.

2. Caring research?

Care is both an "orientation and embodied practice" that "holds the holds the possibility... of facilitating new ways of being together" (Conradson, 2003a, p. 454). It can be transformative and oppressive, joyful and exhausting, beautiful and dirty, and affirming and burdensome (Martin *et al.*, 2015; Puig de la Bellacasa, 2017). Practices of care are carried out daily by human and more-than-human others, who become "both givers and receivers of care all the time, though their capacities and needs shift" (Tronto, 2017, p. 31). As Lawson (2007, p. 5) puts it, we are dependent on care for "our individual and collective survival." Care is the fabric of life, woven through moments that the world is maintained, continued and repaired (Puig de la Bellacasa, 2017; Tronto, 1993).

In 'Moral Boundaries...,' feminist ethics of care scholar Tronto (1993, p. 105) proposed four interrelated phases of care, each linked to a corresponding ethical element: *caring about*

[attentiveness], or noticing the need of care; *taking care of* [responsibility], assuming responsibility to respond; *care giving* [competence], the hands-on work and labour of providing care; and *care-receiving* [responsiveness], the response of that which is cared for to the care given. Later, Tronto (2013, p. 23) added a fifth phase, *caring with* [solidarity], underscoring that care must align with "democratic commitments to justice, equality and freedom to all." These phases illuminate care not as a unidirectional act, but as a shared condition of life of which we are all entangled (Tronto, 1993). They foreground the ethical and political dimensions of our interdependence in a more-than-human world (Puig de la Bellacasa, 2017).

Over recent decades, care has become a central concern across many disciplines. Scholars have examined how care is enacted, distributed, and negotiated across varied contexts – from homes and hospitals (Murphy, 2015; de Vet *et al.*, 2021), to farms and gardens (Buijs *et al.*, 2018; Lonkila, 2021), to smartphone apps and family vehicles (Morgan, 2025; Waitt and Harada, 2016). Care is shaped by socio-spatial contexts and power relations, and unfolds through entanglements of human and more-than-human actors at multiple scales from the intimate to the planetary (Corwin and Gidwani, 2021; Nassauer, 2011). In our current moment, where care feels more needed than ever amid ongoing crises, there is an urgent need to understand care as a practice of survival, resistance, and worlding (Corwin and Gidwani, 2021; van Dooren, 2014; Puig de la Bellacasa, 2017; Tronto, 2013). Researching care is crucial, making visible those lives, places, and practices most in need of care, while also attending to emergent sites of care-fullness, offering glimpses of possibility that we might learn from, nurture and expand.

To research care, care scholars have employed a diverse array of methods, including interviews, participatory mapping, and ethnographic observation, as well as multispecies ethnographies and creative or visual approaches that trace the more-than-human participants of care (Dombroski, 2024; Lonkila, 2021). Yet, many scholars also note the challenges of researching care, given its embedded, relational nature and the often ambiguous, fleeting, and unfamiliar ways it is practiced and experienced. Care is notoriously difficult to pin down, as it shifts across people, practices, and more-than-human phenomena (Puig de la Bellacasa, 2017), and "often remains forgotten, marginalized or excluded" in the world (Yeandle *et al.*, 2017, p. 8). As Morgan (2025, p. 6) writes, care often surfaces in "relations and practices that are often so mundane that individuals can have trouble identifying them as anything other than the normal subconscious rhythms of everyday life." Researching care, then, is difficult. It demands methods attuned to its relational and affective textures, its ephemeral presences, and its more-than-human entanglements. It requires methodological approaches capable of tracing its complexities, contradictions and frictions, as well as its transformative potential.

Scholars have increasingly argued for embedding care in research practices – not as an ethical add-on, but as a way of remaining curious (Haraway, 2007), lingering with uncertainty, and staying with care (Puig de la Bellacasa, 2017). Rooted in feminist ethics of care, this approach challenges extractive and hierarchical research models by foregrounding collaboration, mutual respect, and relational responsibility (Brannelly, 2018; Brannelly and Barnes, 2022a; Lonkila, 2021; Puig de la Bellacasa, 2012). To research *with* care is understood as intentionally centring attentiveness, responsibility, reciprocity, authenticity and solidarity in researcher-participant

relationships (Brannelly and Barnes, 2022a; Edwards and Brannelly, 2017; Edwards and Mauthner, 2012). Some scholars extend this further, exploring how to practice care beyond the human and to be in care-full relation with more-than-human others (Haraway, 2007; Lonkila, 2021; Puig de la Bellacasa, 2012, 2017).

At the same time, critical scholars caution against pedestalling care. Care is not always benign or benevolent. It is, as Martin et al. (2015, p. 627) note, "a selective mode of attention" shaped by power, inequalities, and exclusions. It intervenes in deciding who and what is deemed worthy of attention and concern. As such, Puig de la Bellacasa (2017, p. 8) warns, care "need[s] to be constantly reclaimed from idealized meanings." Researching *with* care is not immune to its own politics; instead, its entanglement with power and prejudice highlights both the risks and the responsibilities inherent in such an approach. Yet it is precisely this recognition that opens up care's transformative potential in research to disrupt dominant logics, reconfigure relations, and enact more care-full ways of thinking and knowing (Puig de la Bellacasa, 2012).

Despite growing calls to recognise the potential of research as a caring practice, tensions persist (Brannelly and Barnes, 2022a; Edwards and Brannelly, 2017; Edwards and Mauthner, 2012; Lonkila, 2021; Puig de la Bellacasa, 2012). Much of the literature still frames care as a one-way relation – researchers caring for (not with) participants – offering little reflection on how it emerges through specific research methods. There is also often minimal reflection of how scholars grapple with researching *with* care as an ongoing, negotiated process throughout the research process (Brannelly and Barnes, 2022a). In this paper, I therefore explore the intersection of care as both an "orientation and embodied practice" (Conradson, 2003a, p. 454) in research and the world – one that is difficult to define, often elusive, yet essential. I offer photo go-alongs as one approach to researching care, researching *with* care, and enacting research *as* care. Recognising that care is always situated and contextual (Puig de la Bellacasa, 2017; Tronto, 1993), I do not present go-alongs as a prescriptive method for all (or any) care research. Rather, I aim to open space for considering how this method might help navigate the possibilities and tensions of researching (with) care in a world where care feels increasingly urgent (Corwin and Gidwani, 2021; van Dooren, 2014; Puig de la Bellacasa, 2017; Tronto, 2013).

3. Go-alongs

Across the social sciences, go-alongs have become an established "ethnographic research tool" (Kusenbach, 2003, p. 455). Typically recognised as "an in-depth qualitative interview conducted by a researcher accompanying participants on outings in their local environments" (Thompson and Reynolds, 2019, p. 157). Combining qualitative interviewing with participant observation and guided tours of relevant sites, go-alongs offer direct insight into how individuals move through and interact with their socio-spatial surroundings (Carpiano, 2009; Kusenbach, 2003, 2016; Larrington-Spencer *et al.*, 2024; Pink, 2008), enriching interviews through experiential engagement (Dowling *et al.*, 2018). As Thompson and Reynolds (2019, p. 157) note, it is a "participatory, interactive research method" that values the co-production of situated knowledge through shared presence among the researcher, participant, and setting.

Unlike more general ethnographic approaches such as 'hanging out' or 'participant observation,' go-alongs emphasise accessing the reflexive and embodied dimensions of lived experience in situ. They allow researchers to contextualise and probe participants' interpretations and interactions with their environments as these unfold (Carroll *et al.*, 2020; Evans and Jones, 2011; Kusenbach, 2003, 2016). Go-alongs can offer a way to witness life as it happens, and to access the unspoken as much as the spoken (Dowling *et al.*, 2018), providing insight into the everyday relations and practices through which social life is enacted. This capacity drew me to the method in the early stages of determining my research methods, particularly regarding its ability to render visible participants' affective and embodied engagement.

While scholars have also reflected on the demands and limitations of go-alongs (Castrodale, 2018; Duedahl and Stilling Blichfeldt, 2020; Larrington-Spencer *et al.*, 2024), they are valued for their potential to disrupt conventional researcher-researched dynamics (Bartlett *et al.*, 2023). For instance, Hitchings and Jones (2004) found that walking interviews in gardens, compared to indoor settings, made participants less concerned with giving the 'correct' answer and more likely to share reflective, affective accounts of their connection with plants. Other scholars have similarly noted that go-alongs can partially unsettle power relations, especially when participants choose the route and move through environments where they feel at ease (Alexander *et al.*, 2020; Bartlett *et al.*, 2023; Brown and Durrheim, 2009; Carpiano, 2009). That said, Alexander et al. (2020) caution that unequal power relations often persist, particularly since the researcher typically defines the research agenda.

Go-alongs can take many forms, lasting from just a few minutes to a full day (Carpiano, 2009; Kusenbach, 2003; Thompson and Reynolds, 2019). While walking remains the most common form of accompaniment (Thompson and Reynolds, 2019), go-alongs can also occur by car (Laurier and Lorimer, 2012), by bicycle (Van Cauwenberg *et al.*, 2018), by wheeling (Parent, 2016), or via public transport (Wegerif, 2019). In my PhD research on care in wildfire risk management in California, I conducted 51 go-alongs between September 2022 and March 2023. These ranged in duration from 42 minutes to over seven hours and involved walking, riding in a car, and running. Reflecting the diverse actors involved in wildfire risk management, participants included both those formally engaged, such as firefighters and emergency planners, and others involved more informally, including wildfire survivors and land stewards. In keeping with the principle that "the socio-spatial environment that the researcher and participant are moving through should be relevant to the objective of the research" (Alexander *et al.*, 2020; Larrington-Spencer *et al.*, 2024, p. 3), I accompanied participants as they went about their everyday activities of wildfire risk management. These included running through state parks to see burn scars, touring emergency operations centres, riding along with fire personnel during home inspections and accompanying nonprofit employees to community outreach events. Participants determined the route and agenda. I followed their lead, observing, participating when appropriate, and interviewing and asking questions along the way.

Scholars working across post-humanism, visual communication, feminist theory, and creative methods have increasingly advocated for the incorporation of photography into go-along practices, often referred to as photo go-alongs, photo walks, or photo talks (Alam *et al.*, 2018; Barron, 2007; O'Neill, 2025; Pyyry, 2015) Photographing go-alongs can decentre the authoritative gaze of the researcher, fostering collaborative knowledge production with human and more-than-human research participants (Barron, 2007; O'Neill, 2025). As Barron (2007, p. 4) writes, their value lies in their capacity to "create detailed material which can provide insight into the lives of participants, foregrounding what matters to them. They get at the messiness of life." Photo go-alongs have also been used to help participants recall habitual or unnoticed aspects of daily life (Pyyry, 2015, 2016), and researchers to unsettle dominant ways of knowing (Alam *et al.*, 2018)

Building on this, my phone camera accompanied me throughout fieldwork, taking 3,045 photographs. These photos captured, for example, people at work, machinery, fire, vegetation, livestock, chipped wood piles and fire danger rating signs. I did not photograph every go-along, nor did I stage scenes. Often, I was guided by participants. *"This is the stuff no one sees,"* one county employee told me, pointing to an evacuation shower trailer stored in a warehouse. Another participant asked me to photograph a scorched metal pan – one of the only remnants of their home after the 2017 Nuns/Tubbs wildfire – saying, *"It matters, you know? Anything that is left."* Some participants shared their own images to help narrate their stories, while others followed up later via email with additional photos and reflections. These exchanges became part of an ongoing, co-produced visual dialogue that extended beyond the moment of the go-along itself.

In what follows, I reflect on the 51 go-alongs I conducted in my research on care in wildfire risk management in California, considering how they functioned not only as a method for researching care but also as encounters that became entangled in relations of care.

4. Researching care

Care is active – as a practice, labour, and enactment – yet it can be difficult to definitively observe or locate in the world. It is pervasive, surfacing by, in, and through complex and shifting relations among people, practices, and more-than-human phenomena (Puig de la Bellacasa, 2017). Many forms of care are so mundane, routine, or taken for granted that they may go unrecognised, perceived instead as simply part of the everyday (Morgan, 2025). To research care, then, is to trace a sprawling entanglement of ongoing, overlapping and ordinary "as well as possible relations" (Puig de la Bellacasa, 2017, p. 6) between humans and more-than-humans. This is where photo go-alongs offered particular methodological promise: their attentiveness to presence, movement, and engagement enabled me to attune to often-overlooked relations of care as they unfolded in situ. In what follows, I detail how go-alongs, through accompanying, observing, listening, asking, and photographing, became a means of researching care in risk management, of noticing and attending to what might otherwise pass unmarked.

Go-alongs allowed me to "start in the middle of things" (Tronto, 2015, p. 4), accompanying participants in their everyday wildfire risk management activities, such as clearing brush, organising stockpiles, and hauling woodchips. This was critical because, as Tronto (2015, p. 4) reminds us, "care practices don't suddenly begin, they are already ongoing." By joining participants amid their activities, I engaged with care as it unfolded in rhythms, routines, and relationships. We did not just talk about wildfire risk management and care; I moved through its traces, contradictions, and textures alongside those enacting it. In doing so, go-alongs brought the peripheral and affective into view – those small, often-unnoticed moments of care that nonetheless hold wildfire risk management activities together.

Over time, I came to understand go-alongs as a mode of "think[ing] as experience"(Dewsbury, 2010, p. 151), or "knowing as we go" (Ingold, 2000, p. 229). As Ingold (2015, p. 47) writes, "moving is knowing. The walker knows as he goes along." Walking, driving, running, working, and pausing together, participants and I noticed, reflected on, and made sense of care – often without ever naming it. These shared movements through diverse socio-spatial environments prompted situated reflections: collecting vegetation for a burn pile evoked conversations about stewardship; riding along to install vents led to discussions of insurance and neighbourly obligations; passing an overgrown dozer line during a run-along triggered memories of the 2019 Kincade fire. These moments made possible by the go-along, prompted mutual engagement with the world of wildfire risk management. They became reflexive situations through which care could be recognised, experienced, and re-evaluated in the process.

While I understood "care... is not necessarily verbal" (Mol *et al.*, 2010, p. 10), it was through go-alongs that I began to grasp how this played out in wildfire risk management. Although I witnessed explicit expressions of care – for example, when accompanying a community member to the fifth anniversary of the Nuns/Tubbs fire memorial – more often, care surfaced in quieter forms: a brief hand on a colleague's shoulder, land stewards sharing lunch while watching clouds build, a nonprofit distributing masks during a week of hazardous air. Go-alongs made these moments perceptible as relations and practices of care. Being there, in situ, allowed me to observe how care was offered and received, ask what it meant to those involved, and witness how it was enacted through ordinary gestures and responsibilities. I would see people smile or nod knowingly; I noticed how the atmosphere could shift from tense to tender, hurried to attentive. After a day of going along, I also often felt different, sensing that the time spent clearing brush or chatting with worried community members was, in some small way, meaningful. These moments signalled subtle but significant relations of care.

Go-alongs also illuminated the contributions of more-than-human others entangled in care; for example, livestock grazing to reduce fuel build-up, fire engines standing-by, phones pinging with ignition alerts, and policies enabling community chipper services. With Anderson and Ash's (2015, p. 34) reminder that "background matters," I came to understand these presences as central to the production and circulation of care. While these more-than-humans may not "care about" sustaining life (Tronto, 1993, p. 127) or express intentionality, they were nonetheless deeply involved in the doing of care. Tools like McLeod's guided fire and nurtured the land. Meals Ready-to-Eat replaced domestic care routines during evacuations. Watch Duty

alerts helped residents rest more easily on dry fall nights. Go-alongs enabled my attunement to these often-invisible more-than-human agencies that sustain life amid crises.

Looking "at the world anew" through my phone camera often sparked further feelings of enchantment (Pyyry, 2016, p. 102). As Pyyry (2019, p. 316) observes, framing the world through a camera lens can direct "attention to details that would otherwise easily pass unnoticed." During go-alongs, photography helped me notice subtle caring gestures, overlooked careful actions, and the diverse participants involved in the circulation of care. Drawing on Alam et al. (2018) understanding of photography as a more-than-human method, I found that taking photos often sparked shared noticing, invited reflection, and deepened the co-production of knowledge with participants. Photography resisted positioning more-than-humans as passive or peripheral to human activity (Haraway, 2007); instead, it renders visible the interdependencies and co-becomings of humans and more-than-humans within the everyday work of care in wildfire risk management.

Go-alongs also cannot be neatly controlled. They cannot be scripted, fixed, or piloted in the same way as structured interviews (Duedahl and Stilling Blichfeldt, 2020; Finlay and Bowman, 2017). Rather than seeing this unpredictability as a limitation, though, I understand it as generative – a space for unanticipated detours and what Thompson and Reynolds (2019, p. 156) describe as "physical and discursive disruptions that challenge the illusion of certainty and "tidiness" in the interview encounter." In my research, such detours and disruptions were common. For example, walking with fire personnel around a defensible space garden was cut short by an emergency call, abruptly redirecting the research encounter. Another time, a planned burn pile day turned into a day of waiting, as shifting weather and agency hesitations delayed the declaration of an affirmative burn day. These disruptions led to various kinds of encounters and unexpected insights, surfacing dimensions of care that were unlikely to emerge in static settings. Moving through these unpredictable moments together with participants provided a valuable opportunity to explore care not as a stable or predefined relation, but something constantly negotiated, improvised, and refined in the world of wildfire risk management.

In their discussions of go-alongs, Thompson and Reynolds (2019, p. 161) argue that disruptions can serve to "illuminate narrative inconsistencies and contradictions, drawing attention to the gaps between what is said and what is done and how narrative and context intersect." While I observed such dynamics – for example, when participants' actions diverged from their stated values – I extend this to suggest that disruptions also surface ethical dilemmas, power asymmetries, and affective tensions. For instance, during one detour to revisit a site treated with prescribed fire the previous year, a participant described the treatment as restoring ecological balance and protecting nearby communities (i.e., care). Yet this account unfolded against the backdrop of the longstanding exclusion of Indigenous fire practices. This moment revealed a deeper power dynamic: care was both enacted and contested, raising questions about whose caring knowledge and practices are legitimised, whose are erased, and how care is framed within dominant wildfire risk management regimes. Through repeated go-alongs, I came to see that relations of care are not always coherent, consistent, or harmonious; they are

often ambivalent, fraught, and contested (Martin *et al.*, 2015; Puig de la Bellacasa, 2017). These disruptions challenged tidy narratives of research, productively complicating how participants, practices and relations came to be understood.

Ultimately, the hybrid nature of going along – blending participant observation, shared movement, interviewing, photography, and responsiveness to disruption afforded a unique capacity to dwell in the complexity of care. In turn, go-alongs not only helped me research care, but they also became a way of researching *with* care and approaching research *as* care.

5. Researching *with* care and research *as* care

The idea that feminist ethics of care can inform research practice is well established. Rooted in attentiveness, responsibility, and relationality, feminist ethics of care emphasises reflexivity and critical awareness of the relationships, power dynamics, and obligations that arise between researchers and those involved (Brannelly and Barnes, 2022a; Edwards and Mauthner, 2012; Lonkila, 2021). Approaching research *with* and *as* care involves cultivating respectful and reciprocal relationships while actively challenging extractive, harmful, or hierarchical modes of knowledge production (Brannelly, 2018; Brannelly and Barnes, 2022a; Lonkila, 2021). In what follows, I reflect on how go-alongs in my research became entangled with relations of care and how I approached them as a caring practice. To structure this reflection, I draw primarily on Tronto's (1993) "phases" (p. 105) and "elements of care" (p. 127), as introduced in the section 'Caring Research,' applying these concepts to the practice and experience of go-alongs.

The first phase, "caring about," is linked to the ethical element of attentiveness (Tronto, 1993, p. 106). During go-alongs, I sought to notice the needs, concerns, and desires of participants. This was not a one-off task, but an ongoing process that required time and trust. Embedding myself in the field for two months before conducting go-alongs was essential in cultivating these relationships and supporting effective communication. The method itself also encouraged attentiveness: participants chose the routes we followed and the sites we visited, which often included places they cared about or saw as in need of care. They shared what mattered to them, and together we engaged in practices they deemed essential to wildfire risk management. While the research agenda was mine (Alexander *et al.*, 2020), it was shaped in situ by the participants' priorities, aligning the project more closely with what mattered to the communities I was researching.

My attentiveness extended beyond human actors. I attuned to the rhythms, presences, and contributions of more-than-human others (Haraway, 2007; Lonkila, 2021; Puig de la Bellacasa, 2017). This involved slowing down, attuning to what might otherwise remain in the 'background' (Anderson and Ash, 2015) – for example, the sounds of sheep, shifting winds, soil moisture, the scent of smoke – and registering how these subtleties shaped activities and relations in the field. Fire, in particular, emerged as a recurrent presence during go-alongs. I saw how people paused to feel the wind before lighting a burn pile, how conversations were shaped by fire risk or the drift of wildfire smoke, and how landscapes displayed scars from past

burns. In this way, fire became an active participant, shaping actions, decisions, and relationships. Attuning to fire's shifting presence required me to recognise it as a relational force, prompting further go-alongs to explore how it was variously cared about, cared for, and cared with.

The second phase of care, "taking care of", involves assuming responsibility (Tronto, 1993, p. 106). During go-alongs, this meant acknowledging my role not simply as an observer or a participant in wildfire risk management, but as someone responsible for identifying matters of concern and care as they surfaced in the field (Puig de la Bellacasa, 2012, 2017) and determining how to respond to them. These responsibilities were not fixed; they evolved over time and varied across contexts, shaped by specific relationships and encounters (Brannelly *et al.*, 2022a; Brannelly and Barnes, 2022b). For instance, while riding along with fire personnel conducting defensible space inspections, I became attuned to the emotional labour involved in managing residents' anxieties and frustrations. This prompted me to approach these moments with greater sensitivity, listening closely, adjusting the pace, and purposefully checking in with fire personnel after each inspection.

Thinking through research *as* care, the embodied, immersive nature of go-alongs unsettled any notion of researcher detachment. I was not outside this world, I was entangled and implicated in it. I breathed the same smoke. I was tired from the same back-to-back outreach events. I rested beneath the same *"spooky trees."*[3] Through these shared movements, I recalibrated myself to this world, adjusting to others' rhythms, feeling the terrain beneath my feet, and attuning to the temporalities of the fire season. Presence, gesture, and responsiveness became ways of caring: fleeting yet affectively charged moments of being together that often resist transcription, but through which trust and mutual recognition were enacted. Becoming entangled and implicated in this world prompted the ongoing question: How might I best support this world of wildfire risk management? This required thinking not only about how to avoid harm, but, more fundamentally, about "how to care" (Puig de la Bellacasa, 2017, p. 5).

The third phase of care, "care giving", is linked to the competence to meet the needs of care (Tronto, 1993, p. 107). In research, this can be understood as the "competence to carry out research well" (Brannelly *et al.*, 2022b, p. 14). During go-alongs, I practiced care through techniques recognised to foster a caring research environment (Bergeron *et al.*, 2014; Duedahl and Stilling Blichfeldt, 2020), such as attentive listening, sustained gazing, and embracing silence and non-verbal communication. I aimed to be attentive and responsive to participants' needs, for example by carrying extra water, pausing in the shade when someone appeared fatigued, or adjusting my pace to match theirs. I took time, followed participants' lead to take a photograph of something that mattered to them, and let more-than-human others re-direct the encounter. Go-alongs also offered moments for hands-on, practical care. I helped during community vegetation clearance days, offered feedback on outreach materials being developed by county employees, and listened as a worried resident shared their concerns with me as I was accompanying a non-profit employee. These instances allowed me to contribute in modest but

[3] Many participants in Sonoma County referred to burnt trees as "spooky trees."

meaningful ways, and to recognise that caring research is both purposeful and adaptable, extending beyond the immediate participant to the broader social and ecological worlds within which the research unfolds.

This is not to romanticise care giving. There were missteps, refusals, and awkward moments. At times, my presence felt intrusive, a photograph poorly timed, or the line between documentation and extraction felt uncomfortably thin. I sometimes lacked the necessary skills, knowledge or equipment to research well. For example, I struggled with practical tasks like limbing up a tree and starting burn pile fires, exposing the limits of my competence. In these moments, I made a point of showing humility, acknowledging my limitations, and deferring to others' expertise. In many ways, there was richness in being vulnerable: it disrupted any illusion of researchers being all-knowing and opened space for reciprocity and learning. Vulnerability, in this sense, became a mode of care, enabling connection, fostering trust, and demonstrating commitment.

Another formative moment came early in the research, when a participant shared a deeply emotional story about the Nuns/Tubbs Fire while we stood at a site of personal significance. I was moved by what they shared, but I was not sure how to respond 'well' as a researcher. I did not want to overstep or intrude on their intimate story. In hindsight, I don't think I researched well in that moment. I hesitated instead of acknowledging the weight of what had been shared, and the opportunity for connection and care passed too quickly. Reflecting on this later – with colleagues and through returning to feminist ethics of care scholarship (Brannelly, 2018; Edwards and Mauthner, 2012) – I began to understand that researching *with* care means allowing oneself to be affected. Going forward, I made a conscious effort to respond rather than retreat into observational distance, aiming instead to foster recognition, emotional presence, and care. These encounters remind me that care is always partial and incomplete, subject to negotiation and shaped by the limits of time, access, and competence. Care giving and research competence, then, are not static qualities but practices that evolve through ongoing relationships (with participants, colleagues, and friends) and reflection. For scholars, this means accepting competence not as final expertise or a fixed achievement, but as an ongoing, collaborative process that requires humility, responsiveness, and a willingness to learn from imperfection, discomfort, and the unexpected.

The fourth phase of care, "care receiving," refers to the responsiveness to care as it is offered or experienced (Tronto, 1993, p. 107). In my research, attuning to responsiveness developed gradually, not just during go-alongs, but across the six months of fieldwork. During go-alongs, I approached care receiving by remaining open to how my presence, questions, and actions were interpreted, embraced, or resisted. Recognising that care is not always received as intended and that its meanings and effects shift across contexts, I paid close attention to (dis)comfort, (un)willingness, and (new) priorities that emerged in response to my presence, allowing these reactions to shape the direction of the research. At times, this required recalibration, asking different questions, changing my gestures and actions, or even redirecting the encounter entirely. More-than-human others also gave feedback: strong winds, for instance, prompted changes in movement and conversation due to their associations with fire weather.

I was also frequently the recipient of care. Participants clarified things when I was unsure, shared snacks during long days, guided me through unfamiliar terrain (both literal and figurative) and checked in when I seemed tired or uncertain. Even now, many continue to follow up with thoughtful messages, resources and updates. While these gestures may appear modest, they were deeply meaningful. They softened the documented cognitive, physical, and emotional demands that go-alongs place on researchers – to keep pace, stay safe, minimise risk, and simultaneously observe, question, and reflect (D'Errico and Hunt, 2022; Duedahl and Stilling Blichfeldt, 2020; Larrington-Spencer *et al.*, 2024). These reciprocal encounters reminded me that care is always a "shared accomplishment" (Conradson, 2003b, p. 508). Extending Duedahl and Stilling Blichfeldt (2020, p. 440) view of "go-along as a process of co-learning and co-navigating", I suggest they are also process of co-caring – collective, relational practices of moving together through complex and uncertain terrain. This troubles the often-assumed one-way caring relationship in research (from researcher to researched) (Larrington-Spencer *et al.*, 2024), showing instead that care is relationally produced among all parties involved. Here, I suggest that caring researchers should more explicitly take notice and centre the care they receive and are accountable to in research method narratives, as doing so could open up space for deeper scholarly reflection on how to respond to such care in ethical and reciprocal ways.

Importantly, care was not only received by human participants. I often felt cared for by more-than-humans, for example, during run-alongs when the landscape offered a sense of calm, or when I found myself in awe of how much the forest had regenerated just a couple of years after the LNU Lightning Complex fires. Go-alongs drew my attention to the interdependence of people, places, and more-than-human others that both give and require care (Puig de la Bellacasa, 2017). They reminded me that, as researchers, we are not observers of the more-than-human world, but capable of cultivating care-full relationships with more-than-humans that acknowledge mutual care, interdependencies, and responsibilities. This orientation, I argue, encourages a shift away from extractive research practices toward more attentive, responsive ways of being and researching with more-than-humans.

The fifth phase of care, "caring with" (Tronto, 2013, p. 23), involves building solidarities among those involved in and affected by care – and, in this context, among those involved in and affected by go-alongs. In my experience, go-alongs supported caring with by researching with, rather than on, participants. This approach shifted my focus beyond institutional ethical procedures toward the deeper responsibilities we hold to those who contribute to our research. This included a commitment to maintaining, continuing, and repairing relations "as well as possible" (Puig de la Bellacasa, 2017, p. 161; Tronto, 1993, p. 103). Go-alongs created opportunities for such collaborative moments, whether tending burn piles, cleaning tools in the community trailer, or discussing shared concerns about climate change. If, as Tronto (2015, p. 35) suggests, "caring with others, when we get good at it, produces the moral effects of trust and solidarity" then caring with while researching with others offers fertile ground for considering how research can build solidarities among those involved and affected – a task increasingly called for across the social sciences (Brannelly, 2018; Brannelly and Barnes,

2022a; Chmutina *et al.*, 2025; Edwards and Brannelly, 2017; Edwards and Mauthner, 2012). Go-alongs, I suggest, helped me operationalise this call by cultivating shared attentiveness, co-presence, and small acts of mutual engagement through which solidarities began to take form.

Caring with also required noticing and responding to who and what I was not caring with. During go-alongs, this meant paying attention not only to what came into view but also to what remained unseen or overlooked. Recognising "*our cares* also perform disconnection" (Puig de la Bellacasa, 2012, p. 204), I grappled with the fact that my attentions were inevitably leaving things out. I tried to stay attuned to these absences both in the research itself and my research practices: for example, questioning whose stories weren't being shared, which relationships were overlooked, and which more-than-human presences were excluded. While there were limits to what I could realistically commit to in the field, I also had to remain aware of how my positionality, privilege, and beliefs shaped my attention.

Crucially, caring with extends beyond the immediate impacts that go-alongs have on those directly involved. It also involves longer-term responsibilities that persist beyond go-along encounters: how we remain accountable over time, how we communicate findings, how we sustain relationships afterwards in ongoing conversations, emails, and follow-ups and how we carry a feminist ethic of care into the broader analysis, communication and dissemination of research (Brannelly and Barnes, 2022a). For example, the photographs I took while going along generated materials that made visible people's everyday experiences of care in wildfire risk management. Going forward, to care with these images might mean centring them in research communication, using them to challenge dominant understandings of risk management and to foreground often-overlooked practices of care. It might also involve checking with participants about these representations and remaining engaged in the ongoing legacies of the research. Such practices would demonstrate a commitment to caring with as an ongoing process.

6. Conclusion

In this paper, I have explored photo go-alongs as one approach to researching care, researching *with* care, and approaching research *as* care. This was not intended as a methodological checklist. Instead, I offered these reflections as a generative space for thinking through the possibilities and tensions of doing care and caring research in precarious times.

Researching care demands methods attuned to its often subtle, relational, and more-than-human surfacings – those that unfold in everyday practices, quiet gestures, and entangled encounters (Dombroski, 2024; Morgan, 2025; Puig de la Bellacasa, 2017). Reflecting on my use of photo go-alongs in wildfire risk management research, I have shown how they create opportunities to share time, space and movement with others, tracing care as it emerges in rhythms, routines, and relationships. They are a mode of inquiry that is capable of attuning to care as a messy, more-than-human, and non-innocent relation. This opens up opportunities for emerging research that centres care because it creates space to notice, engage with, and participate in care as it unfolds.

Using Tronto's (1993, p. 105, 2013) "phases of care" framework, I reflected on how go-alongs became entangled with caring relations and practices, and how they themselves can be approached as care. Go-alongs as a method provided opportunity to listen, document, notice, ask, sit with discomfort, become entangled, and grapple with the complexity of the world I was researching. Doing so required attentiveness, responsibility, competence, and a willingness to be affected and at stake. Through these reflections, I demonstrated that care in research is not unidirectional from researcher to researched but co-constituted in and through encounters, and often supported by the care of more-than-human others. The competence to care in research, I have argued, is not static or perfect; it develops over time and remains always unfinished. Calls for more care-full research must therefore focus on how researchers reconfigure what it means to care (again, again and again) throughout the research process and into its longer legacies.

Ultimately, I argue that caring research is vital not only for understanding the world but for helping to make it more liveable. In this sense, care is what we study, and how we intervene, research, and respond. The task remains, then, to not simply observe or document, but to continually reflect on our methods' capacity to nurture care.

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5. Paper Three: Making care visible: a photo essay on wildfire risk management in California

Authors: Tilly E. Hall
Publication status: In publication in Disaster Prevention and Management: An International Journal

Abstract: This photo essay explores care in wildfire risk management through 13 image-based vignettes drawn from (visual) ethnographic research in Sonoma County, California. Attending to ordinary, more-than-human practices – from packing Go-Bags to grazing sheep – it renders visible the dispersed, relational, and often ambivalent ways in which care surfaces in fire-prone landscapes. Arguing for the photo essay as a critical, affective method of research communication, it invites disaster scholars to embrace image-based work that fosters ethical attentiveness and nuanced representation. Ultimately, it proposes care as a vital, sustaining force in navigating life in an increasingly disastrous world.

Visual communication, risk management, care, caring, wildfire

1. Introduction

Care is rarely centred in conversations about disasters or how their risks are known, managed, and lived with by communities. Dominant narratives tend to prioritise logics of control, top-down management, and efficiency – frameworks more readily aligned with technical, institutional, or securitised approaches of risk. Within these discourses, care is often overlooked or marginalised, reduced to the (emotional) labour of women or emergency responders, typically framed as reactive support for needy others during disaster response or recovery. This paper seeks to reclaim care – not as rescue, heroism, or saviourism – but as an ongoing relational practice concerned with maintaining, continuing, and repairing "as well as possible relations" (Puig de la Bellacasa, 2017, p. 6). Care theorists have long understood care as a vital affective orientation, an ethico-political commitment, and a material doing (Puig de la Bellacasa, 2017; Tronto, 1993). From this perspective, care is "a vital necessity" (Puig de la Bellacasa, 2017, p. 67) – something all are entangled with and dependent upon. In disaster contexts, then, care is not peripheral but foundational to how communities endure and sustain life amid escalating risk. This paper, therefore, brings care to the centre, asking: How does care surface in the ways disaster risk is known, managed, and lived with? And how might we make such care visible?

Scholars of visual communication have long highlighted photography's capacity to evoke affect, capture nuance, and convey counter-narratives. They argue that photographs can illuminate the socio-spatial dimensions, processes, and relationships that shape the worlds we study (see, Chaplin, 2011; O'Neill, 2025; Pauwels, 2012; Rose, 2008). Building on this, visual scholars have demonstrated how photo essays can serve as powerful tools for communicating research beyond academic audiences, disrupting expert-driven, text-heavy conventions of research dissemination (Pink, 2020). Yet photo essays remain underrepresented in both academic and public discourses – especially those that move beyond journalistic formats or dominant media aesthetics (O'Neill, 2025; Pink, 2020). While disaster researchers have increasingly used photographs, these are often employed to document dramatic impacts and aftermaths: "collapsed infrastructure and destitute, hurt, or grieving people" (Kelman, 2024, p. 37). Such representations are frequently "sensationalized and sanitized" (ibid) and rarely capture the everyday practices of risk management or the relational work that communities rely on to navigate life in disaster-prone regions.

In what follows, I present a photo essay that draws on techniques of landscape and documentary photography, while steering clear of mainstream journalistic aesthetics, sensationalism and sanitisation. This essay shifts the visual focus from the spectacular and moments of rupture to the everyday, ongoing care that emerges in how disaster risk is understood, managed, and lived with. I argue that the photo essay is particularly well-suited to making such care visible, as it can draw attention to often overlooked and ambivalent relations and practices of care – such as routine maintenance, repair work, and more-than-human contributions. It also enables the presentation of aspects of care that resist easy articulation in words, including its embodied, affective, and non-verbal dimensions.

This photo essays draws on six months of (visual) ethnographic research in the world of wildfire risk management in Sonoma County, California – a region that has experienced eight federally declared disasters, including four catastrophic wildfires over the past decade. It features mundane images of ordinary wildfire risk management activities – I make no claim that are they spectacular or complete, but I do hope they linger, unsettle, and quietly invite viewers to look closely, feel deeply, and reflect with care. Collectively, these images help render visible the entanglement of care as communities in Sonoma County navigate life in what seems like an increasingly risky world – opening space for viewers reflection, dialogue, and debate. While photo essays are often valued for their ability to depict aspects of social and cultural life that are difficult to represent in text alone" (Wagner, 2007, p. 47) visual communication scholars have increasingly emphasised that the meaning of a photograph rarely resides in a single image (O'Neill, 2025; Pink, 2020). Rather, meaning emerges through the interplay of images, text, and other materials. This photo essay is therefore structured as a series of image-based vignettes that weave together theoretical insights, field encounters, photographs, fieldnotes, and interview excerpts.

2. The photo essay

Figure 1. I'm walking with Gaia near her property to visit what she and many others call the *"spooky trees."* Charred trunks rise around us in eerie stillness, their skeletal branches reaching into the early morning mist. This ridge was devastated by the 2017 Nuns/Tubbs wildfire, which swept through this part of Sonoma County with terrifying speed and intensity. *"Everything is still healing,"* Gaia says quietly. Then, with a faint smile, she gestures toward a small green shrub beside her. *"But we're all learning to live, again."*

Figure 2. From the back of a weathered pickup truck, trays of native grass plugs – 2000 in total – are handed out to be planted across the wildfire burn scar. There are about fifteen volunteers, including me, and we each take a tray to begin planting. It's hard, repetitive labour. We move steadily and mostly in silence, heads down, hands muddy, all focused on finishing before the rain arrives. *"I hope these make it,"* Laura says quietly, pressing another plug into the soil. I can't help but hope too! At the end of the day, as we clean and pack away tools, I ask Haig – one of the committed land stewards who organised the workday – how he thought it went. He smiles and replies, *"It was a perfect day of restoration and renewal. I feel great."*

Figure 3. I'm running with Jonah, Nick, Mali, and Lenny through Trione-Annadel State Park. They have chosen a route that winds uphill toward a lake used by aerial firefighting crews to collect water during wildfire events. Partway up, we come across a large group of sheep and goats grazing along a dry ditch. We stop – partly to catch our breath, partly to watch them at work. *"Why are they here?"* I ask. *"It's a vegetation management program"* Jonah replies. *"You see it a lot here. It's great for keeping everything cut back and that's obviously good for reducing fuel loads and wildfire risk."* Clara adds, *"Yeah, the flerds do way more than we ever could and it feels more, like, like, how it should be, right?"* I continue watching them – heads down, all together, quietly chewing through the vegetation. It's peaceful, almost meditative.

Figure 4. A 12-acre prescribed burn in a grove of old-growth redwoods in Sonoma County. The reintroduction of good fire is part of a long-standing tradition of land stewardship, supporting ecological balance, reducing hazardous fuel loads, and lowering catastrophic wildfire risk. This single burn required months of permitting, training, and careful coordination. On the day, prescribed burning requires rake hoes, flames, drip torches, water, backpack pumps, fire-resistant clothing, committed land stewards, fire personnel, adequate weather and CAL-FIRE approval/sign-off. It also takes humility, trust, and a willingness to learn. Prescribed burning represents a renewed relationship with fire – one that moves beyond control and suppression. But, of course, it's not entirely new. Indigenous communities have been tending and caring for this land with fire for millennia.

Figure 5. The room is filled with fire agency personnel, county employees, fire prevention non-profits, and other local stakeholders. The County is hosting a scoping session for the Sonoma County Hazardous Fuel Reduction project – an effort to foster collaborative planning and broad consultation. But tensions quickly surface. Fire agency staff and non-profit representatives express frustration, viewing the process as redundant and inefficient. *"This data already exists,"* Daniel says sharply. "*You've brought us here without doing your homework – and we've got countless projects ready to go. They just need funding."* Several heads nod in agreement. The County maintains its position, emphasising the importance of shared priority-setting and collaborative project mapping. One fire personnel leans over and mutters, *"If you want a project to die, give it to the County*." Eventually, the mapping exercise begins. After a few moments of stillness, with many sitting silently and arms crossed, a few people start to move, encouraging broader participation. Gradually, more gather around the table, tracing maps to mark critical infrastructure, priority areas, and project proposals. The process is shaped by compromise, memory, and technical knowledge – but remains far from smooth.

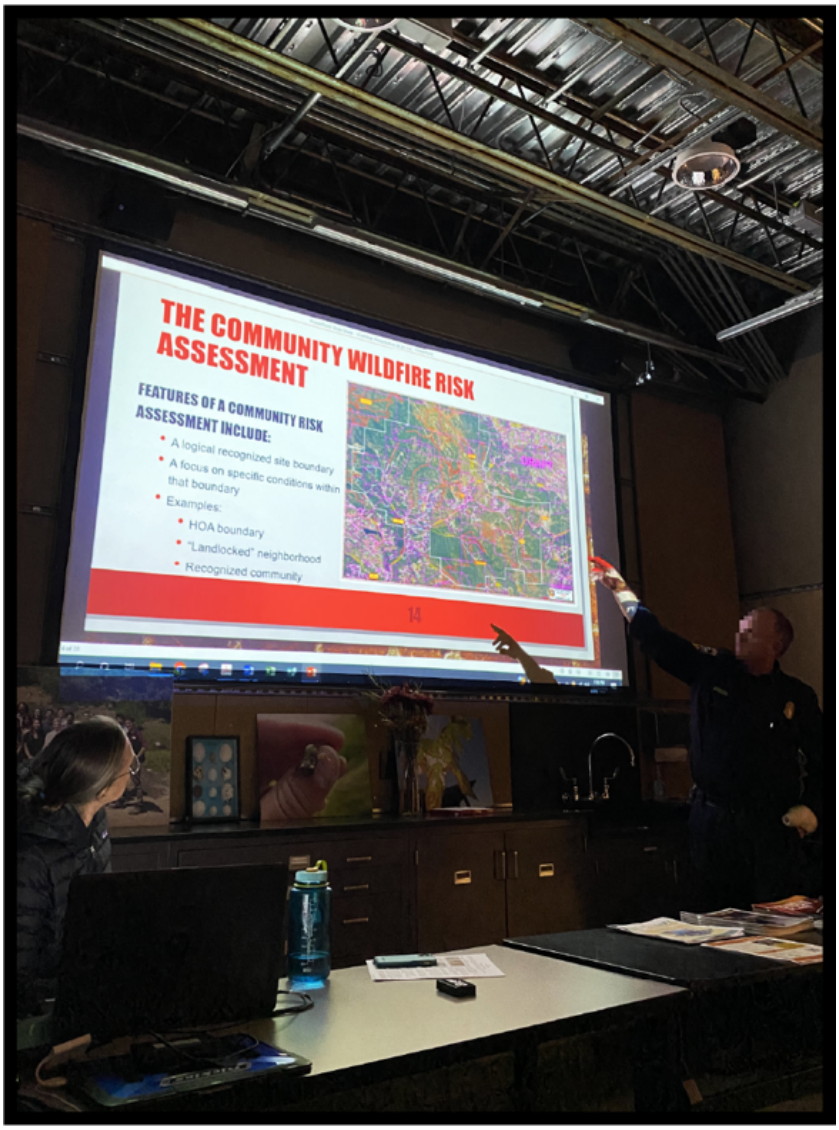

Figure 6. I have spent the day accompanying Mila, an employee at a fire prevention non-profit. It has been a whirlwind – she has taken me along to back-to-back meetings with various stakeholders, picked up her child from daycare, grabbed a quick dinner at In-N-Out, and now we're at an evening community meeting to discuss a neighbourhood's potential application to become Fire Wise. Mila tells me she has asked Terry – a trusted, well-liked fire officer – to lead the presentation, hoping his presence will resonate with the community. Terry stands at the front of the room, speaking clearly to a group of about twenty residents. *"Fire Wise is a pathway to shift the focus from individual properties to collective action. Communities, governments, and local authorities, coming together, working together!"* he says. The community members listen attentively, ask thoughtful questions, take notes, and exchange glances. When the meeting wraps up, no one rushes to leave. People linger, chatting with one another. The atmosphere is upbeat and engaged. It feels as though there is enough momentum for the neighbourhood to move forward with the application.

Figure 7. We're at the Glen Ellen Village Fair – a lively town parade and street party – and the street is already filling up with people out enjoying the crisp fall weather. As we set up, Patricia turns to me and says, *"We can't expect people to come to us, so we've got to meet them where they are. Go to them."* It's a quick remark, but it captures the spirit of their approach to public engagement. The event is full-on: setting up the tent, laying out leaflets, arranging maps and visuals, fielding questions, sharing resources, and encouraging people to care. It's slow, steady, relational work – not just about delivering information, but about building trust, sparking conversations, and being present.

Figure 8. *"It's helpful coming to these events,"* Sheila says as we continue walking between booths. *"You can get a few things, and it gets you started… but it's not enough, you know? Still, it helps to see what else I'm supposed to have."* She pauses to chat with a few more non-profits and collects some of the free supplies being handed out. *"It's hard though,"* she adds quietly. *"I'm not working right now, so it'll take a bit of time to save up for the rest. That radio over there?"* – she nods toward the stand – *"it's forty bucks. I can't afford that."* We find some shade and sit down. Sheila opens her Go-Bag and begins unpacking, showing me each: a foil blanket, a small toiletries kit, a flashlight, a poncho, water, chapstick. *"Even having this,"* she says, looking down at her new Go-Bag, *"it's a relief... in case a fire comes."* In a wildfire, these few essentials could mean the difference between chaos and a safe, swift evacuation, between relying on others or the ability to get by on her own for a little while.

Figure 9. It is an extreme fire danger day, and I'm riding along with fire prevention officers from the Sonoma County Fire District. The atmosphere is tense, with a heightened sense of alert as we patrol a hillside community near Windsor, conducting home hardening and defensible space inspections. We stop at several properties, offering advice on trimming back vegetation and removing flammable materials, such as plastic BBQ covers. The officers move with practiced ease, their eyes meticulously scanning each property for the small details most people overlook – details that could make all the difference if embers start flying. They answer questions, gently guide residents on home improvements, and provide calm reassurance that they will be on duty all weekend until the weather becomes less dicey. While they work, I speak with John, a neighbourhood representative riding along with us. Reflecting on their efforts, he says, "*Fire staff get harassed doing defensible space inspections. But that is as heroic act as going into fires, we need to reevaluate their value, not just coming to the rescue, putting out the bad thing... it's just so juvenile to value be saved from the emergency, but not to value preventing the emergency in the first place...*"

Figure 10. The Sonoma County Fire District is hosting a ribbon-cutting ceremony for their new helicopter – 'Sonoma County 1' – which is equipped with aerial firefighting capabilities. A fire official delivers a speech celebrating this advancement in fire response tactics. There is coffee, cake, and a crowd of senior officials. It is a big event – a moment of celebration. As the ribbon is cut, people applaud, snap photos, and share them on social media. I can't help but notice the contrast. Compared to the quiet, often unseen work of fire prevention and mitigation – home hardening, defensible space inspections, land management, community outreach – this moment feels loud, polished, even performative. *"They'll never stop wanting the bigger truck or the next shiny thing,"* Olivia, a fire prevention officer, murmurs, rolling her eyes.

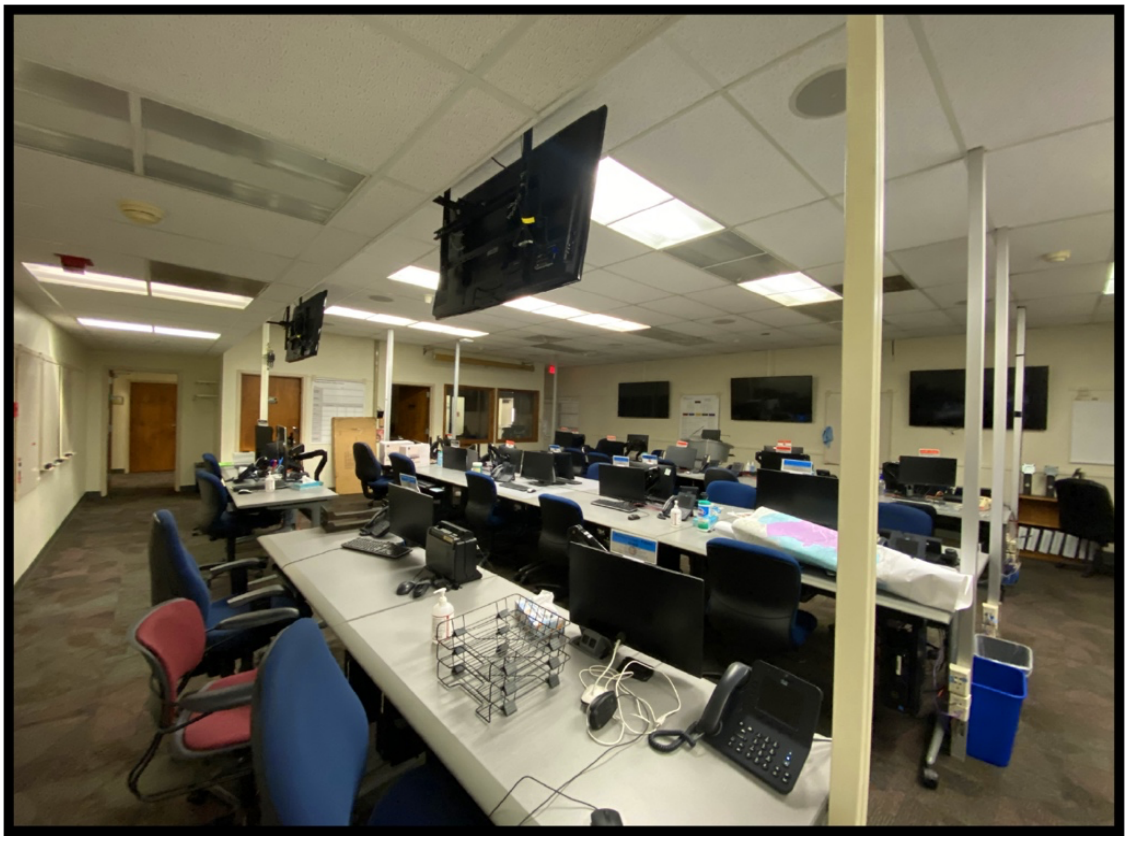

Figure 11. I walk through the County's Emergency Operations Centre. It's a 'warm Emergency Operations Centre,' set up but not staffed. Rows of dark computer monitors, silent radios, and idle telephones line the tables. Chairs sit empty, scattered around the room. Whiteboards, projectors, and maps cover the walls. The building is quiet; only Susan and I are here. It feels still, yet it holds a quiet tension, a readiness. Though dormant now, everything is in place, poised to activate at the onset of an emergency. It's a room built for urgency, simply waiting.

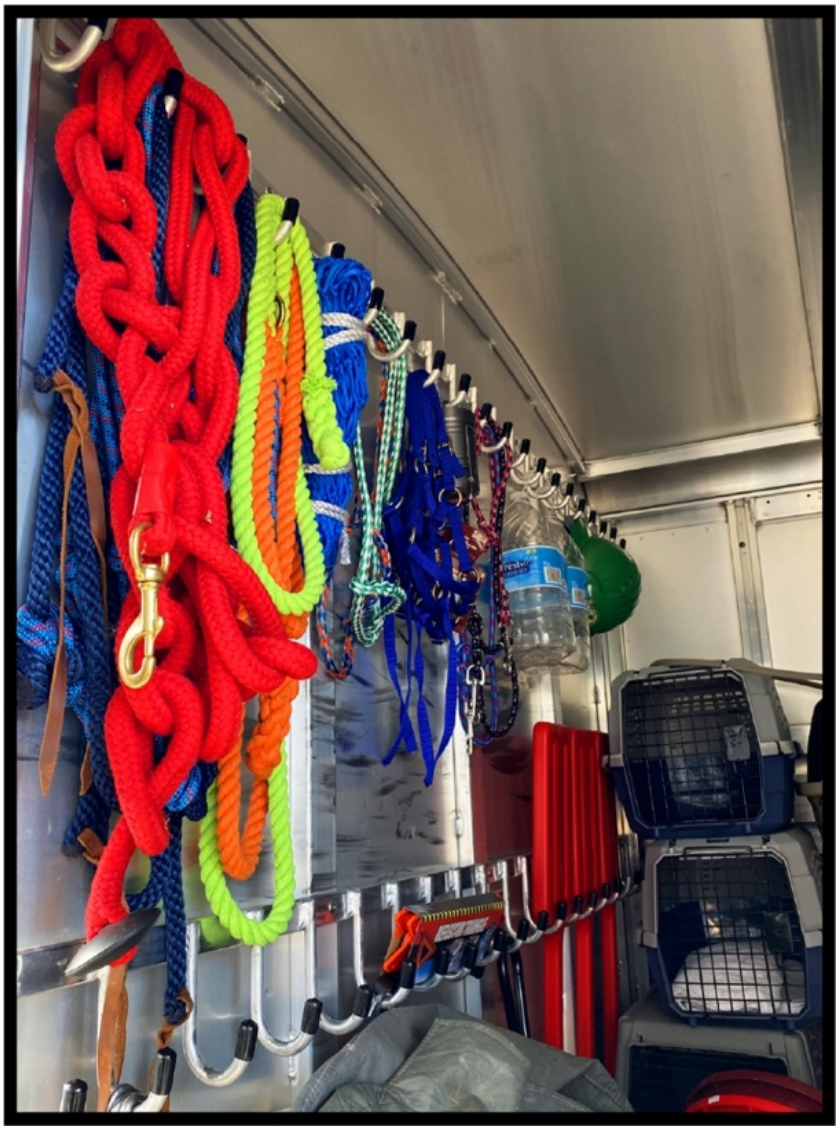

Figure 12. Phoebe walks me around her property, recounting her experience during the 2017 Nuns/Tubbs wildfire. We pause to pet her horses; her love for them is unmistakable. Her voice trembles as she recalls the chaos of evacuation: *"We were racing the fire to load up the horses... trying to remember what to grab... driving through actual flames to get to the fairgrounds... I didn't think we'd make it."* We continue towards a trailer at the edge of the field. *"After that, I said never again,"* Phoebe sighs. *"I have to be prepared. I'm responsible for them – and I want to make sure all animals in Sonoma County are safe. Preparedness isn't just for people."* She opens the trailer, revealing shelves neatly stocked with emergency supplies she's been gathering over time: leads, cat carriers, harnesses, blankets, food, water, helmets. Everything needed to keep animals safe when the next fire comes.

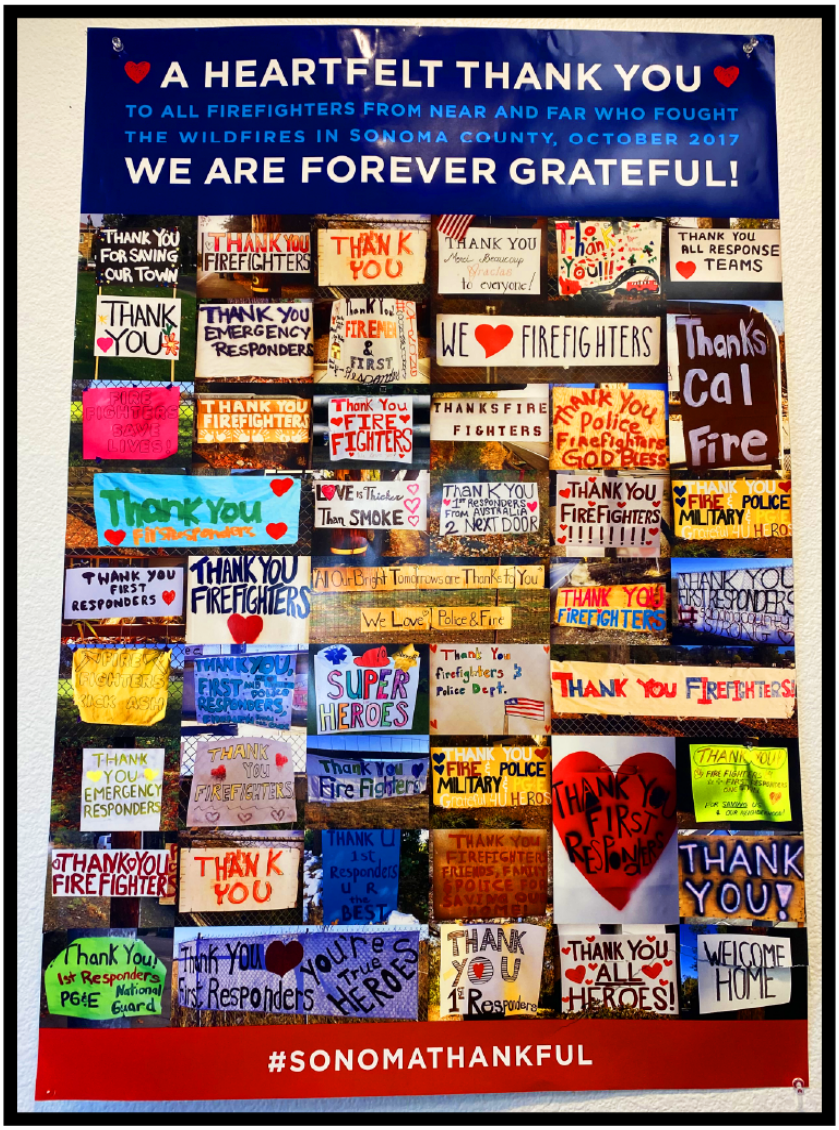

Figure 13. After a ride-along with Roger – a senior firefighter – we return to the station. As we walk down the hallway, we pass a sign on the wall. I've seen ones like it all over Sonoma County: in fire stations, nonprofit offices, even taped in café windows. I ask Roger about it. He pauses. *"Yeah… so, in 2017,"* he begins, then looks away. I offer a gentle smile. "*My neighbours put a sign in my front yard that said, 'A hero lives here.' It was a beautiful gesture and obviously it's still hard on me now."* He wipes his eye, collects himself, then continues: "*But as a professional firefighter, it's what I get paid to do, right? And honestly, it's awkward, not a lot of us felt like heroes at the end of that fire. Not with the amount of destruction and devastation that happened."*

3. Conclusion

By attending to the ordinary, everyday practices of wildfire risk management – clearing brush, managing stockpiles, coordinating neighbours – this paper renders visible the dispersed, relational, and sometimes ambiguous ways in which "as well as possible relations" (Puig de la Bellacasa, 2017, p. 6) surface in surface in how communities know, manage, and live with wildfire risk in Sonoma County. In the case made visible, care did not unfold through heroism, speech, or traditional gendered roles, but rather through mundane practices of risk management, more-than-human entanglements, and collective efforts to live (better) with fire. The relations of care perhaps appeared disengaged, bureaucratic, or unintentional – and may even be dismissed as not-care by viewers. Yet I argue that such diverse and ambivalent engagements reveal the often-unrecognised pervasiveness of care within wildfire risk management – whereby, amongst others, land stewards, sheep, computers at the emergency operations centre, fire personnel, fire itself, all are entangled and dependent upon the care. In many ways, wildfire risk management is a caring entanglement: a collective, more-than-human endeavour sustained through interdependent acts of maintenance and repair that enables communities – human and more-than-human – to continue inhabiting fire-prone landscapes in ways that feel liveable, familiar, and worthwhile.

The photo essay format – composed of 13 image-based vignettes – made these relations of care visible in ways conventional academic text-based formats often do not. The interplay of images and text attempted to offer a textured, sensorial entry into the world of wildfire risk management, creating space for complexity, ambiguity, and speculation. Unlike many disaster photo essay – particularly those that adopt mainstream media aesthetics that gravitate toward spectacle and destruction (Kelman, 2024) – this work centred the everyday, the banal, and the more-than-human: chipped wood, grazing sheep, hand-painted signs, and half-filled Go-Bags. Foregrounding these ordinary scenes matters, shifting attention from crisis to continuity, and highlighting the sustained, quiet care that occurs before, during, and after wildfires. It also expands the frame of both risk management and care beyond human action to include the "unnatural alliances" (Puig de la Bellacasa, 2017, p. 80) that constitute such caring worlds.

Visual communication scholars argue that photo essays, as a sustained form of critical engagement, hold the potential to engage broader audiences in our research and disrupt dominant narratives (Pink, 2020). At a moment marked by urgent concerns about the possibilities for life amid the escalating wildfire and climate crisis, I contend that photo essays are more necessary than ever. They encourage us to notice, make visible, and linger – carefully – with the complex realities of how life is (and is not) sustained in the world. Disaster scholars stand to benefit from embracing this fertile ground of critical image-based work, as these approaches foreground the embodied, relational, and affective dimensions of disaster settings, while fostering ethical attentiveness and nuanced representational choices that honour both communities and landscapes (supporting commitments to 'A Disaster Studies Manifesto' RADIX, n.d.).

Ultimately, I invite viewers to recognise care as "a vital necessity" (Puig de la Bellacasa, 2017, p. 67) – something that sustains and holds together while simultaneously opening new possibilities for inhabiting and flourishing in an increasingly disastrous world.

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6. Paper Four: Stockpiled, standby, stamina: forms of care in disaster risk management

Authors: Tilly E. Hall
Publication status: Revised after referee comments for Transactions of the Institute of British Geographers

Abstract: Care in disaster contexts has often been approached as gendered human-to-human interactions, primarily within disaster response and recovery settings. Drawing on a broad conceptualisation of care, this paper rethinks disaster risk management not simply as a set of technical, securitisation and managerial practices, but as a relational process animated by care. Based on six months of ethnographic research in Sonoma County, California, I identify three divergent forms of care – stockpiled care, care on standby, and care as stamina – each engaging with different temporalities, materialities, participants, affects and practices. By examining what these forms of care do for disaster risk management, I argue care, at different moments, sustains the very world of disaster risk management. This paper therefore contributes to care scholarship by deepening understandings of how care is entangled with human and more-than-human relations, and by making visible the temporal, material, and affective dimensions of stockpiled care, care on standby, and care as stamina. It also advances disaster geography by urging more further inquiry into how care circulates in disaster contexts, and by inviting broader engagement with care as a vital, animating force within disaster risk management.

Care, disaster risk management, disaster, relations, practice, materiality

Prologue

I'm in the emergency operations centre. Dark computers screens sit on tables. Whiteboards and maps line the wall. The building is quiet, its stillness only broken by the water dispenser. My presence reminds me that this space, though empty now, holds the potential for action.

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Driving on Highway 101 on a hot, windy day, we notice smoke over the Mayacamas Mountains. Alarmed, Cari instructs, "check if it's a fire start." I quickly open Watch Duty. "It's a prescribed burn" I assure her. Her tension eases as my adrenaline fades. During fire season, real-time updates are a godsend!

***

I attend a volunteer workday led by dedicated land stewards, restoring burn scars from past wildfires. Under the fall sun, we plant grasses, working hard to heal the land. After lunch, we pause to reflect – uncertain of our impact on wildfire risk but certain that our efforts are worthwhile.

1. Introduction

These research encounters highlight conventional disaster risk management practices: emergency operations centres (EOC), alert and warning systems, and vegetation management. Each also features a distinct form of care. In the EOC, care operates through the building's materialities but remains stored, held back in reserve for future disasters. On a hot, windy day, checking the alert and warning app reassured Cari and me when we saw smoke, a sense of security made possible by meticulous, behind-the-scenes work to keep the app functional. During the workday, care occurred through the repeated effort of planting grasses in burn scars, despite uncertainty about its long-term impact. Considering these encounters and the glimpses of care that animate them, this paper addresses three questions: How does care circulate in disaster risk management?[4] How is care encountered? And what does care do for disaster risk management?

This paper examines disaster risk management in Sonoma County (SoCo), California, which has experienced eight federally declared disasters in the past decade, including four catastrophic wildfires. It contributes to disaster geographies by identifying three distinct forms of care – stockpiled care, care on standby, and care as stamina – that circulate and are encountered in disaster risk management. In doing so, it expands understandings of care as entangled with human and more-than-human relations. Identifying these forms of care further shows how care can be anticipatory, present, and enduring, extending understandings of care

[4] Disaster risk management involves a wide array of targeted strategies and activities aimed to prevent and reduce disaster risk and losses. It represents it represents a gathering of actual entwined trajectories, present moments, and possible and emerging futures (McGowran and Donovan, 2021).

by highlighting its varied temporal, material, and affective dimensions. The paper's central contribution is to demonstrate that disaster risk management is animated by care, moving beyond its conventional framing as a purely technical or securitised endeavour. To make this argument, I first foreground the value of broad conceptualisations of care when exploring care in disaster risk management. The subsequent sections weave together conceptual insights and empirical encounters to present these three forms of care, attending to their distinct temporalities, materialities, participants, affects, and practices. By illustrating how these forms of care coexist, conflict, and converge, I emphasise the work they do in sustaining the world of disaster risk management at particular moments. The conclusion reflects on the twofold implications of centring care in disaster risk management: reconfiguring how care is understood and recognising the extent to which relations of care are a vital, animating force within disaster risk management.

2. Care and disaster risk management

Care is a fundamental aspect of everyday life, shaping our relationships with others and the world (Puig de la Bellacasa, 2017; Tronto, 1993). It is established through "caring about" (attentiveness), "caring for" (responsibility) "caregiving" (competence) and "care receiving" (responsiveness), forming an ongoing relational experience that touches everyone (Tronto, 1993, p. 127). Yet, care remains elusive. Is it the "proactive interest of one person in the wellbeing of another" (Conradson, 2003, p. 451)? A feeling, disposition, labour, or the facilitation of "processes of social reproduction" (Middleton and Samanani, 2021, p. 30)? An "ethical and political responsibility" (McEwan and Goodman, 2010, p. 103)? Embracing these ambivalent grounds, I draw upon Puig de la Bellacasa (2017, p. 161) modification of Tronto's (1993, p. 3) influential conceptualisation of care:

> "Care is everything that *is* done… to maintain, continue, and repair "the world" so that *all…*can live in it as well as possible. That world includes… *all* that we seek to interweave in a complex, life-sustaining web."

In disaster contexts, care is embedded within specific acts such as tending to the injured, securing aid, and rebuilding homes. Everyday care practices – for example, domestic care, cooking and raising children – also continue but may be disrupted, altered, or intensified (Alburo-Cañete, 2024; Ramalho, 2021; de Vet *et al.*, 2021). For example, after the 2013 Blue Mountains bushfires in Australia, parents' capacities for care were challenged due to the loss of home contents that anchored daily care routines (de Vet *et al.*, 2021). Care in disaster settings is also "found in acts of maintaining community life, ensuring the well-being of populations, and sustaining or repairing nature and the environment" (Alburo-Cañete, 2024, p. 16). Examples include mutual aid collectives (Hobart and Kneese, 2020; Spade, 2020), community-based recovery efforts like 'Tradies for Fire Affected Communities' (Carr, 2023), land stewardship (West *et al.*, 2018) and cultural traditions like "Bayanihan" in the Philippines, which foster communal solidarity during disasters (Ramalho, 2021, p. 856). Care in disaster contexts has been found to be transformative, "allow[ing] communities to live through hardship" (Hobart and Kneese, 2020, p. 10), while also placing an emotional and physical

burden on those who give and receive it (Alburo-Cañete, 2024; de Vet *et al.*, 2021). It is not always purely altruistic, innocent or benign, care is shaped by power, privilege, and exclusion, and can be commodified, constrained, and co-opted (ibid; Puig de la Bellacasa, 2017).

Drawing on Puig de la Bellacasa (2017, p. 161) expansive conceptualisation, this paper seeks to recognise further ways care circulates in disaster contexts, emphasising the interwoven "as well as possible" relations that sustain life during crisis. However, if we accept "care is everything that *is* done" (Puig de la Bellacasa, 2017, p. 161), where do its conceptual boundaries lie in disaster settings? Can state employees drafting building codes, land stewards burning vegetation piles, fire engines racing toward a wildfire in the hills, or neighbours empathising over poor air quality all be considered as care? How do we distinguish care from similar relations such as control, joy, neglect, love, or obligation? While such a broad conceptualisation is valuable for exploring care in disaster risk management, it necessitates careful delineation of its scope.

Feminist ethics of care scholars caution against conflating care with abstract concern (Corwin and Gidwani, 2021; Tronto, 1993). Recognising a need – "caring about" something (Tronto, 1993, p. 127) – does not constitute care unless accompanied by "actual practices of care" (Corwin and Gidwani, 2021, p. 13). As Corwin and Gidwani (2021, p. 13) argue, one cannot "care about something and remain disengaged from it." Care in disaster risk management, therefore, must be understood as active engagement rather than mere awareness of risk, vulnerability or need. However, as Puig de la Bellacasa (2017, p. 4) notes, care does not always stem from an "ethical or affective disposition" – it can be driven by necessity or professional obligation. For example, Buser and Boyer (2021) found water infrastructure workers engaged in care through system maintenance, yet their motivations were often shaped by institutional duty and payment rather than personal commitment or emotional investment. This challenges the assumption that care exists solely within a "wholesome or unpolluted pleasant ethical realm" (Puig de la Bellacasa, 2017, p. 8). Care in disaster risk management, therefore, is not merely a matter of intention or sentiment – it is a relational practice enacted in support of safer communities and landscapes, whether or not those involved are consciously aware that their actions are in the service of others. These "as well as possible" (Puig de la Bellacasa, 2017, p. 161) conditions would be the caring outcomes of disaster risk management.

Care in disaster contexts is often framed as a "feminized gendered practice" (Ramalho, 2021, p. 859) that "most often falls to women" (Sims et al., 2009, p. 312). In capitalist and patriarchal societies, care is essentially reproductive labour[5] – necessary yet undervalued and largely invisible. Alburo-Cañete (2024, p. 13) highlights the "feminization of responsibility" in disaster settings, where women's care-based contributions are instrumentalised, intensifying their "productive, reproductive, and affective labors" without improving socioeconomic conditions and reinforcing gender inequalities. To challenge these injustices, Alburo-Cañete

[5] The concept of social reproduction, grounded in Marxist thought, explores how the workforce is reproduced and sustained over time. It emphasises the essential role women play in this process, often through unpaid care labour that is socially assigned to them.

(2024, p. 13) advocates against "the confinement of care to women" in disasters. Building on post-humanist feminist scholarship (e.g., Buser and Boyer, 2021; Puig de la Bellacasa, 2017), I argue for a decentred, distributed understanding of care that includes both human and more-than-human agencies. This perspective disrupts gendered assumptions and expands who (and what) is recognised as a participant in care. By decentring the human subject, disaster geographers can acknowledge that both human (e.g., firefighters) and more-than-human (e.g., helicopters, weather) agencies actively shape the nature of care and, in their entirety, make care possible. For example, firefighters maintain helicopters, helicopters enable aerial firefighting, and weather conditions shape intervention strategies – together, they co-constitute the caring relations that make fire suppression possible during a wildfire. While some may resist framing non-intentional, more-than-human relations as care, embracing these "unexpected unnatural alliances" (Puig de la Bellacasa, 2017, p. 80) challenges dominant narratives that confine care to specific subjects (e.g., women) and spaces (e.g., the domestic sphere). Expanding the scope of who (and what) participates in care highlights the fundamental interdependencies that sustain life (in disaster). Recognising this raises some critical questions: Who (should) care(s) in disaster risk management? How do particular configurations of care circulate in disaster risk management? What does care do for those encountering it? And how does care shape disaster risk management at different moments?

3. Researching care

While care is active – as a practice, labour, and an enactment – it is challenging to observe in 'the world'. Care is pervasive and undertaken by, in, and through complex relations of people, practices and phenomena (Martin *et al.*, 2015; Puig de la Bellacasa, 2017). While there is value in using Puig de la Bellacasa's (2017) conceptualisation of care and Tronto's (1993, 2013) phases of care as conceptual anchor points, a key challenge is holding them together with empirical relations of care already existing. This research had to "start in the middle of things" because "care practices don't suddenly begin, they are already ongoing" (Tronto, 2015, p. 4) To do so, aligning with feminist 'ethics of care', my methodological points of departure had to be open and reflective to who, when, where and how care happens in the relations that attempt to sustain wildfire risk management. It had to allow messiness, ambivalence, complexity and multidimensionality to percolate the research process (Brannelly, 2018).

To explore care in wildfire risk management, I designed a mixed methodology – incorporating document analysis, participant observation, 33 storytelling interviews and 51 go-alongs – guided by an 'ethics of care.' This research was conducted in Sonoma County between August 2022 and March 2023. As the agencies and entities encompassed by care are unrestricted, my research included those formally working in wildfire risk management (e.g. firefighters, emergency planners) and those involved informally (e.g. wildfire survivors, land stewards). I gave attention to engagements with tangible material objects and places (e.g. fire stations, wildland), and less tangible or immaterial objects, atmospheres and policy frameworks. I established caring and careful research processes based on connection, mutuality and trust (Brannelly, 2018) and tried to stay with the ambivalent and contradictory terrains of care.

Before conducting storytelling interviews and go-alongs, I undertook participant observation of wildfire risk management for two months to develop presence within 'the world' of wildfire risk management. To start noticing care, I paid attention to care(ing) language, embodied labour and affective engagements with living and non-living entities. During storytelling interviews, I asked people to tell me a story related to wildfire risk management that mattered to them and asked follow-up questions relating to care. Here, go-alongs included attending community risk mapping workshops and outreach events, observing prescribed burns, volunteering at community workdays, helping clear brush, and supporting fire personnel conduct home inspections ahead of the fire season. Go-alongs combined participant observation and interviewing to approach aspects of lived-experience in situ; these enabled people to reflect upon the non-verbal aspects of care, and for me to question whether care was perhaps obscured or being taken-for-granted.

4. Forms of care in disaster risk management

In what follows, I identify three forms of care[6] within disaster risk management – stockpiled care, care on standby and care as stamina – that circulate and are encountered within disaster risk management. Drawing on various research encounters, I illustrate how these forms of care cut across diverse disaster risk management activities, coexisting, conflicting and working in conjunction with each other, alongside various other relations, both care-related and otherwise. By examining their interactions with various temporalities, materialities, participants, affects, and practices, I speculate on how these forms of care animate – and even sustain – the world of disaster risk management at different moments.

4.1. Stockpiled care

Stockpiled care transverses the ground between past disasters, present conditions and risks, and unknown and imagined future disasters to store-away (the potential of) care. It emerges from the social-political context in which disasters are coupled with a "sense that there is limited time within which to curtail irreparable harm or damage to whatever it is that has been" (Anderson, 2017, p. 465) cared about. By accumulating care through building material stockpiles, maintaining warm EOC's (see, Figure 1) and documenting information in emergency plans, stockpiled care aims to ensure there's 'enough' care to mitigate harm and protect what's cared about during future disasters.

[6] I use the language of 'forms of care' to describe distinct types of surfacings. Where 'practices of care' represent the work and labour involved in care relations, and 'logics of care' align to reflections on what 'good' or 'necessary' care should entail (Mol *et al.*, 2010), 'forms of care' detail the tangible manifestation of care. Forms of care represent the specific ways in which care is configured through distinct temporalities, materialities, spatialities and practices. Forms of care allow us to bridge the conceptual to the empirical and interrogate how care surfaces along with its multiple relations and tensions.

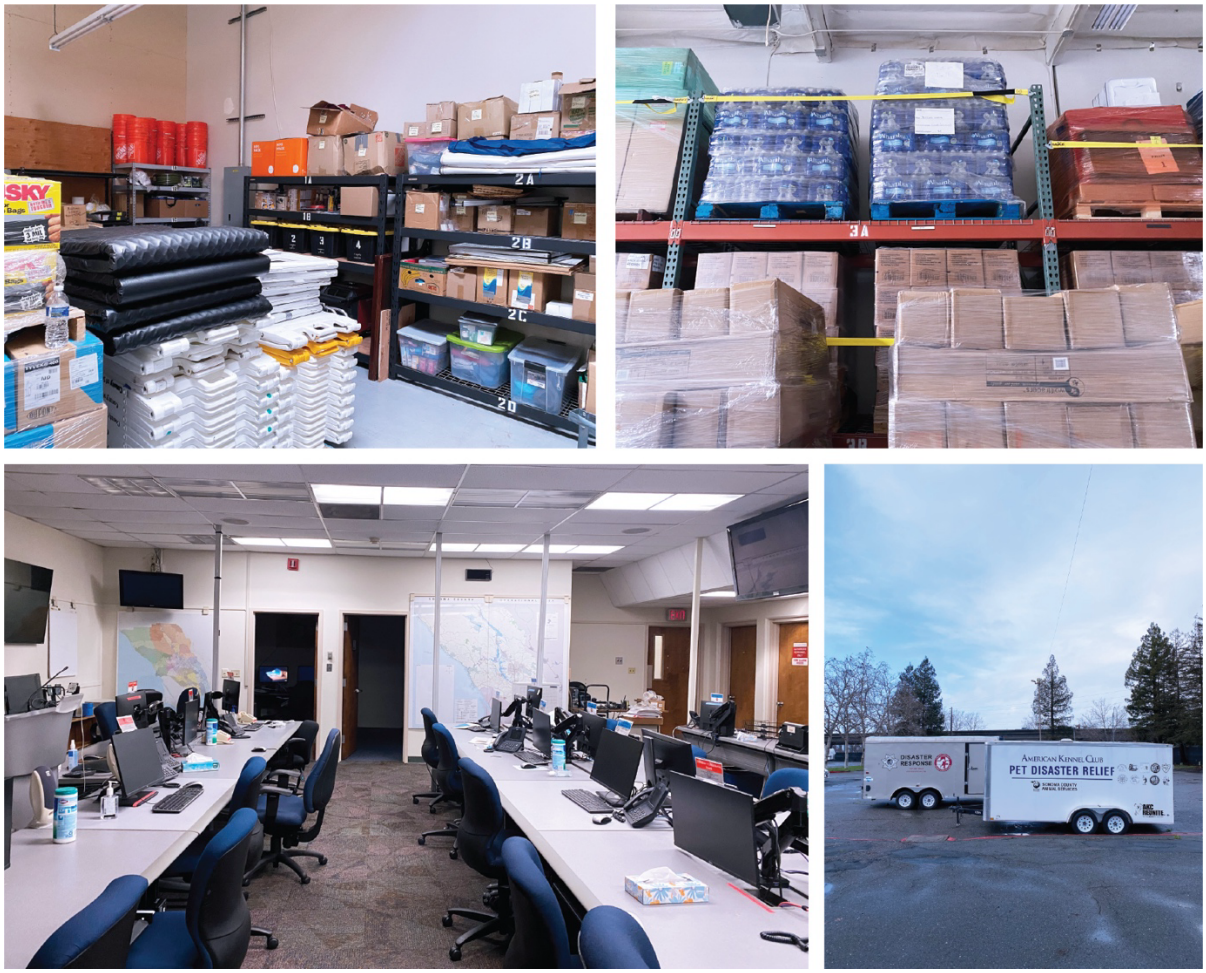

Figure 1. Authors images of stockpiled care.

In SoCo, significant and repeated disaster experience has mobilised the stockpiling of certain material and immaterial resources (e.g., masks, water, information):

> *"It's insane! We went from literally nothing, to every single year there being some type of an emergency that requires a community response. So now we have a stockpile of air purifiers, masks, fire tools. We have shit there because this is the world we live in."* (George,[7] mutual aid organisation leader)

Repeated disaster experience has exposed community vulnerabilities while highlighting the critical importance of preparedness. This awareness compels what Anderson (2010, p. 777) terms "anticipatory action," where current risks are assessed and future disasters imagined. Through "anticipatory and calculative knowledge techniques," people determine "what, when and how much [care] to keep in store" (Folkers, 2019, p. 496). If the future is "a storehouse of possibilities" (Luhmann, 1976, p. 150 cited in Folkers, 2019), stockpiling care seeks to assemble resources in the present to ensure sufficient care during a future disaster. Just like preparedness, stockpiled care "targets a specific temporal domain within the future: the uncertainty of the emergency situation in which response occurs" (Grove, 2012, p. 574).

[7] All participants are pseudonymised.

Stockpiled care is often a socio-material practice involving the acquisition and storage of (material) resources – for example, George's *"stockpile of air purifiers, masks, fire tools*." As an intervention, like preparedness, it "aims to stop the *effects* of an event disrupting the circulations and interdependencies that make up a valued life" (Anderson, 2010, p. 791). "By arresting the processuality and eventfulness of matter" (Folkers, 2019, p. 505) and withholding resources from regular circulation, stockpiling seeks to ensure their availability and caring capacity in a future disaster. During disastrous events, these stored materials may serve as survival necessities or be distributed in acts of care. For instance, air purifiers may be shared with those with respiratory illnesses during wildfires, helping them breathe through poor air quality. These materials might also stand in for overwhelmed caring relations, shaping, enabling or even constraining care. For example, 'Meals, Ready-to-Eat' may replace domestic caregiving, while shower trailer placement can determine which evacuation centres open, altering accessibility. Whatever their use, these materials are expected to play an integral and reproductive role in the 'giving' and 'doing' of care during disaster response, despite lacking a caring disposition or ethical intention (Buser and Boyer, 2021; Puig de la Bellacasa, 2017).

Stockpiled care also extends beyond the temporal domain within the future disaster. While Folkers (2019, p. 497) emphasise the "securing effect" of stockpiles, I argue they produce a 'caring effect' in the present:

> *"So once fire season came round, we were like gathering supplies and shit. It made me feel better, because at least I was walking into the thing as opposed to walking on the side and not knowing it was going to happen."* (George)

> *"As soon as the fire season hits, I pack my Go-Bag in the trunk of my car. I don't take it out till it's over. It's peace of mind, yanno it'll be okay. I have all my important stuff, prescriptions, toiletries, water, but yeah also the stuff that matters. My wedding photos, my mom's jewellery and the kids' stuff...It's good having it there so I can just go..."* (Fiona, community member)

For George and Fiona, the fire season brings heightened uncertainty and concern. Yet, gathering and storing materials offers them reassurance and a sense of agency amid the unpredictability. Gathering supplies shifts George's anxiety about the fire season into proactive care work, fostering a sense of preparedness rather than powerlessness. Similarly, packing a Go-Bag provides Fiona comfort, knowing that her essential and sentimental items are ready for evacuation. Here, stockpiled care is not only driven by expectations of the fire season (e.g., that care might be needed) but also underpins expectations of it. Stockpiles are imbued with the expectation that *"it'll be okay"* (Fiona) if a disaster unfolds. Even if the materials are *"just stuff, waiting, never to be used, if at all possible"* (Susan, DEM employee) or the anticipated disaster never materialises, those stockpiling and resources stockpiled remain active participants in the circulation of care by producing this caring effect in the present. This affective temporality – where care is materially stored in anticipation of a future need yet also felt in the present – challenges Tronto's (1993, p. 127) phases of care by demonstrating how "caring about" and "caregiving" can occur simultaneously and be oriented towards the present

and future. Ultimately, then, stockpiling is a form of care because it is performed to limit disruption and reduce harm to what's cared about in the event of future disasters, while also generating reassurance in the present. Although often indirect and more-than-human, the benefits of stockpiled care are acutely felt by those living in Sonoma County, offering both future protection and present emotional relief.

Stockpiling as a form of care is particularly appealing for those involved in disaster risk management because it engages care in a way that establishes value for any future disaster. As Clara (DEM employee) noted, *"we try to prepare for each disaster...but we are gunna have something else."* Stockpiled care is not limited to a single anticipated event but rather provides a form of care that can be reimagined and repurposed during any disaster. Stockpiling also offers a form of care that requires minimal ongoing labour and relational commitments until disaster strikes. Guided by logics of preparedness, stockpiled care "does not aim to stop a future event happening" (Anderson, 2010, p. 791) but rather aims to keep a future event from becoming completely disastrous, embodying an 'emergency supply' of care. Once supplies are stored, resources allocated and plans documented, further labour and relational obligations can be deferred. For under-funded and under-supported disaster risk management agencies, stockpiled care enables them to portray an image of responsibility, preparedness and care in the present without continuous effort and resources. This dynamic reflects the broader tendency within disaster risk management to privilege anticipatory strategies and logics of preparedness over sustained, systemic interventions (Anderson, 2010; Grove, 2012).

Disaster geographers underscore how disaster risk management is deeply embedded in power relations (e.g., Grove, 2012; McGowran and Donovan, 2021), with stockpiles bestowing significant 'infrastructural power' on those who control them (Folkers, 2019). In the case of stockpiled care, those in control (e.g., the state, disaster risk management agencies) invest in materials they anticipate will be necessary for future disasters. This investment is not neutral; it's shaped by assumptions about which disasters will unfold, what care will be needed, and who will need it. Although the disaster is yet to occur, certain things are categorised as appropriate to stockpile: masks are deemed valuable, cots useful, emergency plans necessary, and the EOC crucial. Stockpiling care reflects a commitment to specific futures and communities as it necessitates the prioritisation of certain outcomes and populations. This raises some important questions: What future disasters are deemed worth caring for? Which issues are valorised as 'matters of care' (Puig de la Bellacasa, 2017) to be addressed by stockpiling, and who defines them? Who gets to use stockpiled care, and who does not?

Recognising the criticality of these questions, I wish to draw further attention to institutional stockpiled care (i.e., the DEM's and FEMA's). In previous disasters, seasonal (often undocumented) farm and vineyard workers, lower-income people, Latino/a people and people experiencing homelessness were overlooked and excluded from institutional stockpiles, creating significant challenges for these groups in accessing medical care, shelter provision and other essential resources. For example, FEMA denied access of individuals unable to provide a formal address to evacuation centres (Spade, 2020). Disaster geographers have consistently highlighted certain groups – e.g., women, LGBTQIA+, undocumented Latino/a immigrants,

people experiencing homelessness and Indigenous peoples – are disproportionately excluded or face significant barriers in accessing institutional resources during disasters (Dominey-Howes *et al.*, 2014; Gaillard *et al.*, 2017; Jean *et al.*, 2023; Méndez *et al.*, 2020; Sultana, 2021; Walters and Gaillard, 2014). This scholarship evidences that pre-existing societal prejudices and inequities are often reproduced in disaster response and recovery, leading to the prioritisation of some groups in resource access while others are marginalised or neglected. Understanding stockpiled care through these findings demonstrates its inherent politics, operating as "a selective mode of attention" (Martin *et al.*, 2015, p. 627), where certain lives and needs are deemed worthy of care while others aren't. Thinking through stockpiled care makes visible ongoing care relations but also simultaneous processes of abandonment and neglect.

Disaster justice scholars emphasise "the state is seen as having a duty of care to its citizens that is not just voluntary or moral but is enshrined in legal and regulatory practice" (Bankoff, 2018, p. 373). When the state fails to provide adequate stockpiled care, often due to chronic underfunding and insufficient resources, it constitutes a breach of its responsibility to citizens. In such situations, community agencies often fill the gaps:

> *"On the one hand, it's like fuck yeah, I'm helping people and that's cool. On the other hand, it's like really upsetting, because why do I have to do it. I mean I'm providing a necessity to someone, so they can basically live…."* (George)

Similarly, under the auspices of resilience, the DEM encourages individuals to stockpile resources in Go-Bags as an additional 'emergency supply' of care. Drawing on Grove's (2014, p. 249) work on resilience, the DEM engineers the public's "feelings of fear, uncertainty, hope, trust, [and I add, care]... in order to increase peoples' motivation to participate in [disaster risk management] activities...and thus *become* active agents in their own survival." While the DEM provides guidance on what to store, individuals are ultimately deemed responsible for their own wellbeing during a disaster, reinforcing neoliberal logics and the individualisation of care:

> *"Yeah, they've [a nonprofit] helped, but I only can buy one thing a week. It's hard cos money's tight, and it's expensive stuff. I know I've gotta keep at it. We flood, and fires have come close...I know I'll be on my own."* (Gail, community member)

Both George's organisation distributing resources and Gail compiling a Go-Bag despite financial challenges highlight the increasing and unequal burden placed on communities to bear the responsibility and labour of stockpiling care in the absence of sufficient state support. However, George and Gail's actions can also be understood as strategies of self-determination (Sou, 2022). They reclaimed agency and power, participating in disaster risk management and enhancing resiliency despite the challenges created by state shortcomings. I'm not suggesting mutual aid organisations distributing resources, saving money to compile Go-Bags or depending on local actors is desirable, as many participants expressed frustration about having to shoulder such responsibilities. Yet, following Sou (2022, p. 23), "everyday resistance can encompass intent to survive, fix a practical problem, or to meet immediate needs." While I

understand George, Gail, and others' committed labour as care as stamina, I place this discussion within stockpiled care to foreground its inherent politics and open space for future reflections on the power shifts needed to recognise, support, and more fairly distribute such care work within disaster risk management activities.

4.2. Care on standby

In disaster risk management, care can resemble electronic devices, "neither completely on, nor ultimately off" (Lemke, 2023, p. 707). Kemmer et al. (2021: 1) define standby "as a state of 'in|activity' that indicates readiness without immediate engagement, but that nevertheless requires and generates energy, resources, and relations." Taking up this "state of 'in|activity'" as key, care on standby represents an energetic caring standstill, where configurations of care are always ready and waiting to be (re)activated. Examples include disaster service workers, mobilised firefighting equipment and alert and warning systems. Care on standby indicates a state of limbo between care relations actively being performed in the present while always orientated toward the future disaster that is uncertain but forever capable of emerging.

Under the California Emergency Services Act, all County of Sonoma employees are classified as Disaster Service Workers (County of Sonoma, n.d.). This arrangement requires all employees to remain 'on call' and ready to respond to disasters at short notice, independent of proximity or familiarity. DEM employees also rotate as 'duty officers,' responsible for initiating an emergency response:

> *"You're just like constantly aware. Like we have the wildfire cameras that are constantly on, and so when you're on duty, if you get a ping of blah blah camera has detected a wildfire… if it's high season and you're on duty, I'm checking that the second I get that notification. And I'm turning on my radio to listen to anything that's going on."* (Camila, DEM employee)

The 'on-demand' labour of County employees and the 'duty officer' rotation within the DEM demonstrates care on standby, as they remain in a state of readiness without immediate engagement, although activation always possible. Camila described duty officers as perpetually ready for (re)action and to respond to "that notification." Unlike in stockpiled care where care labour and relational obligations are deferred, care on standby necessitates ongoing careful alertness, attentiveness and awareness to others needs and a commitment to respond when required. This illustrates the limbo of standby, which blurs the boundaries of being off or on, active or waiting, and working or resting. Crucially, this state of limbo is care because it is sustained by a commitment to be available for others – human and more-than-human – at a moment's notice, requiring not only structural preparedness but also affective and ethical orientations of vigilance, responsibility, and potential responsiveness.

Care on standby is premised on the looming deployment of resources in a future disaster. It is this anticipated disaster that renders care relevant in the present. Take the mobilisation of the 'SoCo 1' helicopter:

> *"With the predicted winds and low humidities this weekend, we are pleased to add our helicopter "Sonoma County 1" to our list of resources staffed and ready to respond to any fire emergency in Sonoma County. Sonoma County 1 is capable of dropping 120 gallons of water on a vegetation fire and of providing a critical set of "eyes in the sky" over a fire emergency."* (SoCo Fire District Facebook post)

Prior to activation, the helicopter was stored in an airport hangar, embodying stockpiled care. However, in response to risky weather, the helicopter was mobilised, evidencing care on standby. Drawing on Anderson (2010, p. 778), this resource mobilisation was guided by logics of precaution, where fire personnel "acted in the present on the basis of the future." They decided the weather conditions presented a "determinate threat" and deemed helicopter's mobilisation "in proportion to the scope of the threat" (p. 789). As Jonny (fire personnel) explained, precautionary action would *"put [them]selves in the best position possible for when that fire breaks out."* Care on standby is not passively waiting but actively performed in the present (i.e., the firefighters mobilise the helicopter, the helicopter remains ready). Yet, it's ultimately intended to bring about a better future in the anticipated disaster (i.e., enhanced firefighting capability).

While care on standby is always in relation to the disaster that comes next, it simultaneously renders a more caring future present. To illustrate this, I turn to Watch Duty, a SoCo-based nonprofit that provides real-time public safety information, including fire starts and evacuation orders, via mobile app push notifications. Watch Duty exists carefully on standby, ready to provide critical information when needed. It offers an improvement over previous failed alert and warning systems[8] while fostering a sense of reassurance:

> *"I like Watch Duty… you can hold it in your hand and what it does is reduces panic. Panic to me is a killer, when people panic horrible decisions get made, and everything falls apart, so Watch Duty is great because you can see smoke, what the fuck, go to Watch Duty and you're like, I get it."* (Colin, community member)

> *"Watch Duty is the big thing to me, it's calming, you get told as soon as it's [the fire] out. I used to stand at the window sniffing for smoke in the night but now, cause my phone, I know I'm going to be alerted… I don't need to do that cause my phone will alert me. I can sleep at night now."* (Jane, community member)

Alert and warning apps (e.g., ShakeAlert, Alertswiss) are increasingly common in disaster-prone locations (Dallo and Marti, 2021). Building on geographical work about how digital technologies reshape care (Schwiter and Steiner, 2020), I contend these apps enable new forms of care on standby to circulate within the background of everyday life. Colin and Jane's accounts indicate Watch Duty gives care in two ways: first, through the concrete work of

[8] In the 2017 Nuns/Tubbs wildfire many residents in SoCo didn't receive any notification of the fire through official (state-led) alert and warning systems.

alerting users and displaying valuable information. Second, through the promise of constant vigilance and connectivity. Colin, for instance, describes the anxiety he feels when seeing smoke. The ability to access Watch Duty reassures him, alleviates his panic, and aids his decision-making. Similarly, Jane shares that Watch Duty has a calming effect, especially in the aftermath of the Nuns/Tubbs fire. The app's promise to alert whenever necessary allows Jane to sleep better, providing a sense of security that extends beyond a wildfire event. In this way, care on standby brings a more caring future present, offering something more reproductive than the caring effect in the present of stockpiled care. The periods between notifications and fire-starts are transformed, now characterised by calmness, confidence, and the assurance of more care to come. This is the kind of care that enables people to live with uncertainty, rendering future care continuously available as a felt presence in the present. By emphasising the affective relations Colin and Jane developed with and through Watch Duty, the conventional dichotomy between "cold technology" and "warm care" becomes increasingly blurred (Pols and Moser, 2009, p. 159). Recognising Watch Duty as care on standby underscores the potential of digital technologies to make care possible – both through active use and as a reassuring background presence sustained by the promise of future care. This analysis extends existing scholarship on human-technology care interactions (Pols and Moser, 2009; Schwiter and Steiner, 2020), demonstrating digital technologies offer both immediate and anticipatory care, and are fundamentally reshaping how care is encountered in disaster contexts.

The standby nature of Watch Duty (and others on standby) doesn't just emerge as caring. For care to exist on standby and render a more caring future present, ongoing care relations must be continuously nurtured and sustained. As Wiedemann (2021, p. 44) states, "being on standby [i]s an internal and affective state of coordination…aimed at holding together." Watch Duty, as a more-than-human entanglement, requires time, energy, and care to sustain its caring existence, potential, and promise. Supported by over 150 volunteers, the app depends on their vigilance to prevent breakdowns. Volunteers monitor radio scanners and official sources to provide up-to-date safety information, maintaining alertness and readiness to intervene when necessary. However, as Victor (Watch Duty volunteer) notes, they *"honor integrity and correctness over speed or sensationalism."* By consistently providing accurate, timely, and relevant information during critical moments, the app's standby nature has earnt users' trust, enabling it to be encountered as caring in the world of disaster risk management. Additionally, Watch Duty volunteers sustain the app's reliability during stable periods. Monitoring the absence of fire starts may signal a 'pause' in active alerting, but stable periods remain essential to upholding the app's functionality. During these pauses, volunteers engage in careful maintenance, ensuring smooth technological operation, preventing failures, and improving app features:

> *"When we first started Watch Duty, we were sending notifications about pretty much every fire and people were like, my phone keeps buzzing, my phone keeps buzzing so I'm like alright, we hear you… so like alright, stop reporting as much, so then we started refining how we do things and that has kinda filtered out to how we operate...Watch Duty's a very small team. But it's really fascinating to say, would this be possible? And the answer is usually not immediately no, it's let's try and figure this*

out...In the past year, we've added evacuation warnings…" (Maria, Watch Duty volunteer)

Here, I understand the maintenance work Maria describes as involving what Mol et al (2010, p. 14) calls "persistent tinkering." This refers to unending practice of "attentive experimentation" (Heerings *et al.*, 2022, p. 39) aimed at achieving a suitable caring arrangement. Watch Duty volunteers took user concerns and needs as the basis for experimentation. They listened to user feedback regarding notifications – an embodied practice of care (Bourgault, 2016) – and adjusted the frequency and functionality of alerts accordingly. They further demonstrated competence by adding evacuation zone warnings, refining the app to meet user needs. These practices of "persistent tinkering" (Mol *et al.*, 2010, p. 14) don't precede care on standby but rather form part of it. Those involved in maintenance (e.g., software developers, fire reporters) are drawn into care on standby, regardless of whether they hold a caring disposition (Buser and Boyer, 2021). It's their commitment and competence in (carefully) figuring it out, adjusting, refining, and paying attention to details that enables care to remain on standby. These ongoing care relations not only contribute to a more caring future (e.g., alerting people in disaster) but also foster a more caring future present (e.g., reducing present-day anxiety, reconfiguring caring arrangements to suit evolving needs).

4.3. Care as stamina

Care as stamina refers to persistent, principled acts of care that circulate within disaster risk management. Consider the numerous fire safety meetings aimed at increasing public awareness, the repeated vegetation management by dedicated land stewards or the countless emails nonprofits send to worried community members, all at different moments demonstrate attentiveness, responsibility, competence and solidarity (Tronto, 1993). In the world of disaster risk management, marked by instability and shifting tensions (McGowran and Donovan, 2021), there is no singular vision of what constitutes 'good' or 'necessary' care (Donovan *et al.*, 2024). Yet, care as stamina reflects the steadfast endurance of those involved to persevere with disaster risk management and continually reconfigure "how to care" (Puig de la Bellacasa, 2017, p. 5).

While stockpiled care and care on standby circulate by, in and through certain disaster risk management activities (e.g., emergency plans, the US-Australia firefighting cooperation respectively), the ongoing, principled work of those involved in disaster risk management is better understood as care as stamina, even when it overlaps with other forms of care. For example, in SoCo, a coalition of community agencies supports those affected by disasters. Although this coalition demonstrates care on standby, activating during disasters, the sustained day-to-day efforts of those involved are better understood as care as stamina:

"My approach to this is there's the urgency that we feel because the climate crisis, like we've got to act fast! But also, real change, real community buy-in, those sorts of things, take a lot of time. If you move too quickly you can maladapt, you can move too quickly in the wrong direction, and then you didn't listen to someone that you needed to listen to, then you leave someone out..., and so for me, like if there's an emergency like

> *wildfire, it's important to mobilise and move quickly and efficiently. But in the meantime, this work has to be relational, sustainable, and trauma-informed..."* (Helen, coalition director)

Helen locates her work in relation to the ongoing climate crisis. However, rather than acting fast, Helen prioritises building relationships, listening, and fostering inclusive participation – practices developed through sustained effort and "becoming attentive to our social and material relations" (Carr, 2023, p. 227). In a disaster, she acknowledges the coalition would need to "*mobilise and move quickly and efficiently"* (care on standby), but between disasters and in the climate crisis, Helen emphasises her *"work has to be relational, sustainable, and trauma-informed"* (care as stamina). This demonstrates Helens steadfast endurance to keep reconfiguring "how to care" (Puig de la Bellacasa, 2017, p. 5). In 'Repair and care...,' Carr (2023, p. 221) asks "what does the work of the climate crisis look like...?" By centring care, relationship-building, and sustainability, Helen's work challenges traditional efficiency-driven, economically quantifiable understandings of labour and employment. Indeed, Helen's narrative reimagines "the work of climate crisis" (ibid) as deliberate, messy and cumulative, emphasising both care on standby and as stamina to navigate between the urgencies of disastrous events and the unfolding climate crisis

Care as stamina emphasises the repetitive, focused work of maintaining and repairing relations amidst ongoing breakdowns. For example, Richard (land steward) spoke about how he understood his work in relation to present crises:

> *"I don't think what needs to happen, can happen, realistically speaking...sorry to get sad but I don't, that's just what I think. I don't think that we are going to manage our way out of the situation...I'm not making it better for me, but just because it's a right thing to do. I honestly don't have a hope that it's going to get better, and I'm reaching the point now where I don't need that...That's an end, I don't believe that the end justifies the means, I don't think the end is more important than means. I think the end is the means and the means is the end. So, when I say, I don't need that hope that things are gonna get better, I'm just doing it because it's a right thing to do, that is the better for me."*

Unlike stockpiled care and care on standby, care as stamina is not primarily anticipatory or future-oriented, it resists this linear temporality. Instead, it is grounded in everyday practices that engage with the uncertainties and shifting tensions of the present. Rather than being directed toward a fixed or idealised future, care as stamina acknowledges the ongoing nature of crises (e.g., wildfire, ecological, climate) and focuses on the here and now as the necessary recipient of care. Richard's work evidences care as stamina as remains committed to maintaining and repairing relationships (with the land), even in the face of deterioration, disappointment, and failure. His statement "*the end is the means and the means is the end"* underscores the non-linearity of care as stamina, framing it as a continuous process where the value lies in the endurance of care itself rather than achieving a distant outcome. This is further emphasised by Richard's belief that the future is foreclosed: he does not believe it's possible

to manage our way out of the crises. For him, his work is not about *"making it better"* or driven by the *"hope that it's going to,"* but rather reflects a deliberate ethical orientation toward action in the present, grounded in responsibility. Care as stamina troubles dominant care scholarship that ties care to moral intention or directedness toward the needs of another (Tronto, 1993). While there is a sense of ethical commitment – *"it's a right thing to do"* – this form of care is not always consciously offered in service of another. Rather, it emerges from an embodied sense of rightness in the moment, untethered from guaranteed effects or recognition. Care as stamina shifts the focus from a future-oriented moral obligation to an immediate, present-focused ethics – where the endurance and repetition of care constitute the caring act. Richard's stance challenges traditional views of care by emphasising that its ethical value lies not in what it achieves, but in its persistence.

Amid ongoing deterioration and uncertainty regarding future disasters, care as stamina can be a positive intervention for those who encounter and enact it. Take, Charlotte's (non-profit founder providing support to firefighters) account:

> *"So, I think what's a really important part of this is, is this is how I'm still here. I don't know if I would still be here without this...I used to lie in bed, with my mind just thrashing, because I was like how can I raise my kid in here? And what is life here? This is an untenable, this is unsustainable. But this work has kind of given me a foothold, and a role to play, and that's how I feel, we all kind of have a role to play, if we're going to keep living in these regions that are emerging as a tip of the spear in climate change, then no one gets to opt out anymore, we have passed the point where we had that luxury, that's how I feel. So, it's meaning, it's meaning, it's purpose, it's joy…"*

Charlotte's account emphasises care as stamina as a meaningful and transformative intervention in the present. By engaging in her work to support firefighters, she situates this care as both a moral responsibility (Tronto, 1993) and a way to navigate personal and collective challenges. Similar to Richard, Charlotte's statement, *"we all kind of have a role to play… no one gets to opt out anymore,"* underscores care as stamina as an ethical obligation to maintain and repair relations – a necessity rooted in the present rather than a resolution for an imagined future. Charlotte's account expands care as stamina, emphasising its potential to be a way to hold onto life in the exhausting and deteriorating context of ongoing crises. Her work – described as *"meaning...purpose...and joy,"* – anchors her in an otherwise *"untenable"* reality, offering stability, life-affirmation, and a *"foothold"* amid deterioration. This resonates with Solnit (2010, p. 306) reflections in '*A Paradise Built in Hell...*' who argues that joy in disasters arises from a sense of "purpose, immersion in service and survival, and from an affection that is not private and personal but civic." Care as stamina can foster this joy, through sustained, purposeful, present-focused efforts that serve the greater civic good.

Even though people's endurance and commitment to the work of disaster risk management were discussed as noble and transformational, I don't wish to romanticise care as stamina. Many involved in disaster risk management described the toll care(ing) takes on them.

Relations of care were often messy, becoming entangled in private life, relationships, and responsibilities:

> *"If I didn't care, if I didn't wanna make this better, I wouldn't have been in the business in the first place, and I certainly wouldn't have stayed in it all this time, especially because so much of what I did, I did for fucking free, they didn't even pay me to do this shit half the time… There is weight, there is a lot of weight in this, and it doesn't get acknowledged much because we can't stop to think those thoughts. Cause it will kill ya, you just gotta keep going, you just gotta keep going. I haven't been to the doctor in three years, because I just don't have time…"* (Victoria, fire prevention officer)

This account emphasises the under-recognised burden of sustaining care(ing) in disaster risk management. Her statement, *"there is weight, there is a lot of weight in this"* captures the emotional labour and strain often experienced by those involved in care(ing) within disaster risk management (Alburo-Cañete, 2024; de Vet *et al.*, 2021). As Kuntz et al. (2013) detailed in the aftermath of the 2010 Christchurch earthquakes, such emotional burden can lead to exhaustion, detachment and burnout. The physical toll of care(ing) is exemplified in Victoria's neglect of her health, unable to find time to visit a doctor due to work commitments. This highlights the dangerous trade-offs caregivers often have make between professional commitment (care work) and personal wellbeing (self-care) (Tronto, 2015). By emphasising doing work "*for fucking free,"* while it *"doesn't get acknowledged,"* Victoria draws attention to how care work is often taken-for-granted, unremunerated, and devalued (Lawson, 2007; Puig de la Bellacasa, 2017). Yet, despite the immense emotional and physical burden, lack of recognition and absence of remuneration, Victoria and others continue to care – demonstrating the persistence that ultimately underpins care as stamina.

5. Staying with care

Geography has increasingly attended to care, engaging empirically with its various surfacings (e.g., Conradson, 2003; Lawson, 2007; Middleton and Samanani, 2021; Schwiter and Steiner, 2020). Disaster geographers have contributed to these conversations, often framing care as a feminised, gendered, human-to-human interaction in post-disaster settings (Alburo-Cañete, 2024; Ramalho, 2021; Sims *et al.*, 2009; de Vet *et al.*, 2021). Building on Puig de la Bellacasa's (2017, p. 161) broad conceptualisation of care – "everything that *is* done..." I embraced the possibilities it opens to ask: How does care circulate in disaster risk management? How is it encountered? And what does care do for disaster risk management?

By bringing this conceptualisation of care into dialogue with empirical encounters, I identified three distinct forms of care that circulate and are encountered within disaster risk management. Stockpiled care moves beyond readings of stockpiles as security techniques (Folkers, 2019), showing how they also store (the potential for) care to ensure that there is 'enough' care to mitigate harm and restore function during future disasters. By storing material and immaterial resources (e.g., masks, information), stockpiles promise that care will be sufficient when needed. Although requiring minimal ongoing labour or relational commitment, it also produces

a caring effect in the present. Care on standby, in contrast, involves "a state of 'in|activity'" (Kemmer *et al.*, 2021, p. 1), where care is suspended for an uncertain future but actively maintained in the present (e.g., fire engine maintenance). This ongoing nurturing of caring relations renders a more caring future present. Care as stamina foregrounds the sustained, principled acts of maintaining and repairing care relations amid uncertainty and crises. It reflects the endurance to persist in disaster risk management work, continually reconfiguring "how to care" (Puig de la Bellacasa, 2017, p. 5). While transformative, care as stamina can impose significant emotional and physical tolls on those who care and keep caring. These forms of care provide conceptual traction for geographers interested in care by expanding its understanding as entangled with both human and more-than-human relations (Buser and Boyer, 2021; Puig de la Bellacasa, 2017), and by illustrating novel ways care engages with diverse temporalities, materialities, participants, affects, and practices – for example, how stockpiled care demonstrates an affective temporality that is oriented toward both the present and future, and digital technology can be engaged in care on standby.

Reflecting on what care does for disaster risk management, I have demonstrated that stockpiled care, care on standby and care as stamina animate disaster risk management. These forms of care cut across the diverse activities that constitute disaster risk management, coexisting, conflicting and working in conjunction with each other and various other relations, care-related or otherwise. They represent "as well as possible" (Puig de la Bellacasa, 2017, p. 161) ways of relating and sustaining life within the world of disaster risk management, with care as stamina offering something particularly generative and reproductive – a vital necessity that enables persistence through ongoing crisis. Thinking with Puig de la Bellacasa (2017, p. 67), provocation that "nothing holds together without relations of care", I argue that disaster risk management is not merely a technical, managerial, or securitised endeavour, but is, at various points, sustained and held together by relations of care. Recognising this opens space for a more care-full mode of inquiry in disaster geography – and geography more broadly – prompting us to ask how recognising and centring care in our work might remake our research, practices, relations, the worlds we inhabit, and the futures we imagine.

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7. Paper Five: The Fire Season?

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Abstract: The changed and changing climate is destabilising the seasons and seasonal cultures. Long relied upon to structure time, anticipate change, and coordinate rhythms between human and more-than-human worlds, seasons are increasingly scrambled – arriving unpredictably, intensifying, or slipping out of sync. This paper examines the fire season in California as a key site of temporal destabilisation, asking how individuals and communities respond when familiar seasonal patterns lose coherence. Drawing on extensive ethnographic research in Sonoma County, I show that people navigate this disruption in two major ways: by reasserting structure through official declarations and by sensing and attuning to seasonal signals. These responses not only enable seasonal living but also help hold the fire season together amid climate change. Challenging claims that the fire season is disappearing or that California is moving toward a 'seasonless future', I argue that the fire season has instead become a dominating temporal force – albeit one that is complex, contested, and continually reconfigured. Ultimately, this paper calls for greater scholarly attention on how people rework temporal structures, coordinate everyday life, and make time liveable in an increasingly unstable climate.

Seasons, seasonality, culture, temporalities, climate change

1. Introduction

"This time of year, traditionally has not been fire season, but now we disabuse any notion that there is a season – it's year-round in the state of California" (Newsom, 2025).

In a video shared on X.com during the catastrophic wildfires that swept through the Los Angeles metropolitan area and San Diego County in January 2025, California Governor Newsom articulated a troubling new reality: the seasons that individuals and communities have long known, experienced, and relied upon are changing. Historically, January has been recognised as a winter[9] month in California, a time marked by cooler temperatures, seasonal rainfall, and relative relief from wildfire risk. By contrast, the fire season has traditionally spanned the hotter, drier months of summer and fall (July~November), when high temperatures, low precipitation, and Diablo winds[10] converge to produce dangerous wildfire conditions (Western Fire Chief Association, n.d.). However, as "unseasonable" (Barry, 2025, p. 1) wildfires ignite and heightened wildfire risk persists year-round, the very notion of the fire season is becoming increasingly scrambled. What was once understood as a discrete temporal period – defined by specific environmental conditions and associated human activities – is now destabilised, stretching beyond familiar times of the year and defying established seasonal expectations.

Social science and humanities scholars have long argued that the seasons serve as one of the "most basic scaffold[s] of peoples' sense of time" (Roncoli *et al.*, 2009, p. 94), shaping how environmental change is measured, shifting rhythms are interpreted, and everyday life is coordinated (e.g., Bremer and Wardekker, 2024; Krause, 2013; Reardon-Smith, 2023; Whitehouse, 2017). However, in the changed and changing climate, seasonal mismatches in timing and coordination are becoming increasingly widespread. This disruption extends far beyond the fire season in California: in the European Alps, the delayed arrival of snowfall is rendering the ski season increasingly unreliable (Nadegger, 2023); in the UK, the wrong songbirds are singing at the wrong time of year (Rutt, 2021; Whitehouse, 2017); in Southeast Asia, the monsoon season is intensifying unpredictably (Bremer and Wardekker, 2024); and in Denmark, swans are attacking kayakers as the boating season falls out of sync with river's ecological rhythms (Jensen, 2024a). In response, scholarly explorations of the scrambling of the seasons and seasonal culture – of "unseasonable seasons" (Barry, 2025, p. 1) and feelings of being "out-of-sync with the landscape" (Jensen, 2024b, p. 7) – are gaining momentum, as

[9] Although I use the term 'winter' here, my research participants in Sonoma County described this time of year using a range of seasonal categories, including 'not fire season,' 'off season,' 'the wet season,' 'burnout season,' 'winter preparedness season,' 'burning season,' 'grant season,' 'silly season,' 'bird nesting season,' and 'flood season.' To reflect these diverse understandings, I interchange the seasonal categories I use throughout the paper. Broadly, I distinguish between 'the fire season' and 'not fire season' when discussing wildfire risk. However, when referring to specific wildfire risk management activities, I adopt one of the more precise seasonal terms that participants used to mark key periods of the year for preparedness, funding cycles, rest and recovery, and environmental shifts.

[10] Diablo winds are hot, dry winds that blow from the northeast in Northern California, particularly in spring and fall. Similar to the Santa Ana winds in Southern California, they are known for intensifying wildfire risk.

part of addressing "how we coordinate ourselves in a time of climate breakdown" (Bastian and Bayliss Hawitt, 2023, p. 1075).

Despite social and cultural geography's sustained engagement with temporality in climate change research (e.g., Brace and Geoghegan, 2011; Edensor *et al.*, 2020), the seasons themselves have received comparatively little attention (see exceptions: Barry, 2025; Brice, 2014; Hitchings, 2010; Phillips, 2020; Varkkey *et al.*, 2025). This oversight is significant: seasons are not merely recurring meteorological patterns but serve as foundational temporal frameworks through which people keep time, anticipate change, and organise social life (Bremer and Schneider, 2024). Therefore, as the changed and changing climate disrupts the seasons – causing them to arrive unpredictably, blur into one another, or cease to follow historical patterns – the temporal scaffolding that structures everyday life is unsettled. For social and cultural geographers, attending to these shifting seasonal configurations is crucial – not only for tracing how time is being reassembled in the context of the climate crisis, but for what it reveals about how people make sense of temporal disorientation, manage uncertainty, and attempt to coordinate everyday life as familiar temporal structures begin to fall apart.

In what follows, I begin to explore these concerns by turning to the fire season in California, asking: how do individuals and communities respond when the once-reliable fire season becomes increasingly scrambled, loses coherence, or even ceases to hold? Drawing on ethnographic research from Sonoma County, California, this paper demonstrates that people find themselves caught between two competing impulses: the desire to hold onto familiar seasons and seasonal ways of living, and a growing recognition of the need to adapt as the fire season bleeds into unexpected times of year, looming over everyday life. Rather than simply preserving or abandoning the fire season as a temporal framework, I argue that this tension reflects an ongoing renegotiation of relationships between shifting human and more-than-human seasonal rhythms. It represents a struggle to rework seasonal culture in order to keep time with a changed and changing climate – even as such work becomes increasingly difficult, fragmented, and fraught.

To make this case, I first survey social science scholarship to develop an account of (destabilised) seasons for social and cultural geographers. I then trace how the fire season became differentially present across my research on care and wildfire risk management (WRM). Through three analytical sections based on ethnographic encounters, I examine: 1) institutional efforts to assert seasonal structure through official declarations of the fire season's temporal boundaries; 2) how people are sensing and attuning to emerging, alternative seasonal signals; 3) the ways the fire season dominates everyday life, spilling into unexpected times of year and unsettling everyday rhythms. I conclude by returning to Governor Newsom's (2025) observation that the fire season is obsolete in the ongoing climate crisis to argue that while this is not quite true (yet), it is being recalibrated, reconfigured, and held together in new ways. This insight is significant for social and cultural geographers because it highlights the seasons as contested and evolving temporal landscapes through which the changed and changing climate is understood and negotiated in everyday life. It invites geographical attention to how time, human and more-than-human rhythms, and mutual coordination are being sustained,

reconfigured or abandoned in world that, as Bastian (2012, p. 24) describes, feels "increasingly out of synch."

2. Seasons and their destabilisation

The seasons permeate everyday life – shaping language, ritual, memory, culture, clothing, stories, diets and festivals – yet they have remained largely overlooked in social and cultural geography (Barry, 2025). Their very familiarity perhaps explains this scholarly neglect: too routine, too institutionalised, too seamlessly woven into the background of everyday life to warrant sustained attention (Bremer and Wardekker, 2024). However, in the context of a changed and changing climate, the seasons have become a timely concern, no longer a stable temporal backdrop, but becoming increasingly deranged and unpredictable. In this section, I review social science scholarship to develop an account of seasons and propose a way for social and cultural geographers to approach their destabilisation amid the climate crisis.

Seasons do more than mark "regular or expected phases of meteorological patterns" (Barry, 2025, p. 3). They are among the most widely used temporal frameworks through which time is reckoned, made sense of, and experienced (Bremer and Wardekker, 2024; Roncoli et al., 2009). Seasons organise annual cycles (e.g., equinoxes, solstices, weather patterns and bird migration) and provide calendrical shape to work routines, holidays, education, religious observance, social practices, infrastructure, and local landscapes (Barry, 2025; Bremer and Wardekker, 2024; Jensen, 2024b). What is recognised, named, and responded to as a season is shaped both by climatic conditions and the "major activities... people undertake during the said periods in the year" (Abubakari et al., 2024, p. 5; Orlove, 2003). For instance, the storm season acknowledges the "recurrence of hazardous rhythmic patterns" (Staupe-Delgado et al., 2024, p. 2), while the marathon season in the running world indexes a period defined by rigorous training, scheduled events and peak performance rituals.

Social scientists, namely anthropologists, have long argued that seasons are systems for time-reckoning (Munn, 1992). They "provide a repertoire for how to tell the time of the year and live seasonally" (Bremer and Wardekker, 2024, p. 1). They offer a structure through which individuals and communities can interpret cyclical patterns, measure the passage of time, and sequence activities and festivities to occur at the 'right time' and 'on time' – for example, to sow seeds when climatic conditions and labour availability are optimal (Bremer and Schneider, 2024; Hastrup, 2016). As Adam (2005, p. 13) notes, seasons provide a framework "within which activities are not only organized and planned, but also timed and synchronised at varying speeds and intensity." Calendars, almanacs, and institutional timekeeping codify this knowledge into bureaucratic forms, embedding seasonal rhythms into education terms, planting schedules, religious calendars and so on. In addition to these formal systems, time-reckoning and seasonal knowledge is also embodied, tacit, and sensory (Jensen, 2024b; Krause, 2013). It resides in habitual gestures, routines, and intuitive practices, such as an experienced winemaker's sensitivity to grape ripeness during harvest season (Brice, 2014) or a city worker's instinct to switch to "thicker clothes and scarves... during winter" (Hitchings, 2010, p. 293).

Beyond serving as a system for parcelling up time, seasons are affective phenomena in which people dwell, part of living with the world's temporal flows (Harris, 1998; Ingold, 2011; Krause, 2013; Whitehouse, 2017). Individuals and communities do not merely pass through the seasons; they live seasonally by attuning to the subtle shifts between them, often anticipating their arrival or departure with longing or trepidation (Rutt, 2021). These transitions are moments for cultural expression, bodily reorientation, and collective ritual: for example, the Gaelic festival of Samhuinn, a walker changing their gait to navigate winter ice, and households spring cleaning. Each season carries a distinct atmosphere – a particular light, temperature, sound, scent, colour, tone, and spirit – that affects us. For example, the chill of winter air on our faces (Nadegger, 2023), "a bout of the 'winter blues'... from a seasonal lack of light" (Bodden et al., 2024, p. 604) or an allergic reaction to rising pollen counts during hay fever season (Jensen and Barry, 2023) all illustrate how seasons register in our bodies. Individuals and communities also live seasonally through seemingly mundane activities: adopting different diets (Bremer and Wardekker, 2024), adjusting movements across regions and even continents (Barry, 2025) and noticing the return of insects and birds (Rutt, 2021). Even in highly urbanised environments, where people are often thought to be more disconnected from seasonal patterns and change, seasonal life remains palpable – evident in bus timetables, shopfront displays, heating routines, and wardrobes (Hitchings, 2010). Individuals and communities also create new seasonal cultures through technology; for example, Whitehouse (2017, p. 185) shows how people are "remote witnessing" more-than-human seasonality through radio-tracking migratory birds.

Seasons, then, are not fixed temporal blocks but emerge through the "continual unfolding" of human and more-than-human rhythmic dynamics (Ingold, 2000; Krause, 2013, p. 24; Lefebvre et al., 1999). Building on this perspective, seasons such as the growing season in Australian viticulture (Brice, 2014) or the fire season in California do not simply denote a period of environmental conditions like grape ripening or high fire risk. Rather, they are temporalities co-produced through the total interplay of more-than-human rhythms (e.g., rainfall, sunlight) and rhythms of human activities like leaf thinning, regulatory frameworks and pesticide application. These rhythms coordinate, resonate and mutually adjust to one another; neither do more-than-human rhythms nor human activities singularly determine the other but together constitute the season (Krause, 2013). From this rhythm's perspective, seasons are momentary, dynamic configurations in which rhythms fluctuate, resonate, and (sometimes) fall out of sync (Ingold, 2000; Krause, 2013; Lefebvre et al., 1999). This means seasonal coherence is not guaranteed but continually negotiated. When one rhythm falters (e.g., due to an unseasonal frost, a labour shortage, or a pest outbreak) the entire season can become destabilised, revealing the fragility of these temporal entanglements.

"Far from climate change as the 'hyperobject'" (Bastian and Bayliss Hawitt, 2023, p. 1084), it has already unsettled once-familiar seasons and seasonal ways of life. It has introduced what Rutt (2021, p. 9) describes as "a creeping strangeness, a delicate series of disorientations", where human and more-than-human rhythms and phenomena increasingly find themselves "out of sync with time, season, country, continent." These disorientations surface in numerous ways: flowers bloom out of season disrupting long-established human-bee relations (Phillips,

2020); seasonal work visas fall out of alignment with the agricultural cycles they were designed to support (Barry, 2025); and intensified El Niño and La Niña events – understood as "beyond-annual seasonalities" – destabilise the storm season (Staupe-Delgado et al., 2024, p. 18). Here, seasons can be understood not merely as background temporal structures of everyday life, but as vital terrains through which the climate crisis is sensed, experienced, and actively negotiated.

Recent geographical scholarship has begun to conceptualise the seasons within the context of the climate crisis. Varkkey et al. (2025, p. 119) writing on the haze season in Indonesia, Malaysia, and Singapore – a recurrent period of hazardous air pollution caused by tropical peatland burning – propose a heuristic of "Seasons of the Anthropocene" to describe how societies are organising around "irreversible (or extremely difficult to mitigate) but recurring anthropogenic environmental changes." Similarly, Barry (2025, p. 2) introduces the notion of "unseasonable seasons" to describe how climate change disrupts expected temporal patterns (including weather, mobility, labour) rendering them increasingly unpredictable, "out of expected timing and duration" and resistant to traditional forms of "records, forecasting and preparedness." Such "unseasonable seasons", Barry (2025, p. 11) argues, challenge colonial assumptions of seasonal regularity and temporal stability.

Building from this scholarship, this paper explores how individuals and communities respond as the once-reliable fire season becomes increasingly scrambled, loses coherence, or ceases to hold in the climate crisis. In doing so, I find particular value in Gan and Tsing's (2018, p. 141) work on coordination and timing of multispecies assemblages, which invites a shift in focus from "why things fall apart" to "how things hold." Their approach draws attention to the ways humans and more-than-humans align through timing "to make living in common possible" (Gan and Tsing, 2018, p. 103), framing seasonality as one "axis of coordination" among many overlapping and interacting temporal rhythms (p. 115). Crucially, in times of disruption, what "keeps livable assemblages alive" (p. 133), is not coherence or stability, but coordination: the "mutual attunements and accommodations" (p. 103) of "worlds in motion" (p. 104). This framing, I argue, opens important analytical space for social and cultural geographers to consider how we – all entangled in the world – use seasons or live seasonally, however tenuously, to coordinate in the absence of coherence or steadiness. I carry these sensibilities forward in the following exploration of California's fire season, shifting the question from why is the fire season falling apart to how is it being reconfigured, recalibrated and held together?

3. Researching (in) the fire season

In September 2022, I travelled to Sonoma County, California, to research care(ing) in WRM. At the time, I had not given much thought to seasons or how they might impact my research. I had assumed that my research would unfold within the familiar seasonal progression of the Gregorian calendar, the seasonal framework I had lived within my whole life. However, upon arriving, I quickly realised that while winter, spring, summer and autumn/fall and their seasonal markers (e.g., short days, cool nights, Halloween decorations) were still present, they were

overshadowed by a more persistent and purposeful temporal framework: the fire season and not fire season.

Indeed, I did not set out to research the fire season, but it emerged as an insistent but uneven presence throughout the six months of my ethnographic fieldwork. Conversations often referenced past, present, or future fire seasons; activities were coordinated around preparing for, responding to, or recovering from it; and roadside signs and social media posts reinforced a collective awareness of being in or out of season. It became clear the fire season was not just the period of heightened wildfire risk but was a temporal framework that structured different modes of living, working, and caring in relation to the region's rhythmic phenomena. Yet, it was evidently losing coherence. Residents described the fire season extending into winter or failing to materialise as expected. A rainy spell in October briefly interrupted the season, but two weeks later, Diablo winds blew, fire danger spiked to 'extreme,' and peak fire season resumed. County employees hurried to compile outreach materials in anticipation of an earlier-than-before start to the fire season. These recurring but diverse presences prompted me to ask how the fire season continues to function as a meaningful seasonal category when climate change is increasingly scrambling its contours. To explore this, I drew on Ingold's (1993) notion of attending – described by Gan and Tsing (2018, p. 116) as a "good place to begin when thinking about temporal [in]coordination." Attending, in this sense, helped me trace how individuals and communities were responding to the destabilisation of the fire season – how they adjust, recalibrate, and struggle, as once-reliable rhythms lose their coherence and cease to hold.

During my first two months in Sonoma County, I conducted participant observation of WRM activities to develop a presence within this world. Collaborating with a local wildfire awareness nonprofit, I built relationships with formal WRM actors (e.g., firefighters, County departments, nonprofits) and informal participants (e.g., community members, land stewards). I attended to seasonal references, fluctuations in social and environmental rhythms, and affective engagements with material objects (e.g., phones, roadside signs) and intangible elements (e.g., wildfire memories, weather forecasts). Participant observation supported me to trace various components of the fire season and explore how people were responding to shifting seasonal rhythms.

During the later four months of fieldwork, I also conducted 33 storytelling interviews, inviting participants to share a story related to WRM that mattered to them. These narratives varied widely, ranging from entire fire stories or career journeys to singular experiences, such as a walk in the Mayacamas Mountains or a brief but meaningful conversation during a community workday. While my primary focus was on expressions of care, I noticed how the fire season, its rhythms, and other related temporalities emerged in these stories. The fire season often served as temporal reference point, structuring the chronology of events or providing context. My follow-up questions explored how participants encountered and navigated the destabilised fire season in their everyday lives.

I also conducted 51 go-alongs – a method combining participant observation with interviewing (Kusenbach, 2003). These included attending risk mapping workshops, assisting with

prescribed burns, volunteering at community events, and supporting fire personnel during home inspections. At times, the fire season was the explicit focus of these go-alongs, while at other times, its presence or absence subtly lingered in the background. However, drawing on Anderson and Ash's (2015, p. 34) argument that "background matters," I realised that the evacuation maps in county offices, the faint smell of smoke, my neighbour mowing their lawn for the third time in October, and the browning of the hilltops were not peripheral details – they were integral to the fire season and how it held together.

Researching in the fire season required careful ethical and methodological reflection on how to conduct fieldwork responsibly within this temporal framework. I had to navigate specific seasonal qualities, uncertainties and demands (e.g., weather, wildfire alert notifications) while ensuring my presence did not interfere with critical WRM efforts. To avoid burdening participants, I scheduled most of my storytelling interviews and go-alongs outside peak fire season and aimed to contribute meaningfully by actively supporting participants in their WRM efforts. Conducting research in the fire season also required reattuning my own sense of time. Community workdays were rescheduled due to air quality alerts, planned go-alongs shifted to unstructured observation as fire personnel responded to emergencies, and I found myself waiting with participants for weather changes, the end of the fire season, and emergency alert updates. These encounters underscored the extent to which the fire season had become the dominant force in Sonoma County, one that required constant navigation of its rhythms, disruptions, and demands.

In the three analytical sections that follow, I draw on insights from my ethnographic research to explore how, amid a changed and changing climate, individuals and communities attempt to assert the seasonal structure of the fire season while also sensing and attuning to its continual transformations. I then consider how the fire season persistently evades these containment efforts, spilling into unexpected times of year and dominating everyday life.

4. Declaring seasonal structure

In Sonoma County, residents commonly refer to a wide range of overlapping and locally significant seasons, such as summer, flood season, bird nesting season, tourist season, and harvest season. Yet only two are officially declared each year: the fire season and winter preparedness season (sometimes called burning season, with terminology varying among fire agencies). These seasons are not permitted to temporally unfold on their own; rather, they are actively declared by a network of fire agencies operating across different jurisdictions – including local agencies like the Sonoma Valley Fire District, Sonoma County Fire District, and Santa Rosa Fire Department, as well as the state-level California Department of Forestry and Fire Protection (CAL-FIRE).

I begin with these formal declarations because, in the context of a changed and changing climate – where long-standing seasonal rhythms are increasingly disrupted, high fire risk periods are lengthening, and seasonal boundaries are becoming more diffuse – I argue that such declarations are critical attempts to assert the seasonal structure of the fire season. They not

only demarcate the annual period of heightened fire risk but also actively produce and stabilise this temporal period as a season. These declarations, then, offer a vital entry point for understanding how the fire season is held together amid the ongoing climate crisis.

Typically, the fire season in Sonoma County is declared to begin in early June and end around November, though the exact timing varies each year. For example, in the Sonoma Valley Fire District, the fire season officially ended on October 27th in 2021, whereas in 2024, it extended until November 1st (Sonoma Valley Fire District, n.d.). These dates are determined through assessments by both local and state fire agencies, who monitor climatological (e.g., temperature), hydrological (e.g., precipitation), and ecological (e.g., vegetation) rhythms. As Bremer and Schneider (2024, p. 2) observe "while seasonal patterns return cyclically, they 'repeat with difference'... (Lefebvre et al., 1999)." Therefore, fire agencies continuously adjust and recalibrate their declarations to reflect the period when environmental rhythms converge to create heightened fire risk with no two fire seasons being exactly alike. Conversely, winter preparedness season marks the period when these rhythms shift, and the risk of wildfires is sufficiently reduced. This aligns with Whitehouse's (2017) relational understanding of seasons, because the fire season is shaped as much by the presence of fire risk as winter preparedness season is defined by its absence. As "hazardous rhythmic patterns" (Staupe-Delgado et al., 2024, p. 2) become increasingly erratic and unpredictable under climate change, these declarations segment and impose order on fluctuating environmental rhythms. They attempt to assert a coherent seasonal structure and relational logic between the fire season and winter preparedness season, even as shifting climatic realities are threatening to unravel them.

While the timing of fire season declarations is primarily determined by the convergence of environmental rhythms, operational factors also play a significant role. For example, Wendy[11] and Clara (Sonoma County Fire District personnel) explained why, in 2022, the Santa Rosa Fire Department ended its fire season earlier than both the Sonoma County Fire District and CAL-FIRE:

> *"CAL-FIRE has the responsibility for all the land that's not in a city or local district. So, they deal with very different kinds of topography. Where Santa Rosa Fire can probably get anywhere in half an hour and with a bunch of fire trucks, CAL-FIRE has to deal with areas where there are no roads, where they don't have access, where they have to bring in planes, and bombers, and things. We also have a big jurisdictional area and need to play it cautious"* (Wendy)

> *"There's a bit of hesitation to sort of end it, yanno, declare 'the fire season is over'... because we may not get all the extra additional resources if there was one"* (Clara)

Wendy and Clara highlight the complex considerations involved in determining the timing of the fire season declaration, as fire agencies balance local variations in "hazardous rhythmic patterns" (Staupe-Delgado et al., 2024, p. 2) with operational constraints tied to geography, firefighting capabilities, and resource allocation. The Santa Rosa Fire Department, operating within a relatively compact and urbanised jurisdiction, can more confidently declare the end of

[11] All participant names are pseudonyms.

the fire season earlier, due to stable fire risk, short response times, and robust firefighting capacity. By contrast, the Sonoma County Fire District and CAL-FIRE oversee vast, topographically diverse areas where fire risk is more uneven and unpredictable. Their ability to quickly reach and suppress wildfires is often limited by remote and inaccessible terrain. As Clara points out, officially ending the fire season also carries institutional consequences: it triggers the suspension of emergency funding, seasonal staffing arrangements and mutual aid agreements. A premature declaration could therefore leave agencies under-resourced should an "unseasonable" (Barry, 2025, p. 1) fire occur. This demonstrates that the declarations do more than simply distinguish a period of elevated fire risk, they represent the different temporal points at which the fire agencies determine that the fire risk exceeds their capacity to manage it independently, with variation depending on operational factors. In the context of the climate crisis, this highlights how fire agencies must account for the new realities facing WRM, as they must respond to increasing unpredictability and intensified fire risk.

The official start and end of the fire season, as declared by fire agencies, is communicated through various channels, including websites, social media, press releases, emails, and outreach events such as seasonal outlook presentations (e.g., see Sonoma Valley Fire District, n.d.). These announcements play a crucial role in stabilising and producing the fire season by establishing a collectively recognised temporal reference point:

> *"Yeah, it makes sense they officially declare it, so everyone knows the risk and the restrictions, like the million rules and different things to do..."* (Cory, landowner)
>
> *"When the email comes through, everyone knows it's time to get to work"* (Lara, prescribed burner)

By clearly marking the fire season's beginning and end, these announcements cultivate a collective temporal awareness, clarifying whether one is in or out of the fire season, that residents use to coordinate their seasonal activities. They shape how *"everyone knows...time"* (Lara) and recognises *"the risk"* (Cory) associated with particular periods of the year. Cory's reference to "*the restrictions, like the million rules"* speaks to how declarations also enforce compliance with institutional regulations, such as the "Weed Abatement/Vegetation Management Rules and Regulations" (Sonoma Valley Fire District, n.d.), and legally restricts activities like open burning, barbecuing, and fireworks (Sonoma County Fire District, n.d.). By authoritatively prescribing when certain seasonal practices should occur, declarations align people's temporal awareness and seasonal culture with fire risk, broader environmental rhythms, and operational capacities. Amid climate-induced fluctuations in seasonal patterns (such as irregular precipitation or fire weather), I argue declarations render the fire season legible and actionable. They do not merely reflect a season but actively produce one, sustaining it as something collectively known, lived, and enacted through timely, seasonally appropriate activities.

While official declarations impose order on fluctuating environmental rhythms and establish a temporal reference point for seasonal coordination, many participants noted that the timing of these declarations feels increasingly misaligned with on the ground seasonal realities. This

dissonance is evident in the descriptions of Finn (land steward) and Cory (Sonoma County resident):

> *"I don't know how they decide and I'm sure a lot of things go into it. But right now, we're just waiting. With the rains, it should've happened, but yeah, you never know"* (Finn)

> *"It's an issue they call it all at once around here [Sonoma County Fire District]. It makes me mad, yanno, seeing as we're in one of the wettest parts of the County, even the State. It's like it would be totally safe to do burns and all that on our place, and we need to be getting on and doing these things... A lot of the time, they don't call it till mid-December or something, which is just crazy. We need to be burning!"* (Cory)

Finn and Cory both emphasised that the declared boundaries of the fire season fail to reflect their local seasonal experience. For them, recent rainfall had already signalled the transition out of the fire season, even though no official declaration had yet followed. This disjuncture underscores the difficulty of segmenting dynamic, cyclical seasonal rhythms into rigid "temporal blocks" with definitive start and end points (Krause, 2013, p. 42). In reality, the shift from the fire season to winter preparedness season is not experienced as a sudden event but as a gradual, uneven, and messy transition: a liminal phase (Olwig, 2005). The fire season begins to fade, and winter preparedness season slowly appears. Seasonal markers, like *"the rains"* (Finn), signal this transitions, but as Gan and Tsing's (2018, p. 116) remind us, "they do not appear like clockwork." These rhythms unfold in ways that defy administrative neatness and resist containment within institutional thresholds. As such, the fire season cannot be neatly said to end on a specific date like October 27th or November 1st; it fluctuates, fades, and returns, generating an extended period of in-betweenness rather than a clear-cut endpoint. This tension between seasonal fluidity and administrative fixity extends broader conversations about the clash between bureaucratic time and ecological time (Brice, 2014; Fischer and Macauley, 2021; O'Malley, 1992; Phillips, 2020).

After clear signs of seasonal transition, the continued official declaration of the fire season can create a sense of being out of sync with on-the-ground seasonal realities. In such moments, these declarations cease to feel like reliable frameworks for enabling timely, seasonal action. Instead, they expose a misalignment between the rhythms of bureaucratic processes (e.g., the act of declaring fire season), environmental rhythms (e.g., precipitation and declining fire risk) and human practices (e.g., prescribed burning). This disconnect constitutes what Bremer and Schneider (2024, p. 4) describe as "a breakdown in social-environment synchronisation." For many who dwell in Sonoma County, this breakdown is affectively felt. Building on Jensen's (2024, p. 14) concept of "temporal pressure" – the tension and stress generated when one cannot act in sync with shifting temporal rhythms – I argue that the period between clear seasonal change (e.g., rain) and the delayed declaration of the fire season's end is often marked by this condition. Cory's irritation at the lagging declaration captures this; his frustration, *"It makes me mad... it would be totally safe to do burns... we need to be getting on and doing these things",* signals an affective response to being temporally constrained, aware of what seasonal activities should be happening to remain in sync with environmental rhythms yet prevented

from acting. Importantly, Cory's experience extends Jensen's (2024, p. 14) conceptualisation of "temporal pressure" beyond immediate bureaucratic delays. It reflects a deeper concern about the dissonance between institutional timekeeping, increasingly unstable seasonal rhythms, and the urgent need to respond to climate change that is driving this destabilisation. His insistence, "*we need to be burning!"* gestures to a growing recognition that fire, once viewed predominantly as a threat under colonial fire suppression, is a crucial tool for mitigating wildfire risk reduction and climate adaptation (Kolden, 2019). Yet the capacity to act on this recognition is undermined by bureaucratic timekeeping lag which prevents him from prescribed burning. Thus, the "temporal pressure" (Jensen, 2024, p. 14) Cory and others in Sonoma County experience is not only about being out-of-sync with current environmental rhythms, but also about the stress of failing to recalibrate with the broader temporalities of a climate-altered world.

Speaking with fire agency personnel about the growing misalignment between fire season declarations and on-the-ground seasonal realities, many acknowledged the increasing difficulty of establishing temporal boundaries that remain both functional and meaningful. What was once a clearly identifiable and easily bounded temporal framework has become increasingly blurred. As Peter (volunteer firefighter) put it, "*we don't have a winter anymore like where things cool off or get wet"* or as Hannah (Petaluma Fire Department personnel) told me, "*I don't feel like I know when it is anymore, it all blends into one."* High fire risk now persists year-round, while other seasonal rhythms appear increasingly mutable, and wildfires ignite outside their expected seasonal windows. This growing ambiguity places additional pressure on fire agencies to sustain a seasonal framework that both coordinates' activities with shifting environmental rhythms and supports (climate-intensified) operational needs around staffing, resourcing, and preparedness. In response, fire agencies are incrementally adjusting their declaration processes. "*We have to do it later and later every year, next one will be well into December,"* noted Gareth (Petaluma Fire Department personnel). Others described scaling back public announcements altogether: *"It will officially end, but like, we're not making a big post or anything like that, because it needs attention year-round... we will declare its start like in May or whenever..."* (Clara, Sonoma County Fire District personnel).While declarations retain the utility of the fire season and impose temporal order and coordination amid increasingly unstable seasonal rhythms, these adjustments signal a growing recognition that the fire season is defying such containment. Through the ongoing revision of these practices, fire agencies are attempting to navigate this tension between bureaucratic time and ecological time to maintain temporal coherence, operational control, and a shared seasonal culture.

5. Sensing and attuning to the fire season

While declarations assert the seasonal structure of the fire season, the diminishing coherence of the fire season – and the growing dissonance between institutional timekeeping and shifting seasonal rhythms – has prompted individuals and communities to sense and attune to the fire season's continual transformations through alternative seasonal signals. These signals – including road signs, evacuation warning notifications, Diablo winds, the smell of smoke in

the air, browning vegetation, Public Safety Power Shutoffs (PSPS), birds nesting, visible fires on hilltops, and helicopters whirring overhead – serve as localised indicators of the fire season. By sensing and attuning to these cues (and being affected by them), people determine whether they are in or out of fire season, using these signals as temporal anchors to recognise change, remain in sync with fluctuating seasonal rhythms and coordinate timely seasonal activities.

I expand sensory attunement to the fire season because it develops a growing body of empirical research suggesting that, in contemporary Western societies, institutional timekeeping methods – calendars, clocks, and, as I add here, official seasonal declarations – are increasingly supplemented by diverse, situated, and embodied time-reckoning practices (Bastian, 2012; Brice, 2014; Hepach and Lüder, 2023; Krause, 2013; Phillips, 2020). In particular, I draw on Hepach and Lüder's (2023) work on extreme weather and climate change, which conceptualises sensing as a process that brings together experience and measurement, the proximate and the remote, the bodily and the abstract, to make sense of unfolding meteorological or climatological situations – or, as I extend here, seasonal ones. By sensing and attuning to shifting seasonal signals, individuals and communities in Sonoma County accommodate dynamic environmental rhythms, coordinate their seasonal activities, and contribute to the ongoing "holding together" (Gan and Tsing, 2018, p. 141) of the fire season.

Some of the seasonal signals used to attune to the fire season's continual transformations originate from institutional sources, grounded in abstract and remote forms of measurement. Yet, over time, they have become deeply entangled in everyday sensory engagement with the fire season. For example, Linda (Sonoma County resident) describes her interaction with fire danger rating signs:

> *"Every time I drive down the road, I look at that arrow, and when it's low, I say 'oh thank god.' Then it goes to the orange, I'm like 'oh man,' and sleep with one eye open… But then when it's red, it's just like 'oh shit.' It affects everything."*

In Sonoma County and across much of California, fire danger rating signs, positioned along roadsides, outside fire stations, and at the entrances to public parks, are among the most immediate and visible indicators of the fire season. Managed by fire agencies, these signs display daily fire danger levels based on a combination of weather conditions, fuel types, and moisture content (Northern Sonoma County Fire Protection District, n.d.). Using a colour-coded scale ranging from 'Low' (green) to 'Extreme' (red), they function to "prevent wildfires by increasing awareness of wildfire ignition and spread potential" (Northern Sonoma County Fire Protection District, n.d.) but also to orient residents towards the fire season. As official declarations of the fire season struggle to keep time with the instability of environmental rhythms, these signs translate the volatility of fire risk into a legible, real-time, and localised gauge of seasonal progression. They help individuals not only recognise that they are in the fire season but also locate themselves within it, whether at its peak or during a transitional phase. For Linda, each movement of the arrow on the sign elicits a visceral response: relief with green, unease and alertness with orange, and alarm with red. Therefore, what begins as a remote, technocratic measurement becomes embedded in affective, embodied, and routinised experiences of living with the world's temporal flows. These signs enable people to sense and

make sense of the fire season because they hold abstract measurement and bodily experience "in a productive tension" (Hepach and Lüder, 2023, p. 357).

As institutional timekeeping methods increasingly struggle to keep time with continual seasonal transformations, individuals and communities are increasingly relying on sensing and attuning to other seasonal signals. One such signal is the atmosphere itself, understood both in the "meteorological sense" and the "affective sense" (Adams-Hutcheson, 2019; Adey et al., 2013, p. 301; Anderson, 2009). Sienna (wildfire prevention nonprofit employee) describes an attunement to atmospheric conditions that enables her to sense the onset, intensification, and easing of the fire season without relying on official declarations, fire danger rating signs, or a red flag warning[12]:

> *"In May, the anxiety begins to surface, and from there, it just increases. September and October are the most intense – the worry, it's constant. But now, we're in the off-season, and I actually feel like my guard is down, yanno? It's a nice feeling, especially compared to September and October, when I'm constantly on edge. The anxiety, the anticipation, it's exhausting. I feel calm now. Actually, it's funny, isn't it? How it mirrors the climate. Suddenly, it gets drier, everything just gets drier, you can see it, you can feel it in the air, everything is just drier. And then, you know, the wind picks up, and you feel it – the fire conditions. You just feel it; we are in the fire season or it's a red flag warning day. You don't even need to look; you can just feel it!"*

Similarly, Paul (CAL FIRE personnel) recounts how atmospheric movement (wind) has become an embodied signal of the fire season:

> *"But then the fire season, you know, it's one of those things that prior to '17, I don't remember, or I know for a fact I wasn't impacted by wind but now regardless of it's an offshore or onshore wind day, wind, just a steady breeze blowing, (long pause) it impacts me (pauses). It's heavy for everyone, I think"*

Both Sienna and Paul's reflections demonstrate how specific meteorological atmospheres (e.g., shifting humidity, gusting Diablo winds, and the palpable dryness of the air) serve as primary cues that people use to know they are in fire season. These are just more than meteorological atmospheres though, they create affective atmospheres, "pressing upon life"(Anderson and Ash, 2015, p. 78), embodied through feelings of worry, calm, anxiety and anticipation. Adams-Hutcheson (2019, p. 1005) writes "atmospheric conditions, such as fluctuating weather conditions, attune bodies in an affective sense." In Sonoma County, these affective responses are seasonal awareness – visceral, immediate, and deeply situated. As Sienna said, *"You don't even need to look; you can just feel it!"* Paul's comment, *"it's heavy for everyone"* reaffirms Anderson and Ash (2015, p. 41) insight that "atmospheres having weight actually chimes with lived experience." Sienna's comment that her feelings *"mirror... the climate"*

[12] A red flag warning is a forecast warning issued by the National Weather Service in the United States for weather events which may result in extreme fire behaviour that will occur within 24 hours. A red flag warning is the highest alert of fire danger (County of Sonoma, n.d.).

underscores the reciprocal relationship between atmospheric conditions and embodied seasonal attunement. The fire season feels dicey, anxious, and intense because the atmosphere is.

Drawing on Ash's (2013, p. 35) notion of "the body is a kind of living or somatic memory, composed of various retentional apparatuses", I argue that this attunement to atmospheres is not only immediate but also mnemonic. It emerges through bodily recollection. Paul's statement, *"prior to '17... I wasn't impacted by wind but now... it impacts me"* reflects a broader pattern. For many, the distinctive feel, temperature, sound, and direction of the wind during the 2017 Nuns/Tubbs fires have become embedded sensory seasonal signals. When the wind picks up, the body responds: tense muscles, quickened breath, adrenaline pumping. Yet, these are not just reactions, they are reminders. The body has become a sensory archive, reactivating memories of past fire seasons and generating a temporal awareness towards the present fire season. While scholars have suggested that meteorological cues for seasonal change are diminishing – obscured by climate-controlled interiors[13] (Hitchings, 2010, p. 283) and "season-proofing"[14] practices that decouple everyday life from seasonal rhythms (Bremer and Schneider, 2024, p. 8) – these findings present a different case. Here, the fire season is acutely sensed through atmospheric shifts, bodily memory, and affective alignment. Under climate crisis conditions, perhaps people are reacquainting themselves with the subtle, affective registers of atmospheric change that official measures no longer adequately capture. In doing so, they are enacting a different form of seasonal time reckoning, one grounded in embodied sensing, attunement and knowing.

By sensing and attuning to a multiplicity of seasonal signals, individuals and communities in Sonoma County gauge the qualities, transformations, and demands of the fire season. These signals often evoke distinct affective states – or what I term seasonal feelings – which in turn cue timely, seasonally-responsive activities that help align everyday life with shifting seasonal rhythms:

> *"It ebbs and flows, when the weather warms up and the meadow dries out it starts, and I feel my chest tighten, it's very present. That's when we know, we pack our Go-Bags and finish our mowing, and they stay in the car until it starts raining and it, you know, feels less dicey"* (Patsy, Sonoma County resident)

> *"When a shutoff comes, I'm straight up my ladder, cleaning the leaf litter out of my gutters. I take the covers off my BBQ's and carry all the garden furniture up to the furthest end of my property..."* (Tony, Sonoma County resident)

For Patsy, the atmospheric conditions of warming and drying are not just abstract indicators but are registered through embodied affect – a tightening chest, a heightened alertness – which

[13] In Sonoma County, indoor environments that decouple from environmental rhythms and buffer against seasonal variability are increasingly common. Examples include fire-resistant home modifications such as ember-resistant vents and cooling systems, as well as infrastructure that mitigates seasonal extremes, like water tanks for withstanding drought and air purifiers to manage poor air quality from wildfire smoke.

[14] In Sonoma County, "seasonal proofing" (Bremer and Schneider, 2024, p. 8) practices are increasing common. These include actions such as temporarily or permanently relocating to regions perceived to have different seasonal rhythms than those of the fire season, rescheduling outdoor work to avoid periods of heavy smoke, and modifying routines to minimise exposure to seasonal qualities, disruptions or demands.

prompt seasonal activities: finishing defensible space work, packing Go-Bags, preparing for evacuation. For Tony, a Public Safety Power Shutoff (PSPS) acts as an infrastructural seasonal cue that intensifies affect and compels rapid activity, such as home hardening and defensible space work. In both cases, seasonal signals (meteorological and infrastructural) summon affective intensities (seasonal feelings) which together trigger seasonally appropriate practices. The key is ensuring that these temporal patterns of activities are performed 'on time' and 'when they matter' (Bremer and Schneider, 2024; Hastrup, 2016; Krause, 2013). For example, Tony's response to a PSPS of clearing leaf litter from gutters and moving flammable materials only makes temporal sense at the specific moment when certain rhythms converge: high temperatures, low humidity, strong winds, feelings of concern and infrastructural strain. If done too early, these tasks may be unnecessary, unsustainable or unseasonal; if done too late, the opportune moment to act will have passed.

This sensing and attunement not only help residents stay in sync with the fire season's shifting tempo, but also actively constitute the season itself. Indeed, as Krause (2013, p. 26) notes, "seasons...come into being in the rhythms of...activities, rituals, residence arrangements, taboos and a range of further social dynamics." In this sense, the fire season is not simply something observed or endured, but something produced – through sensory attunement, affective response, and the coordination of rhythms. These different feelings of the season (e.g., anxiety, stress) and ways of practicing the season (e.g., defensible space work) hold the fire season together, allowing its disparate rhythms (e.g., of weather, infrastructure, emotion, and activity) to cohere. Without the bodily affective response or the prompt to act, a hot, dry day might pass as mere weather, and a PSPS might be dismissed as an inconvenience. But when such signals produce affective responses and elicit corresponding seasonal feelings and practices, the fire season is recognised and realised. It "come[s] into being" (Krause, 2013, p. 26). To miss these signals, to overlook the wind, ignore the heat, disregard the instinctual adrenaline response, is to risk falling out-of-time with the fire season and its unfolding demands, destabilising the coordination that gives it coherence. Thus, sensing and attuning to the fire season through alternative signals – and the seasonal feelings and activities they generate – are not merely responses to living through the fire season, they are part of how it "hold[s] together" (Gan and Tsing, 2018, p. 117).

Sensing and attuning to the fire season's ongoing transformations also involves recognising seasonal signals that suggest its end or that indicate the onset of the next season. As noted in the previous section, one of the clearest seasonal signals indicating transition out of the fire season is precipitation:

> *"Yeah, the first rain is good, although that's not what does it. I need to see a lot of rain. That's what I pay attention to – a good rain event, a proper rain. Then, that's the season over"* (Gary, land steward)

To borrow Tsing's (2015, p. 263) phrasing, seasonal change in Sonoma County "requires human action, but yet exceeds that requirement." The end of the fire season is not something that can definitively declared or scheduled; it must be awaited, sensed, and cautiously interpreted. For Gary, it is not the *"first rain"* that marks the shift, but the material force of

sustained, heavy rainfall, what he calls a *"a proper rain."* A passing shower is not enough; it must be *"a lot of rain"* (Gary). Others echoed this sentiment, pointing to scale and intensity: it takes *"three to four good days"* (Laurel, Sonoma County resident) and *"a good three inches"* (Delphie, Sonoma County resident) to truly signal the end. Although these indicators appear meteorological, they are equally affective. Rain must not only fall but it must feel like seasonal shift. Only when it registers as *"a good rain, a proper rain"* (Gary) can people begin to trust that the fire season is genuinely receding – the atmosphere (metrological and affective) is cooling, refreshing, and calming and other seasonal rhythms take hold.

This period of transition between the fire season and not fire season was among the most intensely affective and temporally ambiguous moments described by participants and encountered during fieldwork. Weather forecasts were monitored obsessively. Land stewards felt the dryness of vegetation each morning. Neighbours in supermarket queues speculated over whether the next storm system would *"do it."* It was a time shaped by heightened vigilance and affective suspension – what Jones (2022) describes as a temporal orientation of waiting: a state marked by temporal elongation, bodily stillness, and affective intensity, where time thickens and feelings float in a liminal period shaped by uncertainty. In this suspended temporality, action is deferred, but alertness remains high; one remains ready, constantly sensing for signals that the fire season has finally ended. Yet in the context of climate change, waiting for rain has become more prolonged, uncertain, and fraught, as precipitation rhythms become increasingly destabilised. What once felt like a routine and almost intuitive shift from the fire season to not fire season now seems more elusive, a felt indicator of a more climatically stable past that no longer exists.

6. Dominance of (the) fire (season)

Despite concerted efforts to declare, delineate, and attune to the fire season – through official declarations, fire danger rating signs, weather patterns and timing WRM activities 'just right time' – it continues to defy containment. Declarations no longer hold the fire season in place, as they quickly fall out of sync with seasonal realties. Individuals struggle to keep pace, as the seasonal signals they rely on to sense and respond to the fire season's continual transformations (e.g., PSPS, a good rain, wildfires, smoke in the air) now arrive unpredictably: mutable, mistimed, or sometimes not at all. In this section, I show how the fire season has become increasingly unruly. It spills into adjacent seasons, flaring earlier, lingering longer, and intensifying beyond established seasonal boundaries. And even when people are technically out of the fire season, they are rarely temporally distant from it. The fire season exerts a dominating force over everyday life – through continual reminders like emergency alerts, smoky skies, and parched landscapes – making it a looming presence that is difficult to ignore. As a result, seasonal culture in Sonoma County is increasingly oriented around the fire season to come. I end with these observations because they reveal how the fire season remains a contested and continually evolving temporal terrain. Yet despite its scrambling and loss of coherence, it is still something people strive to hold onto and to hold together, if only for now.

In Sonoma County, the fire season has extended into parts of the year that were once routinely considered outside its bounds. Where it was previously confined to a relatively predictable window – late summer through early fall – it now bleeds into not fire season (or winter and early spring), traditionally associated with cooler, wetter conditions and lower fire risk. As Danny (CAL-FIRE personnel) and Billy (Sonoma County resident) describe:

> "*There used to be a very palpable fire season... but now in the last year and a half, maybe two, it has been non-stop"* (Danny)
>
> *"There were two weeks last year I wasn't anxious as hell cos fire. It was cool and wet. People need time off from it yanno, but like it's on my mind all the time!"* (Billy)

Their reflections speak to the temporal destabilisation of the fire season. Danny's comment about the fire season becoming *"non-stop"* signals a breakdown in its temporal containment. While Billy's observation that only "*two weeks last year"* felt free of anxiety associated with the fire season offers a powerful insight into the personal and affective toll of its extension. The fire season can no longer be a clearly bounded period; it has become a persistent temporal condition. As fire risk becomes more continuous, the capacity to disengage from the fire season's rhythms, disruptions, and demands is increasingly compromised – *"it's on my mind all the time!"* (Billy). Yet the need for a temporal counterpart (i.e., not fire season) remains deeply felt. As Lilli (Sonoma County resident) explains, *"people need time off [from the fire season] ... You know, to recover and relax. I think people need it."* This period is not simply about the absence of fire risk; it is a necessary counter-season that allows for rest, repair, and the other seasonal rhythms to take hold. I suggest this not fire season is critical to maintaining the relational structure of seasonal life (Whitehouse, 2017), between fires and no fires, stress and calm, preparedness and recovery. As this temporal counterpart is compressed or eroded, the fire season begins to dominate everyday life, expanding not only across the calendar (e.g., into winter months) but also across the social and emotional contours of everyday life.

Another way in which the fire season exerts a dominating force over everyday life – even when people are technically in another season – is through continual reminders that surface throughout the year, often suddenly and disruptively. These recurring reminders unsettle the rhythms of the season individuals are currently in, blurring the line between seasonal states. As Jess (Petaluma Fire Department personnel) explained about smoke:

> "*We get calls for smoke all the time, somebody sees smoke up in the hills right now [early January], they're gunna call 911 and it's probably somebody doing a burn pile, yanno the threat this time of the year is nothing. The public just see smoke and panic. It takes 'em back."*

Traditionally, smoke has served as a defining signal of peak fire season – associated with traumatic memories of past wildfires. As Tony (Sonoma County resident) recalled, *"we were not able to leave the house for months... it was awful, apocalyptic even."* Increasingly, however, smoke appears outside this expected window – during winter preparedness season or burning season, when ecological and fuel reduction burns are permitted (Sonoma County Fire District, n.d.). Yet, encountering smoke in what is perceived to be the 'wrong' season often provokes

feelings of disorientation, confusion and fear. For some, as Jess noted, smoke triggers panic and emergency calls, momentarily collapsing the perceived boundary between fire season and not fire season. These encounters with smoke destabilise seasonal expectations and activate embodied memories of previous fire seasons. *"It takes 'em back"* (Jess), not just cognitively but affectively, reigniting (now temporally misplaced) dread, anxiety, and urgency, even in the absence of other seasonal signals. This confusion illustrates how reminders of past fire seasons infiltrate everyday life, reshaping temporal rhythms and unsettling people's sense of seasonal order. As Haynes et al., (2020, p. 182) observed in the Australian context, emergency management organisations often treat "the bushfire as a temporary presence," a bounded event with a clear beginning and end. Yet, they argue, "the fire is ever-present, haunting through the damaged and changed relationships with the more-than-human landscape." Extending this insight, I suggest that in Sonoma County, the fire season becomes ever-present through these ambient, affective reminders (e.g., smoke, dry vegetation, emergency alerts) which resist being neatly contained within seasonal categories. They conjure the spectre of previous fire seasons, where relationships with the more-than-humans were damaged and changed (Haynes *et al.*, 2020), reactivating affective responses, bringing the fire season back into the present and unsettling the temporal distance between seasons. As a result, residents experience an ongoing temporal disorientation: struggling to situate themselves in time, unsure whether they are still within a past fire season, between fire seasons, or already in the next.

Sign A.

Sign B.

Figure 1. Roadside signs in Sonoma County (Author's images)

In the context of the changed and changing climate, the possibility of fire and the fire season re-emerging is never fully extinguished. The threat remains latent, always capable of reigniting,

always present in potential. This sense of perpetual possibility is encapsulated in the two roadside signs shown in Figure 1. Sign A declares, “WILDFIRE IS COMING” and asks, “IS YOUR HOME READY?”, framing fire not as a contingent risk but as an impending certainty. Sign B similarly warns, “DON’T IGNORE THE THREAT,” extending wildfire risk across the entire Gregorian calendar year. Both signs communicate that fire and by extension, the fire season can no longer be contained within a discrete window of time but instead threatens to disrupt at any moment and perhaps is always, already coming.

During a Go-Along with Anna (Sonoma County resident), as we passed one of these roadside signs, she reflected:

> *“Yanno, it definitely looms over, like fire, and having to evacuate, power shutoffs and, like, all that smoke. I’m okay with that. [Long pause] Well, I can live with it, but yanno, some can’t...”*

Anna’s reflection highlights how ongoing encounters with reminders of the fire season (e.g., unseasonable” (Barry, 2025, p. 1) wildfires, roadside signs, PSPS, smoke, emergency alerts) contribute to a persistent affective condition of anticipation of the fire season. When encountered outside of the fire season, these reminders serve as what Jensen (2013, p. 50) describes as ruptures, “specific moments in time in which... rhythmic patterns, albeit with difference, turn into *crisis*: in which the order and stability of everyday life are overturned.” Yet in the meantime, their presence or even the continual possibility of their presence makes it feel as though fire season is always on the verge of returning. *“It definitely looms over,”* Anna told me, capturing how the fire season exerts a dominating force not only through its actual occurrence, but through its continual, ever-present potential. Thinking with Throop (2022, p. 69), “to say that something is looming is to recognise that something, while still yet indefinite in form, is imposing its impending presence upon us.” Through encountering these reminders, people are drawn into relation with a further disturbance (the fire season) that has not yet occurred but is anticipated and already structuring the present. Unlike the temporal mode of waiting – which holds space for multiple possible futures (Jones, 2022) – looming conveys “a sense of a foreboding arrival of the foreclosure of possibilities” (Throop, 2022, p. 72). The fire season, in this sense, is not just coming – it is “arriving soon now” shaping the present through its encroaching future (Throop, 2022, p. 72). Anna’s admission, *“I’m okay with it. Well, I can live with it”*, reflects a form of negotiated endurance, a way of coping with a season that never fully recedes. Yet her caveat, *“some can’t”*, points to the uneven distribution of capacity to live with this looming. This observation is vital when considering “how we coordinate ourselves in a time of climate breakdown” (Bastian and Bayliss Hawitt, 2023, p. 1075). The experience of the ‘looming season’ is not universally manageable; it is both affectively and materially distributed, with some better resourced to adapt, endure, or persist, while others find the ongoing burden of anticipation unbearable.

As fire season bleeds into months once considered safely outside its bounds, and as people can no longer maintain temporal distance from it – due to continual reminders and its looming presence – it is become an increasingly dominating force in everyday life. This has led to an

ongoing recalibration of seasonal culture in Sonoma County, where daily life is progressively oriented around the anticipation of the next fire season:

> *"We go into every season thinking we'll burn. You know, after 2017, fire risk and the whole climate changing got real for me. I walk around saying goodbye to everything, literally walking around saying thank you and goodbye to it, you have to get okay with it in order to live here, okay with losing everything, cause you don't know like each season, if it will still be here"* (Patsy, Sonoma County resident)

> *"During the wintertime, I'm trying to find a better rhythm, but I come to work with 'what can we get done today to make next fire season better?' and the constant question is 'are we getting as much done as we can before fire season shows back up?' So, yeah, that's winter..."* (Paul, CAL-FIRE personnel)

Both Patsy and Paul's reflections illustrate how seasonal life in Sonoma County is being recalibrated around the future fire season. Thinking with Anderson (2010, p. 777) who writes on pre-emption, (precaution) and preparedness, I understand the seasonal activities taking place during not fire season, but oriented toward the future fire season, as forms of "anticipatory action." For Patsy, the prospect of burning is no longer a possibility but an inevitability. Her seasonal practice of *"saying goodbye to everything"* functions as a personal ritual of pre-emptive reckoning – a way of emotionally pre-empting for loss before it occurs. For Paul, winter – once a season of pause and reprieve – is increasingly being characterised by preparatory labour. His daily rhythm is structured by the logic of preparedness, where every task (clearing brush, inspecting homes, stockpiling supplies) is oriented not toward the present season, but toward the one to come. These anticipatory actions (Anderson, 2010) reflect not only a response to imminent conditions (e.g. weather shifts or fire season declarations) but also a readiness for contingent futures: a wildfire in West County, a sudden heatwave, or the reallocation of limited emergency resources. Indeed, seasonal culture in not fire season is increasingly centred around ensuring that when environmental and social rhythms converge to constitute the next fire season, the conditions are as low-risk as possible. For example, by reducing fuel loads so that vegetation rhythms do not resonate with temperature rhythms to produce extreme fire risk. At the same time, these actions aim to ensure that key human activities and seasonal phenomena – such as firefighting equipment and emergency protocols – are primed and ready to respond when the fire season demands it.

Other "hazardous rhythmic patterns" (Staupe-Delgado et al., 2024, p. 2) and disasters – such as the federally declared disaster of the 2023 winter storms – can momentarily interrupt this fire season-focused temporal regime. Yet these disruptions are often approached not as their own seasonal events requiring full attention, but as frustrating intrusions on the more pressing future fire season. As Fern (Sonoma County Department of Emergency Management) told me:

> *"Post-floods I'm like, oh my God, everything is a month pushed back, and now that time before the fire season is even shorter! So yeah, that has me stressed out. Like, okay, now I have to do all of this in a shorter amount of time?"*

Fern's comments underscore how other seasonal disturbances (e.g., floods, winter storms, heatwaves) do not necessarily shift or recalibrate the seasonal focus. Instead, they compress it, intensifying a sense of "temporal pressure" (Jensen, 2024, p. 14). A flood may be the immediate crisis, but the fire season remains the dominant temporal reference point – always reminding, always looming, even when another season is unfolding. Individuals may sense they are in the midst of winter or flood season and engage in seasonally appropriate activities, yet these periods are often experienced as compressing the available time to prepare for the next fire season. What is emerging, then, is not merely a lengthened fire season or a looming presence but a temporal and seasonal dominance that reorders the structure of seasonal life itself. Being in the flood or winter season no longer primarily involves engaging with the specific qualities those times afford and demand (e.g., wetness, flood response) but instead requires thinking ahead to the next fire season: preparing landscapes, infrastructure, populations, and emotions for what lies ahead. The fire season asserts affective and practical control not only through its continual reminders and looming presence, but by intruding into, reshaping and taking over other seasons – dictating what must be done and felt. This colonisation of time increasingly "hold[s] together" (Gan and Tsing, 2018, p. 117) the fire season as a persistent temporal regime, while eroding the possibility of fully dwelling in or responding to the temporal rhythms, disruptions, and demands of other seasons.

7. Conclusion: seasons of change

The changed and changing climate is unfolding through multiple, entangled temporalities (Brace and Geoghegan, 2011; Edensor et al., 2020). One critical site of transformation within these temporal shifts is the season. Across the world, individuals and communities are experiencing the destabilisation of seasonal cultures, as once-reliable rhythms slip out-of-sync, blur together, or disappear entirely (Barry, 2025; Bremer *et al.*, 2024; Bremer and Schneider, 2024; Jensen, 2024b). This paper suggests that this destabilisation warrants sustained attention from social and cultural geographers because seasons matter: they have long provided a structuring logic for keeping time, anticipating change, and organising social life (Bremer and Schneider, 2024). As climate change scrambles these temporal structures, the question emerges: how do individuals and communities respond when the once-reliable seasons become scrambled, lose coherence, or cease to hold?

Focusing on the fire season in Sonoma County, I have shown that individuals and communities respond to its destabilisation in two principal ways: first, by reasserting seasonal structure through formal declarations that try to establish clear boundaries and cue timely seasonal activity, and second, by sensing and attuning to alternative seasonal signals that indicate the presence, rhythms, and demands of the fire season. These two responses of declaring and sensing the fire season not only help people navigate the changing climate but also actively participate in the "holding together" (Gan and Tsing, 2018, p. 141) of the fire season. They generate seasonal feelings, cue seasonal activities, and enable temporal coordination of rhythms that allow the fire season to "come into being" (Krause, 2013, p. 26).

The fire season increasingly dominates everyday life in Sonoma County – bleeding into periods once considered outside its bounds, sustained by continual reminders that create a looming presence, and unsettling seasonal life throughout the calendar year. The fire season is now an ever-present force, demanding orientation toward the next fire season even as other seasons unfold. Reflecting back to Governor Newsom's (2025) observation, which opened this paper, that the fire season is becoming obsolete in the climate crisis raises an important point, but I argue that this is not yet the case. Rather than a 'seasonless future,' I suggest that what is emerging could be understood as a 'seasonfull future' – one that is contested, evolving, and being recalibrated, reconfigured, and held together in new ways. Indeed, individuals and communities are holding onto the familiar fire season and holding it together (Gan and Tsing, 2018) as it defies containment and dominates seasonal life. This tension is not simply about preserving or abandoning the fire season as a temporal framework. Instead, it reflects an ongoing renegotiation of both human and more-than-human seasonal rhythms. It signals a struggle to rework seasonal culture in order to stay in sync with a changing climate and its demands – even as these efforts become more fragmented and fraught.

Looking forward, in the context of the changed and changing climate, new questions will surface around "unseasonable seasons" (Barry, 2025, p. 1), feelings of being "out-of-sync" (Jensen, 2024b, p. 7) and "how we coordinate ourselves" (Bastian and Bayliss Hawitt, 2023, p. 1075). I argue social and cultural geographers must – and are well positioned to – take seasons and seasonal culture more seriously, particularly as climate instability unsettles familiar temporal structures and rhythms. While social science has often focused on "why things fall apart", this paper has shown the value of attending to "how things hold" (Gan and Tsing, 2018, p. 141) – however unevenly, provisionally, or contentiously. This opens up space to think about seasons as seasons of change: evolving temporal terrains where people navigate disruption by responding with new modes of adjustment, attunement, accommodation, and alignment. In doing so, geographers can engage more deeply with alternative temporalities, emergent rhythms, and renewed questions about what "keeps livable assemblages alive" (Gan and Tsing, 2018, p. 133).

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8. Paper Six: Learning to live with fire: relationships between humans and fire in prescribed burning

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Abstract: The intensifying wildfire crisis in California has necessitated a reimagining of fire management approaches. As wildfires become increasingly frequent and destructive, prescribed burning has emerged as a critical intervention. This practice involves intentionally setting controlled, low-intensity fires to reduce fuel loads and prevent wildfires. Prescribed burning is not simply a reversal of colonial fire suppression or a revival of Indigenous cultural practices; it exists at the intersection of these histories, fostering a new relationship with fire shaped by contemporary realities. Drawing on ethnographic research from a prescribed burn in Sonoma County, California, I reveal the intricate relations of prepping for, connecting to, caring through and grappling with fire. Taken together, I argue prescribed burning represents a relationship with fire that borrows from Indigenous cultural burning while moving away from – and yet remaining in tension with – the legacies of colonial fire suppression. Ultimately, I argue that prescribed burning signifies a meaningful step toward living with fire, illustrating how people are rethinking and reconstructing their relationships with more-than-human entities amid crises, learning to coexist with them rather than oppose them.

Fire, prescribed burning, relations, more-than-human, care, risk management

Prologue

As the morning sun streams through the redwood grove, the burn team gathered at the forest's edge, faces etched with anticipation and determination. The winter preparedness season had been declared, and burning conditions were deemed safe. It was clear that this moment – reintroducing fire to the grove, which had been in a state of fire exclusion for decades – had taken meticulous planning. I noticed the perimeter around each old-growth redwood had been cleared of debris to create a buffer zone, hopefully protecting the trees from the flames.

The ignition teams moved with well-practiced precision, strategically lighting strips of fire across the forest floor. However, as the first twists of smoke drifted into the air, it was apparent the fire had a mind of its own. It eagerly crept closer to the redwoods. Sensing this, the holding teams sprang into action. They headed into the flames armed with rake hoes and water pumps, to gently coax it away from the old-growths and onto the ground vegetation (see Figure 1). Despite brief discussion of using heavies to keep the fire from climbing the trees, the land stewards, respectful of the grove's ecosystem and committed to reducing wildfire risk, used only their bodies, rake hoes, and water pumps to work with the fire.

When the fire finally moved away from the trees and began consuming the targeted vegetation, the burn team stood and watched with satisfaction. They nodded and smiled at one another. As the day wore on and the grove grew smokier, a delicate balance between human intervention and the elemental force of fire emerged. They – the burn team and the fire – became partners in a dance of care, renewal, and coexistence.

1. Introduction

California's wildfire crisis has escalated in recent years. Fuelled by climate change, land use shifts and vegetation accumulation, wildfires have reached unprecedented frequency, intensity and scale (Safford *et al.*, 2022). Between 2015 and 2020, seven of California's ten most destructive fires occurred (CAL FIRE, 2024), and in 2020 alone, more than 9,000 fires burned over 4 million acres (Safford *et al.*, 2022). The 2017 Nuns-Tubbs fire in Sonoma and Napa Counties claimed 25 lives and destroyed almost 7,000 properties, making it the deadliest and most destructive wildfire in the state's history at that time. However, a year later, the 2018 Camp Fire in Butte County surpassed it, resulting in 85 fatalities and the destruction of over 18,000 structures (CAL FIRE, 2024). Wildfires in California have also produced longer-term impacts, including poor air quality, increased prevalence of mental health conditions, and environmental damage (Rosenthal *et al.*, 2021; Safford *et al.*, 2022).

Amid this worsening wildfire crisis, calls to rethink fire management have been increasing (Kreider *et al.*, 2024; Marks-Block and Tripp, 2021; USDA Forest Service, 2022). While Indigenous peoples across California recognised fire's essential ecological role and practiced cultural burning, European colonisation introduced an approach of fire suppression that criminalised Indigenous cultural burning and disrupted fire regimes (e.g., Adlam *et al.*, 2022; Goode *et al.*, 2022; Martinez, Seraphin, *et al.*, 2023). This adversarial approach paradoxically fuelled more frequent and severe wildfires, underscoring the failures of disconnection from fire as a natural and necessary process (Ingalsbee, 2017; Kreider *et al.*, 2024; Vinyeta, 2022).

Fire management in California is shifting from viewing fire as inherently destructive and needing suppression to recognising its vital ecological role in the state's landscape. Prescribed burning has emerged as a key intervention, using controlled, low intensity burns set under monitored conditions to reduce vegetation fuel loads and prevent wildfires.[15] This approach, also known as controlled burning or Rx burning, marks a departure from the long-standing fire suppression paradigm by acknowledging fire as an integral part of the Californian landscape and using it proactively to prevent wildfires (Ryan *et al.*, 2013). However, prescribed burning does not represent a return to Indigenous cultural burning, as it functions within contemporary fire management structures. Instead, as I argue in this paper, it represents a new relationship with fire shaped by current realities, including the wildfire crisis, climate change, and the legacies of fire suppression.

This paper contributes to growing geographical scholarship on fire management (e.g., Beggs and Dalley, 2023; Kolden, 2019; Lange and Gillespie, 2023; Sutherland, 2019) by examining how prescribed burning signals the emergence of a new relationship with fire, distinct from previous fire management approaches. I first explore relationships with fire in Indigenous cultural burning and colonial fire suppression, then introduce prescribed burning as an evolving practice that reflects a new relationship with fire. While focused on California, this narrative resonates in many fire-prone regions globally, including Canada, Australia and the wider

[15] While this paper focuses on California, it is important to acknowledge that prescribed burning practices vary widely across global contexts, shaped by distinct ecological conditions, cultural traditions, governance structures, and relationships with fire.

United States (e.g., Beggs and Dalley, 2023; Sutherland, 2019). The following sections present and analyse four distinct relationships with fire emerging during a prescribed burn – *prepping for, connecting to, caring through and grappling with fire*. Through this examination, I demonstrate that prescribed burning represents a departure from fire suppression, rather than a simple reversal, and draws from Indigenous cultural burning without returning to it. Ultimately, I argue that, despite the tensions inherent in these relationships, prescribed burning signifies a step toward a future where people embrace the necessity of living with fire. This contributes to more-than-human geography, offering insights into how people are learning to coexist with more-than-human entities during crises rather than opposing them.

2. Relationships with fire in fire management

Fire management in California is complex, shaped by a history of both coexistence and conflict with fire (Pyne, 2015). In this section, I explore the evolution of fire management in California as a settler colony, emphasising the relationships with fire reflected in Indigenous cultural burning and colonial fire suppression. I then introduce prescribed burning as an emerging practice which signifies a new relationship with fire.

Cultural Burning: fire as medicine, fire as kin

Before European colonisation, Indigenous peoples across (what is now known as) California routinely and strategically set small, controlled fires to steward their ancestral landscapes (Pyne, 2015). This practice, known as cultural burning, was – and still is, despite legal and jurisdictional restrictions – a vital land stewardship technique. It was widely recognised by Indigenous peoples for its role in maintaining the health of Californian ecosystems. Fire was understood to promote numerous ecological benefits, such as reducing detritus, recycling nutrients, controlling insects and pathogens, and modifying forest vegetation. These ecological processes supported Indigenous cultural practices by increasing the abundance of food, clearing the forest understory for hunting, and regenerating plants used for clothing or shelter (Kimmerer and Lake, 2001; Lake and Christianson, 2019; Martinez, Seraphin, *et al.*, 2023). Indigenous peoples also recognised how burning low-intensity fires helped prevent larger, uncontrolled wildfires by reducing vegetation fuel buildup, promoting biodiversity, creating firebreaks and improving soil health (Lake and Christianson, 2019; Roos, 2023).

Frank Kanawha Lake, a fire personnel, ecologist and Karuk descendent, explains in Roos (2023) that cultural burning is guided by "the tribal philosophy of fire as medicine." This philosophy acknowledges that, when carefully prescribed, fire sustains balance, harmony, and health in both Indigenous communities and ancestral landscapes (Cagle, 2009; Vinyeta, 2022). Understanding fire as medicine emphasises how cultural burning embodies a form of stewardship, allowing Indigenous peoples to express their respect for fire's necessity and value in Californian ecosystems. As Martinez et al. (2023, p. 145) note, "Indigenous peoples of California consider burning a cultural responsibility that defines their role within their more-than-human communities." Cultural burning involves meticulous care to ensure fire is prescribed in the right location, during the correct season, at the appropriate intensity, and with

proper intervals. This careful approach reflects a deep understanding of fire regimes and ecological dynamics – what Huffman (2013, p. 1) calls "traditional fire knowledge," often passed down through generations of Indigenous peoples. It also demonstrates a commitment to ensuring that all others in the ecosystem (e.g., trees, soil and insects) benefit from burning (Kimmerer and Lake, 2001). Through the philosophy of fire as medicine, cultural burning can be understood as an act of caretaking for the land and its people. Those burning honour their responsibility to nurture and sustain the health of their communities and the landscapes they inhabit.

Kincentricity is a foundational worldview in most Indigenous communities, where humans and all in the ecosystem are felt "as part of an extended ecological family that shares ancestry and origins" (Senos *et al.*, 2006, p. 397). To feel all others "as kin is to enact a relational ethos and the responsibilities and accountabilities that accompany it" (Tynan, 2021, p. 600). For many Indigenous peoples across California – such as Kuruk, Pomo, Miwok, Yurok, and Hupa people – fire is included in this kinship network (Anderson, 2018; Norgaard, 2014). By feeling fire as kin, it is understood as a living being with its own agency, spirit, and knowledge (Adlam *et al.*, 2022; Lake and Christianson, 2019). Through careful observation and respectful interaction while burning, Indigenous peoples learn from fire as a teacher, recognising its role in fostering ecological health – e.g., how regular fire disturbances support acorn growth. This reciprocal relationship is central to cultural burning, where fire is not only a tool for land stewardship but a respected partner in sustaining ancestral landscapes. By feeling fire as kin, like an elder whose wisdom and guidance is respected, Indigenous peoples incorporate fire's lessons into their stewardship practices, ensuring that their burning aligns with the rhythms and needs of all in the ecosystem (Adlam *et al.*, 2022; Goode *et al.*, 2022). Fire as kin underscores a sense of responsibility among many Indigenous peoples to respect, care for, and support the relational web of more-than-humans with whom they are interconnected and accountable to (Tynan, 2021).

Fire Suppression: fire as a threat, fire as the enemy

While many Indigenous peoples in California practiced extensive cultural burning, European settler colonialists mandated a policy of total fire suppression in 1850 to systematically exclude, stop and control all fires (Pyne, 2015). As a result, many Indigenous peoples faced devastating colonial impacts on their ancestral lands, leading to a significant decline in cultural burning (Adlam *et al.*, 2022; Goode *et al.*, 2022; Norgaard, 2014; Whyte, 2018). Despite ongoing efforts by Indigenous peoples to resist the colonial erasure of cultural burning (e.g., Eriksen and Hankins, 2014; Marks-Block and Tripp, 2021; Norgaard, 2019), fire suppression remains a deeply entrenched structure today.

European settler colonialists initially introduced fire suppression "to protect the homes and extraction investments of the state's wealthiest residents" (Martinez, Seraphin, *et al.*, 2023, p. 147). In contrast to the relational ways many Indigenous peoples feel the natural world as kin, European colonialists viewed Californian landscapes as passive and profitable resources for development and exploitation (Marks-Block and Tripp, 2021; Martinez, Cannon, *et al.*, 2023; Tynan, 2021). By applying standardised scientific principles that prioritised ecological

conditions conducive to capitalist production and colonial agendas (Vinyeta, 2022), fire was framed as a "destructive agent" (Colman, 1947 cited in Miller, 2020, p. 3) and "implicit threat" (Scott, 1998, p. 18) to people and the landscape. Seeing fire as a threat, rather than a necessary ecological process, enabled European colonialists to justify the control, exclusion, and suppression of fire (Pyne, 2015). Building on Whyte's (2018) work on settler ecologies, fire suppression reflects the settlers' assumed entitlement to environmental authority; it became an ecological assertion of dominance, control, and sovereignty over fire and landscapes.

Since the introduction of fire suppression, fire has largely been framed as an enemy to be fought, defeated, and exterminated. This adversarial stance intensified during the 1930s to 1970s with the '10 a.m. policy,' which mandated all fires be contained by mid-morning the following day (Pyne, 2015). Rendering fire as the enemy also legitimised fire suppression agencies to routinely employ "compounding forms of war logic" (Martinez, Seraphin, *et al.*, 2023, p. 147). For instance, the California Department of Forestry and Fire Protection (CAL FIRE) conducts tactical operations that resemble military manoeuvres, utilises surplus military equipment (e.g., helicopters and tanks) to enhance firefighting efforts, and establishes militaristic command and control structures (CAL FIRE, n.d.). Californian landscapes have also been under constant surveillance – initially through fire lookout towers and now via AI-trained fire-detection cameras – monitoring for potential outbreaks of fire as the enemy (Dixit, 2023). This ongoing militarisation of fire suppression reinforces the narrative of fire as an ever-present, hostile force that must be eradicated to ensure safety and control.

Colonial fire suppression was – and continues to be – not only focused on extinguishing combustion but also on suppressing alternative relationships and interactions with fire. Initially, fire suppression sought to extinguish Indigenous people's knowledges of and practices with fire by framing them as threats to public safety and order. European colonialists employed various strategies – including law, discipline, punishment, and concepts such as Terra Nullius and the public trust doctrine – to violently prohibit Indigenous cultural burning (Kimmerer and Lake, 2001; Ryan *et al.*, 2013; Taylor and Skinner, 1998; Vinyeta, 2022; Whyte, 2018). Fire suppression aimed to erase Indigenous people's kincentric relationships with fire and replace them with "liberal capitalist logics of patriarchal white possession" (Martinez, Seraphin, *et al.*, 2023, p. 145; Whyte, 2018). Even today, educational campaigns, fire management policies and fear-based public messaging regulate and govern people's relationships with fire. A striking example of this ongoing regulation is Smokey Bear, a prominent and long-running public messaging campaign aimed at fire prevention; Minor and Boyce (2018) argue that Smokey Bear operates as a biopolitical tool for managing people and the landscape, promoting fear of fire to ensure compliance with fire suppression policies. They contend that Smokey Bear symbolically and materially territorialises state sovereignty by linking successful fire suppression to a strong American identity (Minor and Boyce, 2018). This ongoing suppression of relationships with fire that fall outside those deemed appropriate by fire suppression stifles alternative ways of interacting with fire and perpetuates fear and apprehension, making it difficult for fire agencies and the public to recognise fire as an ecological necessity.

Prescribed Burning: fire as...

Fire suppression has proven both economically and ecologically unsustainable, costing U.S. taxpayers approximately $2.5 billion annually (National Interagency Fire Center, n.d.) and contributing to the alarming increase in the frequency and intensity of wildfires – a phenomenon described as the 'wildfire paradox.' This paradox arises from fire suppression efforts which, while intended to prevent wildfires, have inadvertently disrupted fire regimes. Consequently, the accumulation of vegetation has created conditions conducive to wildfires (Ingalsbee, 2017). In response to these failures and the escalating wildfire crisis, California fire agencies and state policymakers have begun reconsidering fire's role within the state's landscapes.

Prescribed burning, recognised as a fire management practice since 1978 in California, has recently gained significant traction as a crucial intervention to address the wildfire crisis – this has been supported by policy changes, legal protections and incentives to burn (CAL FIRE, n.d.; Miller, 2020; USDA Forest Service, 2022). Prescribed burning involves the intentional application of controlled fire to landscapes to achieve specific objectives. While prescribed burning has faced criticism regarding smoke emissions, escape fire risk, and lack of social acceptance (McCaffrey *et al.*, 2013; Ryan *et al.*, 2013), proponents emphasise its effectiveness in preventing wildfires (Kolden, 2019). By using fire, prescribed burners reduce vegetation buildup, "changing the composition of the landscape so as to protect certain assets" from wildfire (Sutherland, 2019, p. 782). This embrace of prescribed burning is evident in many fire-prone regions globally (e.g., Australia, Canada, Greece, Scotland), as fire management agencies recognise the need to proactively prevent wildfires.

This approach to fighting fire with fire deserves further consideration as, I argue, it signals a departure from the long-standing paradigm of fire suppression. Prescribed burning attempts to forge a relationship with fire as a tool to support the prevention of wildfires. Although prescribed burning shares similarities with Indigenous cultural burning, specifically in the controlled use of fire, prescribed burning tends to focus on measurable outcomes like fuel reduction and exists in the wake of fire suppression, while Indigenous cultural burning is rooted in Indigenous worldviews and is a deeply "relational practice" (Marks-Block and Tripp, 2021; Tynan, 2021, p. 602). Prescribed burning is, therefore, neither a straightforward reversal of colonial fire suppression nor a simple revival of Indigenous cultural burning. Instead, prescribed burning occupies the intersection of these histories, creating a new relationship with fire shaped by contemporary realities. Considering this, the remainder of this paper details four relationships with fire that emerge in prescribed burning to argue they represents a relationship with fire which borrows from Indigenous cultural burning while moving away from – and yet remaining in tension with – the legacies of colonial fire suppression.

3. Fiery fieldwork

During the first couple of months (September – November 2022) of fieldwork, I spoke, thought and worried about fire nearly all the time. My research focused on forms of care in wildfire risk management, and as a result, fire emerged in every research encounter. Each day, I learned

about how people deployed, fought, and confronted fire as an enemy. Fire also continually loomed over everyday life in Sonoma County, California. I came to understand why this was the case: those living in Sonoma County are having to become accustomed to an ever-lengthening fire season, wildfire alerts pinged on our phones at random times of the day, and the experience of four devastating wildfires since 2017 still hung in the air. During this period, I found myself becoming fearful of fire; to me, fire was a dangerous threat that obviously warranted the control it was receiving.

A few months into fieldwork (November 2022) and nearing the end of the declared fire season, I went to a preserve near Santa Rosa that burned during the 2017 Nuns/Tubbs wildfire. While I was helping clear brush, I talked with three land stewards about fire however, in these conversations, no one discussed fire as a threat, conveyed feelings of fear, or likened fire to the enemy. Instead, they only spoke about prescribed fire which was surrounded by a sense of joy and excitement. From here, I decided I wanted to get close to this fire, prescribed fire.

After the fire season was officially declared over, I followed prescribed fire. I attended two prescribed burning training sessions, five burn preparation days, three prescribed burns, eleven burn-pile days and three prescribed burn mop-ups. During these research encounters, I scribbled countless pages of fieldnotes and took 209 photos of prescribed burning practices. I kept track of the burning conditions, fire behaviour and surrounding landscapes, as well as the conversations, affective encounters, and different tensions that emerged. During one prescribed burn, I wrote in my notebook *"shifting from exclusion and fear into a more mutually beneficial relationship with fire*: *healing? nurturing? caring?"* and underlined caring twice. This notion of relationships with fire in prescribed burning being distinct from those in fire suppression inspired the formulation of this paper.

Rather than working with all my research encounters involving fire, in this paper, I chose to tell the story of just one prescribed burn – the Grove of Old Trees burn. This burn took place during November 2022 at an old-growth redwood preserve that had existed in a state of fire exclusion for decades. I chose to tell the story of this prescribed burn for three reasons; firstly, unlike most research on prescribed burning, this burn was conducted by a prescribed burn association (PBA) – a "community-based mutual aid network that help private landowners put good fire back on the land" (California PBA, n.d.) – rather than by a government or fire agency. This provided insight into the distinct relationships with fire those involved in the PBA and fire agencies (required for safety) developed with fire during the practice of prescribed burning. Secondly, aligning to my fieldwork dates, the timing of the burn allowed me to trace the shifting relations with fire throughout the pre-burn activities, the prescribed burn, and during the moments of reflection after the burn. I also conducted five storytelling interviews with members of the burn team. Thirdly, exploring the relationships with fire that emerge in prescribed burning demands both intimacy and sustained engagement. By focusing on the story of a single prescribed burn, I was able to examine the intricate nuances of these relationships with fire and offer a more thorough and reflective analysis.

Inspired by an abundance of geographical scholarship which encourages storytelling-based forms of presentation (e.g., Bissell, 2014; Lorimer and Parr, 2014; Rose, 2016), in what

follows, I present four extended "impressionistic vignettes" (Bissell, 2022, p. 482) of the Grove of Old Trees burn. These vignettes are formed from a combination of field encounters, photographs, field notes, and storytelling interview transcripts. Together, these vignettes guide you chronologically through the prescribed burn, while each one centres on a distinct relationship with fire – prepping for, connecting to, caring through, and grappling with fire – that unfolded during the burn. After each vignette, I offer analysis of these intimate but intense relationships with fire, highlighting their divergence from Indigenous cultural burning and colonial fire suppression.

4. Relations with fire in prescribed burning

Prepping for fire

It's late fall, the trees have shed their leaves. Rain has arrived, and the air is crisper. For the past few days, I've been helping land stewards clear brush ahead of the winter preparedness season. Although I enjoy the manual labour, I'm unsure I'm doing it correctly. Should I cut back, limb up or leave it? I ask Axel for tips. "Look at things like you wanna burn them, [author]" he explains. "If I'm fire on the ground, what am I gonna do? I'm going to go up that hill, now that wind is blowing this way, I'm gonna go this way. Then, my first thought is I'm going to burn that shrub, flames twice as high, I'm gonna get into that tree, burn that whole canopy. So, what I'll do, I'll go over and limb up that shrub a little bit." I take his advice and use my loppers to prune it. During lunch I ask Skye when fire season will be declared over, "I don't know, soon hopefully! I'm so excited, but every year we literally have to wait by the computer for winter preparedness."

Over the following weeks, speculation about the announcement of the end of fire season and the start of the winter preparedness season grows. "The wet weather should help... you would think it would be soon" Axel tells me at the local farmer's market. I ask what he is doing in the meantime, "urgh" he replies, "we are still getting on with prep work, but there's really not much more to do. I keep thinking we need good fire now." A week later, after a heavy rainfall, the local fire department announces the beginning of winter preparedness. I speak with Axel again who is relieved by the declaration. He informs me a prescribed burn has been approved for Friday at the Grove of Old Trees. He lists all the different "hoops that need to be jumped through" to ensure the burn could go ahead. His excitement palpable, "you should come, you'll love it!"

On Friday, I wake up feeling nervous but excited for the day ahead. I check my phone and see an email from the burn coordinator. The burn has been cancelled! It is a no burn day. The wind conditions are too risky. Riley writes, "the full burn team will remain on site, fire ready. We will gather on-site data on fuel moisture and weather to provide feedback on local conditions to agency partners." Riley ends her email, "let's hope the weather is better tomorrow and we can burn."

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During the fire season, roughly spanning from May to November, fire agencies either prohibit or heavily restrict burning due to the risk of escape fires, a lack of fire personnel, and poor air quality. Prescribed burners use the fire season to prepare future burn sites, which includes clearing brush, limbing up trees, making burn piles, and forming fire breaks. Prepping for fire is rooted in a respect of fire's capabilities in the landscape – its value but also its agency to burn in uncontrolled ways. As Kila (volunteer) told me, fire *"needs to be in the right environment and conditions for it to be a positive thing... we work on the land to create ideal burning conditions and to make sure that we're set up for success to maintain fire in the state that we want it in, and it's working towards what the end state is supposed to be, rather than running the risk of becoming wildfire."* Of the three factors which influence fire behaviour – weather, topography and vegetation load – prescribed burners focus their efforts on vegetation as it is the aspect they can manipulate to create favourable burning conditions. By conducting preparatory land work, prescribed burners are attempting to establish the conditions necessary for a future prescribed fire to remain controlled, not become a wildfire, and meet its objectives. Axel's (land steward) advice – "*Look at things like you wanna burn them"* – highlights that effectively prepping for fire requires acknowledging fire's more-than-human autonomy and agency. By embodying fire, Axel demonstrates awareness of the limitations of human intervention, relying on fire's logic to guide his land preparation decisions. This approach cultivates an understanding of how fire interacts with the landscape, enabling him to intuitively modify the land to welcome fire.

During the later stages of the fire season, as the weather becomes wetter and land prep work nears completion, prepping for fire shifts to a passive anticipation of fire. As Skye (land steward) told me, prescribed burners find themselves *"wait[ing] by the computers for winter preparedness"* to be declared. During this period feelings of excitement about the upcoming winter preparedness season evolved into more strained feelings of uncertainty, expectancy, and frustration. For many, their annoyance at the wait for fire stemmed from confusion regarding fire personnel's hesitancy to declare the fire season over, especially since it had rained. Some land stewards[16] saw fire personnel's reluctance to declare the fire season over as indicative of their detachment from the land. Others interpreted their hesitancy as a purposeful attack, aimed at deliberately delaying burning efforts. While the wait for fire frustrated prescribed burners, it stemmed from their recognition of the necessity of prescribed fire and their eagerness to participate in burning.

Once the winter preparedness season is declared by fire agencies *"burning is way less restricted and regulated. You can burn a lot more freely"* (Gabriel, land steward). In Sonoma County, the declaration of the winter preparedness season brought with it an atmosphere of excitement amongst prescribed burners. They were no longer passively waiting but instead rushed to finish the final pre-burn tasks – admin work, emails, liaison with stakeholders, insurance approvals

[16] I use the term 'land stewards' in the subsequent sections, following the language used by those I am writing about. I do so with awareness that the language of stewardship is historically and culturally situated, and that it can risk conflating non-Indigenous contemporary fire management with Indigenous peoples' knowledge and practices. My use of the term reflects local usage while remaining attentive to the critical distinctions between Indigenous and non-Indigenous peoples' usage of the term.

and burn plan sign-off. While these tasks were considered *"tedious"* (Anna, land steward), *"box ticking exercises"* (Harry, land steward), they were completed quickly and efficiently. They were accepted as necessary tasks to maintain regulatory compliance and build public trust – both recognised as essential in the context of ongoing fire suppression, where fire remains heavily regulated and public fear is significant (Miller, 2020; Williams *et al.*, 2024).

Once preparatory work for a prescribed burn is complete, a further wait for fire is always possible. Temporary bans on the use of fire, known as 'no burn days,' are declared by fire agencies in response to high-risk burning conditions (e.g., lack of moisture, poor weather conditions or air-quality). On the scheduled day of the prescribed burn, the burn team, fire tools, the grove, and all other entities were ready, "standing by" to burn (Kemmer *et al.*, 2021, p. 5). However, prescribed burning was banned due to unsafe wind conditions, forcing them all to continue to wait for fire. This demonstrates that while prepping for fire involves a series of tasks to create favourable conditions to welcome fire, these ultimately do not decide if the wait for fire can be over. Rather, the timing of a prescribed burning is dependent on a range of more-than-humans – wind, rain, air, soil – to collectively produce the ideal conditions to ignite prescribed fire in. Prescribed burning thus "require[s] human action yet exceed[s] that requirement" to extend Tsing (2015, p. 263) insight from Satoyama landscapes. Prescribed burners had to be attentive and responsive to these more-than-humans – for example, by *"gathering on-site data on fuel moisture and weather"* (Riley, burn coordinator) – as the burn was contingent on them. This emphasises the more-than-human relationships that prescribed burners cultivate, beyond traditional command and control, to facilitate the burn to go ahead.

Taken together, prepping for fire constitutes an inherent relationship within prescribed burning, unfolding temporally across the fire season and winter preparedness season. Prepping for fire involves not only the careful creation of ideal burning conditions (i.e., land work, admin tasks), but also patient waiting for the right moment to execute a burn. Unlike fire suppression practices, which aim to create an inhospitable environment for fire, in prescribed burning prepping for fire embodies a different ethos: recognising fire as a possible threat while committing to create and wait for conditions that support prescribed burns to remain controlled and yield ecological benefits.

Connecting to fire

I arrive at the Grove of Old Trees on Saturday. It's 9AM and there is already a hum of activity: fire trucks reversing, people chatting about the day ahead as they finish breakfast, and hose lays being pulled. The atmosphere is full of anticipation and excitement. After the pre-briefing, the burn team get into position as Kaiah signals the test fire can begin. Alice carefully drips fire onto the forest floor and describes the fire behaviour to the excited burn team; "it mellow, it's burning really well." Others use machine sensors to monitor the soil moisture and wind direction. After watching the fire for a few minutes, Kaiah announces "I'm satisfied the fire will be able to meet the burn objectives."

The prescribed burn fully begins (see Figure 2). The firing teams disperse quickly, using drip torches to strategically ignite strips of fire across the forest floor. I'm later told this firing

technique is called backburning. The strips of fire creep in different directions, turning the ground vegetation white. The firing teams move gently through the grove, standing to observe what the fire is doing, and carefully igniting further fire around the redwoods. I note the firing teams look like they are dancing with fire. At first, the holding teams carefully watch the fire behaviour from the perimeter. They then walk into the burn area and continue to observe amongst the flames. Some bend down and feel the not yet burned ground before discussing what holding tactics to take. They rake the forest floor, cautiously securing material on the containment line and pulling vegetation away from the redwoods. The holding teams sense the direction and speed of fire, quickly dispersing dense vegetation in anticipation of its arrival. "I know the fire wants to climb the trees" Noah confidently states as his team diligently spray the trees with water packs and use rake-hoes to try to guide fire away from them and onto other vegetation.

As the burn continues, the firing and holding teams take moments of respite, discussing how the fire "is burning well" and "doing good work." Lottie steps out to the burn perimeter for a drink. "I just wanna be in it again... I just have such an urge. I've never felt this before. It's not black or violent, it just feels right. It's gentle and soft" she tells before heading back into the flames.

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At the start of a prescribed burn, a test fire is lit to monitor and assess how the fire will behave under the current burning conditions. The burn team must evaluate whether the fire will likely remain controlled and meet its objectives – in this case, reducing hazardous fuel and improving grove's ecological health. They watch, feel, sense, listen and burn to gauge how the full-scale burn could unfold. The test burn supports prescribed burners in coming to know and attune to

the fire and grove and begin to understand how they respond to one another (Sutherland, 2019). If it is deemed that a larger burn would likely "escape the limits of the prescribed burn encounter" (Sutherland, 2019, p. 793) or fail to meet the burn objectives, the test fire would be suppressed and prepping for fire would continue. This demonstrates an acknowledgement of the limits of human control over fire, and in turn expresses a respect of fire's agency (Sutherland, 2019). Bobby (land steward) told me that during test burning *"everyone gets scared and anxious"* as they recognise the *"responsibility that comes with [it]*." This highlights the sense of accountability that accompanies prescribed burning, reflecting an awareness among prescribed burners of the potential risks of fire and need for careful management.

During the burn, a crucial tool that supported the burn team in connecting to fire were their own bodies and affective registers. Resonating with Tilley (2004, p. 79) who argues human engagement with the biosphere happens "through our sensing bodies," the burn team's bodies served as instinctive, affective registers that enabled them to connect to fire. Through a large register of bodily practices – e.g., watching the fire from the burn perimeter, feeling unburnt vegetation and the fire's heat on their faces, listening as the flames roared when consuming brush, breathing in its smoke, and recognising their instinctive adrenaline response when fire changed direction – the burn team begun to sense, attune to, understand the fire's behaviour. These intimate embodied experiences meant the burn team, the fire and the grove were brought together and in common with one another (Dudgeon and Bray, 2019; Tynan, 2021).

The firing and holding teams also used technoscientific tools to connect with fire. Technical tools, such as moisture sensors and anemometers, were used for the monitoring and assessment of climatological metrics. Their function was primarily to ensure the fire would likely remain controlled and safe (Sutherland, 2019). Others, such as drip torches and rake hoes, enabled the burn team to work with the fire. For example, using drip torches allowed the firing teams to light fire in strategic places that supported the burning of specific hazardous fuel, and the fire responded to holding teams when they used rake hoes to guide it to burn in a different direction. The burn team additionally relied on tactics inherited from fire suppression to control the fire – for example, they used water pumps, constructed control lines and applied firefighting techniques like backburning. These technoscientific tools and fire suppression strategies also served to mediate and validate the burn team's bodily practices with fire. Since prescribed burning is a relatively new intervention, many prescribed burners were learning to attune to fire. In this context, these tools and tactics provide a sense of security and assurance, allowing them to navigate their uncertainties while attempting to develop an intuitive connection with fire.

By coupling technoscientific capability and intimate bodily practices – drawing from fire suppression and Indigenous cultural burning respectively – moments of mutual understanding between the burn team, fire and grove occurred. For example, by sensing the fire was picking up speed when approaching the redwoods, attuning to their instinctive response, checking the wind direction reports on their radios and applying understanding of fire's rate of spread, the holding team were able to determine that the fire wanted to climb the trees. The burn team consequently responded by using their rake-hoes to guide the fire away from the trees. Connecting to fire left the burn team with new understandings and appreciations, enhancing

their ability to respond to fire in ways that support it to *"burn well"* and *"do good work"* (burn team members).

In 'Matters of Care: Speculative Ethics in More than Human Worlds' (2017), Puig de la Bellacasa emphasises the reciprocity of touch, suggesting touch is never a one-sided act. When one touches something, they are simultaneously being touched by it, highlighting the inherent mutuality of these encounters. Prescribed burners engaged in similar reciprocal encounters with fire. As Lottie (trainee burner) admitted during a break *"I just wanna be in it again... I just have such an urge. I've never felt this before..."* Lottie's urge to return to the fire reveals an intense, embodied connection. Her desire to be *"in it again"* suggests that fire is not something she is just interacting with in a detached manner but rather is a force she is drawn into and deeply affected by. This exchange exemplifies the reciprocity of connecting with fire: just as she touches the flames, the fire touches her and reshapes her experience and perception. Lottie's admission that she has *"never felt this before"* underscores the evolving relationship she is cultivating during the burn, contrasting sharply with her previous, fear-based encounters with *"black"* and *"violent"* wildfires. By connecting to fire, burning became a reciprocal encounter that felt *"right"* because its gentle, healing, co-constituted nature.

Caring through fire

By lunchtime the fire is burning hot and fast. The grove's calm atmosphere shifts to something more intense. Axel warns me "there's gunna be a bit of chaos." Axel was correct: fire starts climbing trees, line of sight communication is replaced with thick radio traffic and golf buggies with water pumps come racing down the track. A land steward pats four old-growths while telling them, "We're here to protect you." One redwood is causing particular concern to the fire personnel as it starts to resemble a candle. They're keen to use heavies and suppress the fire immediately. The land stewards disagree. "Look you've got let some things die, for others to survive, we are encouraging life" Chloe tells them while spraying another tree with water. Later Leilani tells me, tense interactions between fire personnel and land stewards "happen a lot. There's an engrained culture of fire folk and a lack of experience. They have been told they're the experts, when in reality we have more experience lighting these habitats on fire." She sighs, "we are stewards, we do it differently, we aren't just here for fuel reduction, we're here for the land, we're all here as students of fire."

After an hour of high intensity, the firing teams switch from backburning to dot firing around target vegetation. This drastically reduces the intensity of fire behaviour and supports the burn team to get "back in balance." As the atmosphere slowly returns to calm, I stand with Kaiah, gazing at the remnants of the burnt redwood. "We are concentrating our efforts on the old-growths now. We are trying to invest our energy into this place, and everything incorporated in it, all the different species and processes that exist here so it has a brighter future."

The quieter atmosphere remains as the burn transitions from the ignition phase to mop-up. Prescribed burners clear smoking vegetation from the control lines and feel the ground for subsurface hotspots. The flames subside, and the haze of smoke clears. Luna approaches me, looking deflated. "There was too much chaos brough to the forest." While I notice the grove

has settled into a renewed calm since the ignition phase ended, I ask her what she means. "I think the whole operation could have been slower with the types of fire on the redwood trees. There was a lack of understanding in the forest. It was too chaotic." Fynn interjects, "Yeah, we need to come in a different way" Luna nods, "it isn't anyone's fault or to speak badly though, it's all learning."

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Throughout the prescribed burn, the fire underwent a notable transformation in intensity, evolving from a gentle, creeping fire to a fierce, spirited blaze. Thinking with Tronto (1993, p. 127) who identifies four key ethical elements of care – "attentiveness, responsibility, competence and responsiveness" – the burn team attempted to care through fire, aiming to ensure the burn met its objectives. By connecting to fire, the burn team remained attentive to its dynamic behaviour and potential threat to the redwoods. They showed a willingness to respond, taking responsibility to shift their interactions with fire to protect the trees. They demonstrated competence by spraying the redwoods with water, adjusting their ignition strategy, and pulling fire away from the control lines. In response to these careful actions, the fire stopped climbing the trees and decreased in intensity. Prescribed burners interacted with the fire in a way that "render[ed] each other capable" (Haraway, 2016, p. 18). By carefully interacting with fire, they were able to keep it under control and attempt to care for the grove though its use. Without care being taken, the fire would have burnt uncontrolled, threatening the redwoods and entire grove, and forcing fire agencies to intervene and suppress it.

Although fire personnel wanted to use heavy equipment to suppress the fire when it was burning in a challenging way, the land stewards remained committed to prescribed fire. They refused to use fire engines acknowledging fire's more-than-human capacity to care for the

grove and its essential role in supporting ecological balance, which suppression would disrupt. As Leilani told me, tension between fire personnel and land stewards is not unusual due to the entrenched culture of fire suppression and their lack of experience interacting with fire outside of a firefighting context (Marks-Block and Tripp, 2021). Unlike in fire management where "humans are seen to have sole authority over the land" and fire (Tynan, 2021, p. 602), the burn team sought to cultivate more caring relationships with the more-than-humans present. Fire was encountered as a co-worker, caretaker, and teacher to be nurtured, instead of an enemy to be suppressed. Processes of death and disturbance, typically resisted in fire suppression, were embraced as essential to the grove's health. Death was not viewed as destructive but as a form of caring through fire – a necessary renewal cycle that fosters life and supports the ecosystem's longer-term vitality. By caring through fire and enabling it to enact its more-than-human caring capacities, the burn team contributed to *"a brighter future"* for *"all the different species and processes"* (Kaiah, burn boss) within in the forest.

There were, however, tensions in the burn team's attempts to care through fire. As Luna (land steward) observed, *"There was too much chaos brought to the forest... the whole operation could have been slower with the types of fire... There was a lack of understanding..."* This holds resonance with Marks-Block and Tripp (2021, p. 16) who argue prescribed burners "often lack the local fire knowledge or relationships that have co-evolved with fire ecologies." Indeed, the burn team, sometimes, imposed firing and holding strategies that conflicted with the grove's needs, meaning their interventions were *"too heavy-handed"* (Luna). In the essay 'Fire', Tynan, a trawlwulwuy woman, and Cavanagh, a Bundjalung and Wonnarua woman, emphasise that "To know fire and how to do fire the right way has nothing to do with fire. It has everything to do with Country and knowing Country intimately." (2021, p. 3). In detailing Indigenous cultural burning, they highlight burning is not about mastering fire, rather it is a deeply "relational practice" (Tynan, 2021, p. 602) rooted in longstanding relationships with the land. In contrast, the burn team focused on control and efficiency during the prescribed burn, often prioritising this over relationality. Their reliance on technoscientific tools and fire suppression tactics – e.g., firing patterns, water usage, radio communications – detracted from the subtle energetic and relational aspects of burning. This meant the burn team did not always effectively attune and respond to the grove's needs and rhythms, leading to misaligned interventions and dissonance between burning practices and the landscape. At points, the burn team's care through fire fell short of caring for the entire grove; their approach was procedural rather than relational, focusing more on control and efficiency of the fire over the grove's needs. However, as Luna noted, *"it's all learning,"* a reminder that relationships with fire are evolving in prescribed burning. Prescribed burners recognise their shortcomings and remain committed to *"com[ing] in a different way"* (Fynn, land steward). In many ways then, caring through fire reflects the patience, humility, and willingness of prescribed burners to engage in the work of caring, even when outcomes are uncertain or imperfect.

Grappling with fire

A few days after the Grove of Old Trees burn, I help Alice, Bobby, and Skye with pile burning at another preserve. It's nice to be back around prescribed fire. I ask Alice how she felt after

the burn: "It was beautiful! Normally I feel like hell yeah, that was awesome, that was really successful" Alice pauses "I still felt that this time, but in the midst of that I felt frustration, sadness. I felt joy, I felt love, I definitely felt everything, like hope, but I think with that hope, I felt frustrated that these pieces of land are even able to get to this point, that is where the frustration lies. How did we let it get to this point, like this far? Like c'mon people. So, it sucks to be in this position where it's so tricky to burn in these redwoods because that of that lack of stewardship, lack of interaction." We continue working, carefully adding ground fuel to the burning piles. "It's love", Alice smiles. "Huh?" I reply. "I feel like with 100 years of fire suppression and it being drilled into us that fire is bad, it creates death and destruction, but yeah, I don't see it in that way anymore. I see it as there are things that will die in the process, but there is gunna be more life after that, I do believe fire brings so much life, and to me that is loving." Alice shares, at the end of the burn, she "wrote love on the ground… there was a fire burning on the ground that said love." I tell Alice I was sad to miss it, and she replies "yeah maybe no one saw it, but it was sweet, it felt good. The trees saw it though, the forest felt it. I think the forest loves us too." I ask why she thinks that. "She will reveal things to you as you get to know her."

At lunchtime, we gather around a burn pile, and I find myself staring at the flames. Alice smiles, "there's something about it, right?" I sense satisfaction in her voice. "We've been pretty intentionally blind to this family member. We've created challenges in our relationship," she says. "But like, its family, if we are living here, fire is family and we can have empathy for fire, right? Like its role here, and what we've done with that. Empathy for the people who've been using it for so long, who've been side-lined or snuffed in that effort and in that tending and knowledge."

The four of us continue chatting. "Look, we live in California. California is fire. Fire is California. But yeah, we just lost it for a bit. We're in a place with our land where we've never been before, and that's a scary thing! How the heck do we know what to do next? We're the ones trying to figure it out, which means mistakes will be made, it'll be really hard, but we have to keep igniting this new relationship with fire, living with fire!" Annie passionately tells me, while Bobby and Skye nod enthusiastically. The conversation centres around fire management moving forward: "we must learn to be a good family member again", "not demonise it but be considerate in its setting" and "bring it in as a relative, teacher, ally." I provocatively ask, why? They all laugh, "so the winds in fall become safe again," "because we have to, it's right. Colonisers and white people should clean up their fucking mess," "yeah, for the future."

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A prescribed burn is a disturbance, "a change in environmental conditions that causes a pronounced change in an ecosystem" (Tsing, 2015, p. 160). Such disturbance can be "a beginning, that is, an opening for action" whereby "disturbance realigns possibilities for transformative encounter" (Tsing, 2015, p. 152). During the prescribed burn, the burn team were intimately part of this disturbance: they witnessed, felt and were actively involved in its process. For many, this encounter with fire became "transformative" (Tsing, 2015, p. 152),

prompting them to "grapple with" their relationships with fire while opening new avenues of feeling and reflection (Pratt, 1998 cited in Sutherland, 2019, p. 787)

Holding resonance with Jones's (2019, p. 645) work on gardening in urban forests, where gardeners move "their bodies to the tune of plant bodies," enabling them to develop an intimacy that "complicates and changes the way [they] think and feel about them," Alice (land steward) described her own intimate experience of prescribed burning. Through burning – connecting to and caring through fire – she came to know both the fire and grove in new ways, ultimately shifting her thoughts and feelings about them. Alice's experience of burning was healing, she no longer viewed fire as *"bad"* or solely destructive, but as something joyful and *"loving."* Prescribed burning supported Alice to feel differently about fire than the suppression narratives *"drilled into"* her. Prescribed burning also transformed Alice's relationship with the landscape; her embodied engagement with fire facilitated her to attune to the grove in new ways, fostering a reciprocal connection as the forest *"revealed"* herself in the process. This reciprocity, where the burn team expressed love for the grove through fire, and the grove responded by "reveal[ing] herself" (Alice), indicates a deeper relational shift. Prescribed burning, as a practice of disturbance, does more than manage risk or restore ecosystems; it creates possibilities for the burn team to think and feel differently about the more-than-human world.

Prescribed burning opened space for the burn team to grapple with the troubled past, fragile present, and uncertain future of fire. Drawing on Haraway's (2016, pp. 38–39) reflections on mourning, "mourning is about dwelling with a loss and so coming to appreciate... how the world has changed, and how we must *ourselves* change and renew our relationships if we are to move forward from here...," – Annie, Bobby and Skye (land stewards) mourned fire as they confronted its complex history. Their mourning unfolded as an active engagement with the ecological and cultural changes that have shaped California's fragile present. They acknowledged the ecological harm associated with fire suppression, but also the loss of Indigenous cultural burning. They conveyed deep frustration, sadness, and empathy, acknowledging fire suppression had made it "*tricky to burn"* and *"created challenges"* (Alice) in their relationships with fire.

The "transformative encounter" (Tsing, 2015, p. 152) of burning prompted the burn team to recognise fire and themselves as mutually at stake in their relationship with one another (Haraway, 2016). As Alice poignantly stated "*We live in California. California is fire. Fire is California...,"* recognising both the interdependence between humans and fire in California, and how their fates are inextricably intertwined. This realisation compelled Alice, Bobby and Skye to reflect on how prescribed burning must cultivate more intentional and reciprocal relationships with fire. Inspired by Indigenous cultural burning, they proposed relationships with fire in prescribed burning must evolve to *"learn to be a good family member again"* (Bobby), *"be considerate in [fire's] setting"* (Alice), and embrace fire *"as a relative, teacher, ally"* (Skye). The stakes of their vision for the future of prescribed burning extended beyond wildfire prevention and making *"the winds in fall become safe again"* (Skye). Instead, they saw these relationships with fire as key to fulfilling the responsibilities of living in California, addressing the *"mess"* of colonial fire suppression and striving to *"get back to good stewardship"* (Bobby). Grappling with fire, then, involves more than merely acknowledging

its uncertain future; it is about becoming response-able (Haraway, 2016; Tsing, 2015) in relationships with fire. This resonates with Haraway's (2016) wider appeal of 'staying with the trouble' as prescribed burners recognise the challenges and complexities that lie ahead – e.g., potential *"mistakes"* and *"really hard"* work required – while remaining steadfast in the commitment to *"keep igniting [a] new relationship with fire"* and *"living with fire"* (Alice).

5. Towards living with fire

This paper centred the intricate relationships with fire that emerge during prescribed burning – a practice of intentionally apply controlled fire to landscapes to achieve specific objectives. By examining a prescribed burn conducted by a PBA, my empirical findings revealed four distinct relationships with fire: *Prepping for fire* was underscored by an appreciation of fire's value in Californian landscapes while also acknowledging its unpredictable agency. This preparation involved the burn team's careful efforts to welcome fire, requiring attentiveness to the more-than-human entities burning depends upon. *Connecting to fire* emphasised the close engagement and diverse tools essential in prescribed burning. Through the burn team's embodied, sensory interactions – touching, feeling, watching, listening and so on – they begun to attune to fire, gaining new understanding and appreciations of fire. *Caring through fire* illustrated a relationship characterised by intensified attention, involvement, and knowledge, wherein members of the burn team interacted with fire in a manner that "render[ed] each other capable" (Haraway, 2016, p. 18) to care for the grove. Fire, in this view, was a partner in care, not an entity to be acted upon and suppressed. *Grappling with fire* revealed how prescribed burning can be understood as a "transformative encounter" (Tsing, 2015, p. 152), encouraging reflection and new avenues of feelings and perceptions regarding the past, present, and future of fire. It involved coming to terms with the reality that fire and humans are at stake in their relationship with one another (Haraway, 2016). All of which expand geographical scholarship on fire management by revealing the embodied, caring relationships with fire that shape how fire is understood, valued and managed in prescribed burning.

Prescribed burning deserves consideration as it signals the emergence of a new relationship with fire, distinct from previous fire management approaches. While colonial fire suppression aims to eliminate fire as a destructive force, prescribed burning reintroduces it as a beneficial tool for preventing wildfires and supporting ecological health. Prescribed burners welcome fire as both a co-worker and caretaker, while acknowledging it must be carefully prescribed and managed to achieve its objectives and prevent it burning uncontrollably. The affective and caring relationships with fire in prescribed burning move away from the fear-based, controlling, and confrontational relationships characteristic of fire suppression approaches. Prescribed burning borrows from the deeply "relational practice" (Marks-Block and Tripp, 2021; Tynan, 2021, p. 602) of Indigenous cultural burning – e.g., by applying fire to Californian landscapes, – yet it falls short of enacting the reciprocal, kincentric relationships that define such practice.

Prescribed burners occasionally prioritised wildfire prevention, control, and efficiency over connection, care, and relationality. This sometimes led to a reliance on fire suppression tactics or an overdependence on technoscientific tools, rather than embracing fire's more-than-human

agency and building intuitive bodily connections with fire. This highlights the ongoing challenge of prescribed burning to truly move beyond the dominant, controlling, and adversarial relationships with fire as it remains entangled and in tension with the troubles inherited from fire suppression. Addressing this issue calls for a critical examination of the underlying dynamics of settler colonialism in fire management, as prescribed burning cannot – and should not – replicate the relationships with fire that define Indigenous cultural burning. To genuinely move beyond fire suppression, it is essential to rectify the suppression of Indigenous cultural burning and relationships with fire. Therefore, prescribed burning must be coupled with the repatriation of Indigenous lands and the allocation of resources to support Indigenous-led fire initiatives to ensure that PBA efforts do not appropriate Indigenous knowledge and "perpetuate the settler colonial power structures responsible for the volatile conditions of California landscapes today" (Eriksen and Hankins, 2014; Lake and Christianson, 2019; Marks-Block and Tripp, 2021; Martinez, Seraphin, *et al.*, 2023, p. 144).

Despite the tensions inherent in these relationships, prescribed burning represents a meaningful step toward *"living with fire"* (Alice), which is particularly important in the context of the escalating wildfire crisis. Drawing on Tynan (2021, p. 599) who emphasises "relationality is not easy, especially when living in a settler-colony," I argue prescribed burning serves as a means for people – many of whom have been conditioned by dominant fire suppression – to come to terms with their relatedness with fire. Through this process, prescribed burners begin to see themselves as interconnected with fire. They are learning how to cultivate reciprocal, caring, and nurturing relationships, and what it means to become response-able (Haraway, 2016; Tsing, 2015) with fire. This paper thus contributes to more-than-human geography, by demonstrating how people are rethinking and reconstructing their relationships with more-than-human entities amid crises, learning to coexist with them rather than oppose them. I demonstrated that reconsidering relationships with more-than-humans (like fire) is neither simple nor linear; it requires dedicated practice, continual reflection, and a genuine commitment to navigating complexities and uncertainties. Ultimately, this paper encourages further research into relationships with more-than-human entities, challenging us to explore, question, and reimagine pathways toward more caring, relational, and sustainable coexistence with them.

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9. Conclusion

I began this thesis with a poster of Smokey Bear. Water bucket in paw, his eyes soft with concern, his gesture calm and corrective, he offered a simple message: **Care <u>will</u> prevent 9 out of 10 woods fires!** In Smokey's world, care was precise, corrective, and conclusive. Fire was a threat; suppression was the care. Through this care, catastrophe could be avoided.

Now, after six months in the field, three years of reading and writing, and countless hours thinking with care and with those entangled by it, I return to Smokey Bear. I've come to understand that care does not always look like him. It doesn't always wear a ranger's hat. It doesn't always arrive with certainty, clear instructions, or confident hands. Yes, sometimes, care is putting out fires. But sometimes, it is lighting them. Sometimes, it is waiting – for weather shifts, for seasonal declarations, for budgets to be approved. Sometimes, it is repetitive: clearing brush for the fourth time in a fire season, sending follow-up emails, or adjusting the fire danger rating day after day.

Care can be a chipper machine whirring. A line drawn on a map. A sheep bleating while creating a firebreak. A quiet nod after someone says they won't evacuate next time. Care is not one thing, and it is rarely straightforward.

Care, I have learned, is slow, collective, uneven, and often unfinished. It unfolds in fits and starts. It is practiced by people who do not always agree, under conditions they cannot fully predict, with things – such as goats, rake hoes, educational flyers, mobile apps, and weather forecasts – that do not always cohere. Yet it persists, navigates and sustains. Care does not eliminate uncertainty, tension, or ongoing crises, but it makes life and flourishing possible in an increasingly flammable world.

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9.1. Care in an increasingly flammable world

This research unfolded against the backdrop of intensifying wildfires that have offered California a glimpse into the escalating challenges of a climate-changed future. Wildfire is no longer an exception, nor is it reliably seasonal; it arrives unexpectedly, unsettling rhythms of everyday life and reshaping the terrain in which communities must live, manage, and adapt. Following Puig de la Bellacasa (2017, p. 67), who reminds us that care is "a vital necessity" in more-than-human entanglements, this thesis has explored the kinds of care being taken to navigate, sustain, and hold onto life in an increasingly flammable world.

While care has traditionally been associated with the feminine, the private sphere, and intimate, face-to-face encounters, especially in the context of disaster response and recovery (Alburo-Cañete, 2024; Buser and Boyer, 2021; Power and Williams, 2020), this thesis advances a more expansive understanding. Drawing primarily on Puig de la Bellacasa's (2012, 2017) work, I have developed a "triptych notion of care" as a necessary affective state, an ethico-political commitment and a hands-on labour (2017, p. 218). This conceptualisation informed my way of thinking about and with care, as well as my methodology, enabling me to develop an approach attuned to the diverse, situated, and often unexpected ways that care surfaces in an increasingly fiery world. Throughout this thesis, I have demonstrated how wildfire risk management activities, everyday rhythms, and long-term efforts to coexist with fire are animated by, and entangled in, relations of care. These moments – whether found in the movement of grazing sheep, the ping of an emergency alert, the clearing of vegetation, or the first heavy downpour of November – demonstrate that care is not only reactive, but constitutive of how communities in fire-prone regions understand, manage, and live with fire and fiery landscapes. By staying with these surfacings of care, this thesis has attended to their entanglements with multiple temporalities, materialities, participants, affects, and practices. In doing so, this thesis suggests that it is through care, in its many forms, that life continues – imperfectly, unevenly, and collectively – in regions already burning.

In this thesis, I have explored the kinds of care being taken to navigate an increasingly fiery world, focusing on wildfire risk management as a critical site where care unfolds. Extending the work of critical disaster geographers who conceptualise risk management as a more-than-human entanglement (Angell, 2014; Donovan, 2017; Grove, 2012; McGowran and Donovan, 2021), I have argued that wildfire risk management is not only a domain of securitisation and techno-managerial control, but also an entanglement where care is produced, circulated, and encountered. Guided by the recognition that wherever there is a relation, there must be care (Puig de la Bellacasa, 2012, 2017; Tronto, 1993), I have reclaimed risk management as a world animated, and at points sustained, by affective, ethico-political, and material relations of care. Throughout the thesis, I have shown that care is not limited to feminised, human-to-human (emotional) labour following disastrous events, as it is frequently represented in prevailing discourses of disaster (Alburo-Cañete, 2024; Ramalho, 2021). Instead, I have argued that care weaves through the many activities and relations that constitute life in fire-prone regions: care stored in warehouses, care activated on red flag days, care enacted in the present for imagined safer futures, care that helps people sleep in the fire season, and care that falters but tries again.

I have evidenced care in risk management as quiet, uneven, obscured, distributed, disengaged, more-than-human – and all of these at once. There is often nothing exceptional or necessarily heroic about the surfacings of care in wildfire risk management. It is not always proximate, visible, or emotionally expressive. And yet, as this thesis has argued, care underpins the very possibility of sustaining life in increasingly fiery landscapes.

Recognising care "holds the possibility...of facilitating new ways of being together" (Conradson, 2011, p. 454), this thesis has also explored how care is being taken in efforts to live with fire and flammable landscapes. I have argued that care is a vital component that enables individuals and communities to live and flourish in the face of uncertainty, tension, and ongoing crises. In this context, I examined how care can take the form of stamina: a sustained, ongoing commitment to navigating and enduring life in a fire-prone world. I also explored how individuals and communities in Sonoma County hold onto and maintain the temporal framework of the fire season, even as it becomes increasingly destabilised; this involved care in reworking temporal structures, coordinating everyday life, and rendering time liveable amid the instabilities of a climate-changed world. I also demonstrated how new relations with fire are being forged through prescribed burning practices, relations that move away from dominant logics of control, adversary and efficiency. Instead, I argued prescribed burners are learning to cultivate more reciprocal, caring, and nurturing relations with fire, offering an opening toward becoming response-able (Haraway, 2016; Tsing, 2015) within landscapes that burn. While these kinds of care are not always harmonious or frictionless – and are often marked by exhaustion, interruption, or ambivalence – they nonetheless signal a vital orientation toward reconfiguring how to live "as well as possible" (Puig de la Bellacasa, 2017, p. 161; Tronto, 1993, p. 103) with fire and fire-prone landscapes. They embody a commitment to continue caring even when care is difficult, to remain attentive, responsible, and responsive within everyday life increasingly shaped by fire, and to forge "new ways of being together" (Conradson, 2003b, p. 454) that are grounded in interdependence, reciprocity, and repair.

At the heart of this thesis is the argument that care is the very fabric of life in an increasingly flammable world, entangled in moments where life is maintained, continued and repaired (Puig de la Bellacasa, 2017; Tronto, 1993). Care is not only mobilised in the face of wildfire, but is also deeply relied upon in anticipation, in the days in-between, and in the collective effort to work toward more liveable, flourishing futures. It is essential for "individual and collective survival" (Lawson, 2007, p. 5). Throughout the thesis, I have documented diverse ways in which the question and answer of "how to care" (Puig de la Bellacasa, 2017, p. 5) are continually reconfigured to make communities safer, minimise disruption to everyday life, and cultivate healthier, more resilient landscapes. While I have shown how certain relations, people, practices, and more-than-human phenomena need care in a flammable world, I have primarily sought to centre the ways in which more-than-human entanglements are, at times, becoming more care-full. These are moments we can learn from, nurture, and build upon.

Throughout this thesis, I have also explored how care can reorient what research is and what it does. I argued that I was not separate from the caring world I studied, but drawn into it, entangled, implicated, and at stake. I explored why I cared about wildfire, risk management,

and California, and what responsibilities that care demanded of me. Guided by feminist ethics of care (e.g., Brannelly, 2018; Brannelly and Barnes, 2022b; Edwards and Mauthner, 2012; Puig de la Bellacasa, 2012; Tronto, 1993, 2013), I developed an approach that employed intentional practices of researching *with* care and recognised the possibility of research *as* care. Through participant observation, storytelling interviews, photo go-alongs, and document analysis, I created space for attentiveness, responsibility, responsiveness, competence and solidarity. These methods enabled a relational mode of inquiry, where being attuned to care required attention not only to 'data', but also to feelings, failure, and reciprocity. I did not merely observe the world I was researching; I carefully participated in it, moved with it, and was affected by it. I also approached analysis and research communication with care, reflecting on how to represent participants and findings in an ethical and meaningful manner, while attending to the potential legacies of this work and how to conclude it well. This commitment shaped the form of the thesis itself, which opens space for visual data, narrative experimentation, and the centring of participant voice. In doing so, I advocate for more care-full research practices – practices that remain responsive to the people, places, and more-than-human entanglements they become embedded within, and more accountable to the responsibilities those entanglements entail.

In what follows, rather than summarising each of the six papers' conclusions or mapping them neatly onto the research objectives, I draw out the conceptual and empirical insights that run across them. By weaving these threads together, I show how the thesis as a whole contributes to and extends the four key bodies of scholarship introduced at the outset: fire geographies, critical geographies of disaster, feminist and post-humanist theories of care, and scholarship on caring research. In articulating these contributions, I suggest pathways for future research, highlighting how scholars might extend this thesis in exciting new directions. I also offer interventions to those in disaster policy and practice, highlighting the ways in which this research could inform their essential work in the future. I close with a reminder to myself and readers about the ongoingness of care.

9.1.1. Fire geographies

In this thesis, I have demonstrated that fire remains deeply entangled in the histories of colonialism, ecological transformation, and social struggle. As other fire geographers have also argued, these complex, intertwined trajectories render fire not a neutral or purely natural force, but a culturally, politically and ethically charged phenomenon (Beggs and Dalley, 2023; Martinez *et al.*, 2023; Neale, 2018; Pyne, 2015; Sloan Morgan and Burr, 2024; Sutherland, 2019; Vinyeta, 2022). My research has demonstrated that as the wildfire crisis unfolds across the western United States – amid the escalating climate crisis and the failure of fire suppression and dominant techno-managerialist approaches – individuals communities are reconfiguring how they understand, manage, and live with fire and flammable landscapes (Edwards and Gill, 2016; Eriksen, 2024; Howitt, 2014; Sonoma Land Trust, n.d.; Williams, 2014). In this context, I offered an understanding of the kinds of care that are surfacing as part of learning to live and flourish in a world already burning. By foregrounding care, I have argued that the wildfire crisis cannot be addressed solely through technical fixes or managerial control (Asiyanbi and

Davidsen, 2023; Beggs and Dalley, 2023; Essen *et al.*, 2023; Sutherland, 2019), but instead requires more relational, care-full responses. Rather than detailing each of these caring responses in isolation – such as maintaining seasonal rhythms, forging more-than-human relations, or sustaining the stamina to care – I now turn to draw connections across them. In what follows, I articulate three key orientations of care that my research brought into focus, each of which contributes to and extends ongoing conversations in fire geographies.

Across this thesis, I have shown that individuals and communities take care in order to sustain everyday life in landscapes increasingly shaped by fire. This care is about surviving future wildfires and continuing to live 'normally' – maintaining rhythms, routines, and attachments. For instance, in Paper Five, 'The Fire Season?', I demonstrated how individuals and communities uphold the fire season as a meaningful temporal structure, even as the changed and changing climate unsettles its reliability. In Paper Three, 'Making care visible...' and Paper Four, 'Stockpiled, Standby, Stamina...', I demonstrated how care is mobilised to reduce harm and preserve everyday functioning amid future disasters yet to come. This kind of care is attuned not to control but to coping, navigating precarity while striving to sustain or recover everyday life "as well as possible" (Puig de la Bellacasa, 2017, p. 161; Tronto, 1993, p. 103). In doing so, this thesis contributes to fire geographies by advancing an understanding of care that complements and extends existing work on preparedness and resilience (Howitt, 2014; Moritz *et al.*, 2014; de Vet *et al.*, 2019). In particular, thinking with O'Grady's (2018) work on fire governance, I have extended understanding of how care is a lived relation to risk and how future wildfires become the basis for present-day acts (of care). I have shown that amid fiery landscapes, people are not only actively caring in the moment – striving to maintain the everyday – but also caring toward the future, attempting to hold together 'normal' life through disasters yet to come. This dual orientation of coping now and building capacity for what lies ahead highlights care as an ongoing practice that is central to what it means to live with fire and wildfire.

Throughout this thesis, I have also shown that individuals and communities are taking care to cultivate new relationships with fire and fire-prone landscapes in order to live better amid increasing flammability. Building upon debates regarding wildfire risk management approaches (e.g., Beggs and Dalley, 2023; Eriksen and Hankins, 2014; Sloan Morgan and Burr, 2024; Sutherland, 2019), I argued in Paper Six 'Learning to live with fire...' that prescribed burning fosters an emergent set of relations with fire that draws upon Indigenous fire practices while moving away from – yet remaining entangled with – colonial fire suppression. I have also explored how individuals and communities are taking care to build new relationships with other more-than-humans in order to live better with fire and landscapes that burn. Across this thesis, I have traced these relationships as extending to, for example, technologies, fire tools, Diablo winds, landscapes, PSPS alerts, grazing animals, and smoke. This care to cultivate new relationships with more-than-humans extends scholarship that underscores that knowing and learning to coexist with fire and fire-prone landscapes relies equally on experiential insights and embodied practices as on intellectual knowledge (Eriksen, 2024; Williams, 2014). I have shown that such care involves practices of sensing, attunement, recognition and responsiveness

– requiring time, attention, and a willingness to be affected by fire and more-than-human others.

This thesis has also evidenced a third, overlapping orientation of care: the persistent commitment to keep caring amid the growing dominance of wildfire. Drawing together insights from across the research papers, I have shown that despite escalating catastrophic fires, the destabilisation of the fire season, the failures of suppression strategies, and persistent resource constraints, individuals and communities remain committed to care. They continue the everyday, often demanding, work of figuring out how to live better with fire and reconfiguring "how to care" (Puig de la Bellacasa, 2017, p. 5) under conditions of ongoing crisis. For example, in Paper Four, 'Stockpiled, Standby, Stamina...', I conceptualised care as stamina, in Paper Six, 'Learning to live with fire...', I demonstrated how prescribed burners are attempting to undo dominant relations with fire of control and exclusion, and in Paper Three, 'Making care visible...', I extended an argument that care enables people to continue inhabiting fire-prone landscapes in ways that feel liveable, familiar, and worthwhile. Contributing to fire geographies, I show that amid uncertainty, tension, and ongoing crises, a persistent commitment to care endures. This orientation of care involves repeated, individual, and collective efforts to return, adapt, and reconfigure life in the face of fire's growing dominance. I argue that living with fire depends on this everyday, often unseen work of care – of coming back (again, again and again) with attention, endurance and, to borrow Haraway's (2016) vocabulary, a commitment to 'staying with the trouble' of flammability.

Future research in fire geographies can build on these contributions by taking seriously the care being enacted in an increasingly flammable world, not as quick fix-all solutions but as ongoing, relational practices through which people, fire, and landscapes learn to live and flourish together. Future directions could include further attending to reciprocity in burning practices, everyday modes of coexistence, and the emotional labour involved in living with fire. Taking care seriously also means grappling with its frictions, failures, and transformative possibilities – remaining attentive to both the limits and the generative potential of care in fire-prone regions. This requires asking not only how care is practiced, but also where it is absent, excluded, or denied in dominant approaches to living with fire. One critical site of both care and its denial – addressed in Paper Six, 'Learning to Live with Fire...' – is Indigenous fire practices. Future research must engage in collaborative efforts that support Indigenous fire futures, are led by Indigenous scholars and fire practitioners, and are grounded in Indigenous sovereignty. Merely adopting or applying Indigenous knowledge without reckoning with the (care-full and careless) relations surrounding fire management reproduces settler colonialism (Martinez *et al.*, 2023).

9.1.2. Critical geographies of disaster

In addition to contributing to fire geographies, this thesis has made a series of interventions into the closely related, though distinct, field of critical geographies of disaster. In particular, it has offered one of the first sustained attempts to think with and through care within this field. In doing so, I have argued that entangled relations of care (broadly conceived) animate and

sustain the world of risk management. By foregrounding care as a vital, if often overlooked, force in risk management, this thesis calls on critical disaster geographers to more fully attend to the relational dynamics that underpin, maintain, and hold these worlds together.

This thesis has advanced a case for centring care as both an analytical and methodological imperative within critical geographies of disaster. Critical geographical scholarship has long shown how relationships, power dynamics, and value systems shape the production, perception, and management of disasters (e.g., Donovan, 2017; Gaillard and Mercer, 2013; Grove, 2014a; McGowran and Donovan, 2021; O'Grady and Shaw, 2023; Sou, 2022; Sou and Howarth, 2023). Building on work that uses assemblage theory to conceptualise disaster and risk management as situated, contingent and relational (Angell, 2014; Donovan, 2017; Grove, 2012; McGowran, 2024; McGowran and Donovan, 2021), this thesis argued that feminist ethics of care should be central to how these approaches are grounded and researched. In Paper One, 'Critical geographies of disaster...', co-authored with colleagues, we proposed critical disaster geographers "think... with care" (Puig de la Bellacasa, 2017, p. 52) to reorient understanding of disasters and their management as "matters of care" (Puig de la Bellacasa, 2011, p. 1, 2017, p. 1). This approach offers a caring critique – one that is reflexive, power-aware, and attentive to plural lifeworlds and imagined futures. It also opens space for historically and geographically sensitive accounts that contribute to both justice and effective risk management.

This thesis has also made an empirical case for care as "a vital necessity" (Puig de la Bellacasa, 2017, p. 67) in the more-than-human entanglement of wildfire risk management. Responding to Alburo-Cañete's (2024, p. 13) call to challenge "the confinement of care to women" in disaster contexts and responding to my own concerns about its frequent association with the feminine, the private, and face-to-face encounters in disaster response and recovery, I sought to move beyond such limited framings. Throughout this thesis, I have traced how care surfaces in diverse and often unexpected ways: for example, in the maintenance of aerial firefighting helicopters, the planting of native grass plugs in burn scars, the storing of pet carriers in preparation for evacuation, the grazing of sheep to reduce fuel loads and the sustained efforts of non-profits to engage publics in risk communication. These varied relational practices all attempt to make communities and landscapes 'safer' – or life more liveable – in the face of wildfire. This perspective challenges dominant representations of risk management as a purely techno-managerial endeavour, instead foregrounding the entangled and often unseen relations of care that animate, sustain, and hold such a world together. Central to this argument is the idea that risk management is a more-than-human entanglement, where care may not be visible, proximate, human, or emotionally expressive, but is nonetheless essential.

By attending to how care is being taken in Sonoma County as communities navigate life in an increasingly flammable world, this thesis complements and extends the work of critical disaster (and emergency) geographers. In Paper Four, 'Stockpiled, Standby, Stamina...', I examined how practices of stockpiled care and care on standby are shaped by what Anderson (2010) conceptualises as logics of preparedness and precaution. I also introduced care as stamina – sustained, purposeful, and present-focused efforts oriented toward the collective good – and

highlighted how such practices can generate what Solnit (2010, p. 306) describes as "joy in disaster... from that purposefulness." At the same time, I demonstrated how institutional framings of individual resilience (Grove, 2014b), particularly in relation to stockpiled care, often shift responsibility onto individuals as agencies retreat from their duty of care (Bankoff, 2018). In this context, I argued that everyday care practices become a form of "everyday resistance" (Sou, 2022, p. 23), through which people respond to immediate needs, solve practical problems, and sustain life in precarious conditions. Together, these insights show how a focus on care can deepen and nuance critical disaster geography by foregrounding the lived, relational dimensions of risk management.

A focus on care brought into view the temporal and more-than-human dimensions of risk management, offering new insights for critical geographies of disaster. In Paper Five 'The Fire Season?', I developed an account of seasonalities in Sonoma County relating to the "recurrence of hazardous rhythmic patterns" (Staupe-Delgado *et al.,* 2024, p. 2). I traced how communities recalibrated their seasonal ways of living in response to shifting environmental rhythms, prompting new modes of adjustment, attunement, accommodation, and alignment. This analysis raised new questions about alternative temporalities, emergent rhythms and what "keeps livable assemblages alive" (Gan and Tsing, 2018, p. 133). In Paper Six, 'Learning to live with fire...', I showed how people are beginning to reconfigure their relationships with fire, not solely as a destructive force, but also as a vital, caring presence within the landscape. This included efforts to cultivate reciprocal, caring, and nurturing relationships with fire and other more-than-humans, suggesting new forms of coexistence with hazards and risks. Together, these papers extended critical geographies of disaster by showing how people are not simply managing hazards and the impacts of crises, but are finding situated, relational, and often improvised ways to live and even flourish with them – crafting relations, rhythms, and practices that sustain life in an increasingly disastrous world.

Looking ahead, how might critical disaster geographers place care at the centre of their research? As this thesis has demonstrated, centring a feminist ethics of care reorients understandings of disaster and risk management toward questions of responsibility, relationality, and interdependence. Attending with and to care enables researchers to recognise the often-overlooked practices of maintaining, continuing, and repairing that sustain everyday life amid disruption. Future research could build on this work by exploring care in other disaster contexts, including its diverse, de-gendered and de-anthropocentric forms. There is rich potential in examining how hazards, technologies, materials, animals, landscapes, and infrastructures participate in, enable and restrict care. Attending to these entanglements can deepen our understanding of how life is always enmeshed with, and dependent on, more-than-human care. While this thesis has foregrounded the presence of care, further research might also explore its absence – tracing carelessness, neglect, and structural injustice in ways that provoke ethical and political response (i.e., recognise research *as* care). Indeed, critical disaster geographers have long argued that disasters are rooted in power differentials (Donovan, 2017; Enns *et al.*, 2022; Grove, 2014a; McGowran and Donovan, 2021) and a focus on care can extend and complicate these theorisations, offering new ways of understanding and responding to vulnerability, resilience, resistance, and harm.

9.1.3. Feminist and post-humanist theories of care

Alongside its contributions to critical geographies of disaster, this thesis has also responded to feminist and post-humanist calls to rethink care beyond traditional framings of feminised labour and its confinement to human, private, or domestic spheres (Buser and Boyer, 2021; Lonkila, 2021; Puig de la Bellacasa, 2017; Schrader, 2015; Tronto, 1993). Building on a "triptych notion of care" as a necessary affective state, an ethico-political commitment and a hands-on labour (Puig de la Bellacasa, 2017, p. 218), I have argued that specific wildfire risk management activities and everyday practices in fire-prone regions constitute crucial forms of care. I have further contended that more-than-human others are vital participants in these caring practices. In doing so, this thesis expands understandings of what care entails, where it occurs, who enacts it, and to what end(s).

To move beyond common associations of care, I developed a methodology designed to capture forms of care that are often difficult to recognise, name, or grasp. Building on care scholarship that emphasises the challenges of researching care – for example, its embedded, relational nature and the often mundane, fleeting, or unfamiliar ways it is practiced and experienced (Dombroski, 2024; Lonkila, 2021; Morgan, 2025; Puig de la Bellacasa, 2017; Yeandle *et al.*, 2017) – I crafted an approach attentive to care "in the middle of things" (Tronto, 2015, p. 4). By recognising that care unfolds through people, practices, and more-than-human phenomena, I committed (methodologically) to trace care as it surfaced in unexpected ways, extending beyond feminised, domestic, or private labour. To achieve this, I combined conventional methods of multi-sited ethnography, participant observation, and document analysis with less conventional techniques of photo go-alongs and storytelling interviews. This multi-method approach created space for multiple expressions of care, including verbal, non-verbal, mundane, embodied, and more-than-human forms that might otherwise go unnoticed. As I detailed in this thesis, at times, this methodology felt messy and disorienting. I struggled with how to "make the cut" (Candea, 2007, p. 171) when following care, how to track its ordinary, mundane nature, and how to navigate its inherent frictions and ambivalences. Yet, it was precisely this openness to complexity and messiness that allowed me to attend to the many ways care surfaces in wildfire risk management and other efforts to live with fire in an increasingly flammable world.

Through this careful methodology, I have been able to identify and document care in ways that move beyond "reductionist notions of care as exclusively women's work or (emotional) labour in the service of needy others" (Buser and Boyer, 2021, p. 74). Instead, I have advanced an understanding of care as a relational practice that permeates by, in, and through diverse temporalities, materialities, participants, affects, and practices. Throughout this thesis, I have documented the mundane, ordinary and everyday relations and practices of care that are central and essential to sustaining life in an increasingly flammable world – for example, developing alert and warning apps, planning and implementing prescribed burns, maintaining mutual aid networks or routine acts of sending follow-up emails to concerned community members. This care is not always visible, proximate, remunerated, human, or emotionally expressive, but this does not diminish its significance in holding life together "as well as possible" (Puig de la

Bellacasa, 2017, p. 161; Tronto, 1993, p. 103). These relations and practices of care in wildfire risk management facilitate the everyday functioning of communities, contribute to safety amid wildfire risk, and help envision and enact more liveable, flourishing futures.

Responding to Schrader (2015, p. 668) provocation – "can we conceive of a less anthropocentric notion of care that is attentive to indeterminacies in its practices?" – this thesis has further destabilised the gendered, anthropocentric and spatial binaries through which care is often codified (Buser and Boyer, 2021; Puig de la Bellacasa, 2017). Building on Puig de la Bellacasa's (2017) post-humanist conceptualisation of care, I have challenged the ontological limits of who and what can participate in care relations by drawing attention to the diverse practices and participants involved in sustaining and navigating life in an already burning region. For example, I have argued that (among others) sheep, vegetation, fire, drip torches, rain, roadside signs, emergency operations centres, face masks, alert and warning systems, and mobile phones all play a role in producing, mediating, and circulating care. While these more-than-humans may lack ethical intent or emotional disposition (Buser and Boyer, 2021; Puig de la Bellacasa, 2017), I have demonstrated they are nonetheless entangled in the doing of care (see, Paper Three 'Making care visible' and Paper Four 'Stockpiled, standby and stamina...'). More-than-humans also shape what is cared for and when, effectively structuring the temporal rhythms, spatial dimensions and material doings of care (see Papers Four and Five, 'The Fire Season?'). Moreover, people often care through more-than-human, using them as tools or collaborators in practices of care (see Papers Three, Four and Six, 'Learning to live with fire...'). Taken together, these insights contribute to a non-moralistic, more-than-human understanding of care, expanding how care is conceptualised in relation to diverse temporalities, materialities, participants, affects, and practices. They reframe care not as a solely human ethical disposition, but as a distributed, relational process through which humans and more-than-humans co-produce the conditions for living in an increasingly fiery world. This re-conceptualisation brings into focus the interdependencies and responsibilities that sustain life and extends the significance of more-than-human contributions to care in precarious times.

"Thinking with care" (Puig de la Bellacasa, 2017, p. 52), this thesis has attended to the overlooked, hidden, and neglected entities and agencies that shape caring worlds. Following feminist care theorists who remind us that "care is often a site of ambivalence, tension, and puzzlement" (Atkinson-Graham *et al.*, 2015, p. 738; Conradson, 2011; Lawson, 2007; Martin *et al.*, 2015; Puig de la Bellacasa, 2011, 2017), I have sought to make such frictions visible – for example, the persistent tensions in wildfire risk management of settler colonial legacies of fire suppression (see Paper Six, 'Learning to live with fire...'); the uneven access to stockpiled care; and the physical and emotional toll of care as stamina which is often sustained without recognition or reward (see Paper Four 'Stockpiled, Standby, Stamina...'). I have begun to illuminate and interrogate some of the silences, erasures, and "the invisible labours" (Puig de la Bellacasa, 2017, p. 57) that structure care in wildfire risk management, drawing attention to the politics of care in a context where it is frequently overlooked or undervalued. Yet alongside this, I have also stayed with the generative potential of care – centring emergent sites of care-fullness beyond feminised, domestic and private spaces. The kinds of care that, while imperfect and contested, offer glimpses of possibility and transformation – for example, the care that

enables people breathe more safely during poor air quality days (see Paper Four), that supports the continuation of seasonal life (see Paper Five, 'The Fire Season?') and *"make[s] the winds in fall become safe again"* (Skye, Paper Six). By staying with these tensions, this thesis has sought to hold together both the burdens and possibilities of care. Rather than resolving care's ambivalences, it has dwelled with them – arguing that, in unsettled times, understanding care requires grappling with its contradictions, tensions, and transformative potential.

Considering these contributions, what might be the next steps for care scholars? There is much to learn from engaging with care in disaster contexts, especially by examining how care can be further enabled and supported in settings where it is currently constrained, overlooked, or under-resourced. Attending to the mundane and everyday relations of care – beyond feminised, domestic, or institutional framings (Buser and Boyer, 2021; Power and Williams, 2020; Puig de la Bellacasa, 2017) – also could offer critical insight into how care circulates through dispersed, informal, and often unrecognised practices. While this thesis has explored the politics of care, far more work is needed to understand how care is stretched, limited, or denied in different contexts. Further documenting the diverse enactments of a feminist ethics of care could help deepen understanding of "the full potential of radical care" (Hobart and Kneese, 2020, p. 12), especially amid uncertainty, tension, and ongoing crises.

Building on the contributions of this thesis regarding the role of more-than-humans within caring entanglements, much more work could centre their caring presence and capacities. My primary focus has been on people's "affective encounters" with more-than-human others (Archambault, 2016, p. 249) – such as the sense of security felt by stockpiling materials and the collective relief that follows a Diablo wind event that did not result in a wildfire. Moving forward, it would be valuable to explore the extent to which human researchers can further decentre themselves and create space for more-than-human others to assert their own rhythms, agencies, and demands within research processes. This would involve fully recognising and engaging more-than-humans not only as participants in care, but as agents, collaborators, and recipients of care in their own right (Lonkila, 2021; Puig de la Bellacasa, 2017). Such a shift would deepen care scholarship by challenging anthropocentric assumptions and foregrounding the co-constitutive nature of caring worlds.

9.1.4. Scholarship on caring research

Finally, this thesis contributes to a growing body of social science scholarship on caring research by centring feminist ethics of care throughout its research process. While it is well established that feminist ethics of care can inform research practice (e.g., Brannelly and Barnes, 2022b; Edwards and Mauthner, 2012; Lonkila, 2021; Puig de la Bellacasa, 2012), I have extended this foundation by offering a situated account of care in research as co-constituted, more-than-human, imperfect, and ongoing. In doing so, I align with broader efforts to reimagine research as a caring practice, one that remains accountable to the worlds it engages.

Throughout this thesis, I have intentionally attempted to do research that thinks and acts with care (Brannelly and Barnes, 2022b). I provided a reflexive account of how a feminist ethics of

care informed every stage of the research process – from formulating the topic and design to selecting the empirical case, conducting fieldwork, analysing data, communicating findings, and considering the research's longer-term legacies. I designed a methodology that supports intentional practices of researching *with* care and approaching research *as* care, placing relationships, responsibilities, and reflexivity at the centre. Drawing on Tronto's (1993) "phases" (p. 105) and "elements of care" (p. 127), I attended to the needs and concerns of participants, took responsibility for responding ethically to emergent issues, and aimed for competence by maintaining accountable and responsive research practices. I also considered how to build solidarities through shared attentiveness, co-presence, and mutual engagement.

This reflexive account of my research – developed primarily in Paper Two, 'Researching Care, *with* care, and *as* care...', but also woven throughout the thesis – contributed an understanding of care as co-constituted among all involved in the research, including moments when care was extended toward me as the researcher. While existing scholarship on caring research has predominantly emphasised unidirectional relationships, in which the researcher cares about, for, or takes care of participants (Brannelly, 2018; Brannelly and Barnes, 2022b; Edwards and Mauthner, 2012), I drew on feminist and post-humanist theorists that conceptualise care as a "shared accomplishment" (Conradson, 2003a; Tronto, 2013, 2015). In doing so, I observed, documented, and reflected on how care flowed not only from me, as the researcher, to the participants but was also extended by the participants toward me and enacted in collaboration with me. These multidirectional relations of care challenge the conventional framing of the researcher as the sole caregiver, and in my case, helped to mitigate some of the emotional and practical challenges of fieldwork.

Throughout this thesis, I contributed to scholarship on caring research by foregrounding care relations with more-than-human research participants, thereby expanding its scope beyond human-centred paradigms. Building on post-humanist care scholars who advocate for recognising more-than-human others as active participants in the worlds we research and emphasising more-than-human ethical responsibilities (Adams-Hutcheson, 2019; Brice, 2014; Haraway, 2016; Lonkila, 2021; Phillips, 2020; Pitt, 2018; Puig de la Bellacasa, 2017), I developed a methodology – and cultivated an attentiveness – that enabled me to respond to their presences, needs, and contributions. Rather than treating more-than-humans as background or context, I approached them as participants at stake in the research process (Haraway, 2016; Lonkila, 2021; Puig de la Bellacasa, 2017). This attentiveness shifted the research in meaningful ways, such as attuning to their contribution in risk management (see, Paper Three, 'Making care visible...', and Paper Four, 'Stockpiled, standby and stamina...'), recognising the rhythms of the fire season (see, Paper Five, 'The Fire Season?') and following prescribed fire (see, Paper Six, 'Learning to live with fire....'). Drawing further on post-humanist care theorists (Buser and Boyer, 2021; Puig de la Bellacasa, 2017), I also reflected on how more-than-human entities – including weather, animals, landscapes, and technologies – provided forms of care that supported me as a researcher. By documenting and exploring these reciprocal relations, I have challenged anthropocentric assumptions and contributed to an expanded ethics and praxis of care in research.

Scholarship on caring research acknowledges the importance of researchers having the "competence to carry out research well" (Brannelly *et al.*, 2022b, p. 14). While I do not challenge this claim, I have complicated it by showing that competence is rarely perfect, consistent, or complete. Rather than glossing over moments of tension, uncertainty, or potential carelessness, I chose to engage with them as part of my commitment to researching *with* care and approaching research *as* care. I demonstrated how competence – as an element of "care giving" (Tronto, 1993, p. 107) – can develop and shift over the course of a research project, adapting to evolving responsibilities and relationships. Moreover, I argued that competence is not cultivated in isolation but in relation: through humility, responsiveness, and a willingness to learn from participants, colleagues, and existing scholarship. This thesis has aimed to show how embracing imperfection, discomfort, and disruptions can support more reflexive research practice, helping us confront what Lonkila (2021, p. 484) calls "the non-innocence of care as a research practice" (see also, Puig de la Bellacasa, 2011, 2012, 2017). This includes reflecting on who or what may be excluded by our care, identifying the forms of care that are needed, and determining at which moments (Martin *et al.*, 2015; Puig de la Bellacasa, 2017).

This thesis has built upon and extended scholarship on caring research by taking seriously the idea that research *as* care is always ongoing (Brannelly and Barnes, 2022b). I demonstrated a commitment not only to avoiding harm but to continuously asking "how to care" at every stage of the research process (Puig de la Bellacasa, 2017, p. 5). Following Brannelly et al. (2022b, p. 119), who remind us, "we have more roles in research than as investigators", I grappled with how to participate and actively contribute (albeit modestly) to the caring worlds I was entangled within. I also argued that research *as* care extends well beyond fieldwork, to the tone of follow-up emails, moments of generosity in further collaborations, and conversations at conferences. I have sought to show how research *as* care can also be expressed through the analytical, narrative, and representational choices that shape how participants, events, and more-than-human relations are portrayed. Including a photo essay was one such choice: an intentional act of care that invited readers into moments that exceed the limits of text and made visible overlooked forms of care in fire-prone landscapes. Likewise, centring participants' voices and adopting more storytelling modes of research communication (see, Paper Six 'Learning to live with fire...') were deliberate and caring decisions, aimed at communicating the affective textures and ethical stakes of living with fire and landscapes that burn. Ultimately, these gestures, while modest, reflect my commitment to research *as* care – one that does not end with fieldwork but is ongoing in how I analysed, wrote, and remain accountable to the worlds I engaged.

How, then, might other researchers – whether or not they explicitly advance caring research – build on these contributions? Much more work is needed to explore how care, responsibility, and solidarity can be meaningfully enacted across all stages of the research process, from design to practice to dissemination. This concern is particularly urgent in fields such as critical geographies of disaster, where researchers operate within contexts influenced by systemic and intersectional inequalities, along with diverse ways of being and knowing, as discussed in Paper One, 'Critical geographies of disaster...' (Donovan *et al.*, 2024). Importantly, such work must resist framing care as a perfected or tidy practice. Researchers will not always know how to

care at the outset or get care 'right', but this opens up a generative space for reflection, dialogue, and learning. My own contributions, particularly in Paper Three 'Researching care, *with* care, *as* care....' on photo go-alongs, offer one situated account of how methods can support (and sometimes complicate) caring research. Future work may explore other methods to examine the various possibilities and frictions they afford for enacting care. Others may also wish to further consider how caring relations with more-than-human participants might be recognised, deepened, or reimagined. Viewing care as co-constituted invites further reflection on how researchers might respond to care extended toward them. Yet I also offer a note of caution: care is not always benign, it can endanger and should not be blanket romanticised (Larrington-Spencer *et al.*, 2024). Ultimately, I hope this thesis encourages researchers to understand care not as a fixed quality or endpoint, but as a continual practice – one that requires being returned to, rethought, and reconfigured throughout research projects and careers.

9.2. Practical interventions

Disaster scholarship – particularly research that seeks to be caring – should aim not only to speak to academic audiences, but also to speak back to the world it studies. While there is no single solution or 'magic bullet' for care in the context of wildfire risk management or life in an increasingly flammable world, I hope the findings of this thesis can help guide planners, policymakers, emergency responders, and institutional actors. My aim is not to prescribe but to suggest – to point towards areas that could be better addressed, more thoughtfully considered, or more carefully supported. In what follows, I outline five key practical interventions this research seeks to offer.

Risk management can be caring

Many wildfire risk management activities – like clearing brush, organising chipper days, or sharing updates with community members – can be acts of care. When done well, they can strengthen community ties, empower residents, protect homes, support ecological health and help make both people and places safer in the face of disaster. But care is not always easy, gentle, or just. It can involve difficult decisions, exclusions, and unintended harms. Those involved in wildfire risk management should continue to reflect not only on what they do, but also on how they do it. Building trust, listening across differences, and staying attentive to power dynamics are all part of practicing care and risk management well. Caring risk management should create space for reflection, disagreement, and ongoing learning – rather than assuming all care and risk management activities are automatically good. Asking questions like 'who is included in this project?', 'who is left out or burdened by it?' and 'how can we best care here?' can help ensure care and risk management is responsive and inclusive.

It is important to recognise those committed to care

Risk management is often framed around having the right tools or taking the appropriate actions in advance – what I recognised in this thesis as 'stockpiling care' or putting 'care on standby.' However, care is also about commitment over time: attending long meetings, tending

to land slowly, checking in with neighbours, and recovering from exhaustion or burnout. This ongoing, relational work is often invisible, yet it is essential. It requires stamina, persistence, and emotional labour, and it can be very demanding for those providing such care. In risk management, this longer-term, less visible form of care should be better acknowledged, supported, and renumerated. This could include the risk management agencies funding interventions that help reduce emotional and physical strain – such as creating rest and renewal spaces, offering mental health and wellness support, or properly renumerating the small, sustained actions that quietly build safer communities in between disasters. Recognising and resourcing care as a form of stamina would help sustain the people and relationships that make this work possible.

People want and need seasons – work with them, even as they become unpredictable

The fire season is no longer what it used to be. It starts earlier, lasts longer, and unfolds with increasing unpredictability. Yet people continue to feel the need for the fire season and the season that follows – emotionally, socially and environmentally. Wildfire risk management should take these seasonal temporalities seriously, recognising them not only as environmental changes but also as lived, felt, and culturally significant rhythms. Risk management activities, work schedules, and public engagement would benefit from being better aligned with both environmental shifts and the socio-cultural significance of different seasons. For example, aligning wildfire prevention communications with times of the year when the weather feels precarious, when people are anxious, and when communities are beginning to ready themselves to take seasonal action – even the climate crisis unsettles familiar patterns – could help risk communication messages resonate more deeply, foster engagement, and support people in making sense of change. Importantly, the socio-cultural rhythms of life (e.g., how people feel about the time of year and the activities they undertake) are just as significant as hazardous environmental patterns or institutional seasonal declarations in shaping how people live and experience seasonality.

Keep building new relationships with fire but centre Indigenous fire futures

Moving beyond fire suppression necessitates cultivating more respectful, reciprocal relationships with fire – seeing it not only as a threat to be controlled, but as a force that can be lived with, learned from, and even cared for. Practices like prescribed burning represent significant steps in this direction. However, they must be approached with attentiveness, humility, and care. It is insufficient to adopt these techniques in isolation or to treat them solely as fixes to the wildfire crisis. Moving forward, meaningful engagement with Indigenous fire leadership, knowledge systems, and cultural practices is essential. Supporting Indigenous fire futures involves more than symbolic recognition. It entails allocating resources to Indigenous-led fire initiatives, respecting sovereignty and self-determination, and fostering partnerships that are grounded in long-term trust, mutual learning, and genuine consent. This includes listening to Indigenous fire practitioners, supporting intergenerational knowledge sharing, and addressing the legacies of colonial fire exclusion and land dispossession. Only by centring Indigenous fire futures and cultivating ethical, enduring collaborations can there truly be a shift towards more caring relationships with fire.

Different 'things' in risk management can care

Risk management is not solely the work of humans. It is co-constituted through a wider entanglement of tools, animals, technologies and infrastructures that help sense, interpret, and respond to risk. From digital platforms like Watch Duty, to grazing animals reducing fuel loads, the placement of roads, fences, and signage, and stockpiles of basic necessities – these things can play vital, often overlooked, roles in caring for communities and landscapes.

Rather than viewing these things as neutral or merely functional, risk management could benefit from more deliberate and ethical engagement with their caring capacities. For example, thinking with care might prompt Watch Duty developers to consider how the app's functionality (caring capacity) could be extended to support communities during other seasons, such as the flood season, by expanding its alert and warning capabilities. Similarly, while sheep and goats (flerds) care for humans by grazing and reducing wildfire risk, community grazing initiatives – where people care for flerds for set periods – can also promote the wellbeing of both humans and animals. Projects like these, where care circulates among humans, animals, and the land, should be recognised, sustained and supported (see, Fibershed, n.d.). Even infrastructure – such as fire danger signs or evacuation routes – could be implemented in ways that foster trust, clarity, and responsiveness. Caring for, through and with these things shifts them from being passive supports to active participants in the work of making fire-prone regions safer, more attuned to the needs of those who inhabit them, and more liveable.

9.3. Parting thoughts

While writing this thesis, wildfires continued to ignite across California. Approximately 125,000 acres of wildlands were treated with prescribed fire (The California Air Resources Board, n.d.). Smoke drifted across the region, turning skies orange and the air toxic. Sonoma County held its first 'Wildfire and Earthquake Expo', and the fire season was declared earlier than the year before (City of Sonoma, 2025). Community groups continued to meet, adjust, and organise. Thirty people lost their lives and over 200,000 people were evacuated from their homes during the January 2025 Southern California wildfires (Nowell and Helmore, 2025). Watch Duty expanded its coverage across the United States (Watch Duty, 2025). The Sonoma County Fire District acquired two new fire engines (Sonoma County Fire District, n.d.). And, throughout it all, neighbours, non-profit employees, firefighters, county workers, volunteers, and land stewards continued to find ways – imperfect, improvised, and collective – to live better with fire and landscapes that burn.

These ongoing moments speak to the rhythms and ruptures of care amid the wildfire crisis and the broader climate crisis. Care is not only present during wildfires and disasters; it unfolds through routine acts, messy collaborations, and sustained persistence. It stretches across scales and settings – between state institutions and backyard conversations, policy meetings and grazing pastures, community fairs and university buildings. It spans the urgent emergency responses and the slow, deliberate work that happens in between. Care is often unremarkable,

mundane, and ordinary, woven deeply into the fabric of everyday life. It is found as much in the small, quiet gestures of attentiveness and support as in the coordinated, determined efforts of communities and agencies, reminding us that while care is not always visible or celebrated, it continually unfolds.

Care is not a simple fix-all solution to a crisis. It cannot quickly undo the histories and legacies of settler colonial fire suppression, nor is it inherently good or innocent. Care is complicated, compromised, and unfinished. Yet, care is a vital necessity to navigating life in an increasingly flammable world – a way of refusing detachment and embracing responsibility amid uncertainty. Care requires attentiveness, accountability, competence, and responsiveness (Tronto, 1993). It demands a willingness to persist through difficulty, to adapt, and to sustain relationships over time. It's a way of being in the world otherwise.

Ultimately, the work of care neither begins nor ends with a wildfire. It continues in the days between disasters, in the everyday labours that are too often overlooked, in the uncertain fire seasons to come, and in the collective efforts to create more flourishing futures. The work of care is never finished.

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11. Appendices

Appendix 1. Example of information sheet – Go-alongs

Participant information sheet – go-along interview

Ethical clearance number: GEOG-2022-04-25T11_16_19-nrmt75
Research project title: **Care in Wildfire Risk Management**

Researcher: Tilly Hall
Institution: Durham University, Department of Geography
Contact details: caitlin.e.hall@durham.ac.uk

Supervisor name: Professor Ben Anderson
Supervisor contact details: ben.anderson@durham.ac.uk

You are invited to take part in a study that I am conducting as part of my PhD at Durham University. This study has received ethical approval from the Geography Ethics Committee at Durham University.

Before you decide whether to agree to take part it is important for you to understand the purpose of the research and what is involved as a participant. Please read the following information carefully. Please get in contact if there is anything that is not clear or if you would like more information.

The rights and responsibilities of anyone taking part in Durham University research are set out in our 'Participants Charter':

https://www.dur.ac.uk/research.innovation/governance/ethics/considerations/people/charter/

What is the purpose of the study?

The aim of this study is to explore wildfire risk management in Sonoma County, California. I am hoping to document the forms of and encounters with care that happen during wildfire risk management activities. I would like to explore what care is being taken in living with fire.

This research project is funded by the ESRC NINE Doctoral Training Pathway until June 2025.

Why have I been invited to take part?

You have been invited because you meet the following criteria:

- You have been active within wildfire risk management in Sonoma County in the last 12 months.
- You are Sonoma County based or spend extended time there annually.
- You are willing to take part in a go-along.

Do I have to take part?

Your participation is voluntary and you do not have to agree to take part. If you do agree to take part, you can withdraw at any time, without reason or repercussion.

What will happen to me if I take part?

If you agree to take part in the study, I wish to accompany you as you operationalise practices of wildfire risk management. This will be in the form of 'go-alongs' that combine participant observation and interviewing. Here, I will ask questions related the activities you are participating in and care. You can omit any questions you do not wish to answer. I will take field notes. I will take audio recordings if you consent. I might also take photographs if you consent, but no distinguishable features will be included.

Are there any potential risks involved?

Due to the nature of this research, there is potential for institutional reputational harm and public identification. I will however endeavour to minimise this. You are able to stay fully-anonymised. If a

sensitive topic arises, we can renegotiate the inclusion of it in my research project and the consent level you require. It is worth emphasising here, that you can omit any interview questions and also withdraw from the project.

Will my data be kept confidential?

All information obtained during the study will be kept as confidential as possible (unless you express, you or someone else is in significant danger). If the data is published it will either be published as identifiable to you, or not to you but the organisation you work for and your role, or it will be kept anonymous. There are limits to anonymity surrounding small sample size included in this study and the recognisable information you chose to share.

Full details are included in the accompanying Privacy Notice.

What type of information will be sought from me and why?

During go-alongs, I would like to explore care in your wildfire risk management activities. Here, the data will be audio recordings, photos (I will not photograph participants in any identifiable way and will use blur software if required to minimise risk of further identification), and field notes surrounding wildfire risk management activities and care.

What will happen to the results of the project?

Results of this research will be published in a doctoral thesis, academic articles and presented at conferences. I will also share my research findings with you if you would like. If any data is shared with others, for the purpose of further research, it will always be the form you consented to.

All research data and records needed to validate the research findings will be stored for 10 years after August 2024, as is the standard time frame for Durham University's data management policy.

Durham University is committed to sharing the results of its world-class research for public benefit. As part of this commitment the University has established an online repository for all Durham University Higher Degree theses which provides access to the full text of freely available theses. The study in which you are invited to participate will be written up as a thesis. On successful submission of the thesis, it will be deposited both in print and online in the University archives, to facilitate its use in future research. The thesis will be published open access.

Who do I contact if I have any questions or concerns about this study?

If you have any further questions or concerns about this study, please speak to me, Tilly Hall, or my supervisor, Professor Ben Anderson. If you remain unhappy or wish to make a formal complaint, please submit a complaint via the University's Complaints Process.

Appendix 2. Consent form

Consent form

Ethical clearance number: GEOG-2022-04-25T11_16_19-nrmt75
Research project title: **Care in Wildfire Risk Management**

Researcher: Tilly Hall
Institution: Durham University, Department of Geography
Contact details: caitlin.e.hall@durham.ac.uk

Supervisor name: Professor Ben Anderson
Supervisor contact details: ben.anderson@durham.ac.uk

This Research

The aim of this study is to explore wildfire risk management in Sonoma County, California. I am hoping to document the forms of and encounters with care that happen during wildfire risk management activities. I would like to explore what care is being taken in living with fire.

If you agree to take part in the study, I will observe you while you participate in wildfire risk management projects and activities. I might take an audio recording if you consent. I will take ethnographic notes and might ask questions about the wildfire disaster risk management activities you are participating in. You can omit any questions you do not wish to answer. I might also take photographs but do participants or distinguishable features will be included.

Due to the nature of this research, there is potential for institutional reputational harm and public identification. I will however endeavour to minimise this. You are able to stay fully-anonymised. If a sensitive topic arises, we can renegotiate the inclusion of it in my research project and the consent level you require. It is worth emphasising here, that you can omit any interview questions and also withdraw from the project.

All information obtained during the study will be kept as confidential as possible (unless you express, you or someone else is in significant danger). If the data is published it will either be published as identifiable to you, or not to you but the organisation you work for and your role, or it will be kept anonymous. There are limits to anonymity surrounding small sample size included in this study and the recognisable information you chose to share. Full details are included in the accompanying Privacy Notice.

Results of this research will be published in a doctoral thesis, academic articles and presented at conferences. I will also share my research findings with you if you would like. If any data is shared with others, for the purpose of further research, it will always be the form you consented to.

All research data and records needed to validate the research findings will be stored for 10 years after August 2024, as is the standard time frame for Durham University's data management policy.

Confidentiality and Anonymity

Your study data will be handled as confidentially as possible. To minimise the risks to confidentiality, I take the following measures: I will store all your data in password protected computers and padlocked suitcases, I will not discuss our interaction with others unless in a research capacity, I can use obscure and deliberately unspecific language to describe your organisation and role (e.g. local community member, mid-manager at local fire service) and I allow you to choose the form of anonymity you wish your data to be stored and shared in.

You can decide whether or not you wish to allow me to record our interaction, or whether you prefer to remain fully-anonymous. If you choose to remain anonymous, I will not record our interview, and will take care in writing up the research so that there is no way a reader can identify you, including by omitting defining characteristics (e.g. your name, organisation, gender, ethnicity) that singularly or in combination could allow you to identified.

You can remain confidential, whereby your name and defining characteristics will be omitted. However, your role and organisation might be identified. Here, it might possible for readers to identify you through a combination of characteristics due to small sample size or the information you share with me. If I deem this a significant risk, I will use obscure and deliberately unspecific language to describe your organisation and role (e.g. local community member, mid-manager at local fire service).

Or, you can remain fully-identifiable with your name, role and organisation potentially included in the research outputs.

Consent

This form is to confirm that you understand what the purposes of the project, what is involved and that you are happy to take part.

Please initial each box to indicate your agreement:

- ☐ I agree to participate in participant observation / a go-along/ a storytelling interview carried out by Tilly Hall of Durham University, to aid with the research of Care in Wildfire Risk Management.
- ☐ I have read the information sheet related to the research Care in Wildfire Risk Management and understand the aims of the project.
- ☐ I am aware of the researcher will be observing my wildfire risk management activities.
- ☐ I am aware the researcher might take photos of wildfire risk management objects or projects but will not include any distinguishable features.
- ☐ I understand who will have access to personal data provided, how the data will be stored and what will happen to the data at the end of the project.
- ☐ I am fully aware that my personal data will be kept confidential.
- ☐ I am fully aware that data collected will be stored securely, safely and in accordance GDPR and Durham University standards.
- ☐ I am fully aware that I am not obliged to answer any question, but that I do so at my own free will. I am fully aware that I have the right to leave the observation at any point.
- ☐ I understand that my words may be quoted in publications, reports, and other research outputs.

Choose one:

[ ] I agree for my data to be fully-identifiable. You can identify my name, organisation and role.

[ ] I agree for my data to be handled confidentially. I agree to you identifying my organisation and role but not my individual characteristics (e.g. name). I understand that this may not fully protect me from being identifiable.

[ ] I would like to participate anonymously, and for no data about my professional role or position to be disclosed.

Choose one:

[ ] I consent to have my participant observation to be audio-recorded.

[ ] I **DO NOT** consent for my participant observation to be audio-recorded.

Signature / Participants name Date /

If you have any further questions or concerns about this study, please speak to me, Tilly Hall, or my supervisor, Professor Ben Anderson. If you remain unhappy or wish to make a formal complaint, please submit a complaint via the University's Complaints Process.

Appendix 3. Example storytelling interview guide

Please could you tell me a story about wildfire risk management in Sonoma County that matters to you. Please do so however you wish, and then I will interject or follow up with some other questions. You don't have to answer any questions if you don't want to or don't feel comfortable doing so.

Interjection or follow up questions might include:

1. What does your work mean to you?
2. Did you feel any different after that?
3. What makes your work easier? What makes your work harder?
4. How did you find last fire season?
5. How are you feeling about next fire season?
6. What needs to be done as Sonoma County learns to live with fire?
7. How does [insert person, object, feeling etc.] support you work?
8. Why did you choose to tell me this story?
9. What needs to be improved in wildfire risk management?
10. Is there anything else you would like to tell me or think it is important for me to know?

Appendix 4. Example go-along questions

Examples of questions asked on go-alongs:

1. What is your role in wildfire risk management?
2. How does your work contribute to wildfire risk management?
3. What does your work mean to you?
4. Why do you do [insert action, practice]?
5. What makes your work easier? What makes your work harder?
6. How did you find last fire season?
7. How are you feeling about next fire season?
8. What needs to be done as Sonoma County learns to live with fire?
9. How does [insert person, object, feeling etc.] support you work?
10. What does [insert action, practice, object] care about or take care of?
11. How does [insert person, action, practice, object] care for you?

Appendix 5. Example of debriefing sheet

Debriefing sheet

Ethical clearance number: GEOG-2022-04-25T11_16_19-nrmt75
Research project title: **Care in Wildfire Risk Management**

Researcher: Tilly Hall
Institution: Durham University, Department of Geography
Contact details: caitlin.e.hall@durham.ac.uk

Supervisor name: Professor Ben Anderson
Supervisor contact details: ben.anderson@durham.ac.uk

Thank you for taking part in this research. In this research, I would like to explore wildfire risk management in Sonoma County, California. I am hoping to document the forms of and encounters with care that happen during wildfire risk management activities. I would like to explore what care is being taken in living with fire.

The data you have provided is will be stored and potentially published in the form you consented to. If you consented to full anonymity, your data will be shared in a way that cannot be traced back to your identity. If you have consented the organisation you work for or the role that you do might be identified, however no personal details will be shared to anyone outside of the research team. It is important to note that there are limits to this privacy due to potential small-sample size or identifiable stories. Please see, privacy notice for more details. All audio recordings will be destroyed after August 2024. Transcripts created from the audio recordings, photographs and field notes taken will be kept for ten years on completion of this project (August 2024) so any subsequent work can be published following completion of the PhD.

You can withdraw from the project at any time without reason or repercussion. All your data will be destroyed. You will receive confirmation of this process by e-mail. Please do so by 30th April 2023.

If you would like further information about the study or would like to know about what my findings are when all the data has been collected and analysed then please contact me, Tilly, on caitlin.e.hall@durham.ac.uk. I cannot however provide you with your individual results.

If you have any further questions, information for, or concerns about this study, please speak to me, Tilly Hall, or my supervisor, Professor Ben Anderson. If you remain unhappy or wish to make a formal complaint, please submit a complaint via the University's Complaints Process.

Appendix 6. Book review of 'A Fire Story' by Brian Fies and 'Fire Weather: A True Story from a Hotter World' by John Vaillant

Authors: Tilly E. Hall

Classification: Published in the Journal of Disaster Studies
https://muse.jhu.edu/pub/56/article/971162

We are living in an era where wildfires are no longer distant, isolated events confined to the wilderness. They are repeatedly raging into our neighbourhoods, homes, and lives. This new normal is powerfully explored in *Fire Weather: A True Story from a Hotter World* by John Vaillant and *A Fire Story* by Brian Fies. Vaillant presents a meticulously researched and deeply contextualized investigation into the connection between petroleum dependence and the increasingly fire-prone climate. In contrast, Fies offers a poignant, visual narrative of personal loss and survival in the wake of his life being uprooted by a wildfire. Together, these books illuminate the human, environmental, and systemic dimensions of living in a world increasingly defined by fire.

In *Fire Weather*, Vaillant examines the 2016 Fort McMurray wildfire in Alberta, Canada – an "apocalyptic conflagration" that burned 1.5 million acres, destroyed 2,500 structures, and forced the evacuation of about 90,000 people. The book is divided into three parts: the first, "Origin Stories," traces the history of Fort McMurray's rise to the center of Canada's petroleum industry while exploring the evolving relationship between humans and fire. The second, "Fire Weather," recounts the wildfire hour by hour, with the tension and pacing of a horror story. This section, though emotionally taxing to read, offers a crucial account of the extreme fire conditions, the overwhelming challenges faced by first responders as the fire went "past resources" (114) (meaning its intensity exceeded the available resources to fight it), and the personal difficulties of evacuation. Vaillant situates the Fort McMurray wildfire in the broader context of today's wildfires, which, he argues, are unlike any wildfires humans have encountered before. The third section, "Reckoning," addresses the aftermath of the wildfire, focusing on broader climate science and policy.

The intersections of fire, petroleum, and humanity lies at the heart of *Fire Weather*. Vaillant examines humanity's dual relationship with fire – both as a tool essential for survival but increasingly a dangerous force. Petroleum also represents development and economic prosperity while simultaneously driving the climate crisis and intensifying wildfire activity. This paradox is starkly illustrated by the irony of a catastrophic fire consuming Fort McMurray, a city built to serve the petroleum industry and humans' need for fire. Vaillant asserts we are living in the "Petrocene Age," an era shaped by our "willfull blindness" (231) to the destructive consequences of petroleum dependence. In this context, he urges readers to confront our dangerous relationship with petroleum before it consumes us entirely, arguing the capitalist world must stop "bingeing on fossil-fuelled combustion" (273).

The second major theme interwoven throughout *Fire Weather* is cognitive dissonance in the face of climate change-driven disasters. Vaillant argues that disaster "is cognitive dissonance made manifest" (110). He illustrates this vividly through the behavior of Fort McMurray residents as the wildfire approached: despite the imminent danger, many were gripped by inertia and clung to routine. Vaillant contends that this cognitive dissonance extends the broader inaction on climate change exhibited by many. Even after the wildfire's destruction, Alberta prioritized petroleum production over climate action. These two themes offer readers a critical lens through which to understand the forces that fuel wildfires and perpetuate society's failure to respond adequately to their growing threat.

In contrast, *A Fire Story* depicts an intimate and deeply personal account of Fies's experience during and after the 2017 Tubbs wildfire in Sonoma County, California. Originally a webcomic created in the immediate aftermath of the fire,[17] *A Fire Story* was later adapted into a short, animated film and expanded into a full-length graphic memoir. Fies opens with the statement, "On Monday, my house disappeared" (1) and goes on to provide an illustrative narrative that explores his initial disbelief to grappling with loss and navigating the process of recovery and rebuilding. Fies initially uses bold illustrations and a matter-of-fact tone, which later shifts to tightly packed comic drawings and a more contemplative tone as he reflects on the wildfire's profound effects. He includes the stories of five other community members, providing interesting yet surface-level accounts of the demands of wildfire recovery, as well as the resilience and determination of those working to rebuild their lives.

Although *A Fire Story* is not a scientifically rigorous account, it addresses two key themes relevant to disaster scholars and practitioners. First, Fies impressively captures the profound emotional toll of loss, offering an unflinching portrayal of what is lost by wildfires and what it truly means and feels like to lose. Throughout, he details everyday moments – lying in bed, shopping, driving to work, and having dinner – when he suddenly finds himself recalling what he and his family have lost. At times, Fies pauses his narrative to present lists: items destroyed by the wildfire and objects they managed to save, some of which he details have taken on an unexpected nostalgia despite their current uselessness, like his house keys. As he sifts through the remains of their home, Fies reflects, "Well-meaning people say, 'It's just stuff.' But it was **our** stuff. Stuff we created. Stuff we treasured. Stuff from our ancestors we wanted our descendants to have. Stuff is a marker of time and memory. It's roots. I am uprooted" (126–27). This passage, coupled with his moving illustrations, serves as a reminder that the loss caused by wildfires extends far beyond physical destruction; it encompasses the loss of connections, histories, identities tied to "just stuff," as well as the deep sense of dislocation and emotional upheaval that such loss brings.

Second, Fies evidences the numerous bureaucratic hurdles faced by those displaced by the wildfire, including managing insurance claims, legal obstacles, finding adequate builders, and dealing with predatory people seeking to profit from the disaster. However, he complicates this

[17] Brian Fies, "A Fire Story, COMPLETE," The Fies Files, October 15, 2017, https://brianfies.blogspot.com/2017/10/a-fire-story-complete.html.

narrative by also highlighting the simple acts of kindness that occurred after the fire. From first responders and emergency managers to family, friends, and neighbors, as well as café servers and church youth groups, Fies emphasizes the well-intentioned people who operated within, around, and despite these bureaucratic challenges. These acts of kindness, extended to Fies and others, made navigating the flawed systems of rebuilding and recovery – and coping with the emotional toll of loss – slightly more bearable, offering an important insight for disaster scholars and practitioners.

Both books convey the human, environmental, and systemic challenges of living in a world increasingly defined by fire, and there are contradictions worth noting. Vaillant occasionally refers to the Fort McMurray wildfire as a "natural disaster" (e.g., 98), despite his thorough analysis of how society's dependence on petroleum is driving the unprecedented fires of today. Similarly, Fies describes the Tubbs fire as an "equal opportunity annihilator," "slic[ing] through strata of class like a scalpel" (57), while observing how response and recovery efforts often reinforced preexisting inequalities. Rather than diminishing the impact of these works, these tensions should remind readers of the complexities and subtle contradictions that often arise when writing about wildfires.

Together, *Fire Weather* and *A Fire Story* provide powerful and complementary explorations of today's wildfires. Although their content may not offer groundbreaking revelations for disaster scholars and practitioners, they present compelling insights into the macro-level forces driving our fire-prone world and the intimate, often painful realities faced by those affected by these disasters. These books urge us to confront how our entrenched reliance on (and obsession with) petroleum has contributed to the new, unsettling reality of catastrophic wildfires – one that society is struggling to comprehend and respond to. At the same time, they highlight the everyday experiences of people who are "slowly getting used to [their] new life" after wildfires, offering deep insights into "ideas like 'family,' 'community,' 'tradition,' and 'home'" (Fies 141). The contrasting formats of the books – Vaillant's investigative narrative and Fies's graphic memoir – invite reflection on how disaster scholars and practitioners might expand ways of capturing the experiences of those affected by disasters and how we communicate our research or wider work. While both books contain moments of optimism, such as the successful rapid mass evacuation and the effective adjustment of fire-fighting strategies in Fort McMurray, as well as the resilience and solidarity witnessed in Sonoma County, more importantly they serve as a sobering reminder. As Fies cautions, "people seem to want a story with uplift and closure" (141), but these books cannot (nor should they) offer that kind of narrative. Instead, they are demanding and hard reads that compel us to reflect, change, and ultimately act.

Reference:

Fies, B. (2019), *A Fire Story,* Updated and Expanded., Abrams ComicArts, New York.

Vaillant, J. (2023), *Fire Weather: A True Story from a Hotter World*, Alfred A. Knopf, New York and Toronto.