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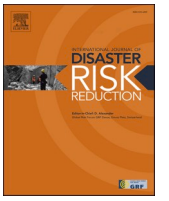

Cooperative community wildfire response: Pathways to First Nations' leadership and partnership in British Columbia, Canada

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ABSTRACT

With the growing scale of wildfires, many First Nations are demanding a stronger role in wildfire response. Disproportionate impacts on Indigenous communities (including First Nations, Métis, and Inuit) in Canada are motivating these demands: although approximately 5 % of the population identifies as Indigenous, about 42 % of wildfire evacuation events occur communities that are more than half Indigenous. In what is now known as British Columbia, Canada, new pathways for cooperative wildfire response between First Nations and provincial agencies are emerging. Drawing from semi-structured interviews with 15 experts from First Nations communities and agencies, and a review of 42 documents on wildfire response, our research highlights the diverse existing capacities, priority opportunities, and processes required to enhance cooperative pathways. Within First Nations communities, existing capacities include local knowledge, firefighting experience, equipment, funding, relationships, and leadership – an overlooked but fundamental capacity. Priority opportunities include ways to build capacity within and beyond wildfire response, such as fully equipped response crews, full-time year-round wildfire management crews, Emergency Management Coordinators, First Nations Liaisons, and cross-trained wildland and structural crews. Translating existing capacities into priority opportunities requires an ongoing focus on cooperative processes, including relationship-building, respecting Rights and Title, streamlining funding, and enabling "cultural safety" to overcome racism. These cooperative pathways can help transform wildfire governance toward First Nations-led partnerships.

1. Introduction

The risk and occurrence of wildfire disasters worldwide is increasing [1]. This reality is prompting calls to reconfigure how disasters are governed, with a focus on more inclusive, cooperative, and adaptive forms of governance [2,3]. Governance is the set of actors, objectives, values, and processes for decision-making that can influence outcomes [4]. While different forms of governance have been explored in a wildfire context, a common practical recommendation is the need to reflect local contexts and empower local people [5], which is in stark contrast to more common, centralized, top-down, command and control paradigms [6,7]. The importance of local input and action in proactive efforts to reduce wildfire risk, such as prevention, preparedness, and mitigation, is well-recognized, yet less attention has been given to local involvement in wildfire response [8]. This is in part due to the inherently dangerous nature of wildfire response compared to proactive efforts, but also because wildfire response is still commonly viewed as the responsibility of

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centralized government agencies, whose rigid governance structures mean there are often fewer clear pathways for cooperation with local people [7].

In Canada, wildfire response continues to be a strong pillar of evolving disaster governance and is generally the responsibility of individual provinces and territories [9], although this is evolving, motivated by impactful wildfire seasons. Two of the top five priorities in the 2019 Emergency Management Strategy for Canada include "enhance whole-of-society collaboration and governance to strengthen resilience" and "enhance disaster response capacity and coordination" [10]. During the 2023 wildfire season, over 18.5 million hectares burned, more than twice the previous record (7.1 million ha) set in 1995 [11]. In response, Canada was at the highest level of national preparedness, level 5, with continuous and full commitment of national resources from May 11–September 7 [12]. The 2023 season reflects ongoing projections that climate change is expected to increase fire size [13,14] and, coupled with growing at-risk interface areas [15], lead to an increase in response spending [16]. Current suppression capabilities will continue to be overwhelmed under climate change [17]. Thus, there is recognition that wildfire governance in Canada urgently needs to change, especially to meet the priorities of whole-of-society collaboration and capacity-building in response.

One key, but often overlooked, actor with local capacity and demonstrated leadership in wildfire governance is Indigenous communities. With regards to climate-related disasters, Indigenous communities are commonly framed as "vulnerable" or at heightened risks, and yet in many cases they are also at the forefront of solutions [18–20]. Indigenous peoples in the land now known as Canada have coexisted with fire since time immemorial, often stewarding fire and fire-affected landscapes according to diverse values, objectives, processes for decision-making, and relationships to fire [21–24]. While interest in Indigenous fire stewardship as an alternative or complement to provincial wildfire governance is growing in Canada [25,26], Indigenous communities continue to face challenges having their expertise valued and leading practical wildfire management because of the history and persistence of colonial systems [27–30]. This is true even as the provincial and federal governments look to institutionalize Indigenous fire stewardship [31] and reconciliation more broadly, which can be performative rather than transformational [32]. To address these issues in a wildfire context, research and practice often focus on proactive management such as revitalizing cultural burning [23,33,34] and FireSmart™ [35], or developing more culturally-appropriate evacuation scenarios [36–38]. While these are critically important aspects of wildfire management that require Indigenous leadership, Indigenous communities are also calling for and demonstrating greater involvement in wildfire response [39–42].

Across Canada, shifting from a provincially-led, command and control paradigm to more inclusive, cooperative and adaptive forms of governance that meaningfully make space for Indigenous partnership and leadership requires intentionally reconfiguring certain governance elements, such as imbalances in decision-making power [5,30,43,44]. Typically, command and control governance centralizes decision-making power into the hands of a single government actor [4,45], such as a ministry or wildfire response agency. This type of governance can integrate different perspectives without fundamentally altering inequitable power structures to make space for inclusion [45–47]. Redistributing or rebalancing decision-making power requires processes to empower local actors [5,48], which can help to enhance the acceptability of outcomes [49]. It also requires adequate supports from complementary (e.g., regional, provincial, federal) levels of decision-making to ensure that cooperation is prioritized across scales, and that higher-level institutions are responsive to local contexts [5,50,51]. These revised processes and structures can support wildfire governance that is adapted to both 21st century climate [7] and social conditions [52]. Governance shifts can be motivated by a variety of factors, such as recognition of Indigenous Rights and Title, government policies, local-scale initiatives demanding recognition, or certain focusing events [19].

Despite the importance of intentionally shifting governance to share decision-making power, there remain several challenges with doing so. First, existing wildfire governance structures are often siloed from other priority issues for Indigenous communities, such as land governance, territorial sovereignty, and redressing the wrongs of colonization [5,19,53]. Sharing decision-making in a wildfire context can therefore be challenging if decision-making is not shared with (or wholly governed by) Indigenous communities for these broader issues. Second, attempts by government agencies to involve Indigenous peoples can fail when the focus is on "integrating" their knowledge into colonial systems [46], rather than rebalancing power structures to foster inclusion; this lack of attention to power reinforces a perceived hierarchy of legitimate forms of knowledge [29,54]. In a wildfire response context, this can manifest as a "subjugation" [55] of Indigenous knowledge whereby Indigenous knowledge holders are unwilling, uncomfortable, or unsupported in sharing their knowledge and contributing to decision-making because of a lack of "cultural safety" [56]. When Indigenous knowledge and experience is not appropriately respected, it can prompt external capacity-building efforts that ignore underlying power imbalances [19], with no actual change in governance [30]. While Canada recognizes that capacity-building is an important building block for emergency management in the 21st century [10], addressing issues of power requires asking "*whose* capacity, capacity *for what*, and *what* constitutes capacity" [57].

Understanding capacities of Indigenous communities in wildfire response in Canada is a prominent research gap. Acknowledging that a gap in research does not signify a gap in lived experience, our research examined how some Indigenous communities (specifically First Nations) in British Columbia (BC), Canada, are currently involved in wildfire response, their desired opportunities for additional involvement, and the pathways needed to support First Nations leadership and partnership. We focus on BC as a Canadian province with a long history of diverse Indigenous fire stewardship, a more recent history of provincial command and control wildfire governance, and a current trend (after substantial contestation) towards enhancing First Nations involvement [58–60]. Furthermore, First Nations in BC are increasingly negatively impacted by wildfires each year due to evacuations, losses of homes, business, and livelihoods, and damage to or destruction of important cultural sites [39–41]. Specifically, through consulting First Nations experts and First Nations and other documents, we sought to answer the following research questions with regards to wildfire response:

1. What are the main motivations of First Nations and agencies to cooperate?

2. What existing capacities to support response do First Nations have?
3. What additional opportunities do First Nations want to enable them to participate as full partners and leaders?
4. What are the key governance pathways to enable more cooperation?

We begin with a brief overview of existing wildfire response governance in BC, then outline the complementary methods used. Next, we present the results following the four research questions posed above. Finally, we end with a discussion of the ways in which First Nations in BC are contributing to a more inclusive, cooperative, and adaptive form of governance that must continue to be systematically supported by provincial government agencies.

2. Methodology

2.1. Study area context

Wildfire governance in BC is complex due to the legacies of colonization and connections with structural firefighting and forest and emergency management (Fig. 1) [58,59,61]. First Nations have stewarded fire and fire-affected landscapes since time immemorial, with many Nations continuing to use or revitalizing cultural burning for ecological benefits, to encourage favored plants and animals, and to minimize the spread of larger wildfires [23,40,62,63]. Colonial efforts to criminalize and suppress all fires, restrict First Nations access to territory by creating reserves, and the systematic racism underpinned by the residential school system led to a form of "cultural severance" [64], which limited (although did not completely restrict) transmission of stewardship knowledge to younger generations [21,29]. Today, colonially granted (and federally managed) First Nations Reserve land constitutes only ~0.4 % of the land area of BC, whereas provincial "Crown" land constitutes ~93 %. However, First Nations continue to claim sovereignty over this provincial "Crown" land as it was never formally ceded and comprises their traditional and ancestral territories [65].[1]

Since 1912 in BC, despite ongoing resistance from First Nations, the provincial government has been the sole decision-maker over wildfire with an overarching objective to protect timber and, more recently, life and property [58,59]. The primary wildfire management agency is currently known as the BC Wildfire Service (BCWS), which is under the umbrella of the BC Ministry of Forests but remains operationally distinct. The BCWS has the primary mandate of wildfire response (as part of wildfire management), yet forest and land-based decision-making (such as how to manage forests to reduce the risk of catastrophic wildfires) is with the BC Ministry of Forests and the BC Ministry of Water, Land and Resource Stewardship, respectively, which further silos and challenges wildfire response decisions [61]. To add to the complexity of wildfire response, the federal Indigenous Services Canada does not have a direct role in response but provisions resources to First Nations to plan and prepare for on-Reserve wildfires and structural fires, such as funding for training, equipment and infrastructure. Although First Nations retain responsibility for emergency response on Reserve [66], their 'granted' responsibility is not always respected nor does it extend across their wider traditional territories [40,41]. Nevertheless, First Nations have continued to contribute to wildfire response through self-governance [39–41], as well as employment in sometimes all-First Nations crews under the BCWS [67]. This involvement is prompted, in large part, by negative impacts from wildfires, which are growing due to climate change and centuries of forest and fire mis-management [15,60].

Negative impacts of wildfires to First Nations are extensive, including evacuations and damage or destruction of their territories and livelihoods [38]. Between 1980 and 2021 across Canada, communities that are predominately Indigenous were involved in nearly 42 % of evacuation events, and First Nations on-Reserve represented nearly 28 % of evacuees, despite comprising less than 5 % of the Canadian population [68]. Today, it is estimated that approximately 19 % of Indigenous people living on-Reserve are in areas at higher risk of wildfire, compared to only 2 % of the off-Reserve population [69]. In the non-boreal forest regions of BC, First Nations Reserves made up 21 % of the evacuated communities between 1980 and 2019 [70]. Furthermore, climate change is expected to more than double the exposure of on-Reserve communities compared to non-Indigenous communities to threatening wildfires [15]. The 2017 wildfire season in BC brought these disproportionate impacts to light. Twenty-six different First Nations (of approximately 204 in BC) were directly impacted by wildfires that mostly began off-Reserve but caused weeks of evacuations, property loss, and extensive damage to critical cultural resources [40,41,71], as well as air-quality impacts across the entire Province. Recent catastrophic fire seasons have prompted detailed written reflections by Indigenous communities, including some Secwépemc communities impacted by the 2017 Elephant Hill Fire [41], Tsilhqot'in communities impacted by the 2017 Plateau Fire and Hanceville Complex [40], and the Nadleh Whut'en impacted by the 2018 Shovel Lake Fire [39] (Fig. 2). Collectively, the impacts on First Nations and communities across BC have prompted a partial shift of responsibility for preparedness and prevention to local communities (such as First Nations and municipalities), but a similar shift has not occurred for wildfire response [58].

2.2. Study background

This project was initiated after calls from First Nations [39–41] and independent reviews [71] for BC to shift towards more cooperative wildfire governance after the 2017 and 2018 wildfire seasons. Responding to these calls and recognizing the need for a partnership-based approach, the BCWS, First Nations Emergency Services Society (a BC-based not-for-profit organization), Indigenous Services Canada, and the University of British Columbia (hereafter the "Project Team") commenced a collaboration in September 2022

[1] See native-land.ca for a representative map of traditional territories.

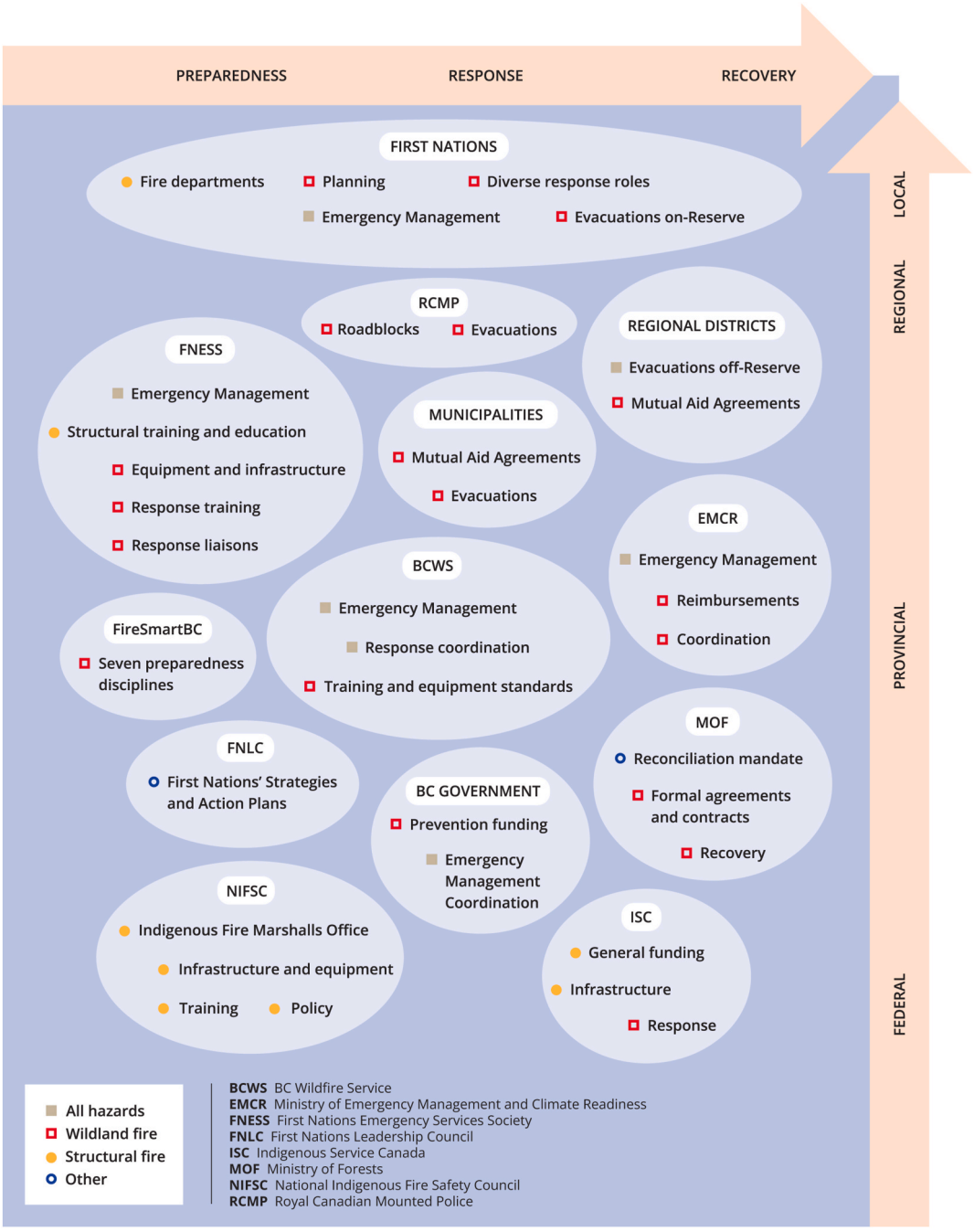

Fig. 1. Main actors and their contributions to wildfire governance as it relates to First Nations in British Columbia, Canada. From left to right (top arrow), actors are arranged based on their *primary* alignment with wildfire preparedness, response, and recovery. From bottom to top (right arrow), actors are arranged based on spatial scale of operation, from federal to local. The contributions of each actor are listed in white ovals, with the symbols corresponding to responsibilities in structural fire (yellow circle), wildland fire (red open square), all hazards (gray square) or other (blue open circle). (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

to identify and address knowledge (Phase 1) and operational (Phase 2) gaps through the *Cooperative Community Wildfire Response* project. This two-phase project began with Phase 1 research to scope existing experiences and perspectives from some First Nations communities and supporting agencies in wildfire response. The results of Phase 1 (September 2022–May 2023; collected prior to the 2023 wildfire season) are being reported here following the release of a public-facing report [72].

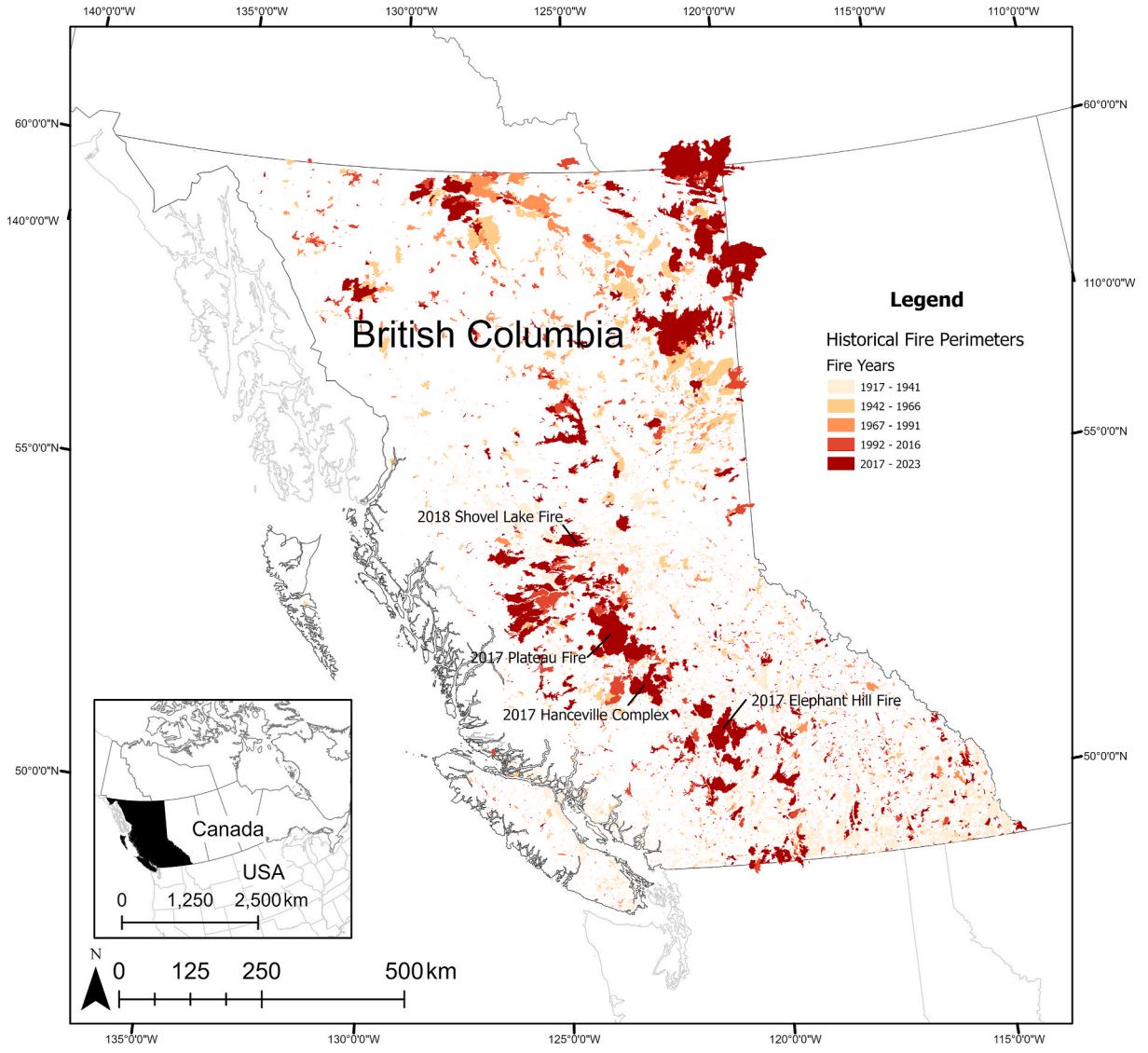

Fig. 2. Fire perimeters for wildfires originating in British Columbia (BC) from 1917 to 2023. Graduated colors represent different fire years, with the darkest red representing fires since (and including) 2017, a noted turning point for fire governance in BC. Note, First Nations lands not depicted due to ongoing sovereignty negotiations. Four fires highlighted associated with First Nations-led reports on wildfire impacts. Fire perimeter data from the BC Wildfire Service (https://catalogue.data.gov.bc.ca/dataset/fire-perimeters-historical). (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

3. Methods

Given the importance of partnerships to the Project Team, an iterative and collaborative approach was used to guide the research, drawing on principles of community-based participatory research [73] and decolonizing methodologies [74,75]. The Research Team (K. Copes-Gerbitz and V. Comeau) led the research design, methods, and implementation. The Project Team guided all stages of the research, with specific input into the scope, ethical protocols and research interpretation [47]. Ethics approval was received from the University of British Columbia Behavioural Research Ethics Board, and protocols for research with Indigenous communities were followed [76,77].

Two complementary qualitative methods were employed to triangulate research findings and enhance research validity and pragmatic applicability of research outcomes [78]. First, document analysis [79] was undertaken on 43 documents (Supplementary Material A) written by First Nations, not-for-profit organizations, researchers, independent authorities, and the BC provincial and Canadian federal governments. Documents included post-wildfire season reviews, agency strategies, webpages, and independent audits primarily from 2017 to 2022 to reflect the current state of wildfire response. Second, 15 semi-structured expert interviews [80] were conducted either in-person or remotely (based on interviewee preference and ease of access) between January and March of 2023

using a purposeful sampling approach [81]. Recognizing many experts have multiple identities, roles, or have diverse experiences over time, interviewees included individuals (at time of interviewing) directly involved in contributing to First Nations community wildfire response (n = 9) and/or who work for an organization supporting First Nations involvement in wildfire response (n = 7; Table 1). Consent and confidentiality options were discussed; if consent was granted, interviews were audio recorded and the transcript was provided to interviewees to ensure accuracy. To preserve confidentiality in the quotes where requested, interviewees are referred to by a number (e.g., Expert #1); otherwise, interviewees are referred to by name, as requested. All interviewees consented to having their names listed as contributors.

Systematic and iterative analysis of documents and interviews was undertaken in NVivo software (v. 12 release 1.7.1 2023). Documents were analyzed first to form the foundation for interview questions and strengthen researcher understanding prior to interviews with First Nations. A combined deductive (to identify motivations, capacities, opportunities, and governance pathways) and inductive (to identify emergent themes) coding approach was used [82]. Prominent themes and results were shared with the Project Team for feedback. Given the importance of qualitative methods for reflecting the oral-based traditions of First Nations [83], the use of storytelling [84] was welcomed and potential quotes were shared with interviewees to ensure they maintained as much ownership over the content as possible [74].

4. Results

Four main cross-cutting themes arose from the document analysis and interviews addressing the four guiding research questions: (1) there are both distinct and shared motivations for cooperation; (2) First Nations have broad capacity for wildfire response; (3) First Nations' desired opportunities are diverse; and (4) pathways are needed for First Nations partnership and leadership. Below, the primary themes and supporting evidence are presented.

4.1. Motivations for cooperation in wildfire response

Motivations for cooperation in wildfire response are as diverse as the First Nations and agencies that are involved. Some motivations are specific to different actors, such as First Nations asserting their authority and responsibility and provincial or federal governments' reconciliation mandates. On the other hand, climate change is a shared motivation among actors.

4.1.1. Asserting authority and responsibility

Many First Nations see leadership in wildfire response as a form of self-governance: "*[Firefighting] is a way for communities to self-govern themselves … it's like a reclamation of their culture, a way for them to evolve new methods of culture, working hand in hand*" (Attila Nelson). In addition, First Nations communities are often involved wildfire response because it is part of their "granted" authority on reserves and Treaty Lands [85]: "*First Nations communities are responsible for using local resources to prepare for and respond to emergencies*" [66]. First Nations authority includes issuing and carrying out evacuation orders and alerts. When this authority is not respected, it undermines First Nations leadership, as was the case for Tsilhqot'in communities in 2017 when government authorities attempted to impose evacuations through "intimidation and persuasion" (pg. 10) [40]. Currently, decision-making authority for First Nations on evacuations or response tactics is not part of their "granted" authority across their broader territories (e.g., outside of reserves or Treaty Lands). Given this limitation, many are motivated to "*look after themselves*" (John Liscomb), as exemplified by "*the reality for many Secwépemc communities during the summer of 2017, and the reality that many First Nations continue to experience: a sense that they are on their own and can't rely on anyone but their own community and Nation to help*" [41].

First Nations are also often involved in wildfire response because they feel a strong sense of responsibility to care for their

Table 1
Experts interviewed for Cooperative Community Wildfire Response project in 2022–2023.

Expert	Affiliation(s) during interview
Rob Bosse	Wildfire Specialist, First Nations Emergency Services Society
George Campbell	Wildfire Officer, Fraser Zone, BC Wildfire Service
Larry Duke	Engineering & Recreation Officer, Haida Gwaii Natural Resource District, Ministry of Forests
	Fire Chief, Daajing Giids Volunteer Fire Department
James Fothergill-Brown	Operations Manager, Khowutzun Forest Services
Joe Gilchrist	Fire Keeper and Interior Salish Fire Keepers
Angie Kane	CEO, Secwepemcúl'ecw Restoration Stewardship Society
Robert Laing	Crew Leader, Khowutzun Forest Services Type 2 Unit Crew
Ron Lampreau	Fire Chief, Simpcw Chu Chua Volunteer Fire Department
	Simpcw Indigenous Initial Attack Crew and Simpcw Councillor
John Liscomb	Forester, Stswecem'c Xget'tem First Nation Development Corporation
Attila Nelson	Indigenous Coordinator, BC Wildfire Service
Dave Pascal	Cultural and Prescribed Fire Specialist, First Nations Emergency Services Society
Mike Robertson	Senior Advisor, Cheslatta Carrier Nation
Darren Stanislaus	Fire Headman, Esk'etemc First Nation
	Wildfire Assistant, Cariboo Fire Centre, BC Wildfire Service
Brett Uphill	Fire & Emergency Service Manager, Yaqit ʔa·knuqɬi 'it
Vic Upshaw	Cultural and Prescribed Fire Specialist, First Nations Emergency Services Society

communities and territories [56]. Decisions to participate in response depend on First Nations leadership, capacities, and expertise, as well as in-community perceptions of whether external help will be forthcoming. John Liscomb described why the Stswecem'c Xget'tem First Nation made the decision to respond to wildfires in 2017: "*the real decision that Chief and Council made … if we would have evacuated … we probably wouldn't have a community to come back to*." Similarly, Mike Robertson emphasized "*The tiny little Cheslatta community, they really stepped up in support of everything going on … If they wouldn't have stayed, if they didn't have a good support system, this whole community would have burnt*." Furthermore, the protection priorities outlined in the BC Emergency Management System [86] – including life, infrastructure and property, then the environment – do not always reflect the priorities of First Nations, who are motivated to protect their culture and lifeways embedded in the land: "*the land is everything to me, water is everything to me, and we will do anything and everything we can to protect our land, to protect wildlife*" (Expert #14).

4.1.2. Reconciliation

In contrast to First Nations, provincial and federal agencies with a role in wildfire response are motivated to cooperate with First Nations because of mandates related to reconciliation. These mandates build on Canada's adoption of the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP), as well as BC's *Declaration on the Rights of Indigenous Peoples Act* (SBC 2019, Ch. 44). These mandates are critical pivot points for meaningful engagement that are motivating a more "*genuine*" approach to cooperate: "*I think that government and [BC] Wildfire, maybe they're being forced to engage a bit more because of UNDRIP. But essentially, I'd say, there is a bit more genuine approach to that reconciliation and inclusion*" (Dave Pascal). This more "*genuine*" approach builds on advocacy from First Nations and the broader issues that have brought attention to the need for reconciliation:

> *"I really believe [cooperation is] starting to happen from the devastating wildfires that we've had in 2017, '18 and '21 where communities were threatened, and First Nations leaders have been more vocal and assertive as to what their needs and wants are … And the other pieces are the mandate of Truth and Reconciliation and the findings of the Residential Schools … So, government has now realized we really need to put our best foot forward to understanding First Nations people and for me it's a long time coming."* (George Campbell)

However, after 2017, some First Nations communities felt that these mandated commitments are not always translating to operational change, and there is need to continually revisit the implementation of those mandates. As the report highlighting the experiences of some Secwépemc communities in 2017 stated: "*there remains a disconnect between high-level government's stated commitments to reconciliation, and (inadequate) provision of funding, resourcing and access to decision-authorities to advance First Nation priorities or cede management authority to Indigenous peoples*" [41].

4.1.3. Climate change

In addition to these distinct motivations for cooperation on wildfire response, there is a shared understanding that First Nations are key actors with expertise and capacity to address the growing impacts of climate change. Severe wildfire seasons pose the highest risk of all climate-related events in BC [87] and wildfire was ranked as the most concerning climate change related event for First Nations [88]. Ron Lampreau described that "*given the growing risk of wildfires due to climate change … it is crucial that we work* together *as a community to prepare for potential emergencies*", echoing the BC First Nations Climate Strategy and Action Plan which highlighted that the "*climate emergency is not a future problem, but the reality of our current moment*" [89]. For its part, recognizing the ongoing impacts of climate change including wildfires, the Government of BC has adopted new emergency management legislation (the Emergency and Disaster Management Act, 2023) guided by the Sendai Framework for Disaster Risk Reduction [90] and principles of collaboration, cultural safety, and recognizing the inherent Rights of Indigenous peoples [91]. The impacts of climate change mean that during catastrophic wildfire seasons, provincial, federal, and international resources are overwhelmed, and First Nations response can help fill the gap: "*the idea is that First Nation communities have the capacity to do that themselves as well, so that it takes the load off of BC Wildfire during busy seasons.*" (Attila Nelson).

4.2. First Nations hold broad capacity for wildfire response

First Nations bring diverse capacities to wildfire response, such as local knowledge, leadership, experience, training, and equipment, which are developed through experiential learning, intergenerational teachings, and intentional capacity-building efforts. There is strong alignment from provincial and federal agencies and First Nations on the need for capacity-building, exemplified by the BC Ministry of Forests' 2023/2024–2025/2026 Service Plan which states a key strategy is to "*strengthen capacity of local emergency authorities and Indigenous communities to prepare and respond to wildfire events*" [33]. Similarly for First Nations, the emphasis is on strengthening existing capacities, rather than starting from an assumption that no capacity exists. For the Tsilhqot'in Nation, for example, "*formalized protocols will help ensure that Tsilhqot'in capacity and expertise is harnessed in a way that protects both Tsilhqot'in communities and the province at large*" [40].

Existing capacities are common in two contexts within First Nations: structural firefighting departments and forestry companies. Structural fire departments are increasingly important because of the incidents of wildland-urban interface fires [15], and (in contrast to wildland fire fighting), capacity-building in on-reserve structural fire departments can be funded by Indigenous Services Canada. Ron Lampreau described the Simpcw Chu Chua Volunteer Fire Department's decision to build capacity for wildfire response: "*we feel that the exterior [structural firefighting] program was enough training structurally, and we really need to focus on interface and vegetation fires*". Forestry companies that are owned and managed by First Nations (usually under their economic development arm) also have existing capacity, such as basic training, appropriate equipment, and forest-based knowledge that can be built upon or tailored to

wildfire response.

4.2.1. Leadership as capacity

Despite alignment on the importance of capacity-building, First Nations and government agencies have different perspectives on what counts as capacity and expertise. First Nations, especially those that responded to wildfires in 2017, often highlighted how leadership is one of their most important capacities. For example, on the Elephant Hill wildfire, *"many Secwépemc communities drew on their collective expertise and capacities to play a leadership role in wildfire response and emergency management*" [41]. Likewise, Tsilhqot'in communities highlighted how *"First Nations leadership ought to be at the centre of effective and appropriate emergency management in First Nations communities. This requires the recognition of Indigenous emergency management laws and practices and the coordination and support of regional, provincial and federal agencies*" [40]. This was in contrast to provincial and federal documents that did not explicitly mention First Nations leadership as capacity. Without recognizing leadership as a form of capacity, First Nations can be overlooked for potential contributions to wildfire response: "*There's way more capacity out there in Nations than [BC] Wildfire realizes*" (Dave Pascal). Importantly, First Nations in leadership positions can also inspire other First Nations to be involved: "*so often the guys see the Westerners at the top level, but I think it's refreshing and comforting to see a First Nations member at that kind of level so that they can just feel like, 'hey, maybe that can be me someday'*." (Expert #7).

4.2.2. Local knowledge

In contrast to leadership, there was widespread recognition among agencies and First Nations that "*local knowledge is key on every fire*" (George Campbell). Expert #2 described how this local knowledge can be utilized in response: "*The ability to formulate your attack plan, envision what you're likely to encounter and prepare accordingly even before being onsite is a huge advantage that local knowledge provides you*." Robert Laing described how their all-First Nations Type 2 crew has a unique type of knowledge that makes them sought after: *"They know what the smells [of smoke] are. We can find the hotspots or smokers that nobody else can find … I guess we're born with this kind of skill. It's some ingrained knowledge that we retain as a First Nations people*." In addition to place-based knowledge and specific skills, First Nations also bring a different relationship to fire (one of kinship) than many agencies: "*To me, fire is my brother and my sister. How can I bring my family in to help me manage the forests?*" (Expert #14).

The important contributions of First Nations local knowledge are strategically recognized by provincial and federal commitments. For example, the 2019 Memorandum of Understanding for Emergency Management Services between the First Nations Leadership Council, the Federal Government (as Indigenous Services Canada), and the Provincial Government (as the Ministries of Forests, and Emergency Management and Climate Readiness) states: "*The Parties share the common goal of incorporating First Nations traditional, evolving and invaluable knowledge into the practice, policy development and decision-making around emergency management*" [92]. This echoes the federal government's commitment to the Sendai Framework on Disaster Risk Reduction to partner with First Nations so that "*relevant policies will be grounded in Indigenous knowledge*" [93].

4.2.3. Other forms of capacity

In addition to leadership and local knowledge, First Nations bring a wide array of capacities, including wildfire response crews, personnel with training and experience, equipment and infrastructure, funding, and important partnerships and relationships that enable their cooperation in wildfire response. These different capacities are defined and described in Table 2 below, and accompanying examples for different First Nations are highlighted. For many communities, capacity is concentrated within existing structures, such as Band Councils where leadership, emergency operations, funding, and many partnerships are situated, or forest management companies and structural fire departments where formal contract crews, training, and equipment are often housed. Some of these capacities are embedded in the history of Indigenous Unit Crews in BCWS, who "*would make it a career fighting fires, and they would stay 10, 15, 20, 30 years … First Nations Indigenous crew would be highly experienced, highly physical and also highly trained*" (Joe Gilchrist). Other capacities are more dispersed across different individuals, such as support services during wildfire response that often stem from a strong sense of community.

4.3. Creating diverse opportunities for cooperation

Given the diverse existing capacities within First Nations, developing a wide range of opportunities for First Nations cooperation in wildfire response is imperative. As the 2018 *From the Ashes: Reimagining Fire Safety and Emergency Management in Indigenous Communities Report* highlighted:

> "*The Committee recognizes that First Nations are in the best position to coordinate and direct local response, and that they must be engaged and involved at all levels if they are not leading the response. Further, since it is difficult to apply a one-size-fits-all approach to all communities given that each one is different, it would make sense to consult them in order to tailor the response to their needs.*" [94].

Most interviewees echoed the sentiment that there is no one-size-fits-all approach, even if their particular First Nation had found an opportunity that worked for them: "*every community is different. Our [model] may not fit the box for another community*" (Ron Lampreau). Similarly, Expert #2 noted that the opportunities for cooperation must be "*up to every community, what they want, and what they have capacity for*." An important qualification is that the perspectives within an individual First Nation are also diverse; as Vic Upshaw described, "*I don't think of them as like one person but in my mind kind of like a roomful of people - they've all got their own values. What's important to them, it's going to vary*." This emphasis on the differing values, priorities, and capacities within individual First Nations underscores why so many different opportunities were proposed by interviewees. Table 3 presents and describes the potential (and in

Table 2
Existing capacities for wildfire response within First Nations communities.

Capacity type		Description	Examples
Personnel and experience			
Contracted response crews	Indigenous Initial Response (IIR)	Provide initial response for assessment, action and containment in an area of choosing by the First Nation, such as within their traditional territory. Dispatched through Provincial Call Center and through own decisions. Direct award.	Simpcw First Nation Indigenous Initial Attack (IIA)
	Type 2	Provide highest capacity external to BCWS for sustained action. Expertise includes Type 2 levels, plus certified faller and ignitions. Guaranteed contract for set amount of time. Procured through BC Bid.	Khowutzun Forest Services has had a Type 2 crew since 2018, which evolved from a Type 3 crew
	Type 3	Provide capacity for low complexity sustained action and mop-up. Expertise includes danger tree assessments, first aid, and power saw operator. Standby contract initiated when needed. Procured through BC Bid.	Nadleh Whut'en crew during 2018 wildfires who were trained and deployed in the same season. Esk'etemc have three Type 3 crews (and two Type 2 crews)
	Type 4 (support function)	Provide capacity for low complexity sustained action within First Nations community or territory. As-needed contract. Previously entry-level fire services.	Yaqit ʔa·knuqɬi 'it relies on this contract type for their structural firefighters to gain wildland fire experience
Other community response groups	Direct response	Community members (and sometimes other non-First Nation local community members) who rely on their expertise, knowledge and authority to respond to wildfires	Tsilhqot'in communities in 2017 who exercised their authority to respond to wildfires
	Support services	Community members who stay behind to help those who are directly responding to wildfires on crews or as part of an Emergency Operations Centre (EOC), such as providing meals and childcare. Also includes First Nations communities who host evacuation camps.	Cheslatta Carrier Nation and local community members who responded to wildfires directly and provided support services to those who responded
Ex-agency firefighters		Individuals in community who previously fought fire for BCWS, often ex-members of Unit Crews that were primarily Indigenous in the 1980s and 1990s	Several members of Simpcw's IIA crew; Elders within Stswecem'c Xget'tem who helped respond in 2017
Emergency Operations		Coordinating EOCs, planning and executing emergency operations such as evacuations	Bonaparte and Skeetchestn during 2017 Elephant Hill wildfires
First Nations' Liaison		Formal part of Incident Management Team who represents First Nations' values, expertise and needs in decision-making and is a conduit back to communities. More formalization of this role is currently underway.	Can be provided by FNESS or appointed by a community/group of communities (e.g., Cultural Liaison from Nlaka'pamux Nation Tribal Council during 2021 Nohomin Creek Wildfire)
Fire watcher or patrol		Community members who patrol for spot fires and provide real-time information and mapping on wildfire behaviour to community members and agencies	Bonaparte and Skeetchestn members during 2017 Elephant Hill wildfire
Heavy equipment operators and line locators		Individuals with expertise operating heavy equipment, often through work in the forest industry	Whispering Pines/Clinton Indian Band members during 2017 wildfires hired as equipment supervisors
Training			
S-series		S-series training are those specifically designed by BCWS. It is most common for individuals to have or have held their S-100 and S-185 certifications, especially if they are involved in the forest industry. First Nations who have contract crews (IIR, Type 2 or Type 3) have more advanced S-series requirements.	Khowutzun Forest Services brings in a specialist First Nations trainer for their Type 2 crews The current Yaqit ʔa·knuqɬi 'it Fire Chief is an S-100 certified trainer
Other trainings		Other training required for contract crews or more generally to add to capacity: Power saw operator, danger tree assessor, First Aid, Helicopter awareness, WHIMS	Simpcw's IIA has crew members who hold these various trainings

(*continued on next page*)

Table 2 (*continued*)

Capacity type	Description	Examples
	(Workplace Hazardous Materials Information System), ICS (Incident Command System), EOC essentials, swiftwater training	
Exterior attack (structure protection)	Structural firefighters with training for exterior attack, and building on these skills for structural protection	Volunteer fire departments in Haida Gwaii can be contracted to provide wildfire response in the wildland-urban interface using their exterior attack skills
Equipment and infrastructure		
Personal protective equipment	Includes fireproof clothing, boots, and hardhats	Standard equipment for all contract crews
Communication devices	Radios or satellite phones where there is no signal	Stswecem'c Xget'tem purchases satellite phones for crews
Hand tools	Required to have basic hand tools for forestry activities	All First Nations who have a forestry company
Pumps and hoses	Often part of an equipment cache, can include structural protection equipment	A structural protection unit jointly owned by Fraser Lake, Nadleh Whut'en and Stellat'en were a critical part of response during the 2018 wildfires
Vehicles	Required minimum specifications for those communities with BCWS contracts. Vehicles have to be outfitted to carry pumps or tow trailers of equipment.	Bonaparte used a newly-purchased fire trucks to respond to the McLeans Lake fire
Chainsaws	Chainsaw requirements can be different between forestry/silvicultural and wildfire activities	Khowutzun Forest Services crews, where necessary buy their own saws and the company reimburses them each time they are used
Funding mechanisms		
Internal funding	Own-source revenue from within a First Nation used to fund positions, training, equipment, infrastructure, and operations for wildfire response crews. Own-source revenue often comes through Economic Development or forestry company	Skeetchestn has several companies, such as their Natural Resources Corporation, that cover costs for training and equipment for their staff
External funding	Funding avenues offered by supporting agencies such as FNESS, ISC and Union of BC Municipalities for training, equipment, and infrastructure.	FNESS' Wildland Fire Equipment Purchasing Program and ISC's Capital Facilities and Maintenance Fund and Emergency Management Assistance Program
Partnerships and relationships		
Mutual Aid or Service Agreements	Agreements between different jurisdictions to offer services to one another and outline roles and responsibilities.	Simpcw's Chu Chua Volunteer Fire Department has Mutual Aid Agreements with the Thompson-Nicola Regional District and the District of Barriere; 2022 Tsilhqot'in Collaborative Emergency Management Agreement with ISC, BC Ministry of Public Safety and BC Ministry of Forests
Other formal and informal partnerships	Formal and documented partnerships or informal relationships that contribute to success of wildfire response efforts	Indigenous Emergency Management Regional Partnership Tables
Internal relationships and a sense of community	First Nations' communities (and many surrounding local communities) have a strong sense of care and responsibility for protecting their communities and territories that motivate them to participate in wildfire response locally	Fires in Cheslatta Carrier Nation's territory prompted response and support services from First Nation and local community members

Table 3
Potential opportunities for First Nations response proposed by experts interviewed, and existing capacities that may be leveraged to support those opportunities.

Potential opportunities	Description	Existing capacities
Fully equipped wildfire response crew (e.g., Indigenous Initial Response, Type 2, Type 3)	A trained and equipped wildfire response crew that can respond to wildfires in an area of their choosing, such as adjacent to reserves, their broader territory or provincially. For some First Nations, having several crews is a benefit because one can always stay close to home.	Forestry or economic development company, volunteer fire department, natural resource department, existing contract wildfire crews
First Nations' Community Liaison	A Liaison appointed by an individual or group of First Nations who represents their interests and is incorporated directly into the Incident Management Team. This Liaison can be a specialist in a particular topic (e.g., cultural heritage) and/or represent community interests more broadly. Ideally the Liaison is identified *before* a wildfire ever starts.	Leaders and knowledge holders in community
Ad-hoc (temporary) incident supports, such as hosting camps, fire patrol/watchers, or line locators	Individuals brought in as temporary or emergency hires during a wildfire through the *Wildfire Act*. Broad opportunities based on the skills, training, knowledge, and experience of communities. May be an option for communities with no pre-existing contracts in place and provide flexibility based on need and proximity of different wildfires.	Capable community members outside of formal contracts (such as a forestry or land and resources department)
Expanded First Nations (or local community) Unit Crews; other employment opportunities in BCWS	Revitalizing the BCWS Type 1 Indigenous Unit Crew program may help inspire the next generation of firefighters, especially through opportunities like the First Nations bootcamp and Junior Firefighter camp. BCWS Unit Crews can be an important entry point for permanent positions with more decision-making ability, such as who to hire and how to respond to wildfires in a culturally respectful ways, reducing barriers to First Nations input.	Previous agency firefighters or interested youth
Full-time Emergency Management Coordinator	Wildfires are only one type of emergency that First Nations communities may face, and much of the wildfire response expertise can be applied to other emergencies. First Nations currently do not have specific allocation to fund an emergency coordinator, rather they can choose to do so through the general allocation of funding from Indigenous Services Canada.	Existing emergency response personnel
Mutual Aid or Service Agreements	Opportunities to formally share equipment and gain training and experience in wildfire response from neighboring communities. Although formal agreements are helpful, developing these agreements can help to strengthen or build informal relationships.	Relationships with neighboring agencies or communities
Multi-capacity crews: cross-trained structural and wildland firefighters; full-time wildfire management crew	Year-round crews can be an important opportunity for employment, as well as addressing community concerns beyond wildfire fighting, and may include structural firefighting, wildfire prevention (such as fuels treatments or prescribed or cultural burning), or fire guard rehabilitation.	Combining wildfire response with other stages of (wildfire) emergency management or structural firefighting

some cases, ongoing) opportunities discussed, as well as some of the existing capacities (from Table 2) that could be leveraged to align with those opportunities.

4.4. Pathways for First Nations partnership and leadership

Strengthening existing capacities and connecting them to desired opportunities requires efforts to overcome four primary barriers: missing or strained relationships, clarity over 'legal' frameworks, a disconnect between wildfire response and management, and underlying structural racism. While these barriers are acknowledged by documents and interviewees alike, and there is ongoing work to address them, a significant gap in overcoming them still exists. The overarching aim of additional action has been focused around a key recommendation after the 2017 wildfire season to "*establish Indigenous Peoples as true partners and leaders in emergency management by including First Nations from the beginning and at all levels of planning, decision making and implementation*" [71]. Doing so requires overcoming the four barriers to strengthen cooperation pathways, which in turn can help to redress power imbalances in decision-making.

4.4.1. Build relationships

Building mutually respectful relationships between First Nations and agencies, especially prior to the wildfire season, was reiterated as the most important foundation for First Nations partnership and leadership: "*there's so much work that needs to be done that partnerships have to be made*." (Joe Gilchrist). Similarly, Expert #14, in recalling a story of seeing a black bear, a cougar and a three-year

old cow moose and its calf eating together in a field surrounded by burnt areas, described how the current wildfire reality is one that requires strong relationships: "*There's a point in nature where they say it's not about predator versus prey, it's about what can we do together to survive*." This is true not only for wildfire response, but the many intersecting issues that wildfire touches, such as wildfire management (including cultural burning), forest management, and emergency management: "*Indigenous people are not going away. They're only going to get louder. And we need to say … 'How can we work together to protect and conserve our forests, and build stronger self-reliant communities for future generations?'*" (Expert #4). These relationships are also important for First Nations and neighboring communities; for example, to bolster recruitment for a First Nations volunteer fire department that is receiving training in wildland firefighting, Expert #16 described how "*Most of them aren't there for the money … so I focused a lot on team building within the department … Now, a lot of the people are friends outside the department that probably didn't know each other.*"

Open communication underlined with respect is viewed as a "*key ingredient*" (Vic Upshaw) for trust, which is a necessary part of relationship-building. Unfortunately, the skills and competencies to build trust are not always as equally valued as technical knowledge or fireline experience. This imbalance can lead to contrasting experiences for First Nations on the fireline, such as some Incident Commanders who are grateful for First Nations input, whereas others completely disregard their needs, knowledge, and contributions [40,41]. A lack of respect for First Nations can also lead to frustrations over who has authority to 'certify' expertise and knowledge. Expert #14, who is a Fire Headman (or Fire Keeper) for their First Nation, reflected on this frustration as a new employee of the BCWS: "*My question is when are you going to give up your government training to those First Nations who know what I know?… That's why I'm here, so I can get trained to their standards … My 21 years [of firefighting experience] means nothing.*"

4.4.2. Clarify legal frameworks

For many First Nations, even if their Rights and Title extend throughout their traditional territories and they operate under their own legal frameworks, their "granted" decision-making authority can be constrained to emergencies on-Reserve or on Title Land, according to provincial and federal law. This creates complexity and uncertainty that partially stems from unrecognized or unsettled sovereignty claims, a lack of understanding or respect for Indigenous Rights and Title [40,41], siloed decision-making between wildfire emergencies (response) and wildfire management [58], and the fact that "*First Nations responsibilities are not specifically set out in [provincial or federal] legislation*" [94]. Reconciling overlapping or contrasting legal frameworks has been a focus for both the Nisga'a [95] and Tsilhqot'in [40] Nations, with the latter developing a formal Collaborative Emergency Management Agreement between their Nation and the federal and provincial governments in 2018 and renewing it in 2022 [96] – the first agreement of its kind in BC.

The legal complexities of wildfire in BC often manifest as concerns over liability. Vic Upshaw describes liability that the BCWS can face depending on what jurisdiction the land falls under: "*[The BC Wildfire Service] is bound by the Wildfire Act and the Wildfire Regulations … but that doesn't apply on federal [Reserve] land. So there's also certain liabilities that a provincial agency like BC Wildfire Service is exposed to when they step outside of that.*" Liability is similarly a concern for structural fire departments who are increasingly called upon to respond to wildfires outside their existing jurisdiction: "*whenever I leave my municipal area, I have to be working under some sort of agreement or process, or else the liability coverage isn't there*." (Larry Duke). For communities, liability often feels like a justification by agencies for restricting their involvement in wildfire response [41]. Mike Robertson reflected that "*the [obsession] over this liability is so unrealistic in an emergency situation*," when local community members were unable to contribute place-based knowledge and mapping skills because of liability concerns.

4.4.3. Reconnect response to wildfire, forest, and emergency management

The complex governance structure in BC means wildfire response is managed in siloed ways, often disconnected from other stages of wildfire, forest or emergency management including prevention, preparedness, and recovery [58,61,71]. All interviewees and many documents discussed the importance of capacity-building for response as an important component, but not the only part, of managing wildfire under current conditions. There are strong synergies with wildfire management: "*I think, fiscally, it's more expensive for us to respond to wildfires than to prepare communities. And I think that was where the FireSmart program kind of blossomed from*" (Atilla Nelson).

One emerging area of focus for connecting response to wildfire and forest management more broadly is through cultural burning, which Joe Gilchrist describes as *"an Indigenous land management way of thinking … taking the knowledge from the past and applying it for a result for 100 or even hundreds of years into the future by using fire.*" Expert #7 similarly articulated the importance of considering fire in forest management: "*I feel like the only way that we're going to get on top of this wildfire situation is to kind of do a review of our forestry practices*." Reflecting these perspectives, and expanding beyond the wildfire-forestry link, the BC First Nations Climate Strategy and Action Plan notes that "*sustainable forest management*" must be prioritized, "*in recognition of the interconnectedness and link between forest fires and increased floods, erosion and landslides*" [89].

Wildfire is also strongly linked to emergency management, though the emphasis has shifted through time: *"Traditionally, [Emergency Management] has been primarily concerned with preparedness and response activities, but the current risk environment requires a shift in focus toward proactive prevention/mitigation efforts and forward-looking recovery measures."* [10]. A focus on proactive efforts for wildfire as a key part of emergency management has slowly emerged since the 2003 wildfire season [97] and developed more rapidly since 2017 [71]. Reinforcing this emphasis and the importance of relationship-building as a pathway for partnership and leadership, a primary focus in BC has become "*strengthening First Nation-led emergency management and preparedness mechanisms and increasing collaboration between relevant entities*." [89].

4.4.4. Address racism

Every expert interviewed who identifies as First Nations shared a story of experiencing racism on the fireline, in their own life, or described how it negatively affects their ability to enact the positive change in wildfire management that they want to see. As Dave

Pascal stated, this racism continues even against the backdrop of reconciliation and diversity and inclusion efforts: "*the reconciliation and inclusion stuff is awesome, but we're still not past all that. There's still racism. It's still every day*." Joe Gilchrist, for example, described how it is the "*systematic racism*" embedded in the interview, application process, and fitness test that reduced the number of BCWS Type 1 all-Indigenous crews from as many as 25 in the 1990s to only one today. Expert #4 highlighted why efforts to build relationships can be challenged by racism rooted in colonization: "*we've got to remember that the government has pushed colonialism so much on Indigenous communities that they just don't trust anymore*."

Despite these challenges, several experts describe the importance of ongoing efforts, within both agencies and First Nations communities, to address racism. George Campbell described how "*I owe it all to BC Wildfire*" even though "*the journey wasn't easy for me as a First Nations person to get to where I am today*." Robert Laing similarly noted how racism can be a barrier to First Nations participation on community-based wildfire response crews: "*It's sometimes so easy for our people to give up because they've always been told that they can't do it or they're stupid or whatever it is, and they start believing that. And I myself, encourage them, try it again*", which also speaks to the importance of First Nations in leadership positions. Efforts to address racism can include creating more "*culturally sensitive or culturally safe*" (Expert #4) spaces for First Nations. "Cultural safety" has emerged as an important occupational health and safety requirement for First Nations in wildfire response, and includes honouring traditional ecological knowledge and cultural practices and customs, as well as having inclusive and respectful work environments [56]. Continuing to address racism embedded in legal frameworks and operational practice is important for strengthening relationship-building efforts.

5. Discussion

Our results demonstrate that First Nations partnership and leadership in wildfire response is bolstered by unique and shared motivations, diverse existing capacities, a range of desired opportunities, and targeted pathways to overcome persistent barriers. Critically, existing capacities within First Nations are an important entry point for a shift towards more inclusive, cooperative, and adaptive forms of wildfire governance in BC. Nevertheless, an intentional shift in governance must also be facilitated by a commitment from non-First Nations decision-making authorities to address governance structures that constrain inclusion, cooperation, and adaptation.

5.1. Local inclusion is more than 'integration'

The unique capacities of First Nations in BC facilitates their active partnership and leadership in wildfire response, which is in stark contrast to their portrayal as passive communities requiring agency oversight whose perspectives can be easily integrating into existing (often colonial) structures [98,99]. Acknowledging and strengthening existing capacities is a critical process for facilitating inclusion, as is creating diverse opportunities for cooperation [100]. Currently, capacity-building is taking the form of enhanced training programs for First Nations (such as the Coordinated Training Strategy led by the First Nations Emergency Services Society) and the development, revision, and implementation of a range of contract types by BCWS (Table 3). Critically, climate change as a shared motivation between First Nations and agencies is an important opportunity for collective action and inclusion [19]. However, a shared motivation does not necessarily translate to agencies equally valuing all capacities [41], evidenced by the examples where First Nations leadership is often overlooked, but local knowledge is valued. While local knowledge is an entry point for inclusion and pathway for more adaptive governance [7], a preoccupation with 'integrating' Indigenous knowledge without attention to underlying power imbalances can reinforce marginalization and gender bias, enhance vulnerabilities, and perpetuate settler colonial ideals [19,41,46,59,98].

First Nations in BC with forestry or natural resource companies tend to have a concentration of different capacities that can be leveraged for wildfire fighting. This concentration of capacity is similar to other rural or resource-based communities with forestry activities in the US [101–103] and Australia [104]. For example, Rangeland Fire Protection Associations [105,106],"working landers" [107] and "experienced independents" [104], as well as individuals who choose to stay and defend their properties [108], share characteristics with First Nations in BC who have concentrated capacities and are motivated to participate in wildfire response through a strong sense of personal (or communal) responsibility. For First Nations in BC, however, this sense of responsibility extends beyond property to their territories more broadly, which is often further motivation for First Nations in Canada who choose not to evacuate [37]. Although a concentration of capacity can be helpful for identifying First Nations communities ready for inclusion, additional training may be required to navigate bureaucratic or complex contracting requirements [101]. Importantly, Indigenous communities with concentrated capacities provide benefits beyond their communities to their territories and society such as economic enhancement and a sense of community or pride, evidenced by the stories shared in this research that mirror experiences of Indigenous fire brigades in Brazil [109], Mexico [110], and Venezuela, Brazil and Guyana [111]. Expanding opportunities to build concentrated capacity may be supported by efforts such as the growing Indigenous Guardians program in Canada [42,89,112].

5.2. First Nations wildfire response strengthens cooperation

First Nations partnership and leadership has become a critical pathway for enhancing cooperation amongst the different levels of government, agencies, and communities. The repeated efforts of First Nations to assert their responsibility and authority and highlight their unique capacities has demonstrated that cooperation in wildfire response could exist across a spectrum, from additional decision-making autonomy for First Nations to more transparent partnerships. For example, new models of involvement (such as Indigenous Initial Response contracts), government-to-government agreements (such as the Tsilhqot'in Collaborative Emergency Management

Agreement), and working relationships (such as respect from certain Incident Commanders) demonstrate both formal and informal opportunities are important. A strong sense of care for their communities and territories makes First Nations well-positioned to also benefit financially, especially as suppression costs continue to grow [16,113]. Furthermore, through their participation, First Nations bring to light underrecognized values that should be a part of decision-making on the fireline, such as cultural heritage protection [19,41].

The diverse opportunities for cooperation and pathways for First Nations partnership and leadership identified through this research are motivating collective action beyond just wildfire response. Cooperation can be considered a form of collective action, whereby diverse actors are working towards a common goal or have a shared commitment [114]. While collective action can be difficult to achieve, especially given the diverse knowledges, strengths, and modes of decision-making of different actors [7,50,114], the opportunity to bring people together to discuss a shared way forward is imperative. In the western US, for example, the desire to grow prescribed burning programs has motivated partnerships between Indigenous communities and agencies [115] and collective action for wildfire management [116], demonstrating the importance of a focusing issue to encourage cooperation [19]. In BC, the wildfire seasons of 2017, 2018, 2021, 2023 and 2024 are focusing attention on the need for a shared way forward; however, over time, state governments can revert to less meaningful actions as public attention or urgency fades [31]. Nevertheless, the potential pathways forward in wildfire response and wildfire, forest, and emergency management, as well as broader processes for addressing racism, building relationships, and clarifying legal frameworks are demonstrating that First Nations partnership and leadership in wildfire response is also strengthening cooperation in other governance contexts.

5.3. Adaptation requires intentionally shifting governance

While the individual and collective efforts of First Nations are already leading to more inclusive and cooperative wildfire response in BC, adaptation requires the provincial and federal government to support mechanisms for change [7,43,44,117]. Two primary mechanisms for adaptive governance include pathways to 'legitimize' different forms of knowledge [7] and the strengthening of social networks, whereby important actors are more functionally connected to one another [7,117]. Although First Nations expertise is inherently valid [29], the emergence of formal contracts, agreements and relationships can bolster the *perceived* legitimacy of First Nations expertise within agencies [105], which can lead to a stronger willingness to cooperate on the part of agencies. Beyond formal processes, government actors can support the social networking and connection-making important for community resiliency (such as through facilitating mutual aid agreements), without intruding on more place-based or grounded elements of resiliency (such as defining a community's values or priorities) [118]. The alignment between interviewees and recent documents on the important contribution of Indigenous knowledge and the acknowledgement that diverse opportunities for cooperation are imperative demonstrate progress on these mechanisms for adaptive governance.

Another key mechanism for adaptation is trust that is facilitated by government actors [43] yet guided by the needs and priorities of First Nations [44]. The focus on pathways such as relationship-building and addressing racism reflect the importance of trust-building and that ongoing work is needed. This work often requires going above and beyond existing expectations within agencies and governments, and the onus is on them to shift the baseline of employee skills, competencies, and abilities to engage respectfully with First Nations [7,55,119]. Trust-building is imperative for building cooperative partnerships and social capacity [119] and addressing the legacies of mistrust and misunderstandings of decision-making on the fireline [106], such as Incident Commanders who overlook or underestimate the capacities (especially leadership) of First Nations. Building agency capacity for trust-building requires a focus on principles of respect and cross-cultural understanding, rather than an emphasis solely on building technical capacities [19,119]. Furthermore, trust-building requires long-term social (in terms of personnel and competencies) and financial commitments from agencies to demonstrate a commitment to positive change [48].

The final underlying mechanism needed to support more adaptive wildfire governance and facilitate First Nations partnership and leadership in response is addressing underlying power imbalances that affect territorial-scale decision-making [5,54,120]. Colonial contexts, such as the residential school and reserve systems, and the federal *Indian Act*, reinforce presumptions that First Nations are incapable of or unequipped to contribute to decision-making [19,98]. However, the breadth of existing capacities, and leadership of First Nations in BC during wildfire events, demonstrates that this presumption is not justified. Pathways such as clarifying legal frameworks, particularly through foregrounding Indigenous law [29,31,59], and reconnecting response to wildfire, forest and emergency management, highlight that progress will continue to be constrained unless underlying colonial contexts (and the associated socio-economic vulnerabilities) are addressed [19]. Thus, a symbolic recognition of Indigenous Rights and Title and capacities, such as noted in many government-sponsored documents, can amount to institutionalization of fire management [31] and reconciliation [32], and will continue to lead to conflict during wildfire response [121] without operational change [41,98]. Instead, the traumas of colonization must be addressed [98] to help shift power in a way that means First Nations can lead and partner in decision-making over the future of wildfire response [31,43].

6. Conclusion

Our research demonstrates the diverse motivations, existing capacities, desired opportunities for cooperation, and pathways required to enhance First Nations leadership and partnership in wildfire response in BC. While motivations vary among First Nations and agencies, climate change is a uniting concern that can help facilitate collective action. Importantly, recognizing and finding ways to uplift the range of capacities of First Nations, especially the overlooked capacity of leadership, is imperative to translate existing capacities to desired opportunities. Continuing to develop desired opportunities requires both formal (such as training and contracts)

and informal (such as social networks) interventions. In addition to specific attention to the opportunities for involvement in wildfire response, First Nations leadership and partnership must be enabled by more-than-local efforts at relationship-building, clarifying legal frameworks, reconnecting response to management, and addressing underlying racism. This research fills a prominent research gap highlighting how First Nations in BC are bringing much needed local capacity to wildfire response [8] and the pathways for ensuring their capacities contribute to decision-making.

The shift towards more inclusive, cooperative and adaptive governance in wildfire response requires ongoing efforts to empower First Nations and ensure collaboration is flexibly integrated across governance scales [5,7,48,51]. Given that adaptive governance requires matching the scale(s) of decision-making to the scale(s) of impact [43,117], it is imperative that both local and territorial decision-making *and* provincial-level decision-making shift to more meaningfully include First Nations. This requires addressing power imbalances that limit ethical cooperation at each scale [5,54,120]: locally and territorially to ensure that First Nations are leaders and partners in decision-making over wildfire response capacity-building and operations, and provincially (or federally) to ensure that wildfire response is considered in the broader contexts of wildfire management, forest management, and emergency management. Fundamentally, asking "*whose* capacity, capacity *for what*, and *what* constitutes capacity" [57] highlights that all actors must strengthen their social (trust, networking, relationship-building) and operational (training, equipment, contracts) capacities to respectfully and successfully work together in wildfire response and shift towards more inclusive, cooperative, and adaptive wildfire governance in BC that limits negative impacts from future wildfire disasters.

CRediT authorship contribution statement

Kelsey Copes-Gerbitz: Writing – review & editing, Writing – original draft, Project administration, Methodology, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Dave Pascal:** Writing – review & editing, Supervision, Project administration, Methodology, Data curation, Conceptualization. **Vanessa M. Comeau:** Writing – review & editing, Methodology, Formal analysis. **Lori D. Daniels:** Writing – review & editing, Supervision, Project administration, Funding acquisition.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:Kelsey Copes-Gerbitz reports financial support was provided by the British Columbia (BC) Wildfire Service. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

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Data availability

The data that has been used is confidential.

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