SFU MORRIS J. WOSK CENTRE FOR DIALOGUE

THE MITIGATING WILDFIRE INITIATIVE:

LANDSCAPE RESILIENCE AND WILDFIRE

A Primer for Collaborative Dialogue

THE MITIGATING WILDFIRE INITIATIVE

The Mitigating Wildfire Initiative (MWI) advances solutions to catastrophic wildfire in British Columbia. Our purpose is to support dialogue and collaboration among governments, Indigenous Peoples, local communities, rights-holders, tenure holders, knowledge-holders and other impacted groups in collectively addressing the root causes of catastrophic wildfire—while also supporting community well-being, upholding Indigenous stewardship and increasing the resilience of our forests. Throughout this work, MWI will provide a platform to hear from those most impacted by wildfire and will strive to ground discussions in community and Indigenous values.

The Mitigating Wildfire Initiative (MWI) has four key objectives that guide the direction of our programming:

Strengthened Relationships and Collaboration: Working relationships at many different levels have become strained as the impacts of catastrophic wildfire have become more acute, yet the need for collaboration to address this complex challenge has never been greater. MWI will seek to strengthen the capacity of groups and individuals to work together in removing barriers and advancing solutions, as well as to build governance that meaningfully incorporates the United Nations Declaration on the Rights of Indigenous Peoples.

Improved Understanding: Climate change, increased recognition of Indigenous rights and title and other paradigm shifts mean that some legacy approaches to wildfire may be insufficient or even counterproductive. By bringing focused attention to the challenges and implications of catastrophic wildfire in BC, MWI will contribute to an improved understanding of present-day issues, their interdependencies and potential solutions.

A Shared Agenda: Wildfire mitigation activities across sectors are currently informed by a number of foundational reports, frameworks and recommendations. MWI will build upon this work by pinpointing elements of a shared vision, identifying barriers that require collective work to address and overcome, and assessing progress toward implementation, including ongoing processes for learning and consensus-building.

Real-World Impact: MWI will seek to promote innovation and real-world impact through a mixture of "quick wins," incremental progress at the systemic level, long-term planning and transformative change. This multi-faceted approach recognizes that investing in trust, strengthening relationships and promoting shared accountability will be necessary precursors to advancing transformative change. It further recognizes that multiple pathways are required to advance solutions at a speed and scale proportionate to the risk of catastrophic wildfire in BC.

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An earlier version of this document was prepared by members of the Mitigating Wildfire Initiative team, James Whitehead (Engagement Analyst), Dr. Kelsey Copes-Gerbitz (Mitigating Wildfire Advisory Committee, and Centre for Wildfire Coexistence, University of British Columbia) and Julian Griggs (MWI project team and Independent Facilitator) in October 2023 to inform discussions at the *Wildfire and Landscape Resilience in the Cariboo* workshop, held in November 2023 in Williams Lake. This revised version incorporates learnings and conversations from the workshop and was finalized in January 2024.

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PURPOSE OF DOCUMENT

PURPOSE OF THIS DOCUMENT

This document explores the concept of resilience in the context of wildfire in British Columbia, and is intended to inform reflection, dialogue and collaboration on this topic across a broad array of regions, planning initiatives, and management processes.

The document draws from a recent workshop focused on landscape resilience and wildfire in the Cariboo region, and reflects potential pathways to support the building of resilience through collective efforts. The Mitigating Wildfire initiative acknowledges both the unique circumstances that characterize different regions in British Columbia, and also that past and current knowledge of fire is held in both oral and written forms, not all of which is appropriately or easily incorporated here. With that caution in mind, this document is intended as a starting place for engaging in constructive discussions and future action rather than attempting to provide a comprehensive reflection of all perspectives on resilience, or a rigid prescription for planning and management approaches in any given location.

NOVEMBER 2023 WORKSHOP

In November 2023, the Mitigating Wildfire Initiative convened a two-day workshop in Williams Lake, to explore the concept of landscape resilience and wildfire in the Cariboo. The workshop was by invitation only,

and included a diverse group of 24 participants ranging from Indigenous, Provincial and Municipal governments, the forest industry, academia and on the ground practitioners of fire stewardship. The objectives for the workshop were to (i) strengthen the network of working relationships among those involved, (ii) explore and refine a shared understanding of wildfire and resilience, (iii) identify potential opportunities and improve resilience at the landscape scale, and (iv) develop one or more summary products related to improving landscape resilience and our ability to co-exist with wildfire, intended to inform collaborative planning and management initiatives (such as Forest Landscape Planning). The workshop was also conducted under a modified Chatham House Rule, meaning that the content from the workshop could be shared outside of the event but without attributing comments to any individual or organization. This approach was intended to allow for full and open participation from all involved.

While the concept of landscape resilience in the context of wildfire is complex and is shaped by multiple intersecting issues, this workshop specifically focused on resilience from the perspective of local leaders and practitioners in the Cariboo (It was acknowledged that the Cariboo is a specific administrative boundary and that this geographic term means different things to different people; see Describing the 'Cariboo' below). The focus of the workshop was a discussion among local experts on mitigating catastrophic wildfire through landscape management, prescribed fire and cultural fire, and primarily at the landscape-scale (rather than stand-scale).

DESCRIBING THE 'CARIBOO'

The term 'Cariboo' means different things to different people. For example, it is a dynamic landscape–one that contains diverse values, ecosystems, communities, networks and governing frameworks that have shifted through time. It is the traditional territory of the Secwépemc, Tŝilqhot'in and Dakelh Nations, who have stewarded fire and fire-affected landscapes since time immemorial and continue to maintain vibrant cultures, stewardship and connection with the region. It has also become the home to people who depend on the region for recreation and their livelihoods through land-based economies.

Ecologically, the Cariboo includes diverse ecosystems, the majority of which are Interior Douglas-fir (IDF), Sub-Boreal Pine-Spruce (SBPS), Sub-Boreal Spruce (SBS) and Montane Spruce (MS) zones. Much of the Cariboo is classified as Natural Disturbance Type (NDT) 3 (frequent, stand-initiating events) or 4 (frequent, stand-maintaining events), with some of the wetter habitats classified as NDT 1 (rare, stand-initiating events) or 2 (infrequent, stand-initiating events).

As a result of fire stewardship and regular burning from First Nations in the area, along with lighting ignitions, landscapes in the

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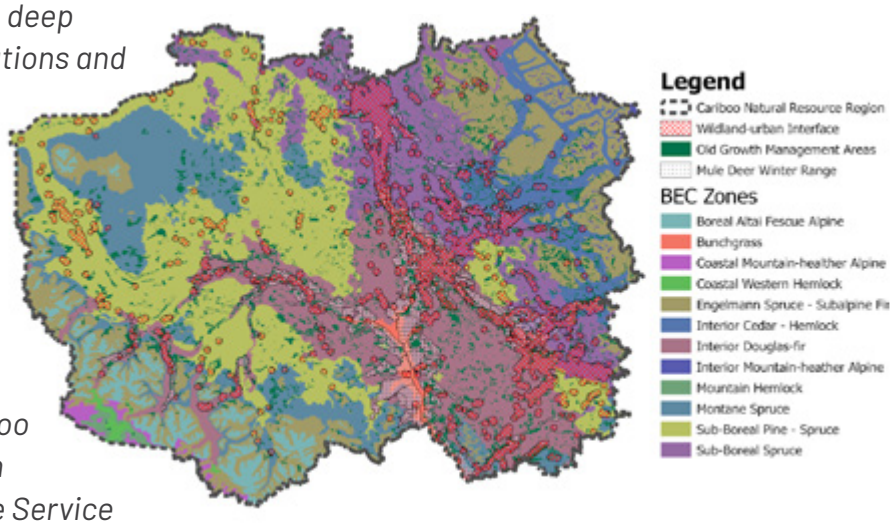
Cariboo were historically characterized by a mixed-severity fire regime which ranged from having a high proportion of low severity fires (e.g., in the IDF) to a high proportion of more moderate to high severity fires (e.g., in the SBPS), which created more heterogeneous, patchy landscapes. As is common in many parts of BC, colonial laws and effective fire suppression have reduced this patchwork and led to more dense forests, which are more conducive to extreme fire behavior, especially in the context of a changing climate. This is of no surprise to many participants and long-time residents who experienced the catastrophic 2017 fire season, which led to the evacuation of thousands in the region, disrupted local economies and simultaneously strained and strengthened relationships across the region. Despite these challenges, the 2017 fire season set in motion deep reflection, new collaborations and innovative solutions that are continuing to unfold.

To assist in forest and fire management, the Cariboo has been delineated into the Ministry of Forests Cariboo Natural Resource Region as well as the BC Wildfire Service Cariboo Fire Centre. There are also multiple overlapping planning frameworks within the Cariboo, ranging from Nation-specific stewardship plans, various Forest Stewardship Plans developed by licensees, the Cariboo-Chilcotin Land Use Plan and, since 2021, government-to-government Forest Landscape Plans. Layered into the landscape is an extensive wildland-urban interface, as well as thousands of hectares that are at high to extreme risk of negative impacts from wildfire (Figure 1). While this diversity makes addressing wildfire risk in the Cariboo more complex , it can also be a source of strength as in enabling wildfire resilience. For the purposes of this workshop, and respecting the reality that fire does not care about boundaries, the exact delineation of the 'Cariboo' is less important than ensuring the complex spirit of the 'Cariboo' is reflected in our expert-informed, place-based definition of resilience.



● Figure 1: Map of some of the jurisdictional, ecological and planning boundaries in the Cariboo.

WHAT IS WILDFIRE RESILIENCE?

WHY RESILIENCE?

The concept of resilience is increasingly being used in the context of wildfire across Canada, whether specifically in the context of 'wildfire resilience' or in related conversations about forests, communities, climate change, or disaster management. Despite its increasing use, however, questions remain about what the term resilience actually means and what assumptions are associated with this concept. Some of the challenges related to the use of the term resilience have emerged due to the following:

- The term 'resilience' has evolved through time based on inputs from different (primarily academic) theoretical origins, including ecology, health, and social theory;
- Because of its academic origins, the term resilience does not necessarily resonate with all knowledge holders, such as Indigenous and local communities and practitioners;
- There is often an assumption—frequently unchallenged—that resilience is inherently good or desirable and thus that everyone's vision of resilience is the same; and,
- Some perspectives on resilience can dominate the conversation, without consideration for broader or more inclusive perspectives.

These challenges highlight the importance of early and ongoing conversations about what resilience means *to any group of people who intend on using the term to define shared outcomes or the processes to achieve those outcomes*. In the absence of these important conversations, it may be difficult to move forward in a transparent, coordinated, and equitable way.

WHAT IS RESILIENCE?

The most common conceptualizations of resilience that are applied in a wildfire context include those that have emerged from ecological and social-cultural research, and, more recently, those linked to social-ecological perspectives.

Ecological resilience is typically defined as the ability of an ecosystem to absorb and bounce back from an external disturbance. In this context it can similarly be understood as the capacity to persist and maintain essentially the same structure, function, and feedbacks (or identity). Ecological resilience can include the separate but related concept of 'resistance,' which describes how easy or difficult it is to fundamentally change the identity of an ecosystem. In ecological resilience, people are considered external to the system of interest[1,2].

Social resilience places people at the centre of a system where human impacts, decision-making and connectedness are all critical. Social resilience asks the question "resilience for whom and at what cost to others?"[3], which brings equity considerations to the forefront. The use of the term in this context also raises questions as to whether resilience is inherently a good or desirable trait, especially given that different people may have different perspectives on resilience, and acknowledging that social resilience may not resonate as a concept for some at all. For this reason, an understanding of who is making decisions, and who is not, is key for understanding what social resilience means in practice[4].

Social-ecological resilience recognizes that social resilience inherently affects ecological resilience, and vice versa. When considering social-ecological resilience, four primary principles have generally been identified as important[5,6]:

- Building resilience means strengthening the capacity to navigate change and uncertainty;
- Resilience is multi-scalar—it may look different at local, regional, and provincial scales, as well as over different time scales;
- Resilience relies on understanding *memory*—the legacies from the past that shape what the future may look like; and,
- Resilience relies on fostering diversity across scales, given the high likelihood of uncertainty.

The concept of resilience can also be applied in different ways. First, the concept can be used to refer either *specifically* to a part of a system (such as a certain ecosystem or community) or *generally* about a whole system (such as a landscape with embedded communities). Second, the concept can either be considered as an outcome (more often used with "resilient") or a *process* (more often used with "resilience").

- Typically, when applied *specifically*, the question "what is resilient to what?" is being answered and is often outcomes-focused (e.g., the dry-belt Interior Douglas-fir is resilient to catastrophic fire)[7]

- When applied *generally*, resilience tends to describe the functioning of a system and the processes needed to ensure resilience (e.g., the dynamic ecosystems in the Cariboo are supporting multiple values and able to withstand negative impacts of climate change)[8].

Finally, the concept of resilience includes both *adaptation* and *transformation*:

- Adaptation typically refers to incremental changes that are implemented to help build capacity. The concept of adaptation is more aligned with fostering specific, or outcome-focused resilience
- Transformation typically refers to system-wide changes that can either be forced (e.g., through a catastrophic wildfire) or intentional (e.g., through a change in policy), and is more aligned with ideas of fostering general or process-oriented resilience[9].

Because of the complexity of resilience, situating resilience in a particular context (i.e., at a particular time and place) is imperative. Furthermore, providing clarity on what type of resilience is considered and whether there are multiple perspectives on the nature of resilience that are appropriate for a given context is important. Acknowledging this inherent complexity and the need for clarity on the use of term further highlights the need for targeted conversations and collaborations to ensure that resilience is appropriately situated and understood within the context in which it is being applied[10].

RESILIENCE IN THE CONTEXT OF WILDFIRE

In the wildfire context in BC and Canada, resilience is being used by Indigenous groups and Nations[11], provincial[12] and federal governments[13], professional organizations[14], and researchers[15]. For example, Community Wildfire Protection Plans were transitioned to Community Wildfire Resiliency Plans to recognize that resiliency incorporates broader considerations for communities. However, in common usage, the term resilience is not always explicitly defined, or it is readily evident that different perspectives are being employed, typically framed as either ecological or social (community or disaster) resilience. These differences underscore the importance of clear definitions and the need for intentional conversations to ensure that the use of the term resonates with the diversity of individuals and groups engaged in addressing catastrophic wildfire. While consensus is not always an appropriate end-goal of these types of conversations, the opportunity for those involved in a collaborative initiative to deliberate respectfully can serve to highlight both shared and divergent perspectives, all of which may be important for future action given the complexity of wildfire. Finally, notwithstanding the potential for differences in definitions and interpretation, there often appears to be a common understanding that wildfire resilience refers to a vision for the future in which wildfire is inevitable and where our social and ecological systems have learned to coexist with it[16].

In applying resilience to landscapes and wildfire, there are several interconnected approaches that are commonly discussed for both ecological and social-cultural resilience (*Table 1*)[17].

● Table 1: The application of resilience to landscapes and wildfire through ecological and social-cultural lenses.

	Landscape	Wildfire
Ecological	◉ Restoring appropriate disturbance regimes ◉ Developing successional heterogeneity across scales (from patches to ecosystems) ◉ Enhancing diversity to increase redundancy where possible	◉ Selecting or managing for certain species or stand characteristics ◉ Reintroducing appropriate or characteristic fire, such as through prescribed burning or managed wildfire
Social-cultural	◉ Ensuring appropriate or shared decision-making ◉ Developing community capacity to contribute ◉ Enhancing economic opportunities ◉ Bringing equity considerations to the forefront (e.g., reconciliation through cultural burning)	◉ Reducing constraints within existing legislation, regulations, and policies ◉ Considering perceptions of risk and willingness to accept interventions ◉ Understanding trade-offs of reducing wildfire risk with other values ◉ Identifying appropriate and diverse knowledge inputs

First, it is important to clarify at what *spatial scale* resilience is being applied (e.g., local, regional, provincial), and in what *context* (e.g. wildfire or landscape or disaster resilience). Second, it is important to clarify what *type* of resilience is under consideration (e.g., ecological or social-cultural). Ensuring that there is a shared understanding of these aspects of resilience can help to ensure that collaborative efforts to address issues such as wildfire mitigation through landscape resilience are better aligned and more effective.

Moreover, in BC at the present time, wildfire is also clearly related to other, broader issues, such as climate change and reconciliation, and is thus influenced by legislation, policy and other initiatives intended to address those issues, such as the 2021 *Declaration on the Rights of Indigenous Peoples Act*, the Old Growth Strategic Review, Forest Landscape Planning processes, and the 2023 *Forest Practices Board's Forest and fire management in BC: Towards landscape resilience*. For example, building wildfire resilience may focus on specific forest management actions, such

as fuels treatments. However, understanding the processes and potential constraints for those forest management actions, such as who is actually making decisions on what actions are applied, is also important. This latter example speaks to governance, which is increasingly the focus of high-level discussions such as government-to-government negotiations or Forest Landscape Planning.

WILDFIRE RESILIENCE IN BC

While situating resilience in local and regional contexts is important, there are some broad elements of resilience that may apply across BC in the context of wildfire. The elements below emerged from discussions during the November 2023 Workshop on Landscape and Wildfire Resilience in the Cariboo, yet have the potential to be applicable at multiple scales as well as in both ecological and social-cultural contexts. These elements can thus help prompt more holistic thinking about resilience *(Figure 2)*. While the elements below are not presented as a comprehensive list, they can perhaps be used as a starting place for discussions that are more place-based and context-specific.

- **Shared experience**: Wildfire is increasingly becoming a shared experience that can catalyze action, but action must be thoughtful and respectful of the potential trauma associated with historical and modern fire-related experiences.
- **Social, cultural and spiritual considerations**: Given how embedded wildfire is in the land and in society, as well as in processes such as reconciliation with Indigenous peoples, there is a need to centre and uplift social, cultural and spiritual well-being. For many Indigenous communities and individuals for example, there are beliefs, perspectives, forms of knowledge, and lessons from and about the land and wildfire that may not be easily translated into English (nor that fit readily into a resilience framework) but that are critical nonetheless.
- **All-of-society approach**: To address resilience effectively, strong connections and partnerships are required that span organizational silos, sectors, and different forms of knowledge. Such approaches can help to create a sense of shared interests and 'togetherness.' This in turn suggests that there is an ongoing need to garner public support through education and engagement.
- **Prioritize proactive work**: Efforts to build resilience must continue to focus on proactive rather than reactive interventions. This shift will require a consideration of the true costs of inaction and a recognition of the inevitability of wildfire on the landscape. In order to address this, proactive work must be incentivized.
- **Dynamic management**: The status quo of static management is not appropriate for the dynamic reality of wildfire today. Dynamic approaches to management are imperative to address the complex systems and disturbances impacted by wildfire and can encourage the consideration of multiple values across the landscape, given that static values can more easily be destroyed by catastrophic wildfire.

● Figure 2: A graphic recording from the Williams Lake workshop on various conceptualizations of resilience

EVOLUTION OF RESILIENCE THINKING IN THE CARIBOO

In advance of the Williams Lake workshop, most participants participated in an interview in which they were asked "what does landscape resilience in the context of wildfire mean to you?" Throughout the responses, there was a strong inclination towards ecological definitions of resilience, fundamentally describing the concept as the ability of a system to maintain key functions after a disturbance. There was much less considering social, or other definitions of resilience which provide a different lens for the concept. A broad overview of the key themes can be seen in Figure 3, a word cloud of the responses to the questions.

After a presentation on the different types and conceptualisations of resilience as well as a full group discussion about what resonates in the discussion surrounding resilience, participants highlighted highlighted several key themes around resilience in the context of wildfire in the Cariboo, which are described in the previous section of this report. While the overall conversation surrounding resilience was divergent, there was a general shift in perspective and a coalescence from participants around the importance of social and cultural resilience in the context of wildfire. This includes building community and social structures that can withstand disturbances, enabling cultural fire practices and engaging all of society in building in addressing the challenge of wildfire in the Cariboo.

- **Innovation**: Where it is possible to do so, opportunities for innovative action and adaptive management should be created, rather than accepting status quo models that might disincentivize experimentation. In other words, efforts are needed to build in mechanisms that enable out-of-the-box thinking and adaptive learning.
- **Legal, regulatory and policy change**: An oft-cited constraint in dealing effectively with wildfire is the mix of legal and regulatory frameworks within which wildfire and landscape-related decision-making is situated. Opportunities are therefore needed to revisit, adjust and, where needed, replace outdated or ineffective legal frameworks.

Figure 3: Word cloud of participant responses during pre-workshop interviews in answer to the question: What does landscape resilience in the context of wildfire mean to you?

PROGRESS TOWARDS RESILIENCE

In light of the scope and scale of recent catastrophic wildfire seasons, many different strategies and initiatives to mitigate the risk of catastrophic wildfire and address the need for landscape resilience are already underway in BC. To date, there have been five main categories in which progress is being achieved:

- planning;
- operations;
- networking;
- research and knowledge generation; and,
- public engagement.

The work underway in each of these categories is often interconnected, and progress across several of these categories is integral for effective resilience-building efforts, as illustrated below and in the sections that follow (Figure 4).

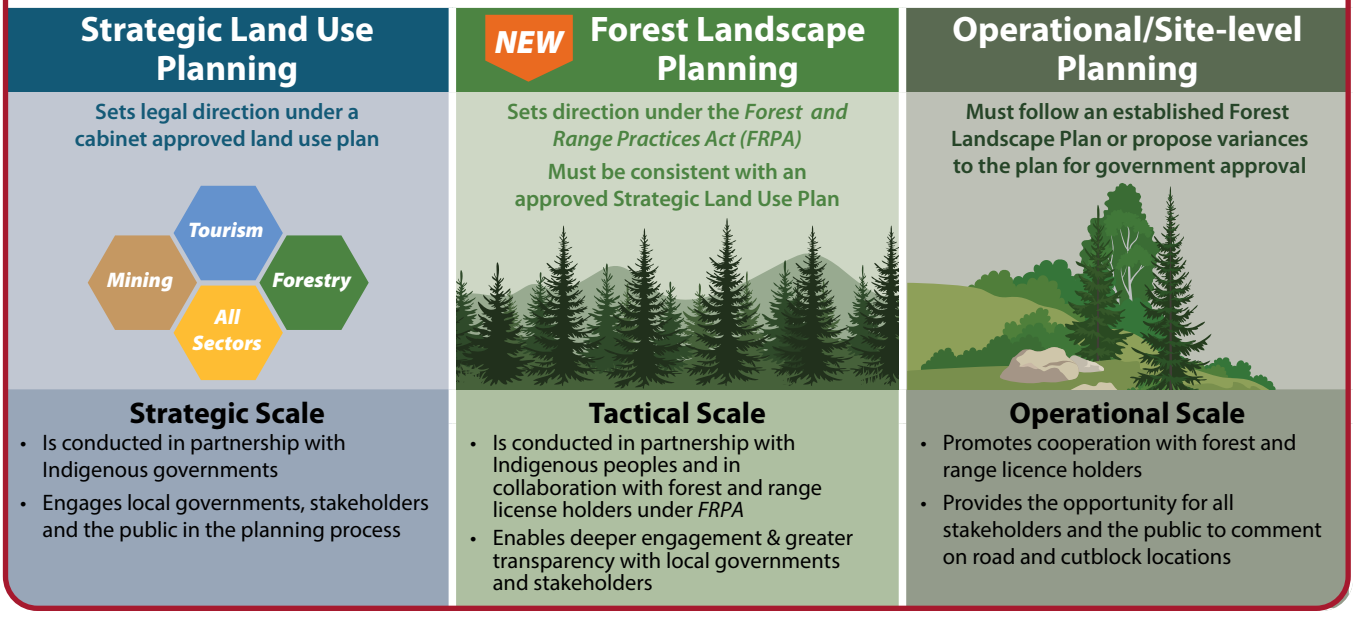
Figure 4: Five interconnected categories that contribute to wildfire and landscape resilience.

PLANNING

Planning as referred to here encompasses various efforts—undertaken by First Nations, local and regional communities, the provincial government, or through partnerships between some or all of these groups—to assess existing conditions, determine desired conditions, and confirm how to move from existing to desired conditions. The focus for such planning efforts can include decision-making arrangements (e.g., co-governance), emergency management planning, or overarching landscape conditions (e.g., forests with high biodiversity and cultural fire). Planning might also zero-in on more narrowly defined issues as they relate specifically to wildfire (e.g., fuel arrangements). Importantly, a shared focus on planning helps implement resilience-building processes by connecting diverse knowledge and practice holders, and is also inherently proactive. For example, government-to-government planning processes, such as those initiated by Nations[18] or by the provincial government (including Forest Landscape Plans *(Figure 5)* and anticipated risk management

● Figure 5: Forest Landscape Planning.

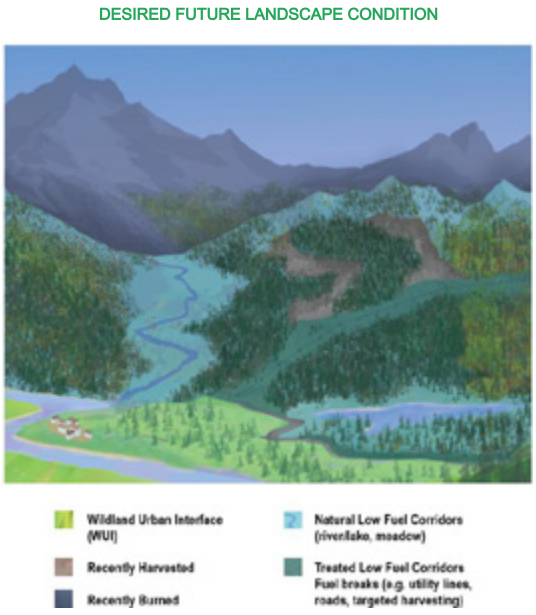
Forest landscape planning was introduced in 2021 to help modernize the application of the *Forest and Range Practices Act* in BC and establish clear objectives and outcomes for forest management. The planning process focuses on a partnership between Indigenous Nations and the BC government, supported by engagement with licensees, local governments, and other stakeholders. The intended outcome is to create tactical plans that link higher-level strategic land use planning to operational or site-level plans. Four pilots are underway, including in the Quesnel Timber Supply Area in the Cariboo, with forthcoming expansion of the program.



planning through the proposed Emergency and Disaster Management Act - Bill 31), are helping incorporate wildfire into conversations about landscape and community resilience more broadly. Most recently, the Forest Practices Board Special Report 61 set out a vision to "restore landscape resilience to co-exist with fire" through landscape fire management *(Figure 6)*.[19] Individual First Nations are also undergoing their own internal planning to chart more resilient futures tailored to their Nations and territories. More specifically to wildfire, some communities are developing and implementing Community Wildfire Resiliency Plans for preparedness and prevention or Tactical Plans for wildfire risk reduction[20].

● Figure 6: Vision for Landscape Fire Management

The 2023 Forest Practices Board Report *Forest and fire management in BC: Toward landscape resilience* set out a vision for mitigating catastrophic wildfire through landscape fire management (LFM). LFM is described as a "**holistic approach to addressing forest fuel build-up and improving landscape resilience... The goals of LFM include wildfire risk reduction to protect important values and, through time, restore resilience to the landscape on all public lands**." The landscape fire management concept reflects an important link between wildfire and landscape resilience.



PLANNING IN THE CARIBOO

One key ongoing land planning initiative has been the Interior Douglas-fir Landscape Planning Table, which commenced in 2021 to develop a strategic vision, principles, goals and objectives for managing the dry-belt IDF in the Cariboo. A fundamental principle of the resulting Strategic Plan is that "healthy ecosystems are resilient" to disturbances such as wildfire, a principle that is being operationalized through the development of a best management practices guide. Other planning processes in the Cariboo include community wildfire protection/ resiliency plans, land use planning initiatives for various First Nations and joint initiatives between local governments, First Nations and the provincial government.

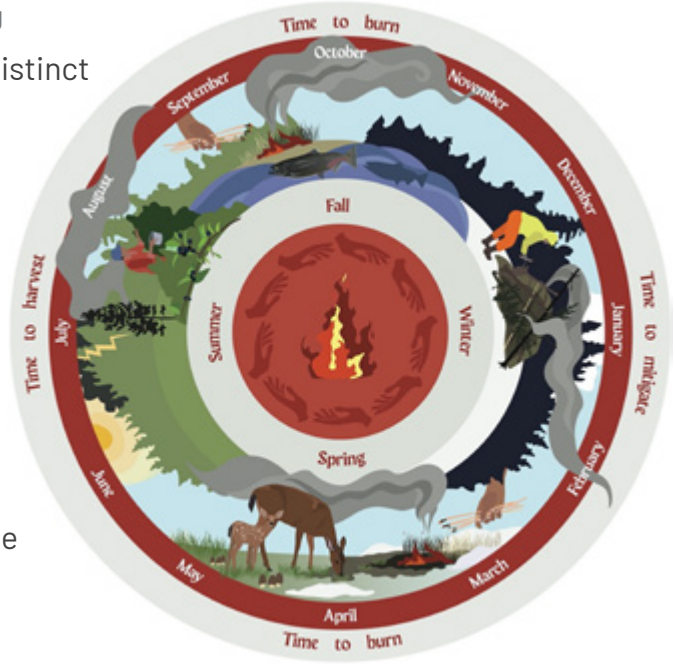
OPERATIONS

Operational practice related to wildfire resilience is occurring at different scales in BC, largely in a forestry context. At a landscape level, the Forest Practices Board has articulated in its recent report how landscape fire management can be operationalized through six principles: (1) define the landscape, (2) understand current and projected conditions, (3) understand risks to values, (4) set complementary wildland fire objectives across land use, (5) coordinate intervention and (6) learn from experience[21]. Many of the specific strategies proposed to help create complementary wildland fire objectives and coordinate intervention are already a current part of operational practices in BC, including converting, reducing or isolating fuels through fuels treatments, cultural burning and prescribed burning. Combining these strategies in appropriate ways, especially through a programmatic forest management approach that includes long-term maintenance, can help enhance landscape and wildfire resilience through encouraging more patchy fuel (and ecosystem) arrangements that reduce the likelihood of an uncharacteristic catastrophic wildfire.

At the stand scale, testing innovative management approaches that enhance resilient ecological and social characteristics has been an important priority for smaller tenure holders, such as Community Forests[22]. Specific to wildfire resilience, fuels treatments

● Figure 7: Diagram for Seasonal Cultural Burning

Cultural burning is uniquely defined and distinct among Indigenous Peoples. Generally, cultural burning is a part of Indigenous fire and landscape stewardship that includes the intentional application of fire for cultural objectives according to appropriate intergnerational protocols. It is guided by both knowledge and practice, as well as leadership and language. Cultural burning helps create a patchy landscape mosaic that minimizes the potential of catastrophic wildfire while enhancing cultural and ecological values.



A seasonal calendar depicting some elements of Indigenous fire stewardship, including cultural burning. (Hoffman et. al. 2022)

that reduce surface fuels and ladder fuels and widen crown separation are being prioritized in high-risk areas through wildfire risk reduction treatments on Crown land[23] and in smaller tenures. Developing practice guidance for specific ecosystems, such as has been done for dry-belt Interior-Douglas Fir (IDF) ecosystems, can be a useful tool for considering wildfire resilience in forest management[24]. One emerging area of focus in BC is on cultural burning and prescribed burning where it is deemed appropriate for a given ecosystem and desired set of values. Cultural burning is being led by Indigenous communities or Indigenous practitioners, following the knowledge and wisdom of Fire Keepers or Fire Headmen and Elders *(Figure 7)*[25]. Prescribed burning is often (although not exclusively) agency-led. Both cultural burning and prescribed burning are priorities supported by the BC Wildfire Cultural and Prescribed Fire Program. Progress is being made to put more cultural and prescribed fire on the ground. Nevertheless, key questions remain around governance and

OPERATIONS IN THE CARIBOO

Throughout the Cariboo, there are various wildfire initiatives that are currently being operationalized on the ground. These include, but are not limited to cultural burning initiatives underway in both Tsilhqot'in and Secwépemc territories, prescribed burning implemented in partnership with the BC Wildfire Service, selective harvesting, landscape-level fuel treatments and fire breaks throughout the region, ongoing work to address fire hazard in various community forests and private woodlots, as well as fuel treatments surrounding various communities (both within and outside the designated wildland-urban interface). These operations are being led by local First Nations, communities, forest contractors, government agencies and concerned citizens.

liability of cultural and prescribed fire and how to deploy it on a landscape scale, and there is still concern that BC is behind where it needs to be[26].

NETWORKING

A key strategy for ensuring resilience across scales is to create connected networks of knowledge holders and practitioners[27]. These networks are emerging both formally and informally through planning processes, conferences, communities of practice, or previous networks that have incorporated wildfire into their focus. Networks are a critical resilience-building process because they help strengthen relationships and provide a framework within which productive (and sometimes challenging) conversations can be held. One important example of a purpose-built network at the practitioner level is the Community Wildfire Roundtables in BC's interior, hosted by the Fraser Basin Council and funded by the BC Wildfire Service. These roundtables bring together a variety of practitioners and organizations to coordinate planning and operation of wildfire preparedness and risk reduction activities. Another practitioner network is the Forest Professionals of BC Wildland Fire and Fuel Community of Practice, which aims to connect practitioners to one another and also enhance opportunities for learning. Other networks have been created or adapted to support strategic thinking to connect wildfire to broader issues, such as the SFU Mitigating Wildfire Initiative and the University of Victoria POLIS Project on

NETWORKING IN THE CARIBOO

Since the 2017 wildfire season, both formal and informal networks around addressing wildfire in the Cariboo have formed throughout the region, often through formal planning processes such as the Community Wildfire Roundtables throughout the region or the Interior Douglas-fir Landscape Planning Table. These networks help strengthen relationships among Indigenous, municipal and provincial governments, practitioners and knowledge holders, and provide a uniting framework around which productive (and sometimes challenging) conversations can be held. In addition to formal networks that are embedded within planning processes, there are also many informal networks and relationships that formed through necessity during the 2017 fire season that have persisted. Finally, there are networks in the region which are emerging informally in the Cariboo through collaboration on specific wildfire risk reduction projects or preparing for and learning from cultural and prescribed burning projects, such as those led by the Tŝilqhot'in to revitalize cultural burning and the Cariboo Fire Art project. The above networks are simply some examples of many networks and initiatives focused on bringing people together to work collaboratively in addressing the risk of wildfire throughout the Cariboo

Ecological Governance. Still others have been developed to enhance research innovation, such as the NSERC - Canada Wildfire Research Network or university-based research centers dedicated to wildfire. These different types of networks are important for building stronger relationships and more effective outcomes through synergizing efforts, reducing duplication, and collectively overcoming potential barriers, especially as they provide a regular forum for conversation.

RESEARCH AND KNOWLEDGE GENERATION

In order to inform resilience-based planning and operations, there is a clear need to be guided by place-based information, including the knowledge of Indigenous Peoples, managers, practitioners and researchers. Indigenous knowledge and practice is the most time-tested research, having evolved through millennia and incorporating expertise related to wildfire, landscapes (including wildlife and water) and people—as well as interactions between them[28]. Indigenous stewardship reflects many important characteristics of broad resilience while maintaining the fundamental connection to place that is needed to enhance specific resilience, as long as it is not appropriated by other knowledge systems[29]. Much of this knowledge and practice is Nation-specific and continues today, guided by the concerns and needs of different Nations. Complementing and in many cases overlapping with Indigenous knowledge is the expertise developed by wildfire and forest and habitat management practitioners. Practitioner knowledge is also critical for enabling place-based resilience, as it typically emerges through long-term local practice that adapts to evolving conditions. Indigenous knowledge holders and practitioners have constantly adapted their practices, especially in the last several decades with the landscape-scale impacts of the mountain pine beetle and

RESEARCH IN THE CARIBOO

The Cariboo is increasingly the focus of western science research on wildfire, that is primarily oriented towards ecological perspectives of resilience. This includes, tree-ring based fire histories that have illustrated the departure of current forest characteristics and fire regimes from historical ones. Following this research has been careful consideration of how forest management operations are reducing wildfire risk in dry forests and how wildfire interacts with wood-boring insects that are a major concern for interactive disturbance effects. Wildlife is also a priority value in the Cariboo and there has been substantial work on interactions between fire and mule deer in the dry forests as well as the impacts of wildfire and other disturbances on the endangered Caribou Some social research on wildfire resilience has occurred in the Cariboo region such as a 2019 workshop on Preparedness, Management and Recovery in Community Forests in 2019 hosted by the BC Community Forest Association and UBC Alex Fraser Research Forest. During that event, participants were asked to describe a resilient forest, and some of the same concepts arising from the pre-interviews for this workshop, such as fire, forest and diversity, were highlighted in (Figure 8) and in a subsequent What we Heard Report.

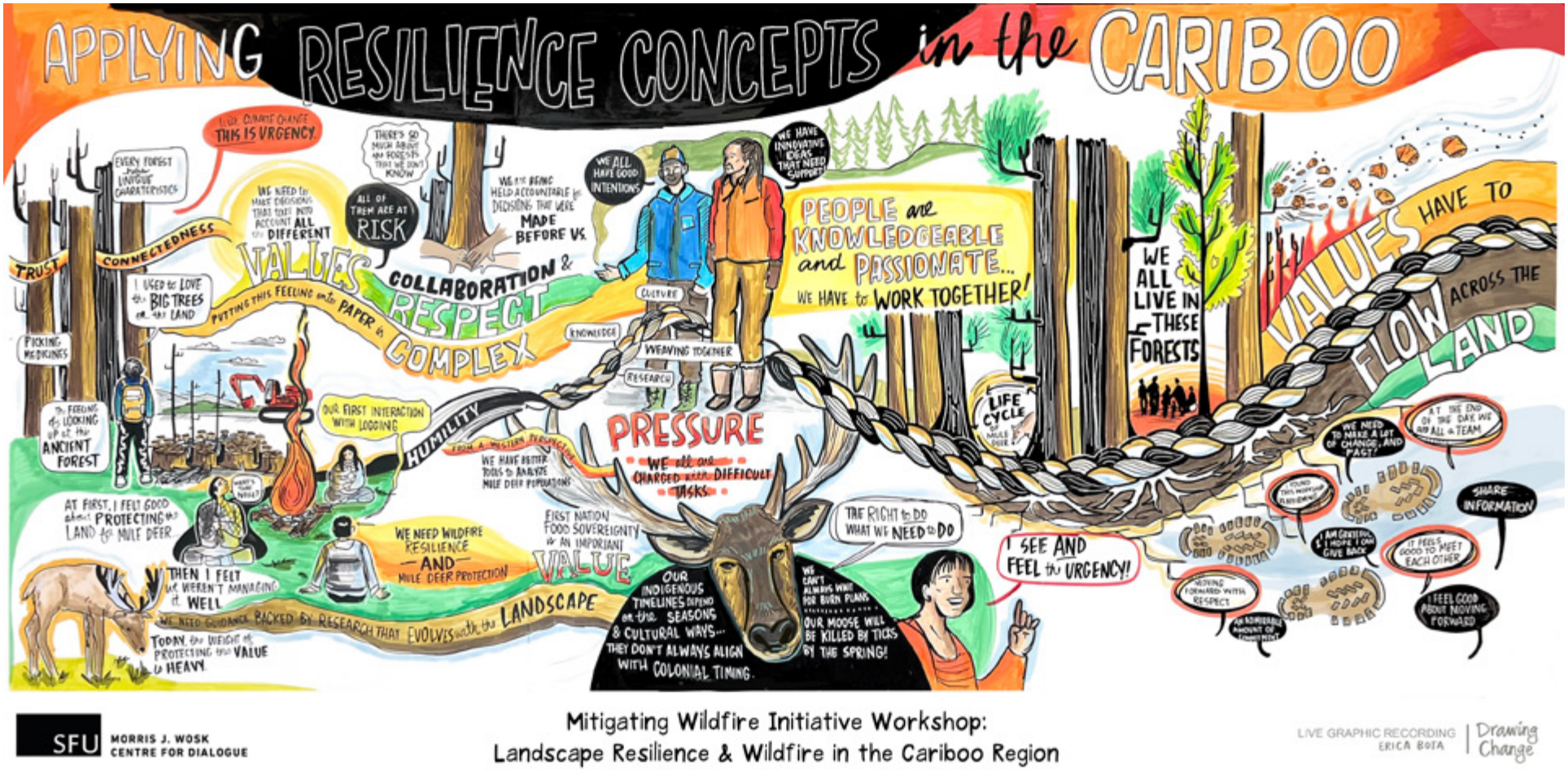
● Figure 8: Word cloud of responses to the question: "What does a resilient forest look like to you?" from the 2019 workshop on Preparedness, Management and Recovery in Community Forests in Williams Lake.

wildfires,[30] as well as anticipating the effects of climate change[31].

Western science research complements Indigenous and practitioner knowledge, and BC is increasingly the focus of western science research related to wildfire. This research includes biophysical (or natural sciences), health, and social sciences. Biophysical research, with a focus on climate change, forestry, fuels, habitat and species, and interacting disturbances or disasters, tends to be the most common and is typically used to inform decision-making around wildfire[32]. With the growing impacts of wildfire on people, health-related research has also rapidly expanded. This health research tends to focus on smoke impacts to the public, firefighter physical and mental health, and—as has been brought to light during recent wildfire seasons—inequities in wildfire impacts. Social science research includes both economic analyses as well as research into the social experiences, perspectives and preferences of people. Although rather limited compared to biophysical research, social science research that explores perceptions of wildfire risk, action taken to address that risk (such as through homeowner mitigation programs like FireSmart™ or fuels treatments) and the important capacities and leadership of communities is generating new insights for the social side of resilience[33]. Other social science research on wildfire governance is further contributing knowledge on how communities and other decision-makers are interacting to enhance certain forms of resilience[34].

PUBLIC ENGAGEMENT

The focus on an all-of-society approach and managing multiple values inherently means that public engagement and education are a key component of resilience. Supporting public engagement is a two-fold focus on creating processes that help to better connect the public into decision-making, as well as achieving outcomes that have more public buy-in or support. Community Forests, for example, are playing a leading role in implementing innovative strategies for connecting with communities and adjusting their operational practices according to local values. These strategies include both formal and informal exchanges with the public, through open houses, public meetings, field visits, or general chats as managers move through their daily lives[35]. FireSmart BC has also placed a major emphasis on the importance of public engagement through



● Figure 9: A graphic recording from the Williams Lake workshop on applying resilience in the Cariboo Region

developing user-friendly website interfaces, broadly pitched media campaigns, online training for interested citizens, and most recently through the BC FireSmart Education Program, with lessons for K-12 students. Public engagement is a critical process for resilience because it helps to bring a more diverse group of people into the conversation, identify gaps in understanding, and ensure that planning, operations, networking, and research and knowledge generation are informed by public need.

PUBLIC ENGAGEMENT IN THE CARIBOO

In the wake of the 2017 fire season in the Cariboo region, there is a strong understanding among the public of the risks posed by wildfire. Many participants in the November 2023 workshop referred to the sense of togetherness and collaboration that emerged during the large-scale evacuations of that season. That said, the legacy of the 2017 fire season is also one of collective trauma and fear, where many residents were forced from their homes and feared long term damage to their territories, communities and homes. As a result, there is both a keen public interest in addressing wildfire risk, but also an underlying fear of fire on the landscape. Ongoing public engagement initiatives aimed at engaging residents in discussions about wildfire include the Cariboo Fire Art project and other initiatives focused on building support for prescribed fire in the region. In addition, there are numerous education and outreach measures at the provincial level, including work being done by Firesmart BC.

MOVING FORWARD: BUILDING RESILIENCE AT THE REGIONAL SCALE

Resilience is a term that is often at the forefront of many land use planning and wildfire mitigation initiatives, and yet it is a complex and sometimes imprecise term that means many things to many people. The origin of the terms lies in academia, but it has become more common in day-to-day conversations and can variously be used to refer to ecological systems, social and cultural systems, or both. Confusingly, resilience can also refer to a process or an outcome, and can be achieved incrementally through adaptation or more dramatically through transformation.

When considering efforts to improve resilience in the context of communities and landscapes affected by wildfire, it is important to engage those involved in a robust dialogue about the nature of resilience, how the building of resilience might (or might not) align with their individual and collective interests, and what aspects of resilience might characterize their shared vision for the future. Based on recent experience, some of the key themes that might need to be included in these dialogues about wildfire and resilience include:

- The importance of recognizing shared experience, including not only past success from collaboration but also the potential trauma associated with historical and modern fire-related experiences.
- The importance of social, cultural and spiritual considerations of resilience—or other related concepts that might originate from Indigenous worldviews—as well as the ecological dimensions of resilience.
- The crucial need to focus on the building of local capacity that is required to to

manage dynamic change and navigate uncertainty around wildfire.

- Adopting an 'all-of-society approach' for the building of resilience—one that is founded on relationships and partnerships and that emphasizes a sense of shared interests and 'togetherness.'
- Emphasizing forward-looking, proactive work, based in part on a deeper understanding of the true costs of inaction and a recognition of the inevitability of wildfire on the landscape.
- The importance of dynamic management rather than the more static, status quo models, given the reality of wildfire today.
- The value of innovation and experimentation, to encourage out-of-the-box thinking and adaptive learning.
- The need for timely legal, regulatory and policy change.

Collaborative efforts to build resilience with a region need to be designed and led by those directly involved, and must be tailored to match local conditions and preferences. The case study presented in this report reflects some of the recent experience in the Cariboo, but other regions will need to forge their own path based on their own, unique circumstances. Wherever such collaborative efforts are made to improve resilience, some of the key areas where progress might need to be made include:

- Planning, which is inherently a forward-looking, collective initiative, and which draws from the wisdom and experience of all those involved. Ideally, planning is co-designed and jointly-led by Indigenous governments and BC, is capable of addressing multiple values across the landscape, and includes consideration of broader processes such as cumulative effects. Planning might also be needed at multiple scales, and might include the revisiting and revision of historical plans that are potentially driving undesirable outcomes.
- Operations, to improve practices and standards and to give effect to innovative management approaches. Making improvements might require scaling up operations beyond the wildland-urban interface to achieve landscape-scale outcomes, and should include technological innovation and a focus on creating incentives for new approaches and methods (or identifying and reducing disincentives for operational practices such as fuels treatment reductions). Improving operations will also require enhancing capacity and capabilities for operators through training and practice.
- Networking, to help establish, support and strengthen working relationships among diverse interests and provide a framework within which productive (and sometimes challenging) conversations can be held. Both ad-hoc and long-term networks are likely important. Efforts might also be needed to strengthen existing wildfire networks by incorporating underrepresented partners, and encourage knowledge exchange and mentoring.
- Research and knowledge generation, to surface critical place-based information,

including the knowledge and deep-rooted experience of Indigenous Peoples, as well as the experience of managers, practitioners and western scientists. Research can also deepen the shared understanding of wildfire, landscapes (including wildlife and water) and people—as well as the many interactions between them—and help to drive innovation and adaptive learning over time. Social science research is needed in particular to explore potential trade-offs (e.g., related to the introduction of operational practice), deepen an understanding of public perception, and provide greater insight into new governance models that will enhance resilience. There might also be a need to develop a network of 'boundary spanners' (including dedicated individuals and organizations) who can help ensure that practical needs are guiding research and research is reaching those who need it the most.

- Public engagement and education, to build and sustain a constituency of support for more proactive approaches to wildfire, and to connect the public into decision-making. Deliberate efforts might be needed to engage youth or under-represented groups, and to ensure that public engagement is not just one-way education from experts but instead includes open conversations to listen to public concerns and needs.

The purpose of this document is to explore the concept of resilience in the context of wildfire in British Columbia, and is intended to inform reflection, dialogue and collaboration on this topic across a broad array of regions, planning initiatives, and management processes. By expanding and refining the meaning of this term, and its potential application in the context of planning, management and governance, it is hoped that this document can serve as a resource for First Nations, Governments, planners and practitioners operating in many different areas and in many different contexts.

GLOSSARY

The definitions of these terms are based on how they are being used in the context of the *Mitigating Wildfire Initiative*.

The definitions of these terms have been collated from the CIFFC Canadian Wildland Fire Glossary (2023), and revised for application in BC and the *Mitigating Wildfire Initiative*. Where definitions were taken from an alternative source, the source has been referenced.

Catastrophic wildfire: A wildfire that causes catastrophic impacts to the things we value, including life, livelihoods, property and infrastructure, the landscape and our social and cultural fabric (such as sense of community). Catastrophic wildfires are destructive rather than regenerative; however, not all wildfires are catastrophic, and not all catastrophic wildfires have the same characteristics (such as severity or size)[36].

Cultural burning or fire: Cultural burning or cultural fire is uniquely defined and distinct among Indigenous Peoples. In general, cultural burning is a part of Indigenous fire stewardship that includes the intentional application of fire for cultural objectives according to appropriate and intergenerational protocols[37].

Dialogue: Dialogue brings together many voices, stories, perspectives and experiences to increase mutual understanding and identify shared solutions. Instead of arguing for what you already know, dialogue is entered into with a spirit of curiosity and an openness to be changed. Instead of a conversation with sides, dialogue has a centre.

Fire severity: Degree of fuel consumption within a given area. In a forestry context, it is often associated with the proportion of mortality of above-ground trees and shrubs.

Fire regime: The collection of characteristics of wildfires over time and space, including the return interval (how often), fire severity and seasonality. In a forestry context, fire regimes are often characterized as a continuum of low-severity and high-frequency to mixed-severity (and mixed frequency) to high-severity and low-frequency.

Fuel treatment: Altering landscape fuels (typically trees and shrubs) to reduce the likelihood of a wildfire, potential damage and/or resistance to wildfire control through delimbing, chipping, crushing and piling, and burning fuels.

Hazard: The probability of a severe wildfire event at a particular location in a specified time period. Hazard varies across BC depending on weather, topography and ignitions[38].

Indigenous fire stewardship: The stewardship of fire by Indigenous Peoples to modify fire regimes and increase the abundance of favoured resources, following intergenerational teachings. Can include

stewardship of both fire itself (through cultural burning) and fire-affected landscapes[39].

Mitigation: Proactive actions, including preparedness and prevention, taken to reduce catastrophic impacts of wildfires.

Preparedness: Proactive actions including planning, resource allocation and capacity-building. Some preparedness activities are focused on reducing wildfire risk (such as cooperative planning for fuels treatments) while other preparedness activities are focused on being ready for more effective wildfire response; the former is included in the **Mitigating Wildfire Initiative**.

Prescribed burning or fire: The deliberate and planned application of fire by authorized personnel to accomplish objectives such as wildfire risk reduction and ecosystem restoration.

Prevention: Actions taken to avoid negative consequences of wildfire; can be a part of mitigation. In BC this is part of the "Mitigation" pillar of Emergency Management and can include fuels treatments, cultural and prescribed burning, Indigenous fire stewardship and education of wildfire risk.

Recovery: Post-wildfire actions, including land-based recovery through ecosystem rehabilitation and cost recovery for expenses.

Response: Actions taken during a wildfire to minimize negative impacts on values. The Government of BC's emergency response protection priorities, from highest to lowest are: (1) human life and safety, (2) property, (3) high environmental values and (4) resource values[40].

Risk: A function of the likelihood and consequences of a wildfire. Includes total value of potential loss to damage to life, assets, ecosystem services, values and livelihoods.

Wildfire: A fire that burns in wildland or wildland-urban interface areas whose spread is dictated by available fuels (trees, shrubs and grasses), weather and topography. Can be of human or natural (lightning) origin and spreads through embers or direct contact of fire to fuels. Many ecosystems throughout BC are adapted to wildfires of varying characteristics which, prior to widespread suppression and exclusion, maintained healthy ecosystems, biodiversity and cultural values.

Wildfire season: The period of the year during which fires are likely to start, spread and do damage to values at risk sufficient to require organized wildfire response. In BC, the wildfire season is typically considered May to October.

Wildland-urban interface: The area where homes and other human developments meet or are intermixed with wildland fires. In BC, for planning purposes, the formal definition of the wildland-urban interface is a 2 km buffer around a structure density of 6 structures per hectare and a 2.75km buffer around a structure density of 25 structures per hectare (to capture private land)[41].

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CONTACT

Mitigating Wildfire Initiative -
SFU Morris J. Wosk Centre for Dialogue