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REVIEW

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Wildfire research and mental health: impacts, reflections, and a call to action

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Abstract

Background In response to record-breaking wildfire seasons worldwide, wildfire researchers are increasingly called upon to conduct research to better understand the drivers and impacts of "megafires." However, there is limited attention to the mental health risks and potentially traumatizing experiences of working in these disaster-affected social-ecological landscapes, or the implications of this on our ability to conduct collaborative and trauma-informed research. In this forum, we seek to raise awareness and catalyze action within the wildfire community to sustain the mental health and research capacity of wildfire researchers.

Results We highlight the mental health risks of conducting wildfire research, in which both direct and secondary traumatic experiences can often be compounded by feelings of climate anxiety and ecological grief. We then reflect on our own experiences conducting interdisciplinary and community-engaged research in western North America during and after recent wildfire seasons, including the challenges of recognizing and addressing the psychological impacts of this work. Finally, we synthesize actionable recommendations, and share practical frameworks and tools, for individual researchers, supervisors, and institutions to support researcher mental health and wellbeing in wildfire-related research.

Conclusions We present tangible actions that individual researchers, supervisors, and institutions can take to support the mental health and wellbeing of wildfire researchers, and call on the wildfire research community to advocate for and implement these within our respective institutions. We argue that concerted action, and cultivating communities of care, is necessary to ensure the quality and sustainability of wildfire research.

Resumen

Antecedentes Comorespuesta al quiebre de los récords en cuanto a las temporadas de incendios de vegetación a nivel mundial, los investigadores en incendios están llamados a conducir investigaciones para entender mejor los factores conducentes e impactos de los "mega-incendios". Sin embargo, es muy poca la atención que se brinda a los riesgos para la salud mental y sobre las experiencias traumáticas de trabajar en los desastres que afectan la parte social y los paisajes ecológicos que éstos fuegos ocasionan, o sus implicancias en nuestra habilidad o aptitud para conducir investigaciones colaborativas y reportar los resultados de estos traumas. En este foro, buscamos captar la atención y catalizar las acciones dentro de la comunidad relacionada a estos incendios, para apoyar la salud mental y la capacidad investigativa de los investigadores relacionados con los incendios.

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Resultados Destacamoslos riesgos sobre la salud mental de quienes realizan investigaciones sobre incendios de vegetación, en las cuales las experiencias traumáticas directas o secundarias pueden frecuentemente estar compuestas por sentimientos de ansiedad por el cambio climático y el duelo ecológico. Reflejamos luego nuestras propias experiencias conduciendo investigaciones interdisciplinarias, y en comunidades comprometidas en el oeste de Norteamérica, durante y luego de las recientes temporadas de incendios recientes, incluyendo los desafíos de de reconocer y abordar los impactos psicológicos de este trabajo. Finalmente, sintetizamos recomendaciones de posibles aplicaciones, y compartimos los marcos conceptuales y herramientas, Psychological Fir

para investigadores individuales, supervisores, e instituciones de salud mental y vida saludable, que apoyen investigaciones sobre estos temas relacionados con estos incendios.

Conclusiones Presentamos acciones tangibles de que investigadores individuales, supervisores, e instituciones, pueden aportar a la salud mental y la vida saludable de investigadores en el tema de incendios, y hacer un llamado a la comunidad relacionada con estos incendios para que aboguen por, e implementen estas acciones, dentro de sus propias instituciones. Argüimos que la acción concertada, y el mantenimiento de comunidades cuidadosas, es necesario para asegurar la calidad y sustentabilidad de las investigaciones en incendios de vegetación.

Introduction

In early 2025, Southern California faced a series of devastating wildfires. Fueled by exceptionally strong Santa Ana winds, multiple fires started across the region, overwhelming the region's firefighting response and displacing tens of thousands of residents. In less than a month, wildfires had burned over 50,000 acres (approximately 20,000 hectares) in Los Angeles County alone, destroying over 16,000 structures and resulting in at least 29 fatalities (CALFIRE, 2025). These destructive wildfires are part of a growing trend of record-breaking wildfire disasters worldwide, with escalating impacts on people, ecosystems, and the global climate (Cunningham et al. 2024; United Nations Environment Programme 2022). In response, fire scientists and managers are calling for transformative change in how societies coexist with fire, and for scaling up strategies to mitigate risk and enhance both ecosystem and community resilience (Bowman 2024; Daniels et al. 2025; McWethy et al. 2019).

Following major wildfire events, government inquiries and reviews are often tasked with examining the causes of, responses to, and impacts of these fires (e.g., Teague et al. 2010; Abbott & Chapman, 2018). Similarly, researchers often look to these events as opportunities for learning and informing policy and practice (Domney-Howes 2015; Gaillard & Gomez 2015). For example, the 2019/2020 Australian "Black Summer" bushfires and the 2023 Canadian wildfires catalyzed extensive research to understand the drivers and impacts of these megafires (Byrne et al. 2024; Daniels et al. 2025; Driscoll et al. 2024; Gorta et al. 2023; Jain et al. 2024). For wildfire researchers, this often involves conducting fieldwork in landscapes still bearing the physical and social scars of recent wildfire impacts, exposure to individuals or communities recovering from traumatic experiences such as evacuation or loss, and prolonged engagement with ecological or social data documenting the impacts of wildfires on people and places. Yet despite the growing body of literature analyzing the mental health impacts of experiencing (To et al. 2021) or responding to (Agyapong et al. 2022; Verble et al. 2024) wildfires, there is limited attention to the potentially traumatizing experiences faced by researchers working in these disaster-affected social-ecological landscapes (but see Eriksen 2017, McLennan et al. 2016 and IAWF 2025 for notable examples). This is particularly the case in the context of biophysical and other quantitative sciences, despite researchers in these disciplines increasingly being exposed to and engaging with communities and ecosystems impacted by devastating wildfires and other climate-related hazards.

In this Forum, we seek to raise awareness and catalyze action within the wildfire community—including both biophysical and social scientists—to sustain the mental health and research capacity of wildfire researchers in this current era of megafires and climate crisis. We recognize the important ecological and cultural role of fire throughout diverse ecosystems and communities worldwide and the need to restore positive relationships with fire by revitalizing local and Indigenous fire stewardship (Copes-Gerbitz et al. 2024; Daniels et al. 2025; Eriksen 2024; Hoffman et al. 2022). However, as the negative impacts of large and destructive wildfires continue to dominate much public and political discourse around wildfire and fire management, wildfire researchers are increasingly exposed to data and narratives documenting loss and devastation. Here, we use megafire to refer to fire events that cause "catastrophic damages" and impacts of "astounding magnitude…relative to our historical expectations" (Attiwill & Binkley, 2013: 1). While we acknowledge critiques of this term, particularly due to the context-dependent, subjective, and often emotive nature of its varied definitions (Stoof et al. 2024), we use

this term because it captures the intense personal and emotional experiences of experiencing, witnessing, and studying wildfire.

First, we describe the potential mental health impacts of conducting wildfire-related research, with particular attention to the concept of secondary traumatic stress and how this can be amplified by direct traumatic experiences of wildfire as well as underlying feelings of climate anxiety—characterized by fear, worry, or helplessness about anticipated climate change impacts—and emergent ecological grief—the profound experience of loss related to environmental degradation (Cunsolo et al. 2020; Ojala et al. 2021; Pihkala 2020b, 2020a, 2022). While similar experiences of secondary trauma, climate anxiety, and ecological grief have been described by researchers in related fields such as climate science (Head & Harada 2017) and other natural hazards (Calgaro 2015; Varutti et al. 2025), we argue that wildfire researchers are particularly vulnerable to both secondary *and direct* traumatization due to increasing risks of direct exposure to wildfire events or associated traumatic experiences such as personal evacuations or smoke-related health impacts. We then reflect on our own experiences conducting interdisciplinary and community-engaged research in western North America during and after recent wildfire seasons, including the challenges of recognizing and addressing the emotional and other psychological impacts of this work. In doing so, we aim to highlight the risks of both secondary *and* direct traumatization faced not only by qualitative social scientists, but also by biophysical scientists, particularly (but not exclusively) those conducting community-engaged research. Finally, we synthesize recommendations for individual researchers, supervisors, and institutions to support researcher mental health and wellbeing in wildfire-related research.

The psychological risks of conducting wildfire research

Ample evidence highlights the potential psychological and physical impacts of secondary exposure to traumatic events and experiences (Bride et al., 2004). Secondary traumatic stress—what the American Counselling Association refers to as the "emotional residue" of bearing witness to the direct trauma of others (American Counselling Association, 2010 cited in Williamson et al. 2020: 56)—can manifest in a range of physical and psychosocial impacts, often mirroring those of post-traumatic stress disorder (Chrestman 1999; Figley 1999; Pulido 2007). Symptoms can include headaches, insomnia, anxiety and the inability to concentrate, and unexplained feelings of anger and despair (Bride et al. 2004; Coles et al. 2014; Figley 1995; Steed & Downing 1998). These symptoms can have a sudden onset and be debilitating, or can occur at relatively low intensities, often passing undetected for long periods of time after the secondary exposure until manifesting as burnout or more serious health conditions that demand attention (Eriksen 2017; van der Merwe & Hunt 2019). Along with cognitive shifts, such as feelings of helplessness and loss of a sense of personal control, these symptoms can impair both day-to-day functioning and, for researchers, the ability to productively and ethically engage in collaborative and trauma-informed research (Alessi & Kahn 2023).

Much of the research on secondary traumatic stress has focused on "helping professionals" (Bride et al. 2004) such as mental health service providers (Cleary et al. 2024; Hensel et al. 2015), social workers (Pulido 2007), or other frontline workers (Morrison & Joy 2016; Orrù et al. 2021). However, Coles et al. (2014) suggest that symptoms may be magnified among researchers due to an "inability to 'help' the victim" (p. 96), whether that victim is a human research participant or research partner, or the non-human world. Additionally, many other risk factors for secondary traumatic stress, such as a lack of support networks, prolonged exposure, and levels of life stress and mental health (Lerias & Byrne 2003), can be exacerbated during extended periods of field research (IAWF 2025). Graduate students, early career researchers, and non-tenured faculty, who disproportionately experience psychological distress and mental health concerns due to factors such as financial and job insecurity and academic pressures of productivity (Levecque et al. 2017), may also be particularly susceptible.

Several scholars have reflected on their experiences of secondary or vicarious trauma associated with conducting research (Calgaro 2015; Dickson-Swift et al. 2007; Dominey-Howes 2015), and a smaller number of empirical studies have analyzed these impacts on researchers working on sensitive topics such as sexual violence (Coles et al. 2014), gender-based violence (Williamson et al. 2020), mental health disorders (van der Merwe & Hunt 2019), or genocide (Goldenberg 2002). Across disciplines, the literature has predominantly focused on the challenges associated with conducting qualitative research, and have been published in qualitative methods (Dickson-Swift et al. 2007; Eliasson & DeHart 2022), psychology (Howlett & Collins 2014; van der Merwe & Hunt 2019), or interdisciplinary emotion-related (Drozdzewski & Dominey-Howes 2015) journals.

In terms of wildfire-related research, the limited literature examining mental health impacts on researchers has similarly focused on qualitative researchers who have been exposed to stories of trauma through methods such as interviews and participant observations with survivors of wildfire disasters, and through subsequent prolonged engagement with transcripts and field notes documenting

these traumatic experiences (e.g., Eriksen 2017; McLennan et al. 2016). However, researchers of all disciplines and methodologies are increasingly seeking to partner with Indigenous and local communities in collaborative and applied wildfire research, and as a result, biophysical scientists and quantitative social scientists are also at risk of secondary traumatization through interactions with affected communities. Biophysical scientists and other researchers trained in (post) positivist paradigms may be less prepared to identify or manage these impacts, due to disciplinary norms and standards of validity that force a separation of emotion and subjective experiences from research (Williamson et al. 2020). For all researchers, these impacts can be heightened through exposure to the physical scars of devastating wildfires, such as fire-damaged homes and scorched landscapes.

Unlike other sensitive research contexts where trauma exposure may solely be secondary or vicarious, wildfire researchers often experience a complex layering of trauma that includes direct threats to personal safety, secondary exposure through community interactions, and the profound grief of witnessing environmental destruction of places they value personally and professionally. For example, field-based wildfire researchers are increasingly at risk of being directly impacted by wildfires, smoke, and evacuations that overlap with summer field seasons. For ecologists and biologists, the process of collecting data on negatively impacted plant or wildlife populations, or the experience of witnessing field sites transformed after severe wildfire, can also be deeply traumatizing. Collectively, these factors point to the unique ways in which wildfire researchers can be both directly and indirectly exposed to traumatic wildfire-related experiences during research, and how this intersects with feelings of environmental loss and grief.

Climate anxiety and ecological grief

Over the past two decades, a substantial body of literature has highlighted the increasing psychosocial (including mental health) impacts of climate change and ecocide, from post-traumatic stress disorder, anxiety, and depression to behaviors such as substance misuse and aggression (Aylward et al. 2022; Burke et al. 2018; Clayton et al., 2017; Hayes et al. 2018; Hayes & Poland 2018). The impacts of climate anxiety and ecological grief on climate-related researchers—and the real and perceived barriers to mourning and embracing these emotions (Varutti 2024), particularly in (post) positivist science—can be substantial and can amplify the mental health impacts of secondary traumatic stress.

For wildfire researchers, climate anxiety may be exacerbated by working directly in fire-affected landscapes: witnessing firsthand that these wildfires were intensified by climate change and observing the consequences of delayed climate action on both human and non-human communities. A sense of anticipation and urgency may be particularly acute for early career researchers who are balancing a desire to contribute to solutions amid a worsening climate crisis, while also establishing their careers and research agendas. Wildfire researchers may also experience ecological grief, especially if they have strong emotional connections to the now-burned landscapes and places they study. Solastalgia, the distress caused by environmental change in one's home or place of meaning (Albrecht et al. 2007), is particularly relevant for researchers conducting long-term field work in areas transformed by wildfire. Seeing the immediate impacts of destructive wildfires on cherished forests can lead to such grief and solastalgia.

Researchers with dual identities (i.e., scientists and community members) may feel this grief more intensely, as it intertwines their personal and professional lives (Cavanagh, 2020; Tom et al., 2023). Aboriginal researcher and Bundjalung Wonnarua woman Vanessa Cavanagh (2020) embodies this duality in her reflection on the loss of an ancient tree after the Gospers Mountain bushfire complex, which burned over 1 million hectares in the Australian state of New South Wales during the 2019–2020 "Black Summer," likening it to the "deep hurt of losing someone far older and wiser than me." This profound connection between personal and professional loss highlights the emotional toll wildfire research can take on researchers. As we detail in our own reflections below, the complex intersections of identity, trauma, and grief manifested for us through experiences such as reading accounts of and witnessing repeated evacuations from partner communities, observing compounding impacts of wildfires and heatwaves on ecosystems, returning to permanently altered childhood landscapes, and facing psychological barriers to analyzing emotionally intense data. For researchers with connections to fire-affected places, the professional obligation to document wildfire impacts can complicate personal grieving, with profound implications for both mental health and our subsequent capacities to engage productively and ethically in this research.

Reflections from two megafire researchers

We share our stories of experiencing secondary and direct trauma and ecological grief. We do this to ground our descriptions (above) of the mental health challenges of conducting wildfire research in personal experience and to emphasize the need for greater awareness and action to both support researcher wellbeing while sustaining rigorous and ethical research practices.

Francisca

"Fires can jump highways," my dad explained after we had driven out to catch a glimpse of a fire burning several canyons away, its orange glow visible as the sky darkened. His description emphasized both fire's unpredictability and its power to defy human infrastructure and planning. As a child in the 1990s, growing up in Paradise, California, wildfire was an ever-present threat. One summer, I remember helping my aunt and cousins prepare to evacuate their home as a wildfire burned nearby. Thankfully, their home was spared that year, but that summer taught me that wildfire was a part of life in the Sierra Nevada foothills.

For my family, a familiarity with fire shaped our sense of its dangers and how to live with it—but nothing could prepare us for the ferocity of the Camp Fire. By 2018, it had been more than two decades since I'd lived in Paradise, but a part of me still considered it home. On the warm autumn evening of November 8, I was sitting at dinner with a friend when my mom texted me, asking if I had heard the news about Paradise. That day, the entire town had been evacuated and destroyed. My family members who lived there—my uncle, two cousins, and their families—had all lost their homes. The house where I grew up, along with the neighborhood where I rode my bike and climbed cherry trees, were gone. In that one day, the landmarks of my early childhood were erased.

When I started my PhD, wildfire wasn't a topic I expected to study or research. Although I was interested in how humans make decisions to adapt to climate change, I had planned to apply this interest to coastal contexts. But after the Camp Fire, and the megafires in 2020 and 2021 that brought weeks of suffocating smoke to Northern California, I became increasingly curious about how people were coping with the risks of fire and smoke. Wildfire smoke was both a distant reminder of burning landscapes and a direct threat to public health.

My first wildfire-related study explored the role of social support and social norms in shaping wildfire smoke protective health actions. Interviewing people from three counties in Northern California where smoke had created growing health concerns, I heard stories of worry for vulnerable family members and pets, and frustration at not knowing what protective actions were most effective. Many interviewees also knew people who had lost homes in the Camp Fire and shared the grief rippling through their social networks. The emotional weight of the work left me questioning whether sharing my own story would help build trust or place an unfair burden on those already processing personal loss.

In 2023, I expanded my research to examine the overlapping impacts of fire, smoke, and power shutoffs in Northern California. Despite feeling more prepared, some interviews were emotionally intense. A Forest Service employee expressed guilt about not saving more homes in the Ranch Fire of 2021, and a mother spoke with difficulty when sharing her worries about the mental health of her children, who had experienced repeated evacuations. When I occasionally shared my own experiences with fire, including that I had lived in Paradise as a child, I often felt conflicted; my losses seemed so small compared to theirs.

Wildfires leave physical marks on the landscape, and emotional ones on people who live through them. My research reminds me how I have also changed. There are times when I feel blocked, unable to bring myself to analyze my data because the stories feel too heavy to revisit. Other times, I read interview transcripts and dissociate, reading without truly integrating, my brain and body are trying to protect me.

Since the Camp Fire, I've looked for support through journaling, therapy, and talking openly with friends and colleagues. I even visited Paradise in 2023, an experience both disorienting and grounding. At the property where my childhood home once stood, I found the cherry trees I once climbed burned out and dead. The forest canopy in the neighborhood was gone, the views unfamiliar and eerily expansive.

While standing there on the empty lot, taking it all in, I watched a brilliant sunset of orange and peach hues wash across the sky—something I'd never seen before from that place. I saw how fire isn't just a force of destruction; it is also one of renewal. Prescribed burning and cultural fire practices are gaining support, reminding us that fire can heal both land and community. In addition to shifting attitudes toward fire suppression, I can also sense a shift in those who live in fire-prone landscapes and study fires' impacts. We know that many landscapes we live and work in are unhealthy after decades of fuel buildup (Collins et al. 2011; Hagmann et al. 2021; Kreider et al. 2024; Parks et al. 2018), and that change is inevitable. In a way, studying wildfire and smoke has become my way of confronting and understanding loss. By honoring what was lost, we can open ourselves, societies, and landscapes to new ways of living with fire and caring for our forests.

Sarah

Despite having grown up in south-eastern Australia, one of the most fire-prone regions of the world, wildfire risk always felt far away; something that existed "out there," beyond the city limits. Even during my Master's, when I spent the summer months interviewing rural volunteer firefighters to learn about their histories and practices of prescribed burning, the tangible impacts of wildfire and community experiences with evacuation and loss felt distant. This all changed in 2018, when I flew halfway

around the world to Vancouver, Canada, to commence my PhD.

I arrived to a province shrouded in wildfire smoke, amid the second year of back-to-back record-breaking wildfire seasons. Soon after, I was invited into developing research partnerships with Secwépemc Nation communities centered around understanding ecological and community recovery after the 2017 "Elephant Hill" megafire that had burned over 190,000 ha throughout the heartland of their traditional territory in interior BC. Over the next two years, as I built relationships with these communities—as a colleague, co-researcher, and in some cases, a close friend—I was brought into their ongoing work leading land-based recovery, eventually conducting interviews to document the role of Secwépemc communities in leading wildfire response and recovery. Then in 2021, three years into my PhD, I set aside these hours of recordings and hundreds of pages of transcripts to spend a summer of fieldwork in the mountains, monitoring ecosystem recovery throughout this fire scar.

After a snowy start to the field season, by late June the temperatures had started to rise, and the federal environmental agency issued warnings of a "dangerous, long heat wave": the record-breaking "heat dome" that caused devastating impacts and loss of life across the Pacific Northwest (Baum et al. *in revision*). On Sunday, June 27, 2021, our final day of field work before a week's break, temperatures exceeded 35° C by 9 am. Three days later, as I sheltered inside from the scorching heat, provincial and national media became dominated with news that the Village of Lytton, located just one hour from our field site in the traditional territory of the neighboring Nlaka'pamux Nation and that just the day before had set national temperature records with a temperature of 49.6° C, had burned to the ground. This event—a fast-moving wildfire leading to two fatalities, the near-total loss of a small rural village, and extensive damage and disruption to the local First Nation—not only captured the attention of the nation, but also had a ripple effect throughout many communities, including my partner communities who were still recovering from their own experiences of evacuation and loss.

Later that week, as I drove back to reconnect with my field assistants at our field house, I looked out my window and saw tall flames cresting the hills above the Secwépemc community of Skeetchestn (Fig. 1)—the community of two of my dissertation advisors, whose home had come to feel like a home away from home for me. That week marked the start of what would soon become one of the most destructive wildfire seasons on record in BC, with over 1600 wildfires burning 869,279 hectares, resulting in a 56-day provincial State of Emergency and hundreds of communities being placed under evacuation or alert (BCWS, 2025).

Fig. 1 The 2021 Sparks Lake megafire burning above Skeetchestn. Photo credit: Sam Draney

The remainder of that summer passed in a blur: endless days of heavy smoke and ash that often forced us to stay inside, the surreal feeling of working among tall blackened forests under a glowing red sun, and the soon-routine process of packing our valuables—from laptops to beading kits—into the field truck each morning when we headed out, just in case we couldn't make it home. Throughout all of this, I felt a constant and conflicting tension between the need to keep my crew safe, and the pressure to complete my PhD fieldwork.

Somehow, despite the megafires burning all around us, we never had to evacuate. Yet as we watched our friends and collaborators in other communities evacuate or stay behind to protect their communities, I also felt a growing sense of helplessness and guilt—helpless that I didn't have any practical skills to assist with wildfire suppression or emergency response, and guilt that I, as someone who wasn't the *real* victim of these impacts, should be feeling anything at all. I pushed these feelings down, to support my crew and myself. And, as I heard once again of the challenges First Nations faced during wildfire response and evacuations, and knowing of the recovery work to come, I started to write.

In the evenings after fieldwork, or during the many days it was unsafe to even step outside, I returned to those interviews, working through a persistent sense of *deja vu* while reading accounts of evacuation and devastation from many of the same people who were once again being forced from their homes. At the time, I felt that writing helped me set aside the immediate feelings of anxiety and dread, as I focused on telling the stories that had been shared with me. A sense of urgency kept those feelings buried: urgency to publish these findings in a major community report (Dickson-Hoyle & John, 2021), to coordinate a launch with First Nation and provincial

Table 1 Actions to mitigate the psychological risks associated with conducting wildfire research

Actor	Research phase				
	Throughout	**Research design**	**Data collection**	**Analysis and write-up**	**Community connections**
Researchers	· Build awareness and competencies in identifying and supporting students through experiences of secondary trauma · Foster open and supportive research culture that explicitly prioritizes mental health and wellbeing · Consult with, or include on the study team, a mental health clinician or researcher · Consult with institutional ethics review boards to promote awareness of risks to researchers and report any adverse impacts	· Reflect on individual research context and personal risk factors that may trigger secondary trauma or other psychological impacts · Critically reflect on the ethics of conducting post-disaster research with affected communities; prioritize collaborative and trauma-informed research that is responsive to community needs · Identify psychological and mental health risks and mitigation strategies in field safety planning; develop self-care plans	· Schedule rest breaks during extended fieldwork and remain flexible to take "time out" if needed · Self-monitor, and monitor team members, for signs or symptoms of secondary trauma or other mental health impacts	· Proactively communicate with supervisor(s) and/or other trusted peers or mentors, including scheduled debriefs Seek mental health supports as needed	· Take a trauma-informed approach to knowledge mobilization · Facilitate open dialogues with research teams, including through peer support networks, to share experiences and impacts of conducting trauma-exposed wildfire research
Supervisors		· Identify and/or organize, and where necessary budget for, psychological first aid or other relevant training (for supervisees and self) · Identify and ensure supervisees are aware of institutional mental health resources and services	· Encourage, and ensure supervisees schedule, rest breaks during extended fieldwork · Schedule and facilitate regular check-ins and debriefs with supervisees; assess for signs and symptoms of secondary or direct trauma and provide psychological first aid when appropriate	· Facilitate one-on-one debriefing session(s) with supervisees · Monitor supervisees for signs or symptoms of secondary trauma or other mental health impacts; connect to support services as needed	
Professional associations	· Develop and/or connect association members to professional development training and resources related to psychological first aid and mental health · Develop guidance, in collaboration with researchers, to support the identification and management of researcher mental health impacts				
Universities	· Provide embedded trauma counselors within faculties to support students and to develop and facilitate tailored training · Incorporate assessment of risks to researcher in institutional ethics applications · Incorporate psychological safety assessments into research-related safety protocols				

government partners, and to help facilitate months of meetings to advance the recommendations for supporting First Nations-led wildfire response and recovery.

A year later, as I sat down in Vancouver to write the opening chapter of my dissertation, things started to unravel. I found myself crying in my office, or during presentations where colleagues shared photos from the 2021 fire season. I felt constantly on edge, unable to focus, or to identify the source of these feelings of unease that would come seemingly out of nowhere. It took a friend, another graduate student who was on that field crew in 2021, to point out the smoky skies outside as a trigger for our anxiety. It took finding a skilled counselor to recognize both the direct and secondary trauma, and to address my persistent feelings of guilt that I had no right to be feeling these emotions in the first place. And it took realizing how, even with skilled and supportive supervisors like mine, universities are failing to adequately prepare or support graduate students working in these traumatic contexts, to motivate me to write this paper and advocate for action.

A call to action

Our experiences echo those documented in other autoethnographic accounts from disaster scholars as well as the literature on secondary traumatic stress. Both reflections document feelings of guilt and self-doubt—that we weren't the "real victim" (Dominey-Howes 2015: 59) or that our experiences weren't comparable to those of the communities we were working with—that prevented us from recognizing the impacts on our own mental health and wellbeing. The inability to make sense of these experiences and emotions manifested in different ways: for Francisca, at times through avoidance or inhibited thinking; for Sarah, keeping symptoms "in check" (Pulido 2007: 278) until the research was complete. In both cases, we eventually sought support through counseling and have felt able to discuss these impacts with our mentors or peers. However, we recognize that many researchers, particularly students and early career researchers, face financial and professional barriers to seeking support, including fears of stigmatization (San Roman Pineda et al. 2023) and a lack of accessible mental health services.

Our relationships with affected communities heightened these impacts. We not only felt the weight of documenting and give voice to disaster-affected communities (Dominey-Howes 2015) and of contributing to positive impact (Klocker 2015), but also deeply personal connections and responsibilities to these people and places impacted by wildfire disasters (our childhood hometowns, our research partners and mentors). As wildfire researchers increasingly seek to engage in collaborative and community-partnered research, our experiences highlight the additional risks that must be addressed when engaging in this work.

The existing literature highlights a range of strategies, from self-care and mindfulness practice (e.g., Coles et al. 2014; Eriksen 2017; Eriksen & Ditrich 2015) to stronger

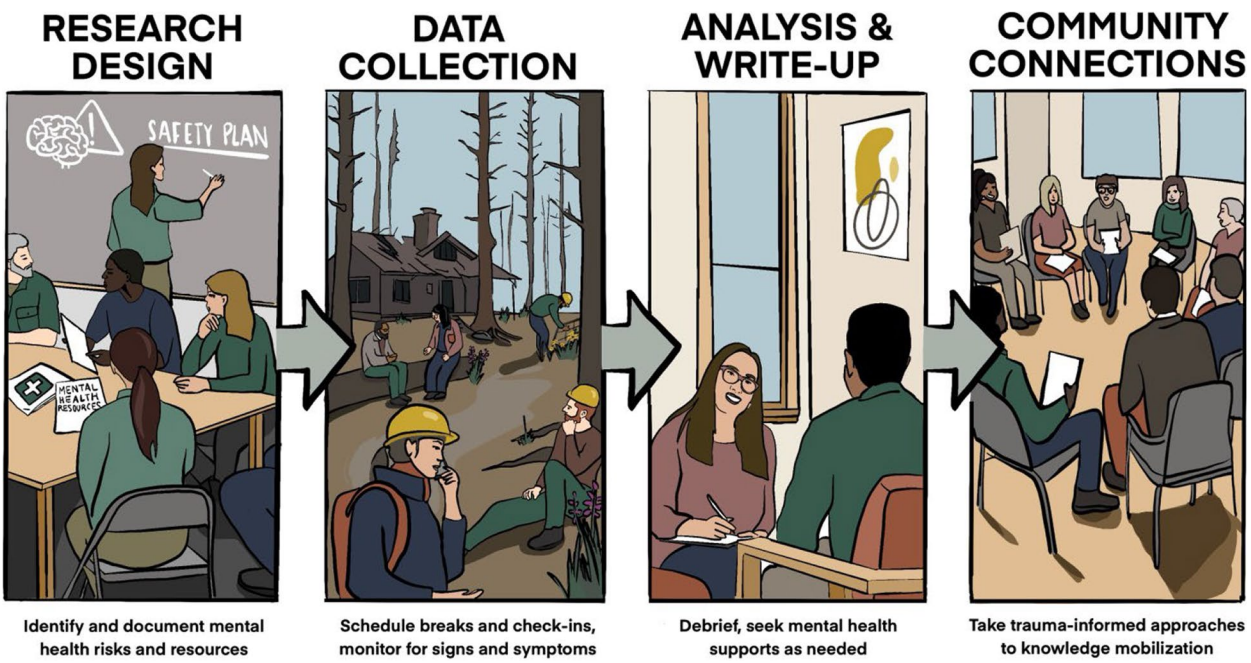

Fig. 2 Priority calls to action for researchers and their supervisors to mitigate the risk of mental health impacts throughout the research process. Design credit: Kelly Dunn

Table 2 Frameworks and resources to support the mental health and wellbeing of wildfire researchers

Framework/approach	Description	Select resources
Psychological first aid	A psychosocial support activity to assist people in distress and support coping (e.g., following a traumatic event or crisis). These support activities aim to ensure safety, promote calm, connectedness, and self-efficacy, and instill hope Goals of psychological first aid include: • Making people feel calm and secure • Identifying and assisting with immediate needs • Connecting people to resources or support services • Reducing the risk of additional harm	Australian Red Cross (2020). *Psychological First Aid: Supporting People Affected by Disaster in Australia.* Available online (PDF) https://psychology.org.au/getmedia/1a0384ce-929d-422e-ad33-9c650eb42b91/psychological-first-aid-an-australian-guide.pdf Canadian Red Cross (2019). *Psychological First Aid:Pocket Guide.* Available online (PDF) https://cdn.redcross.ca/prodmedia/crc/documents/CRC-Psychological-First-Aid-Guide-2019.pdf World Health Organization (2011). *Psychological First Aid: A Guide for Field Workers.* Available online https://www.who.int/publications/i/item/9789241548205
Self-care	Actions that individuals engage in on a regular basis to reduce stress and maintain and enhance health and wellbeing. Individualized self-care plans can identify negative and positive coping strategies, and outline strategies, practices, and resources to support mental health and wellbeing	Butler et al. (2015). *Self-care starter kit.* University of Buffalo School of Social Work. Available online https://socialwork.buffalo.edu/resources/self-care-starter-kit.html
Trauma-informed research	An approach to research that acknowledges the widespread impact of trauma on research participants/partners and aims to prevent re-traumatization or further harm. Key principles include: • Safety: fostering physical, emotional, and relational safety • Trustworthiness: being open, clear, and transparent; building and maintaining trust • Choice: ensuring researchers and participants have agency and meaningful decision-making power • Collaboration: throughout the research process, with individuals and communities who are the focus of research and will be impacted • Peer support: relying on others can foster sense of collaboration and create safety • Empowerment: providing a voice so people feel respected and validated. Promotes self-efficacy and self-advocacy	Alessi and Kahn (2023). "Toward a trauma-informed qualitative research approach: Guidelines for ensuring the safety and promoting the resilience of research participants." *Qualitative Research in Psychology,* 20(1) Isobel et al. (2024). *Towards Trauma-informed Tesearch: A Brief Overview & Practice Guide.* University of Sydney. Available online (PDF)https://cmhdaresearchnetwork.com.au/wp-content/uploads/2024/07/CMHDARN_Towards_Trauma_Informed_Research_2024.pdf Substance Abuse and Mental Health Services Administration. (2014). *SAMHSA's Concept of Trauma and uidance for a Trauma-informed Approach*. HHS Publication No. (SMA) 14–4884. Substance Abuse and Mental Health Services Administration

training, research ethics and safety protocols (e.g., Eliasson & DeHart 2022; Williamson et al. 2020), to support the mental health and wellbeing of researchers. Despite this, there is still limited awareness, and more importantly limited action, within universities and the research community regarding these issues, particularly in terms of graduate researcher training and guidance (Eliasson & DeHart 2022). University research ethics protocols and trauma-informed methods training, for example, still predominantly focus on identifying and mitigating risks to participants while failing to acknowledge the potential risks faced by researchers themselves (Eliasson & DeHart 2022; Eriksen 2017). Natural science field safety plans also primarily focus on physical hazards rather than psychological risks. While McLennan et al. (2016: 104) suggests that there is a low probability of long-term psychological harm to researchers who experience secondary traumatic stress, this was dependent on researchers both having experience in researching sensitive topics, and being "prepared for what they may face in the field." From our own experiences, and evidence from the wider literature, it is clear that in many cases, researchers—particularly students—are not being adequately trained and prepared to identify and address these impacts, which we argue results in an unacceptable risk of harm.

In Table 1 and Fig. 2 we synthesize tangible and actionable recommendations from the diverse literature on research-related secondary traumatic stress (see in particular Calgaro 2015; Coles et al. 2014; Dickson-Swift et al. 2007; Dickson-Swift et al. 2008; Dominey-Howes 2015; Eriksen & Ditrich 2015; Markovic and Živanović, 2022; San Roman Pineda et al. 2023; Santana et al. 2021), highlighting key actions that can be taken throughout different phases of wildfire research.

The actions outlined above, while predominantly targeted to individual researchers, will only be effective if supported by broader systems of training and cultures of care and acceptance (Eriksen 2017). We therefore call on researchers and institutions to build capacities in psychological first aid, prioritize cultures and practices of self-care, and promote training in trauma-informed research and practice (Table 2). In doing so, we echo and uplift the recent call to action from the International Association of Wildland Fire (2025), which outlines tools and mechanisms for enhancing health and wellbeing, and presents key actions for governments, agencies and policymakers to "promote and contribute to the mental, cultural, physical and emotional safety of wildland fire practitioners worldwide". These frameworks offer principles and strategies for supporting ones' own mental health and wellbeing, and that of others, from students and employees to research partners and participants. However, it is critical that the burden of exercising these strategies doesn't fall solely on individuals, and that a neoliberal hyper-individualized conception of "self-care" (Letak 2025) is not used to distract from the duty of care that universities have to students and faculty, particularly early career researchers. It is also important to recognize how power dynamics inherent many academic relationships (e.g., student-supervisor) may hinder junior researchers from seeking support or admitting to the emotional toll of their research, for fear of judgment or reprisal (Eliasson & DeHart 2022; San Roman Pineda et al. 2023). As such, it is the responsibility and role of those in positions of power and seniority to exercise leadership by creating support structures, including offering training and mental health resources, facilitating safe spaces for dialogue where managers and staff discuss the impacts and risks of direct and secondary trauma, and integrating psychological risk assessment of the researchers into ethics and safety protocols.

Without concerted action, and the necessary institutional support, both the quality and sustainability of wildfire research and the research community are at risk. Potential compounding impacts resulting from a lack of action include (1) adverse impacts to researcher physical and mental health; (2) attrition of researchers, including graduate students, due to these physical and mental health impacts, and an associated decline in wildfire-related research outputs; and (3) reduced capacities of researchers to productively and ethically engage in either collaborative or trauma-informed research. We call on the wildfire research community to advocate for and implement these actions within our respective institutions. Finally, we argue that it is only by acknowledging the role of emotions in motivating us and shaping our experience as researchers, and allowing space for our full selves and experiences in the research process, that we can begin to cultivate communities of care to sustain ourselves as researchers and ensure the future of ethical and trauma-informed wildfire research.

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Authors' contributions

SD-H, CS and NO conceived of this manuscript. SD-H and FS framed and wrote the initial manuscript and conceived of Fig. 2. All authors contributed to and approved the final manuscript.

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