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# The experiences of First Nations peoples as presented in Australian bushfire research: a scoping review

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**ABSTRACT**

Despite growing interest in Indigenous fire stewardship practices and knowledge, there is a substantial gap in the literature relating to empirical research documenting First Nations peoples' voices/experiences/effects of bushfire. This scoping review aimed to explore the available literature on the effects of bushfires among the Australian First Nations peoples and emphasised the ways First Nations peoples experienced bushfires. Specifically, the review aimed to answer the following questions: How have bushfires impacted the lives of the First Nations peoples of Australia? How have First Nations peoples' responses to bushfires been documented? A systematic search of five electronic databases and grey literature was initiated. A total of sixteen English-language publications related to the multifaceted impacts of bushfires on Australian First Nations peoples were included. Descriptive thematic analysis identified three major themes: (1) disproportionate effects; (2) health and overall wellbeing effects and access to primary health care; (3) First Nations peoples' response. We found that Australian First Nations peoples' experience of bushfires was described in the literature as unique and different compared to others because of a qualitatively different relationship with the Country. This review also identified that First Nations peoples' knowledge, historical legacies, cultural values, and practices were greatly misunderstood and, in many cases, ignored by the relevant agencies while taking and executing bushfire management strategies.

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Bushfires; fires; Australia; first nations peoples; aboriginal; indigenous

## 1. Introduction

In recent years, bushfire incidents have increased globally (Fletcher et al. 2021; Walters 2023). The recent Australian Black Summer bushfires (2019-2020), the 2020 and 2018 Californian wildfires, the 2019 Amazon wildfires, and the 2023 Canadian wildfires are

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examples of the frequency of large bushfires across the globe (Barlow et al. 2020; Fletcher et al. 2021; Kirchmeier-Young et al. 2019; Kramer et al. 2019; Liang, Liang, and Zeng 2024; National Interagency Fire Center 2018; State of California 2021). Deaths, housing collapse, and associated economic impacts resulted from those bushfires (Bowman et al. 2020; Kirchmeier-Young et al. 2019; Liang, Liang, and Zeng 2024; Read and Denniss 2020).

While climate change, driven by the rising greenhouse gas emissions that intensify global warming and elevate land and sea temperatures, was identified as the main cause of the increasing frequency of bushfires (Borunda 2020; Center for Climate and Energy Solutions 2020; Cormier 2019; Gray 2019; National Centers for Environmental Information 2021; Schauenberg 2020), little attention has been given to exploring the impact of bushfires on Australian First Nations peoples and communities. According to Australian population statistics, one-quarter of the First Nations peoples of NSW and Victoria live in bushfire-affected areas (Williamson, Markham, and Weir 2020). Australian First Nations peoples along with tens of thousands of people were displaced by the 2019–2020 bushfires, including residents, tourists, and visitors to affected areas (Whittaker et al. 2021). Recent research (Whittaker et al. 2021; Williamson, Markham, and Weir 2020), however, has demonstrated that the voice of First Nations peoples is relatively absent in the current literature related to the impact of bushfires on rural and regional communities. Researchers need to include the voices of First Nations peoples' experiences of the 2019–2020 bushfires (Williamson, Markham, and Weir 2020), as well as other major bushfires events, to better understand their impacts and to inform culturally informed and effective strategies for future bushfire management.

The purpose of the review is to synthesise findings across studies of First Nations peoples in the context of Australian bushfire research. Previous research on Australian bushfires has mostly overlooked the effects of bushfires on First Nations peoples; instead, research has focused on the changing bushfire management practices (Williams, Ford, and Rawluk 2021), Aboriginal fire knowledge (Atkinson and Montiel-Molina 2023), and connection between cultural burning and fire management (Atchison and Pilkinton 2022; Prober et al. 2016). This review aims to explore the available literature on the effects of bushfires among the Australian First Nations peoples. It also emphasised the ways First Nations peoples experienced bushfires. Specifically, the review aims to answer the following questions: How have bushfires impacted the lives of the First Nations peoples of Australia? How have First Nations peoples' responses to bushfires been documented? We aimed to map the (1) evidence of how research on the effects of Australian bushfires captures the experiences, responses, and voices of First Nations peoples; and (2) to identify the gaps in research about the experiences and reactions of First Nations peoples to bushfires. This review protocol has been registered in the Open Science Framework (OSF), and the registration DOI is https://doi.org/10.17605/OSF.IO/U32TD.

## 2. Methods

### *2.1. Design*

Scoping reviews are distinctive from many other forms of review as they offer a more systematised and transparent method to identify and analyse all relevant literature (Grant and Booth 2009). Researchers can map, describe, and analyse a larger body of

literature by using scoping reviews, which are at the centre of a continuum of review methodologies (Bradbury-Jones et al. 2022). The most appropriate method for exploring and examining the available evidence in this field was determined to be a scoping review methodology, which allowed the research team to understand the range and diversity of what has been reported in the literature around bushfire management concepts, to identify gaps in the literature, and highlight areas for future research (Bradbury-Jones and Aveyard 2021). A key element of the scoping review process is establishing a predetermined eligibility criterion to assist in the identification of relevant studies. The eligibility criteria for inclusion and exclusion of literature (see Table 1) in this review were determined using the Population-Concept-Context (PCC) framework, which defines the population of interest, the core concept under investigation, and the relevant contextual setting, as recommended for the conduct of a scoping review (Pollock et al. 2023).

### 2.2. Search terms

Indigenous OR First Nations* OR Aboriginal OR Torres Strait Island* AND fire* OR bush fire* OR bushfire* OR wildfire* OR forest fire*

### 2.3. Search strategy

The search included a comprehensive strategy to identify published available literature using the search terms developed within the PCC framework (Pollock et al. 2023). A three-step search approach was used, as advised in all Joanna Briggs Institute (JBI) reviews. The first step involved one reviewer who performed and conducted an initial search to determine key terms and develop the search string. A health librarian was consulted (agreed upon by the research team) to ensure the databases and search strings would produce the desired results. The search was pilot tested in three databases (EbscoHost, Informit, and Proquest) to ensure the search strategy was robust and sufficient to locate the required literature and validate the search string. Following that process, the

**Table 1.** Inclusion and exclusion criteria.

| Inclusion Criteria | Exclusion Criteria |
|---|---|
| The literature focusses on First Nations peoples and communities in Australia and their experience of bushfires | The literature presents information related to First Nations peoples and communities outside of Australia |
| The literature is available in English | The literature does not directly focus on bushfire and First Nations peoples |
| The literature published between 1 October 2013 and 6 November 2024. | The literature was not available in English |
| Peer reviewed journal articles including original research and discursive papers | The literature that was published before 1 October 2013, considering the significance of contemporary evidence in bushfire research. |
| Evidence also includes grey literature produced by the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) and Australian Indigenous Health Info Net (AIHIN) | Literature such as government reports, editorials, or opinion pieces that have not undergone some type of peer review or quality assessment process. |
| | Reviews, conference abstracts or proceedings, newspaper articles, books, chapters, blogs and reports by non-UN organisations |

search was conducted by two researchers across the following databases: Informit, ProQuest, EbscoHost, SCOPUS, and Web of Science.

Keywords/key search terms were searched connecting Boolean operators OR/AND. The searches were restricted to title, abstract, and topic. Searching was undertaken in November 2023 and then updated in 2024, and restricted to the literature published between October 2013 and November 2024 to ensure relevance to current environmental conditions, capture current evidence, alignment with current policy and practice, avoiding redundancy from previous reviews, and a focused review with a manageable volume of research. It is worth mentioning that scoping reviews are particularly useful for mapping key concepts and identifying gaps within a given timeframe, often spanning the last 5–10 years to ensure both breadth and relevance (Peters et al. 2020).

Due to the large number of studies obtained by the initial search, limiters (e.g. Australia, peer-reviewed) were applied per the inclusion criteria. The search terms were modified for each database as required (Supplementary file, Appendix A)

In addition to the database searches, two reviewers searched Google Scholar and the following journals relevant to the topic (selected and agreed upon by the librarian and research team): Australian Journal of Emergency Management, Australian Forestry, International Journal of Wildland Fire, AlterNative: An International Journal of Indigenous Peoples, and the Bushfire Bulletin for resources related to bushfires and the experience of First Nations peoples of Australia. The used search terms for each journal are added as a supplementary file (Appendix B). In addition, two non-peer-reviewed Aboriginal databases namely the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) and Australian Indigenous Health Info Net (AIHIN) were searched and retrieved 66 articles for title and abstract screening, which are documented in the supplementary file (Appendix C). For each database and journal, the relevant papers were identified, and the reference, title, abstract and keywords were exported as an RIS file into EndNote. The results were exported to Covidence and duplicates removed and two reviewers undertook title and abstract screening followed by full-text screening. The reviewers discussed any discrepancies in their decisions and sought consensus, and reference lists of all included studies were systematically examined to identify additional relevant sources.

The PRISMA checklist for Scoping Reviews tool (PRISMA-ScR) (Tricco et al. 2018) was used to report the results of the screening process. It is important to note that the review protocol was originally intended to evaluate the included literature using the Aboriginal and Torres Strait Islander Quality Appraisal Tool (QAT). However, the protocol was modified, as the main goal of the QAT tool is to assess the quality of empirical research, and this scoping review includes literature reviews, discursive papers and original research articles; hence the tool was deemed inadequate for the process. Furthermore, as risk of bias and critical appraisal are not necessary for scoping reviews (Heaney et al. 2021; Pollock et al. 2023; Usher et al. 2023), this process is not included in the manuscript.

### *2.4. Data extraction and analysis*

The data extraction process provides a logical and descriptive summary of the results that align with the objectives and research inclusion criteria of the scoping review. Two independent reviewers extracted data from the literature included in the review using the standardised JBI data extraction process (Table 2). The data extraction table (Table 2) gathers

**Table 2.** JBI template source of evidence details, characteristics and results extraction instrument.

| Citation | First Nation author/s or no | Aims/objectives | Type of Publication (original or discursive) | Study Design and methodology | Analysis methods | Overall results |
|---|---|---|---|---|---|---|
| Upward, Usher, and Saunders (2023) | Yes | Climate change and its impact on the social, emotional, physical, spiritual and cultural wellbeing of First Nations peoples and mental health services in a rural region. | Perspective paper | N/A | N/A | - In First Nations communities, long term and deep spiritual connections to Country and responsibilities to care for Country are affected by wildfire.<br>- There is a lack of planning and prevention strategies that were not implemented prior to the bushfires.<br>- Bushfires prevention models should be initiated in collaboration with local, state governments, emergency response organisations, and local First Nations communities. |
| McDonald et al. (2023) | No | The impacts of landscape fire smoke (LFS) on adults and children with asthma, highlighting the greater impact LFS on Aboriginal and Torres Strait Islander peoples. | Review paper | Review | N/A | - First Nations peoples are at greater risk of symptoms during LFS exposure periods.<br>- 15% greater risk of hospitalisation was described in First Nations peoples of Australia compared to non-Indigenous people. |
| Atchison and Pilkinton (2022) | No | The re-articulation of power over invasive life during disaster reproducing its abjection, and the colonial context in which invasive species management and disaster responses occur. | Discursive paper | N/A | Empirical analysis of media discourse and responses to Australian 2019–2020 bushfires | - First Nations peoples' experience of the bushfires was vastly different to those of non – Indigenous people.<br>- First Nations peoples were disproportionately affected by the bushfires. |
| Usher et al. (2022) | No | Unlike physical health effects of bushfires on the First Nations, mental health impact should get equal priority following bushfire | Correspondence/ discursive paper | N/A | N/A | - The already vulnerable First Nations (socio-economic and rural disadvantage, and pre-existing mental and physical illness) peoples are particularly at-risk of bushfires.<br>- First Nations peoples in Australia are particularly vulnerable given their strong connections to Country, and |

(*Continued*)

**Table 2.** Continued.

| Citation | First Nation author/s or no | Aims/objectives | Type of Publication (original or discursive) | Study Design and methodology | Analysis methods | Overall results |
|---|---|---|---|---|---|---|
| | | | | | | which eventually affects the mental health and well-being. |
| Hall and Crosby (2022) | Not mentioned | Vulnerabilities of human health of residents in remote Indigenous communities to human-induced climate change to contribute to adequate responses of prevention and preparation. | Review paper | Narrative review | Narrative | - The impacts of bushfires, cyclones, and drought raise the expense and demand for healthcare and exacerbates pre-existing health disadvantages for First Nations peoples of Australia who live in rural places with a high prevalence of chronic disease and are far from health facilities. |
| Lundberg (2022) | Not mentioned | Understanding the complex nature of bushfires and argues that green criminology must attune to the intersections between bushfires, space, mobility and meaning. | Perspective paper | Secondary resources | N/R | - First Nations peoples were deeply affected by the 2019–2020 fires.<br>- The article found that 84,000 First Nations peoples, representing one quarter of the entire First Nation population in the two Australian States Victoria and New South Wales, were affected by the bushfires. |
| Beggs et al. (2021) | Not | Explanation of two new indicators heat impact on physical and sporting activities and bushfire adaptation and also briefly outline key points relating to the other indicators | Report/Perspective paper | N/A | N/A | - Climate change disproportionately threatens First Nations peoples of Australia's wellbeing in multiple and complex ways<br>- Linkages among health, climate change and bushfires are need to be analysed to understand the impacts of bushfires. |
| Heaney et al. (2021) | Not mentioned | Bushfire smoke events potentially increase healthcare contact among the most risk populations including those with underlying cardiorespiratory disease, elderly, paediatric, pregnant persons, and First Nations peoples. | Review | Scoping review | N/A | - The First Nations peoples in Australia and people of African or Hispanic descent in the United States have been found to have comparatively worse health outcomes<br>- The study explored that bushfire smoke events potentially increase healthcare contact, especially presentations triggered by |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | respiratory illness among the First Nations peoples. |
| Bourke, Atkinson, and Neale (2020) | Yes | The management of Country, or lands and waters, and how bushfires can play both a generative and potentially harmful roles in the management of Country. | Original | Qualitative: one to one conversation | N/A | - Non-indigenous people should understand First Nations' ways of controlling the bushes to save the Country from burning.<br>- Due to the lack of incorporating Indigenous knowledges, there have been seen a lot of large wildfires in the summer.<br>- Cultural fire is different form the wildfire<br>- Losing lives that matter for the First Nations people |
| Sangha et al. (2020) | Not | Assessing the loss of ecosystem services from bushfires in the Northern Territory (NT), Australia, where wildfires are frequent, extensive, and often destructive. | Original | Trans-disciplinary approach was used | N/A | - Bushfires affect the well-being of remote First Nations peoples by compromising economic opportunity, health, and safe and supportive environment, and values.<br>- Bushfire-related well-being losses for the First Nations population living in remote areas were significant, costing about $272 million per annum. |
| Sangha et al. (2019) | Not mentioned | The effect of bushfires on "loss of wellbeing" for the remote Indigenous population. | Original | A step-wise case study approach was applied. | Substitute value of welfare expenditure was used | - To date, there has been no accounting for bushfire-related losses because, no measures have been available to account for loss of natural systems nor First Nations wellbeing.<br>- -The environmental and First Nation peoples' wellbeing losses should be considered together.<br>- -There are significant biodiversity and soil-erosion losses that have not been accounted for. |
| Christianson (2015) | Not mentioned | Explored the contemporary Indigenous wildfire management in Australia, Canada and the United States after the year 2000 | Review paper | Review | N/A | - First Nations peoples were more accepting of wildfire risk and had more trust in the capacity of their community to deal with wildfire than non-Indigenous people in the community |

(*Continued*)

**Table 2.** Continued.

| Citation | First Nation author/s or no | Aims/objectives | Type of Publication (original or discursive) | Study Design and methodology | Analysis methods | Overall results |
|---|---|---|---|---|---|---|
| | | | | | | - Wildfire mitigation was an important part of life for First Nations peoples.<br>- Wildfire in the dry season needs to be considered as the main hazard in the rural/remote places. |
| Head et al. (2014) | Not mentioned | The impacts of bushfires on Indigenous peoples' political, economic, and sociocultural contexts. | Discursive paper | N/R | N/R | - A history of state sanctioned forced removals and dispossession means there is significant distrust, and a strong potential for evacuations to become relocations, separating people from their homelands.<br>- Based on the available data and climate forecasts, the study suggests that heatwaves and bushfire weather are likely to occur more frequently in the future. |
| O'Brien and Watson (2014) | Not mentioned | Understanding Indigenous frameworks and ethics in relation to land and losses of lands by bushfires. | Original paper | Qualitative: one to one conversation | N/A | - The limitations of Western understandings of environmental management – and in particular the prevention of bushfires – from an Indigenous knowledge's standpoint.<br>- Fire brigade's work needs to be co-operative with the local First Nations communities rather than in isolation from First Nations communities.<br>- Indigenous knowledges enhance the management of the environment. |
| Woodland et al. 2024 | | This study identifies environmental factors that functioned as barriers and enablers to Aboriginal Australians' experiences accessing primary health care. | Original paper | Case study approach: In-depth interviews | Thematic analysis | - Barriers to access primary health care housing; financial constraints; difficulties with transport; medical bureaucracy and the physical environment of the health care setting, including appointment-making processes; interactions with medical reception staff; and waiting room environments. |

| | | | | | | |
|---|---|---|---|---|---|---|
| Keevers et al. 2024 | Yes | The collective experiences of people affected by cumulative disasters to identify the practices that support healing, and recovery for Aboriginal communities. | Original paper | Narrative inquiry | Reflexive thematic analysis | Enablers: The supportive role of the local Aboriginal Community Controlled Health Organisations (ACCHO) and their staff.<br>- The paper demonstrates the need for disaster responses to be community-led and culturally<br>- Emphasised on assisting communities (re)gain First Nations peoples' sense of belonging, hope for the future, control over their lives and their capacities to care for and to be cared for by Country, is key to both enhancing healing, health and well-being and harnessing the strengths of communities. |

specific information on authors, year of publication, aims, type of publication, methodology, and key findings that relate to the experience and impact of bushfires among First Nations peoples in Australia. A descriptive thematic analysis was performed to group the results by recurring themes, which is a common practice in scoping reviews (Usher et al. 2023).

Descriptive thematic analysis was conducted using the six procedures described by Braun and Clarke (2006), which are frequently employed in health research (Kabir, Wayland, and Maple 2023; Usher et al. 2023). After becoming acquainted with the data from the research that was finally included, the two authors reviewed and reread the data to gain a thorough understanding. Second, preliminary coding was produced. Third, the codes were developed to help create the basic themes. Fourth, the codes and themes were collapsed and refined. The fifth step determined how the story advanced the themes. Lastly, an assessment of the themes was done to see if they accurately captured the meaning of the data set and coded extracts. The results were examined by the entire research team. The reviewers provided the data in table form (Table 2), which visually enhances our presentation by showcasing the included literature covering the themes that are consistent with earlier scoping reviews (Usher et al. 2023). This scoping review presented the results using direct quotations from the included studies following a recently published scoping review (Usher et al. 2023).

## 3. Results

A total of 843 literature sources were found through electronic databases (n = 643), other sources (n = 190), and reference searches (n = 10); 435 duplicates were eliminated, leaving 408 studies for title and abstract screening. A total number of 316 articles was deducted based on the title and abstract screening. Finally, we retrieved 92 articles for full-text screening of which sixteen articles met with the inclusion requirements. After searching these sixteen publications' reference lists, 10 additional evidence were found for the title and abstract screening (see Figure 1).

Of the finally included sixteen articles, six articles were identified as discursive/perspective studies, six were based on qualitative narrative inquiry and case study-based original studies, and four were review studies. All studies discussed bushfires and their direct/indirect impacts on the First Nations peoples of Australia. By following Braun and Clarke's (2006) six steps as mentioned earlier, two researchers formulated three main themes based on the data, which addressed the aims and objectives of this scoping review: (1) disproportionate effects; (2) health and overall wellbeing effects, and access to primary health care; and (3) First Nations peoples' response. Table 3 presents a summary of themes reported by each study.

Before focusing on the main themes, it is worth mentioning that several evidence (Atchison and Pilkinton 2022; Bourke, Atkinson, and Neale 2020; Christianson 2015; O'Brien and Watson 2014) included in this review highlighted the misconceptions about the causes of bushfires. For example, cultural fire is often blamed for bushfires (Christianson 2015). This aspect of First Nations culture is frequently misunderstood as a cause of bushfires (Bourke, Atkinson, and Neale 2020). Atchison and Pilkinton (2022) stated that cultural burning is differentiated from other types of fires used in hazard reduction burns and the range of other outcomes associated with cultural burns used by First Nations peoples. Studies mentioned that bushfires are mainly caused by climatic

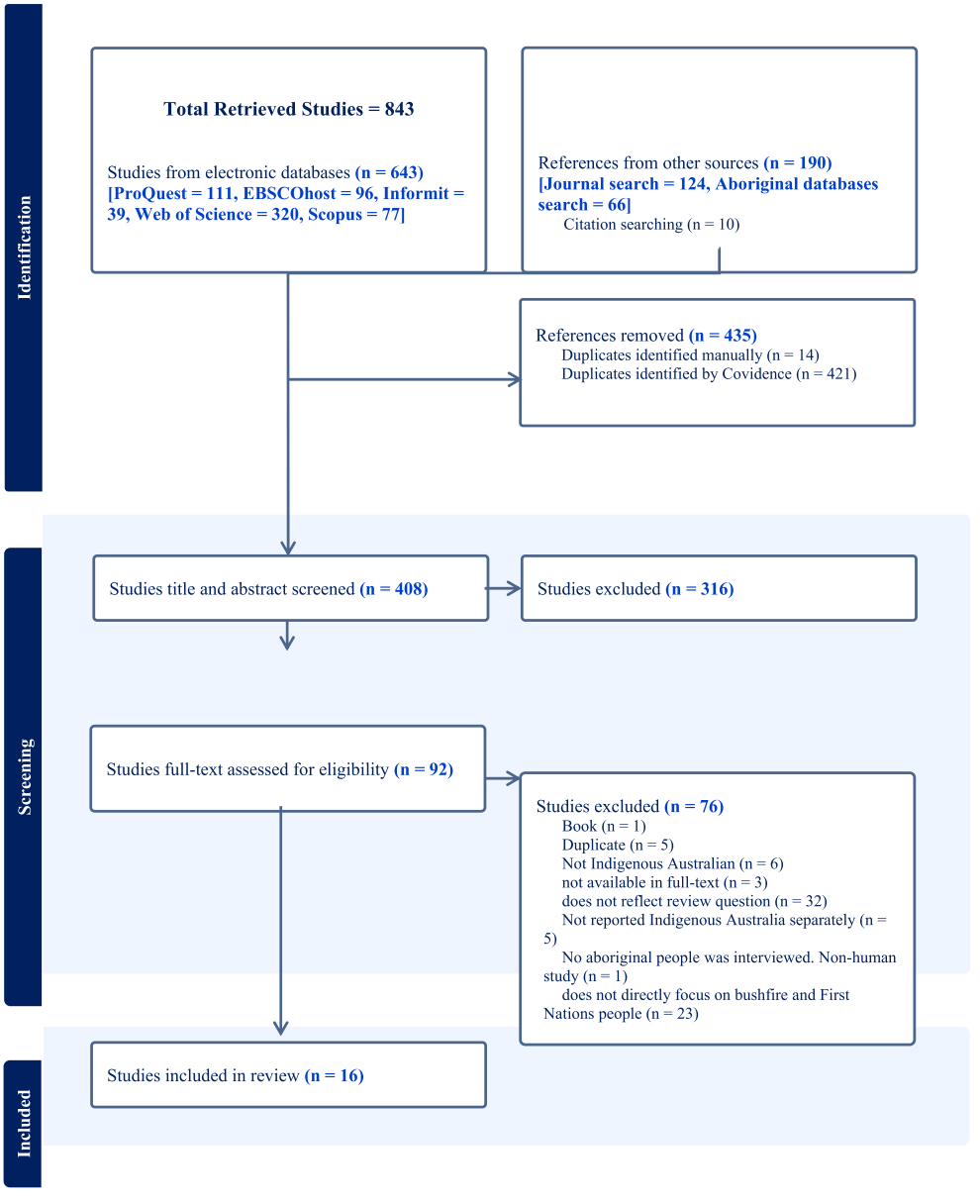



**Figure 1.** PRISMA flow chart.

change/environmental degradation (Lundberg 2022), the dryness and amount of fuel, prevailing weather, and likelihood of ignition (Head et al. 2014), and lightning strike (Lundberg 2022; O'Brien and Watson 2014), yet have disproportionate effects.

### *3.1. Disproportionate effects*

Nine studies (Atchison and Pilkinton 2022; Beggs et al. 2021; Bourke, Atkinson, and Neale 2020; Hall and Crosby 2022; Head et al. 2014; Heaney et al. 2021; McDonald

**Table 3.** Summary themes reported.

| | Themes | | |
|---|---|---|---|
| Citation | Disproportionate Effects | Health and Overall Wellbeing Effects | First Nations Peoples' Response |
| Upward, Usher, and Saunders (2023) | - | X | X |
| McDonald et al. (2023) | X | X | - |
| Atchison and Pilkinton (2022) | X | X | X |
| Usher et al. (2022) | - | X | - |
| Hall and Crosby (2022) | X | X | - |
| Lundberg (2022) | - | X | - |
| Beggs et al. (2021) | X | X | - |
| Heaney et al. (2021) | X | X | - |
| Bourke, Atkinson, and Neale (2020) | X | - | - |
| Sangha et al. (2020) | - | X | - |
| Sangha et al. (2019) | X | X | - |
| Christianson (2015) | - | X | X |
| Head et al. (2014) | X | X | - |
| O'Brien and Watson (2014) | X | - | - |
| Woodland et al. (2024) | - | X | - |
| Keevers et al. (2024) | - | X | - |

et al. 2023; O'Brien and Watson 2014; Sangha et al. 2019) reported the disproportionate effects of bushfires. McDonald et al. (2023) found that considering poor recognition and acceptance of First Nations fire prevention practices, First Nations people are more susceptible to the devastating impacts of bushfires. The impact of the bushfires was disproportionately felt by First Nations peoples (Atchison and Pilkinton 2022). This is mostly due to the experiences of First Nations peoples with recovery efforts that silenced or excluded, and overrepresentation as a percentage of the population residing in bushfire impacted areas. The disproportionate effects were mainly caused by remote geographical locations where many First Nations peoples reside (Hall and Crosby 2022; Head et al. 2014; Sangha et al. 2019), and they have a long historical legacy. The following statement reported in (Atchison and Pilkinton 2022) would make a sense of it,

> … *The long-term effects of colonisation has meant Aboriginal communities are (for better or worse) accustomed to living with catastrophic changes to their societies and lands, adjusting and adapting to keep functioning,* (6).

Losing millions of hectares of land due to the bushfires also meant losing Aboriginal cultural stories, which is evident from the following statement,

> *The Aboriginal community is hurting right now, … we've lost millions and millions of hectares of our cultural values, our kinship, and our stories,* (7).

As a result, it can be argued that the threat of bushfires in remote communities depends on the geographic location/remote locations (Hall and Crosby 2022; Head et al. 2014), and when costs are assessed for the loss of services and benefits from large bushfires for First Nations peoples living in remote areas, the losses are quite high (Sangha et al. 2019), and often considered as double effect (O'Brien and Watson 2014). Overall, climate change, which has resulted in frequent bushfires in Australia, disproportionately threatens First Nations peoples' health and wellbeing in multiple and complex ways (Beggs et al. 2021; Heaney et al. 2021).

### 3.2. Health and overall wellbeing effects, and access to primary health care

Fourteen (Atchison and Pilkinton 2022; Beggs et al. 2021; Christianson 2015; Hall and Crosby 2022; Head et al. 2014; Heaney et al. 2021; Keevers et al. 2024; Lundberg 2022; McDonald et al. 2023; Sangha et al. 2019, 2020; Upward, Usher, and Saunders 2023; Usher et al. 2022; Woodland et al. 2024) of the sixteen studies reported information on health (both physical and mental health impacts) and overall wellbeing, and access to primary health care of First Nations peoples of Australia following bushfires. Studies found many health issues including respiratory conditions (Heaney et al. 2021), injuries (Sangha et al. 2019 & 2020), post-traumatic stress disorders (PTSD), and trauma (Head et al. 2014; Upward, Usher, and Saunders 2023; Usher et al. 2022), mood disorders and anxiety (Hall and Crosby 2022), and overall wellbeing effects (Beggs et al. 2021; Lundberg 2022). Besides these health and overall wellbeing effects, Hall and Crosby (2022) exposed the deaths caused by bushfires. For example, they noted that bushfires caused 433 deaths and over 8,000 injuries between 1967 and 2013; in 2009, there were 173 deaths from bushfire-related burns and injuries (Hall and Crosby 2022). The study also noted that during the summer of 2019–2020 in southern and eastern Australia, there was a prolonged period of high-intensity bushfires. The fire damage, along with the prolonged human exposure to smoke and ash, resulted in acute health effects like asthma and heart problems and contributed to dislocation due to the loss of homes, property, and communities.

The study conducted by McDonald et al. (2023) reported that in Australia, extreme bushfires cause landscape fire smoke (LFS) impacts on vulnerable groups, particularly older people and pregnant women. Individuals who have asthma are especially susceptible to the negative consequences of LFS exposure. The study conducted by Heaney et al. (2021) reinforced the claim that bushfire smoke events potentially increase several health risks especially among elderly, paediatric, pregnant persons, and First Nations peoples.

Keevers et al. (2024) exposed the feeling of loss, grief, and worry by First Nations peoples following the bushfires. By quoting the following statements, they illustrated the mental health impacts of bushfires-

> *It was like the apocalypse. It was confronting living in bush smoke every day. Having, you know, ashes landing in your backyard, just awake all night with the worry of maybe the house might get burnt down … [Manaaki]* (7).

> *So, when we came back from the bushfires and come back into work, and there was that feeling of loss, and there was that feeling of grief … [Sharmaine]* (8)

In addition, other studies (Sangha et al. 2019, 2020) identified health, death, loss of ecosystems, and cultural assets as the direct of impacts of bushfires. For example, Sangha et al. (2019, 2020) explained how in the Northern Territory (NT), the loss of wellbeing benefits for the First Nations peoples' population is ~$272 million per year. If the environmental and First Nations peoples' wellbeing losses are considered together, the cost estimates are ~$470 million per year. Upward, Usher, and Saunders (2023) described how bushfire also impacts First Nations peoples through the experience of homelessness. In a rural community in Northern New South Wales, for example, Upward, Usher, and Saunders (2023) highlight a story of a First Nations family who lost everything during the 2019–

2020 bushfire season and remained living in a caravan on a remote site without services two years after the disaster.

Besides the direct impacts of bushfires, First Nations peoples experience difficulties accessing primary health care services following bushfires. For example, Woodland et al. (2024) reported that numerous environmental factors impacted the accessibility of health care for members of the First Nations community during times of crisis including bushfires. These factors included: the impact of non-health-related priorities on the experience of receiving health care, which includes housing and other priorities (financial constraints, lack of available transportation from remote to the medical centre) as well as unhelpful medical bureaucracy (medical reception staff, making appointments and physical spaces such as medical waiting rooms impacted health care access during crises) (Woodland et al. 2024). Woodland et al. (2024) pointed to the following statement, highlighting the financial costs of keeping well in a quote from a First Nations participant:

> *… it's too hard, too much, too much stuffing around, you've gotta get the appointments like, and then get there, and then get home, and you dunno how much it's gunna cost, and is it worth it even? And then you've gotta go back to the doctor again …* . (85)

Additionally, First Nations peoples who are already in a crisis relating to bushfires and environmental stress, received unwelcoming treatment from medical professionals and administrators, elucidated by the following quote:

> *You just feel like, unwanted. You just feel like they don't want to treat you, it just becomes … I don't know if those are the right words, but it just feels so like–is racism playing its part again in that? Intimidation was the word, but you just feel like you know, you're not worthy of going in to see a doctor, which puts a lot of people off.* (85)

### *3.3. First Nations peoples' response*

Three studies (Atchison and Pilkinton 2022; Christianson 2015; Upward, Usher, and Saunders 2023) focused on First Nations peoples' response to bushfires. Every year, bushfires pose a threat to a large number of First Nations communities, yet little is currently known about how these communities manage fires. How "values at risk" are categorised is one major distinction between First Nations peoples and bushfire management organisations when it comes to responding to wildfires (Christianson 2015). While wildfire managers could consider buildings, infrastructure, and natural resources as of most importance, First Nations peoples might consider traditional hunting places, trap lines, and archaeological sites to be of greater value. Numerous other elements, including decision-making, firefighting response, evacuation alerts and orders, and individual community member experiences, could be investigated in relation to wildfire responses with First Nations peoples. Christianson (2015) found that First Nations peoples experience a lack of access to firefighting supplies for controlling bushfires.

According to Upward, Usher, and Saunders (2023), a large loss of wildlife could have an impact on First Nations communities' long-standing, profound spiritual attachments to their Countries and their duty to preserve it. In response to the apparent lack of planning and preventative measures that were not put in place before the Black Summer bushfires, many First Nations community groups have expressed their frustration of not being

supported or listened to by government organisations (Upward, Usher, and Saunders 2023). Many people think that the forced cessation of regular burning that was conducted in the past caused an excess of forest fuel, which is to blame for the intensity of the Black Summer bushfires in 2019 and 2020. In response to the impact of the Black Summer bushfires in Australia, the World Health Organisation (2021) stated: "The 2019/2020 bushfire season demonstrated that bushfire behaviour is becoming more extreme and less predictable. Catastrophic fire conditions may become more common, rendering traditional bushfire prediction models and firefighting techniques less effective". As a result, it is imperative that disaster response agencies, local and state governments, work with First Nations communities who have a long history of caring for the Country. Importantly, First Nations communities and agencies should begin by developing and putting into practice preventative methods that draw from First Nations' custodianship collaboratively. Upward, Usher, and Saunders (2023, 1492) shared their own experience as follows,

> *In our work with local Aboriginal people affected by the Black Summer fires in the Hunter New England area we have observed great concern around the lack of input into land management, especially about the lack of fire protection practices.*

Furthermore, Atchison and Pilkinton (2022) made two significant observations about how First Nations peoples respond to bushfires: (a) During the fires, First Nations peoples concentrated on the larger context of environmental governance and management rather than on particular kinds of actions to control invasive species, and (b) they conveyed the idea that the bushfires might also present different opportunities than those being proposed in relation to the control of invasive species. In other words, the First Nations peoples of Australia are primarily interested in enhancing ways to support bushfire prevention in the future instead of focusing on the occurrences of the past.

## 4. Discussion

This review found the varied experiences of First Nations peoples in Australia following bushfires as presented in the literature. It is evident that recent bushfires have had a profound impact on First Nations communities. In addition, this review has highlighted the struggles First Nations peoples undergo to have their knowledge and experience in managing bushfires respected. Our analysis identified three interlinked themes in the literature describing the impacts of bushfires on First Nations peoples. A total of sixteen full-text articles were included in this review. Most importantly, this scoping review identified knowledge gaps and recommend the needs for further research in this area. The majority of the articles (n = 14) focused on how bushfires impacted First Nations peoples' health and overall wellbeing including access to primary health care facilities following the crises.

In general, the studies were conducted by non-Indigenous researchers and there was little evidence of attempts to co-design research projects with First Nations peoples. Only two papers (Bourke, Atkinson, and Neale 2020; Upward, Usher, and Saunders 2023) were authored/co-authored by First Nations people. Research around issues of relevance to First Nations people needs to be led by and with First Nations communities across all aspects of the research (Dillon 2021). Where possible, research should be led by community members. When First Nations leadership is not possible, there must be local First Nation representation on research teams (Beer et al. 2022). Importantly, this study has

been researched and written by three First Nations scholars and researchers who have been involved at every stage of design and write-up.

### 4.1. Bushfire effects

Country for First Nations peoples refers to more than the land or environment. The review found that there are multiple dimensions to what First Nations peoples live with, including the impact of bushfires on people who have custodial and cultural responsibilities for a Country that has been disrupted/destroyed by colonisation. We argue that First Nations peoples in Australia live with the memories that bushfires snatched from them when their homes, their ties to the land, and their traditional beliefs were devastated by bushfires. This loss resulted in physical and mental health effects including feelings of loss, grief, and worry (Keevers et al. 2024); an outcome which is often ignored in academia (Usher et al. 2022). In line with this finding, Montesanti et al. (2021) highlighted negative consequences of wildfire on Canadian Indigenous peoples' physical and mental health, social relationships, and overall resilience.

First Nations peoples in Australia are already living in a society where unequal access to health care facilities and health inequities are well documented (Usher et al. 2023), and First Nations peoples face additional barriers to accessing primary health care following bushfires (Woodland et al. 2024). This unequal access to healthcare facilities is exacerbated by the impact on services affected by sudden and cumulative disasters such as bushfires, Covid-19, floods, etc. Christianson (2015) and others (Upward, Usher, and Saunders 2023; Woodland et al. 2024 for example) have revealed how the First Nations peoples' health and overall wellbeing are also severely impacted and exacerbated by bushfires because of ongoing health inequalities and inequities. Similar to what this scoping review found, the Victorian Government Aboriginal Affairs Report (2020) report stated that Australian First Nations people have been disproportionately affected by the impacts of bushfires mainly due to historical and intergenerational trauma, current structural and financial disparities, and the substantial effects that bushfires and bushfire protection have on County and its cultural heritage.

### 4.2. Misconception about the causes of bushfires and their management

First Nations peoples have cultural burning traditions and practices that regenerate and care for the Country and have used these practices for thousands of years, which in turn reduces the risk of bushfires. The review explored the common misconceptions regarding cultural fires/burns. Cultural fire is often misunderstood as one of the reasons for bushfires (Atchison and Pilkinton 2022; Bourke, Atkinson, and Neale 2020; Christianson 2015; O'Brien and Watson 2014). Unfortunately, Bourke, Atkinson, and Neale (2020) exposed the reality that cultural burns have been banned by local governments in many regions of Australia due to misunderstandings. Therefore, long grasses are now seen in the countryside, especially in regional, rural, and remote areas and are the likely cause of recent bushfires.

It is worth mentioning that Christianson (2015) outlined how Cultural burns can be considered a management tool for controlling bushfire risks. First Nations peoples' practice of cultural burning was found to be effective in reducing hazard reduction and

consequently the occurrence of bushfires (Atchison and Pilkinton 2022). In addition, their practice cultural burning ceremonies as a response to bushfires, and as a means of healing and coming together during bushfires (Keevers et al. 2024). Indeed, the practices of burning the unwanted grasses near their living places made communities safe from bushfire risks (McKemey et al. 2021; O'Brien and Watson 2014). Likewise, recent research revealed that Indigenous cultural burns were identified as an effective management strategy to mitigate bushfire risks in Canada (Copes-Gerbitz, Daniels, and Hagerman 2023) and Brazil (Falleiro et al. 2024).

Our review found that the primary causal explanations for bushfires are linked to climate/environmental change (hot temperatures/lightning, less rainfall) (Beggs et al. 2021; Hall and Crosby 2022; Head et al. 2014; Lundberg 2022) and poor land management practices (Lundberg 2022). Instead of restricting the cultural fire/burns by local First Nations peoples, more attention could be directed towards working with Indigenous knowledge systems on how to manage the environmental and other impacts of bushfires, whilst enhancing more opportunities for caring for Country activities and First Nations' custodianship of the land through use of culture burns.

Significant steps have been taken by the Australian government to control bushfires. Albeit current laws regarding bushfires in many parts of Australia do not recognise traditional First Nations practices of cultural fire/burning (Bardsley, Prowse, and Siegfriedt 2019; Preece 2007; Ruane 2018). The time is now to incorporate and listen to First Nation peoples' knowledge and practices and manage more effectively the Country in ways that have been practised for thousands of years. First Nations peoples are defined by qualitatively different relationships with the land to that of those no longer Indigenous to place. In Indigenous knowledge systems health and wellbeing are closely linked to the health of the Country (Terare and Rawsthorne 2020). Importantly, connection to the Country and caring for the Country requires active involvement and participation of First Nations peoples and communities in managing and preventing bushfires. For this to happen, local, state and federal governments and agencies need to enable support and collaboration of meaningful strategies from within and with First Nations peoples nationally.

#### *4.2.1. Collective and collaborative efforts*

Studies emphasised on collective and collaborative efforts for managing bushfires (Atchison and Pilkinton 2022; Keevers et al. 2024; O'Brien and Watson 2014). Despite living with loss, grief, and shock during and post-bushfire periods, First Nations peoples cared for, nurtured, loved, and managed the Country to make it liveable once again. A common practice evident in community yarns is the healing power of caring for Country and learning to care for Country after the bushfires. First Nations peoples observed that modern bushfire management was ineffective in terms of governance practices, and as a result, have expressed a desire to be more actively involved. Atchison and Pilkinton (2022) emphasised the need to revisit the limited engagement of First Nations peoples in bushfire management and the need for opportunities for First Nations peoples to be heard in relation to bushfire management practices. Atchison and Pilkinton (2022) found that First Nations peoples' responses were apparent within the media discourse and often centred on relational obligations to heal and care for the land as a Country. They identified the need for a mutual relationship between First Nations peoples and different types of agencies including firefighters to work together to manage catastrophic

bushfires. Undoubtedly, First Nations peoples have the knowledge to prevent future catastrophic fire events and sustainable ways to care for the Country including the use of cultural burns that are low heat rejuvenating the land.

#### *4.2.2. Post-bushfire caring of the country/land*

Despite understanding the impacts of bushfires on First Nations communities, this review has also further identified how First Nation peoples care for the Country during the post-bushfire periods (Keevers et al. 2024). Because of their caring and healing, the black land turns into green again during the post-bushfire periods. This not only represents their ties with nature but also their considered responsibility to make the Country liveable again for them, animals, and plants. The knowledge and expertise of caring for the land during the post-bushfire periods are also successfully transmitted from generation to generation in ways that heal the impact of colonisation on their enduring relationships with the Country.

### *4.3. Limitations*

Our study included the literature published between 1 October 2013 and 6 November 2024, which inherently excluded the literature based on the previous large fires. Since this review considered peer-reviewed journal articles and grey literature only, many important books (such as those by Steffensen (2020), did not come up in the searches). One limitation of this study concerns the inability to capture and amplify the experiences of bushfires by the First Nations peoples in Australia. The majority of the studies included in this scoping review did not articulate or amplify the voices of the First Nations peoples in Australia directly. Thus, the multifaceted impacts of bushfires could not be explored in this study. Further, most of the papers included were based on secondary data and/or discursive papers (such as review papers) and few focused on cumulative disasters (inclusion of bushfire, flood, Covid-19), limiting our ability to better understand the localised contexts and communities affected by the bushfires in Australia.

Due to the application of the inclusion/exclusion criteria, we found insufficient data to compare findings within the global literature, which can be considered as the future research scope. Studies authored by First Nations researchers on their experiences of bushfires could provide valuable insight into the management of bushfire impacts and the role of community-led initiatives.

### *4.4. Future directions*

Due to the inclusion of literature published between 2013 and 2024, this review excluded previous multiple large fires (such as 2009 Black Saturday, 2006/2007 alpine fires, 2003 ACT fires, and many more) that had substantial literature resulting from them. Therefore, future research should extend the inclusion period to explore the holistic effects of bushfires on the Australian First Nations peoples.

## 5. Conclusions

Repeated bushfires in recent times have become a serious concern for First Nations peoples in Australia because of qualitatively different experiences and understandings

of Country, connection, place and environment. The health and well-being of First Nations peoples have been severely affected by bushfires, and their experiences have received relatively little attention in the literature surrounding fire management research. Further, their expertise and knowledge have been ignored/erased in some research disciplines associated with bushfire management. It is widely recognised that First Nations peoples' values and practices and their focus on justice for nature/environment are essential for understanding effective bushfire management in Australia and elsewhere (e.g. Victor Steffenson's international foundation "Firesticks'). Our study presents a scoping review of the literature upon which to base further investigation and initiate discussions with relevant regional stakeholders involved in developing bushfire management strategies by the First Nations peoples.

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No potential conflict of interest was reported by the author(s).

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