



A Report for Government
and British Columbians

Addressing the New Normal: 21st Century Disaster Management in British Columbia

*Report and findings of the BC Flood and Wildfire
Review: an independent review examining the
2017 flood and wildfire seasons*

Submitted April 30, 2018

“The drum reminds us of the heartbeat of our ancestors and the heartbeat of our generations yet to be born. Mother Nature also has a heartbeat and we must listen to her as we listen to the drum. She is reminding us of the interconnectedness of all things: sun and moon, earth and sky, animals and humans, fire and water.”

— Elder Charlotte Manuel, Tk'emlúps te Secwépemc









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We recognize the individuals, organizations and communities that took the time to contribute their thoughts, input and insights — in writing and in person. Without their valuable perspective, this review would not have been possible.

Finally, we take this opportunity to acknowledge the efforts of those who fought wildfires and floods in 2017, and those British Columbians who were so deeply and personally impacted by events — particularly, those who lost their lives.

George Abbott
Co-chair

Chief Maureen Chapman
Co-chair

April 30, 2018

The Honourable John Horgan, M.L.A.
Premier of British Columbia
Room 156, Legislative Assembly of British Columbia
501 Belleville Street
Victoria, BC V8V 2L8

Dear Premier:

We are pleased to submit this report detailing the findings and recommendations from our independent review of British Columbia's unprecedented flood and wildfire 2017 season. We have been very honoured to serve as co-chairs for this significant undertaking, critical to mitigating the future impact of wildfires and flooding on BC's communities and landscape.

Beyond exploring the overall context for the devastating events, this report includes highlights from a robust series of public engagement sessions that took place in winter 2018, as well as a series of recommendations. Many of the recommendations we are making align with those made by individuals, organizations and the many First Nations communities that were directly impacted. Their valued contributions, perspective and willingness to share were central to our recommendations. At all stages of our work, we experienced a true willingness on the part of all British Columbians to collaborate in improving emergency management in our province.

The challenges faced in 2017 may not have been an anomaly, but a strong indication of a new normal our province and planet now face due to the unpredictable and increasingly volatile impacts of climate change. Moreover, the strength of the United Nations Declaration on the Rights of Indigenous Peoples and the commitments outlined in your Ministerial mandate elevates the voices and positions of Indigenous Peoples. This report presents many opportunities for your Government to engage in true Nation-to-Nation relationships with the First Peoples of the province.

Given this new reality, it is imperative the Government of British Columbia take immediate steps to begin addressing the issues raised in this report. To this end, many of our recommendations include practical solutions that can be readily implemented in the days, months and years ahead.



George Abbott
Co-chair



Chief Maureen Chapman
Co-chair

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Every effort has been made to ensure the information in this document is accurate and current at the time of printing. All figures cited in this publication are in Canadian dollars unless otherwise stated.



LIST OF ACRONYMS

AAC Allowable annual cut

BCERMS British Columbia Emergency Response Management System

BCR Band Council Resolution

BCWS BC Wildfire Service

DFA Disaster Financial Assistance (provincial)

DFAA Disaster Financial Assistance Arrangements (federal)

EMBC Emergency Management British Columbia

EOC Emergency Operations Centre

ESS Emergency Social Services

FESBC Forest Enhancement Society of British Columbia

FLNRORD Ministry of Forests, Lands, Natural Resource Operations and Rural Development

FNESS First Nations' Emergency Services Society

FNHA First Nations Health Authority

FRPA *Forest and Range Practices Act*



FSR Forest Service Road

HEMBC Health Emergency Management BC

IC Incident commander

ICS Incident Command System

IMT Incident management team

LiDAR Light detection and ranging

LRMP Land and Resource Management Plan

OFC Office of the Fire Commissioner

OGMA Old Growth Management Area

ORVs Off-road vehicles

PEP Provincial Emergency Program

PREOC Provincial Regional Emergency Operations Centre

SWPI Strategic Wildfire Prevention Initiative

UBCIC Union of British Columbia Indian Chiefs

UBCM Union of British Columbia Municipalities

WUI Wildland urban interface



1.0 INTRODUCTION

This strategic Review examines and assesses government response to flood and wildfire events of the 2017 season. In considering all aspects of the Province's response to the floods and wildfires of 2017, the Review team engaged British Columbians directly in the process. This included consulting with individuals, Indigenous and non-Indigenous communities, organizations and other stakeholders to gain the widest possible cross-section of

perspectives through sessions undertaken in or near affected communities. As outlined in greater detail in Section 4.0, engagement included submissions received in writing and conversations that took place with one or both co-chairs. For more detailed information on the Review team's findings, see Section 5.0. For a detailed examination of our proposed recommendations, see Section 6.0.



Review parameters

As mandated by the Province in our terms of reference, this Review includes recommendations (see Section 6.0) to assist the Province in improving its systems, processes and procedures in the future. More specifically, this Review has focused on governance aspects of the system, including statutes, regulations, policy and leadership practices that define the context within which the emergency management system operates.

This Review and our recommendations are intended to provide guidance to the Province in four areas, as set out in the terms of reference (see Appendix A for the complete terms):

- **Planning and preparedness**

- This Review considered governance, process, communications, capacity and resources (both financial and human). More specifically, scope included:

- reviewing the status of assessment of hazards, risks and vulnerabilities;
- the status of provincial governance, planning and preparedness levels;
- the Province’s capacity to plan for and ensure support to First Nations and local governments; and,
- the status of First Nations’, local government and regional district governance, planning and preparedness levels.



Scope also included examining resourcing requirements for flood and wildfire events for all key capability assets.

- **Prevention and mitigation** — This Review considered management practices, economic costs and benefits, and capacity and resources (both financial and human). More specifically, scope included:
 - examining current activities and opportunities for new activities by government and partners (including activities at the landscape level) that could contribute to enhanced prevention and mitigation for natural hazards;
 - reviewing current forest management practices, including but not limited to hazard abatement and harvest age; and,
 - the economic costs and benefits associated with existing practices and possible enhanced mitigation practices for natural hazards.
- **Response** — This Review considered governance, process, internal and external organizational communications, tactical efforts, capacity and resources (both financial and human). More specifically, scope included considering:
 - execution of the 2016 BC Emergency Management System;
 - the Province’s ability to respond effectively and sustain operations over a longer term during major emergency events, including resourcing requirements for all key capability assets;
 - the Province’s ability to effectively support local government’s response during significant emergencies; and,
 - the Province’s ability to quickly and effectively secure required resources during critical incidents.

Under this umbrella, the Review’s scope also included

examining: the capacity of First Nations and local governments to respond to respond effectively during major emergency events; the state of coordination and communication structures and processes in place within the provincial government; coordination and communication structures and processes with other levels of governments and external partners, including but not limited to First Nations, Canada, local governments and regional districts, communities and the public; and examining private and public sector best practices to respond to major emergency events of provincial significance.

- **Recovery** — This Review considered governance, process, internal and external organizational communications, and capacity and resources (both financial and human). More specifically, scope included reviewing the Province’s current state and capacity for assisting and supporting communities, businesses and individuals in recovery efforts.

The terms of reference detailed here were intended to be as comprehensive as possible; however the Province has provided flexibility such that this review can — and does — consider other items in the context of emergency preparedness, response and recovery.

As outlined in the terms of reference, this final report and recommendations are intended to help inform government’s actions in advance of the 2018 flood and wildfire seasons.

In addition to examining these areas, the terms of reference also stipulate that the Review team consider the work of the independent report by the Honourable Gary Filmon, former premier of Manitoba, *Firestorm 2003: Provincial Review*, commissioned by the Government of British Columbia in the aftermath of the devastating Okanagan Mountain Park and Barriere-McLure wildfires of 2003.



Review announcement and co-chairs

This Review and terms of reference were announced by the Province on December 4, 2017. Also announced at that time were Review co-chairs George Abbott and Chief Maureen Chapman.

With a long and distinguished career in public service, George Abbott was BC’s Minister of Education from 2010–12, Minister of Aboriginal Relations and Reconciliation from 2009–10, Minister of Health from 2005–09, Minister of Sustainable Resource Management from 2004–05, and Minister of Community, Aboriginal and Women’s Services from 2001–04. From 1996–2001, Abbott was deputy house leader for the Official Opposition in the BC Legislature. He also served for 17 years in local government, including as director and chair of the Columbia Shuswap Regional District and as a councillor with the District of Sicamous. Abbott was a sessional lecturer in political science at Okanagan University College from 1980–1996, and at the University of Victoria in 2013.

Shxwetelemel-elhot (Chief Maureen Chapman), has been Hereditary Chief of Sq’ewá:lxw (Skawahlook) First Nation since 1999. She has a provincial and national reputation as a committed advocate for First Nations self-governance and autonomy, with a particular interest in children, families and women’s health issues. Chapman was born in Clearwater and has been a teacher and mentor on community-identified issues, both as an educator and as Chief. She has always believed in maintaining family connections as a way of strengthening First Nations and re-establishing cultural ties within communities. As an active Chief in BC’s Fraser Region, Chapman is recognized for bringing an honest, fair and practical approach to many difficult issues. She supports and has been involved with the Principles Respecting the Government of Canada’s Relationship with Indigenous Peoples, a 10-point platform that revives nation-to-nation relationships between First Nations and the federal government.

This Review conducted by Mr. Abbott and Chief Chapman complements three earlier evaluations led by Emergency Management British Columbia (EMBC) and the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) of operations in 2017. It concludes the fourth of four phases, or tiers, of reports conducted and/or commissioned by the Government of British Columbia. These phases are summarized in the following table:

Tier	Purpose
1	This organization-specific response consisted of internal debriefs conducted by key ministries, First Nations and local governments and other organizations involved in or impacted by wildfire, flood or debris flow events in 2017
2	This provincial inter-ministry and agency response review consisted of cross-ministry debriefs with government organizations that had a role or were impacted by wildfire, flood or debris flow events in 2017
3	This review looked through the lens of the various partners that had a role in or were impacted by wildfire, flood or debris flow events in 2017
Strategic Review Led by an Independent Team	
4	This Review serves as an independent examination of the Province’s response to flood and wildfire events of 2017

Revisiting the Filmon prescription

Our terms of reference for this Review included a mandate to assess recommendations made by *Firestorm 2003: Provincial Review*, also known as the Filmon report, a response to the dramatic wildfires of 2003 in Kelowna and Barriere-McLure. Offering constructive recommendations in several areas, its central focus was on enhanced protection for communities by fuel mitigation within wildland urban interface (WUI) areas. In 2004, the Province created the Strategic Wildfire Prevention Initiative (SWPI) in cooperation with the Union of British Columbia Municipalities (UBCM) through multi-year investments totaling \$78 million. At that time, the Province also provided an analysis identifying more than one million hectares of hazardous fuels. In 2016, the Province established the Forest Enhancement Society of BC (FESBC) with a broad mandate to treat a variety of forest conditions — including at the landscape level — with a total provincial government investment to date of \$235 million.

Experience across 14 years has demonstrated that the cost for fuel mitigation through SWPI has averaged \$5,000 per hectare. In more challenging locales, such as the Resort Municipality of Whistler, average cost was much higher. Where fuel mitigation was offset by the value of timber extracted, treatment costs were as low as \$1,500 per hectare.

Published accounts point to an approximate 78,000 hectares treated since 2004, not all through SWPI. Unfortunately, those 78,000 hectares represent less than 10 per cent of the

800,000 hectares identified as moderate- to high-risk. BC's Auditor General estimates the cost of treating all remaining risk areas at \$6.7 billion. This figure is consistent with estimates provided by other learned observers.

Despite earnest efforts, BC has made disappointingly little progress on the goal of enhanced community safety since 2003. As the BC Auditor General recently reported (2018), at least 80 communities have completed Community Wildfire Protection Plans but have not undertaken on-the-ground fuel mitigation. Further, “approximately 49 per cent of communities who have completed plans have not completed any operational treatments.”³

In response to why most local governments did not complete any operational treatments, we heard a common refrain from local governments:

Most, if not all, local taxpayer dollars are committed to building and maintaining water, sewer, roads, street lights, parks and recreation and solid waste infrastructure. How can we justify spending local tax dollars on treatment of adjacent provincial Crown lands as we struggle to maintain that infrastructure?

Achieving the goal of safer communities will require, we submit, substantial revision of the existing treatment models outlined below.

In 2017, wildfires prompted a 10-week provincial state of emergency — the longest in British Columbia’s history, displacing more than 65,000 residents



The experience of the past 14 years suggests the need for a new and multi-year, multi-pronged approach that reflects our growing understanding of the world since the Filmon review. The Government of British Columbia faces two core questions around enhancement of community safety in the face of climate-intensified wildfire. The first is:

How can more wildland urban interface areas be treated more quickly and at lower cost on a per-hectare basis?

We believe a new and more successful approach must include the following critical elements:

- A comprehensive strategic plan identifying those communities at greatest risk from wildfire, coupled with a commitment to treat those most at risk regardless of the ability of local governments to pay.
- Broader use of post-harvest residual wood fibre for biomass energy production wherever possible and practical.
- More low-cost, landscape-level treatments (including prescribed burns) that can slow, divert or even halt large-scale wildfires.
- Greater use of prescribed burning to achieve fuel mitigation at both the interface and landscape levels. In partnership with First Nations, incorporate greater traditional use of fire as Indigenous Peoples have been doing for millennia.
- Addressing land use plan protected areas (such as old growth management areas and ungulate winter range) with high concentrations of diseased or dead trees within wildland urban interface areas where community safety may be threatened.
- Within wildland urban interface areas, revisit post-harvest replanting requirements for forest licensees so community safety is considered first and foremost.

- Move remaining SWPI resources into the Forest Enhancement Society of BC and include UBCM representation on the FESBC board.
- Within wildland urban interface areas, mandate building code and/or development permit requirements for use of fireproof building materials and promote expanded use of sprinkler technology.
- Fund and foster a revitalized FireSmart program and encourage dynamic partnerships with local and First Nations governments as well as the participation of large private landholders.
- Expand the community forest program to other communities where interest and capacity exist (see Best Practice story ‘Being Proactive about Wildfire in Logan Lake’ in Section 5.0).
- Where community forests do not exist, work with forest licensees to develop fuel mitigation models in conjunction with the FESBC.
- Regularly evaluate the effectiveness of treatment and mitigation strategies at both the interface and landscape levels.

The second core question for Government is:

Should prescribed burns be more extensively utilized at both the interface and landscape levels with the goal of slowing down, diverting, or controlling potential future wildfires?

BC is far from alone in facing this question. Alberta and other Canadian provinces, as well as nations such as Australia, have been moving quickly to better understand the potential benefits of prescribed burning on their fire-prone forests.

LEARN MORE

What is prescribed burning? Why is it valuable?

According to the publication *Managing Forest Fuels in the Wildland Urban Interface*, “Planned fire, or prescribed burning, is the traditional tool of fuel management; it can be inexpensive, effective and environmentally appropriate. But concerns about smoke, escaping fires, lack of burning expertise and local bylaws have severely limited the use of planned fire in recent years, particularly in WUI [wildland urban interface] areas.” Prescribed burning is also known as controlled burning.

Prescribed burns that might help contain a potential wildfire will never produce carbon emissions comparable to those produced by that wildfire. As we heard directly from Dr. Lori Daniels of the University of British Columbia, “Prescribed burns conducted under cooler weather conditions burn less intensely, consume less fuel and release less smoke than wildfires burning in the heat of the summer.” To this end, it is worth noting that the BC wildfires of 2017 emitted an estimated 190 million tonnes of greenhouse gases into the atmosphere — almost triple BC’s annual carbon footprint. Wildfire emissions also dramatically diminished air quality. According to a CBC news report, the City of Kamloops experienced its worst air quality in recorded history on August 3, 2017. On a scale where any reading over 10 is considered very high risk, Kamloops recorded a reading of 49. BC would be well-advised to learn from our own experience, and from other jurisdictions, and move quickly to understand the benefits of prescribed burning.

The challenges of fuel mitigation and community safety will not diminish. As communities grow over time, areas requiring treatment will also grow — as will the maintenance costs for previously-treated areas. Solutions will be neither easy nor inexpensive, but in the absence of substantial new investment we can expect that the costs of wildfire

***Estimated cost of total flood response
in 2017: more than \$73 million***

suppression, and losses to citizens and the provincial economy, will continue to grow.

The world since 2003

Our world has changed remarkably since 2003, when fires devastated the Okanagan region.

One area where this is more apparent than ever is First Nations and First Nations communities. Indigenous Peoples' lands and territories have been at the environmental, economic, social and cultural heart of their communities for thousands of years. Given the inter-connectedness between and among First Nations communities, this also means that not only will the effects of trauma be experienced by all First Nations directly impacted and their families, but through family ties extending across the land.

This report carefully considers the unique circumstances faced by Indigenous Peoples, as do our recommendations. They underscore the need for improved thinking and approaches by governments in adequately responding to Indigenous Peoples, notably First Nations, in emergency situations. Emergency management policies are required to ensure the long-term economic, environmental and cultural survival of Indigenous communities and must advance First Nations inherent, inalienable right of self-determination, Aboriginal title and rights and Treaty rights, and must improve the socio-economic conditions of First Nations people and communities.

LEARN MORE

What is the United Nations Declaration on the Rights of Indigenous Peoples?

The United Nations Declaration on the Rights of Indigenous Peoples was adopted by the UN on September 13, 2007:

Today the Declaration is the most comprehensive international instrument on the rights of Indigenous Peoples. It establishes a universal framework for minimum standards for the survival, dignity and well-being of the Indigenous Peoples of the world and it elaborates on existing human rights standards and fundamental freedoms as they apply to the specific situation of Indigenous Peoples.

As stated in the mandate letters for every cabinet minister in the Government of British Columbia, each minister is responsible for moving forward on Truth and Reconciliation Commission (TRC) calls to action, and for reviewing policies, programs and legislation to determine how to bring United Nations Declaration on the Rights of Indigenous Peoples principles into action in BC.

Mental health is another area where understanding has generally improved since 2004. An holistic approach to disaster management must consider the mental health and well-being of those impacted by such events. Equally, mental health as it relates to the four pillars of emergency management calls not just for thinking about mental health and well-being in the recovery phase, but in the other three phases as well — so supports are in place before disaster strikes rather than as an after-thought:

There will always be a psychological impact to those affected by an emergency, regardless of whether it is a large-scale event or limited to one



or two individuals. The psychosocial component of an emergency can have long lasting and often detrimental implications if consideration is not given in the planning stage to mitigation strategies capable of addressing the greater community needs.⁹

In an era when substance abuse and addiction to opioids has reached crisis levels, the reality is that living through a disaster may be a ‘tipping point’ for some — a coping mechanism in the face of adversity.

Communication has also witnessed profound shifts since 2004, when the Filmon report was published. One of the most profound changes is the power and reach of social media. Facebook, Twitter, Instagram and other channels did not exist. While they yield profound benefits, such as the ability to rapidly communicate with a wide audience, we heard social media was a source of misinformation during and after events in 2017. Going forward, any thinking about disaster management must fully consider social media. In the report, we include an example of how social media was used successfully by the Skeetchestn Indian Band to keep members of its community informed following the community’s evacuation due to the wildfires (see the Best Practice story, ‘Being Emergency-Ready: The Skeetchestn Indian Band’ in Section 5.0).

Since 2004, the impact of climate change on BC has become much more apparent. Our understanding of how climate change is impacting BC and Canada is far richer and deeper in 2018. A range of data from reputable sources points to growing challenges with respect to heat, drought, lightning and intense rains intersecting with snow melt, underlining the imperative for government to respond in new, different or better ways. Our understanding of the impact of insects






and diseases on our forest has also grown substantially since 2003. The impact of the mountain pine beetle (MPB) proved even greater than anticipated and was in many ways at the heart of 2017 wildfires. We can no longer rely on cold winters and summer fires to keep these pests in check. Climate change impacts us all.

Our approach to this report

In thinking about this report, how to capture what we heard, what we read and what we saw, we carefully weighed numerous factors. That included our mandate to deliver on the terms of reference set out for us and focusing on the audience for this report. Naturally, in that we are delivering this report for the Province, government is one audience. Equally, we viewed this report as a document that should be accessible to all interested British Columbians — not only in that it is British Columbians who ultimately pay the bills, but because they are integral to the emergency management equation.

For this reason, and as much excellent material has already been written delving into the more technical aspects of managing flood, debris flows and wildfires, we have tried to keep this report as straightforward as possible for one simple reason: we want it to be read, absorbed and understood by the widest possible audience. In turn, it is our hope that the recommendations we are making in Section 6.0, and how we reached them, will be more clearly understood. Whether readers agree with some, all or none of our recommendations, it is our hope they will appreciate how we arrived there.

In keeping with this approach, we have also consciously kept the report’s tone as reader-friendly as possible. To this end, readers will note some conventions throughout this report,

 102 FEEDBACK FORMS COLLECTED	 503 MAIL LIST SUBSCRIBERS	 8 OPEN HOUSES	 20 COMMUNITIES VISITED	 60k PEOPLE REACHED ON FACEBOOK
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⁹ Government of British Columbia. Emergency Management in BC: Reference Manual. 2011. Chapter 6, Page 15. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.

including ‘Learn More’ boxes, where we have provided added context on concepts critical to understanding flood, debris flow and wildfires. We have also tried to create better understanding by sharing some of the personal stories arising from events in 2017. Showing the human side, they offer readers a glimpse into the lives of those who lived these events — what happened, and how they are managing nearly one year later. These ‘First-Hand Accounts’ include various perspectives and voices. Equally, other stories convey practices that could be implemented by other communities and British Columbians. We refer to these stories as ‘Best Practice.’

This report and the recommendations we are making would not have been possible without giving due consideration to a number of reports and documents identified in the Works Consulted section.

In reviewing these documents, and through the many conversations we had with concerned citizens, communities, First Nations and stakeholders, we recognize some recommendations we are making may have been previously made elsewhere. We believe the greater the number of voices making the same recommendations, the more seriously Government should be considering them.

Estimated cost of fighting wildfires in 2017: \$568 million

Key report themes

Across the open houses and one-on-one conversations that were held and through the written submissions we received, recurring themes became apparent. In determining how to best capture the extent of input we received, it made sense to work under several umbrellas. Four key themes emerged from our engagement:

- **Partnerships and participation** — Given the sheer scale of extreme weather events in the 21st century, partnerships between and among governments, local and First Nations communities, regional districts, organizations, stakeholders and others are vital to more effectively, and quickly, responding to events. Participation is an important part of this equation; it also extends to families and individuals and what proactive actions they might take — such as adopting FireSmart principles to better protect their properties from wildfires. Engaging citizens and communities happens continually, not just when a weather event is occurring.
- **Knowledge and tools** — Tapping into Indigenous and local knowledge of roads, watercourses, weather patterns and other criteria, is a must if government hopes to be more effective in responding to extreme weather events going forward. Equally, having the proper tools, including technology-powered solutions, could make a very real difference in how our province approaches disasters in the years and decades ahead. An investment in \$170 million for sophisticated light detection and ranging (LiDAR) technology, for example, though costly, pales in comparison to the \$568 million spent in responding to the 2017 wildfires. This figure does not begin to address the associated costs of lost tourism, economic disruption, or the social costs.

- **Communication and awareness** — Our world has changed in many ways since the Filmon report was published in 2004. Among them is the power and reach of social media. In an emergency, effective communication involves using all relevant communications channels — including social media — to provide reliable information generated by credible sources so that misinformation does not create additional challenges during a time of crisis. Equally, effective communication is about ensuring citizens, communities and organizations understand what they should be doing and the recourse available to them during a disaster and in its aftermath.
- **Investment** — Since 2004, the gap has grown between expenditures for response and those for planning/preparedness and prevention/mitigation (see Appendix B for details). To achieve any kind of meaningful change and address any gaps, there must be stable, predictable and proactive investments in technology, infrastructure and teams. In our view, investment is vital to realizing any real improvement in better preparing our province for disasters of any kind going forward.

In addition to these four themes, we also considered international thinking on disaster management found in the *Sendai Framework for Disaster Risk Reduction 2015–2030*, a publication of the United Nations. Developed in the aftermath of the devastating earthquake and subsequent tsunami that took place in Japan in 2011, the publication includes a series of valuable insights that can and should inform any resulting changes the Province should make going forward following in the aftermath of the 2017 flood and wildfire season.¹⁰

CLOSING THOUGHTS

As in other parts of the world, climate change is having a profound effect on British Columbia. In 2017, extreme weather events prompted floods, debris flow and wildfires in several corners of our province, causing severe damage in their wake.

The massive lightning storm of July 7, 2017, and the more than 160 wildfires that immediately followed, confirmed the need for more extensive partnerships with local and First Nations governments, rural and remote communities and industry.

It is imperative that we move to a multi-year, multi-pronged approach to community safety — one that involves concerted, proactive investment *before* emergencies happen.

The experience of 2017 demonstrated the consequences of ignoring the growing gap between spending in the areas of response versus planning/preparedness and prevention/mitigation. If we are to limit the vulnerability of our homes, our properties and our communities to such extreme weather events and the new normal, the time to reinvest is now.

FOR FURTHER REFLECTION

—
Why should government take this report and recommendations seriously?




2.0 THE 2017 SEASON: SETTING THE CONTEXT

British Columbians experienced unprecedented impacts from the 2017 flood and wildfire season. The events were among the worst in the province's history, prompting a 10-week provincial state of emergency. More than 65,000 residents were displaced, with flood response costs estimated at more than \$73 million and direct fire suppression costs estimated at more than \$568 million.

The extreme weather events of 2017 were separate incidents occurring at different times of the year in distinct parts of our province. Though this may seem like an obvious point to the thousands of British Columbians affected, it is critical to highlight for readers who may not be as familiar with British Columbia's geography or those events. That said,

there are underlying factors common to both the flood/debris flow and wildfires of 2017 that inform the scope of this independent report and why the Government of British Columbia commissioned it — namely the response to major disasters in BC and the Province's ability and readiness to deal with such catastrophic events. What became clear to us during this Review was the undeniable impact of climate change manifested in these events. We delve further into this later in this report.

This section of the report sets the context for events in 2017 by looking specifically at key criteria for each event including timelines and major milestones, and other details that will provide context-setting to better understand what we heard from British



Columbians through the engagement process (see Section 5.0) and, ultimately, our recommendations (see Section 6.0).

This section also includes a series of first-hand accounts, told from the perspective of those individuals, families, communities and organizations who lived through these events — and, as many of the stories suggest, are still very much living the aftermath of those events nearly one year later. These stories are intended not only to help provide additional understanding about many of the salient issues that happened during the response phase, but to provide critical knowledge about where clear gaps exist in the recovery phase. For each story recounted here, there are countless others.

A closer look at flooding and debris flow in 2017

According to the publication *Emergency Management in BC: Reference Manual*, flooding is one of BC's most frequent hazards.¹

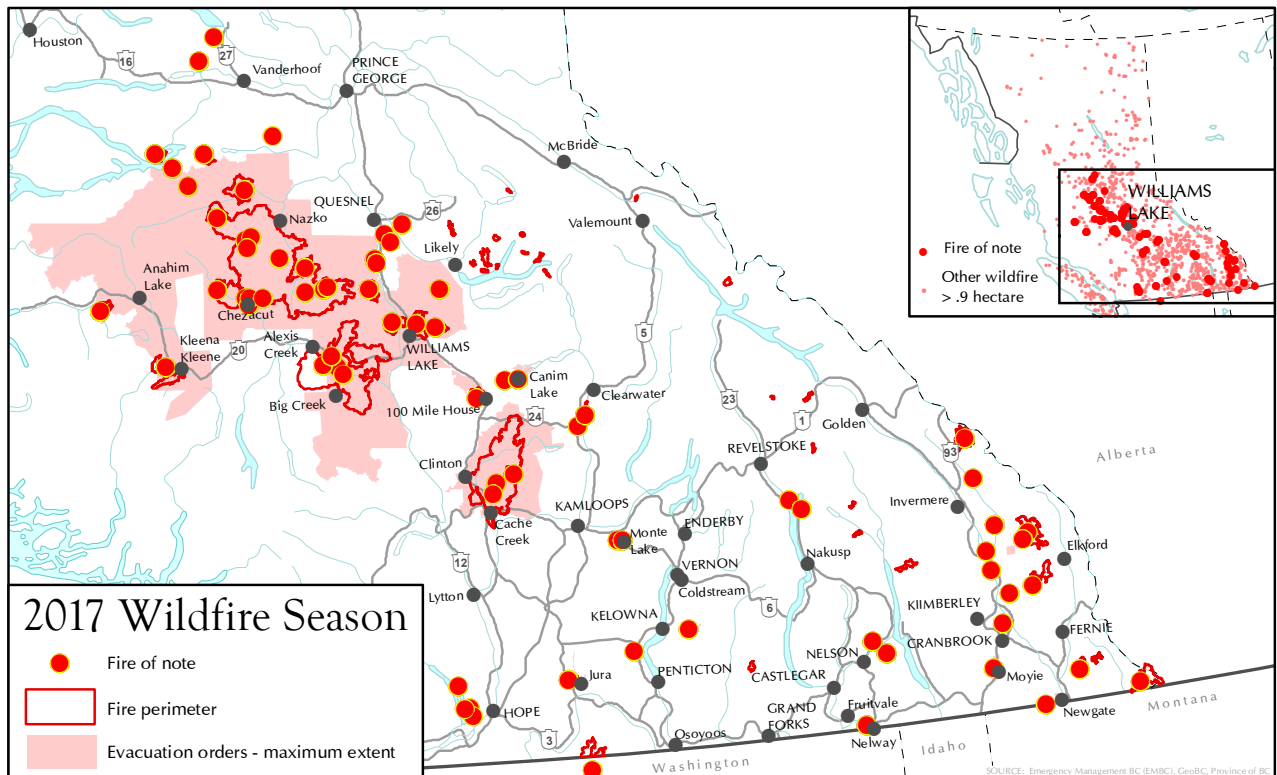
LEARN MORE

Flood vs. debris flow²

It is easy to confuse flooding and debris flow, two very different phenomena. Flooding occurs when water accumulates from forces such as excessive rains or rapid snowmelt, or there has been such an accumulation to the point it exceeds a river channel, stream bank or a lake's high-water mark. The BC River Forecast Centre defines floods based on the severity of such events, then groups them into watches, warnings and alerts.³

In contrast, debris flow, which some also refer to as landslides, generally occurs when water is being misdirected by something causing it to flow out of its natural drainage

pattern onto unstable terrain. With debris flow situations, water is usually involved. When it rains and the water flows, if that water runs along its natural pattern, a situation generally does not arise. It is when that water is diverted into a new pattern by some object, such as a culvert, which then gets clogged and causes the water to divert outside its natural drainage pattern and onto unstable terrain. The water will then begin moving in unusual ways, gathering speed and volume while picking up other material in its path. That debris can include trees, rocks and mud. People often use the terms mudslides or mudflow, but the general term for this type of event is debris flow.

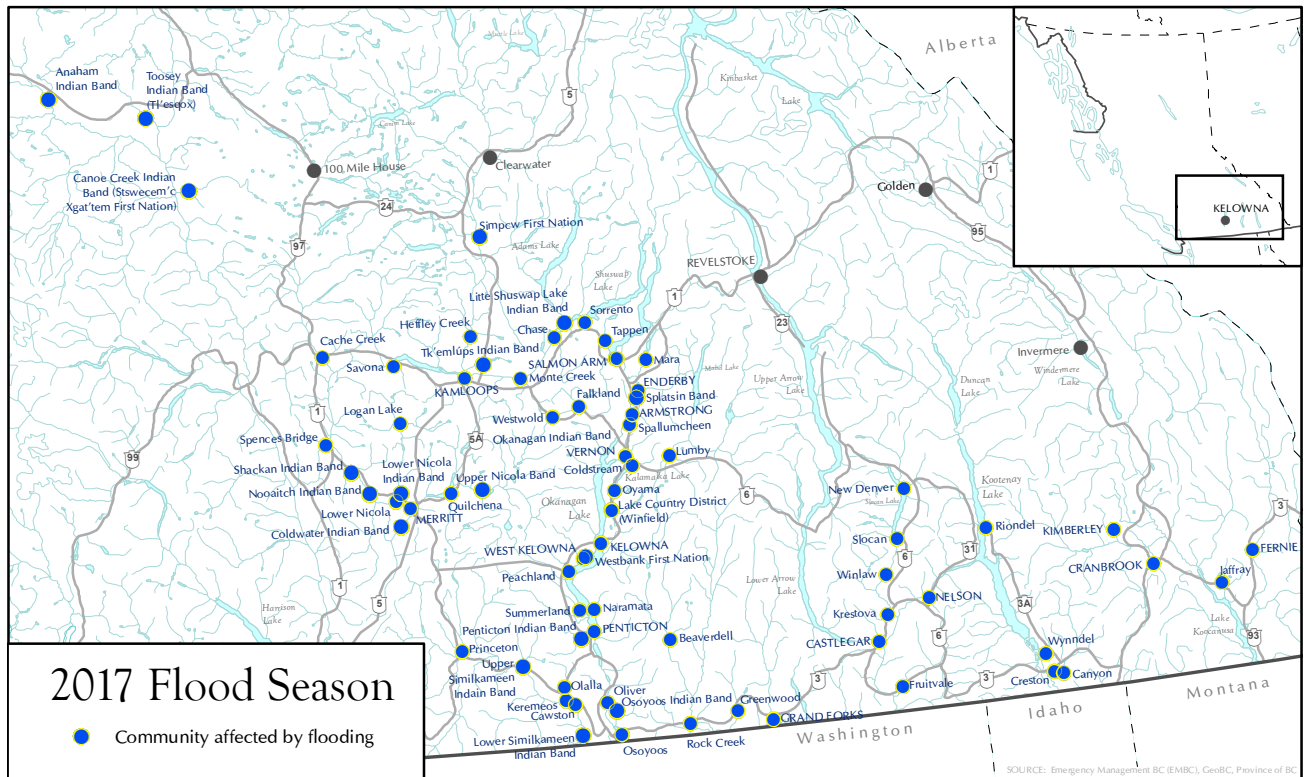


1 Government of British Columbia. *Emergency Management in BC: Reference Manual*. 2011. Chapter 1, Page 1.

https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.

2 Information in this 'Learn More' box was informed by an interview between the report author and Ray Crampton, Acting Regional Executive Director with the Resource Management department for Okanagan-Shuswap with FLNRORD on February 26, 2018.

3 More information on these categories is available at the River Forecast Centre website, at <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/drought-flooding-dikes-dams/river-forecast-centre>.



In 2017, flooding devastated areas of the south and central Okanagan and the Kootenay and Shuswap regions, as shown in the map that follows. Like the wildfires impacting our province in 2017, flooding was not relegated to one single area.

One year later, many British Columbians continue dealing with the aftermath of the flood and debris flow events of 2017. The flooding period largely began in April and ended in June. Key milestones included April 27, when the Province’s regional emergency operations centre was activated to support freshet-related events in BC’s Southern Interior and states of local emergency were declared in some communities due to floods; and August 5, when all freshet-related states of local emergency were lifted.

LEARN MORE

What is freshet?

The term ‘freshet’ refers to the movement of water associated with the thawing of ice and snow each spring. This runoff can result in high water levels in streams, lakes and other waterways. Flooding may occur in nearby areas. It is important to note here, however, that freshet is a natural function of the overall ecosystem and ecosystem maintenance. Freshet happens each year but does not necessarily result in flooding in a given year.

To give report readers better understanding of debris flow, we interviewed a family directly impacted by events. Their story follows.



FIRST-HAND ACCOUNT

LIVING THROUGH A DEBRIS FLOW AND ITS AFTERMATH

On the night of May 5, 2017, at around 11 p.m. in Tappen, on Shuswap Lake, Rachel and Ian Sudbury were winding down for the evening when they heard a low rumbling that within minutes had turned into a roaring thunder of rushing water and crashing trees. It was the sound of a major debris flow that left their house in ruins and a newly created stream running through their property.

On the evening of the debris ‘event,’ as the Sudburys reference what happened on that fateful night, they had mere minutes to escape — enough time to put on boots and a toque and grab the dog. Rachel, still in pyjamas, was five months pregnant. At the time, they didn’t know how real the danger was. Less than 10 minutes after leaving the house they had spent years building, Rachel says “... I heard glass breaking and wood popping.” Footage from their security camera, retrieved later, showed the debris flow that enveloped the entire basement after they escaped included a mix of water, mud, logs and car-sized boulders.

Regrouping afterwards

In the days following the event, the Sudburys received a stipend from the regional government for some groceries, but felt there could have been better information around the support available to them in the aftermath of the event. Beyond that, they had to scramble when area evacuation orders were lifted — meaning that the 24 hour/day security monitoring their damaged home suddenly disappeared,

leaving their house and remaining possessions vulnerable. From there, days turned into weeks and months as the Sudburys were impacted by a lack of clear organizational lines and roles between and among various government entities in seeking appropriate Disaster Financial Assistance — a fund, they say, was intended “to allow people who have been decimated to restart their lives” and extends not just to the value of their home but the contents they also lost, says Rachel. This web has included the Ministry of Transportation and Infrastructure, the Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Emergency Management BC, the RCMP, and the Columbia Shuswap Regional District.

For Ian, a major issue has been the disconnect between the immediate small-scale funds the Sudburys received for groceries following the debris flow and the months-long delays to receiving any kind of meaningful payments that would allow them to truly move forward with their lives. “We were displaced, made homeless, tied up financially and we



still have a mortgage on this destroyed house that we're still paying," he says. Among the many expenses they've had to absorb since the event, they say, have been paying construction crews to stabilize the house — even though they're not living there.

Trying to find normalcy

With a new five-month-old baby, the Sudburys (along with their dog and three cats, which survived the debris flow) now live in a tiny two-bedroom house that belonged to Ian's late grandmother — far from the dream home they'd spent years planning and building. Through their ordeal they've tried to make the best of the situation by focusing on the everyday things in life. "It has made me appreciate vulnerability, being alive and the smaller, day-to-day, basic pleasures in life for which I am grateful," says Rachel.

If there's one thing the Sudburys hope to see come out of this Review process, says Ian, "It's to highlight a severe need for the new handling of emergency situations of a public

nature in BC, which extends beyond the acute event to the events afterward and the support that's provided to the taxpaying citizens who need it."

If there's one thing they hope readers will take away from their story, should they find themselves in similar circumstances, it's to document everything — times, dates and conversations — and to be persistent. "Make as much noise as possible as there's not really a system in place to effectively deal with the aftermath, so if you're not constantly following up then nothing is going to happen," says Ian.





Unlike the 2017 wildfire season, which was characterized by many distinct events, flooding incidents across the province were far less well-documented than the wildfires. This is evident, even on just a quick scan on the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) website which includes a much more robust collection of information — much of it used later in this section to set the stage for that context-setting.

The flood situation in our province in 2017 was most well-documented in the Interior, when “record-setting freshet flooding” began in the Interior. That flooding impacted 15 First Nations communities, resulting in damaged homes and infrastructure. It called for the forced evacuation of some areas as well as the declaration of local states of emergency through Band Council Resolutions (BCR) and the subsequent activation of Emergency Operations Centres (EOCs) to coordinate with BC’s regional emergency operations centre (one of six centres, as outlined further in this report), the Central Region Provincial Regional Emergency Operations Centre (or PREOC).

Understanding why the flooding of 2017 happened in the Interior calls for presenting a clearer picture of how water levels are managed in Okanagan Lake, which is regularly adjusted based on a complex series of factors, so flooding can be avoided wherever and whenever possible. The First-Hand Account that follows sheds further light on how this all takes place.



FIRST-HAND ACCOUNT

ANATOMY OF A FLOOD: TRYING TO PREDICT THE UNPREDICTABLE IN THE OKANAGAN

Over the course of eight months in 2017, the Okanagan experienced three extreme weather events: an extremely cold and dry winter followed by massive rains, producing some of the worst flooding ever seen in BC, then some unseasonable record drought and heat conditions. Understanding how to better prepare for such events calls for better understanding the circumstances and why critical decisions were made.

According to Environment Canada, Kelowna experienced the fourth-highest precipitation for March/April/May on record, Vernon saw the second-highest record for those three months while Penticton experienced the highest precipitation ever in that period. Vernon and Penticton saw 100-year records shattered.¹

Looking back one year later, this is something no one saw coming at the time says Shaun Reimer. Shaun is a section head with the Public Safety & Protection Section within the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD). His job involves public safety and protection in the area around Okanagan Lake. Specifically, he says that relates to “maintaining the series of dams, dikes and the channelized river that flows from Okanagan Lake. It includes operating dams in Vernon and on Okanagan, Skaha and Vaseux lakes.” Guiding everything in the Okanagan Lake Regulation System (OLRS), as it is named, is a series of federal-provincial agreements and policies negotiated decades earlier that leave control over the OLRs to the BC government — an exception in the province, where such stewardship is typically managed by local governments.

Managing water inflows and outflows

Shaun and his team of two, including a fellow engineer and a technician, supported by colleagues in FLNRORD, other government departments and occasional contract support, must manage the water level in Okanagan Lake at any given time. It’s a tricky balance. Leave too much

water in the lake and flooding will happen (as in 2017); fail to leave enough and there are major implications not only for ecosystems and the environment, such as the Columbia Basin’s strongest remaining sockeye run, but the region’s tourism and wine industries, jobs and, ultimately, the region’s economic well-being, as 3,600 hectares of area vineyards and orchards are irrigated by the Okanagan River. In their work, Shaun and his team consider all these factors as they make decisions about the lake’s water levels. For them, however, it is the many people living in the area, those whose lives are directly connected to or impacted by the OLRs, that are always the overriding priority.

Decisions about the lake’s water levels include tweaks (minor adjustments) so everything stays balanced or allowing for greater outflows (the term for letting water out of the lake) when weather events, such as heavy rainstorms continuing for days, as in 2017, threaten lake levels. How often they adjust levels is seasonal, says Shaun. “During the dead of winter, we may not make a change for a month, unless we get some steady precipitation. During the freshet period, starting in April and ending in late June/early July, we might make changes every few days.” These adjustments are made with great care based on best available data, computer models, historical precedent, decades of team experience and other tools. Among many considerations, the team assesses water surveys and gauges, snowpack on local mountains and weather forecast predictions (which Shaun says are generally only accurate for about five days out).

¹ See June 20, 2017 story from www.kelownanow.com, “What the Province learned from the flood so far.” https://www.kelownanow.com/watercooler/news/news/Kelowna/What_the_Province_learned_from_the_flood_so_far/



LEARN MORE

Why does snowpack matter?

The BC Ministry of Environment and Climate Change Strategy website suggests snowpack is important as, “Snow acts as a temporary storage system for winter precipitation. When snow melts, the water becomes available to fill reservoirs and rivers, recharge groundwater aquifers and replenish soil moisture. Changes in snowpack affect the amount of water that is stored over the winter and released in the spring and summer.”²

The Ministry has a snow monitoring program to measure water volumes in the snow. It monitors 20 sites in the Okanagan, with several automated sites that provide real-time information. Shaun and his team consider all this data in their lake inflow/outflow decision making; their target levels change depending on the inflow forecast, which is based on that snowpack data.

“Last year, the models were telling us we were fine and based on the snowpack everything looked fine. The wildcard really was the rain. We were expecting drought [earlier in our season lookahead]. By the third week of April, even though our models still said we were OK, I started thinking we were going to be in some trouble so we increased the flows well beyond [normal]. One of the big puzzles last year was the rain and how fast the inflow came into Okanagan Lake. It overwhelmed our ability to get water out,” he says.

Takeaways from 2017

Though some local residents have blamed Shaun and his team for the area’s flooding, he says there’s nothing they could have done to prepare for what ultimately happened, as all best information had he and his team preparing for drought.

For Shaun, a key takeaway was how quickly weather conditions changed dramatically, then changed again, and yet again, in mere months. One year later, to be on the safe side, he has released more water than usual.

He also says his program (in Penticton), the Ministry and the Province continue trying to improve their understanding of forecasting and operations. That includes, for example, commissioning a new inflow forecasting model based on snow melt parameters that uses improved computing power (rather than relying solely on the same inflow models used for the last 20 years). These efforts, taken before 2017, complement steps taken to automate key snow-measuring sites.

If he could revisit any decision made in 2017, Shaun says he would have started releasing water from the lake much sooner, on February 17, to be exact. He has drawn this conclusion after assessing data generated after the flood, and the unusual weather year that was 2017. Though that date would have been exceptionally early by any previous standard, and “no water manager would ever have increased flows to those levels when all key indicators at that time were suggesting drought,” he believes only that may have prevented the flooding that ensued.

² See www.env.gov.bc.ca/soe/indicators/climate-change/snow.html.

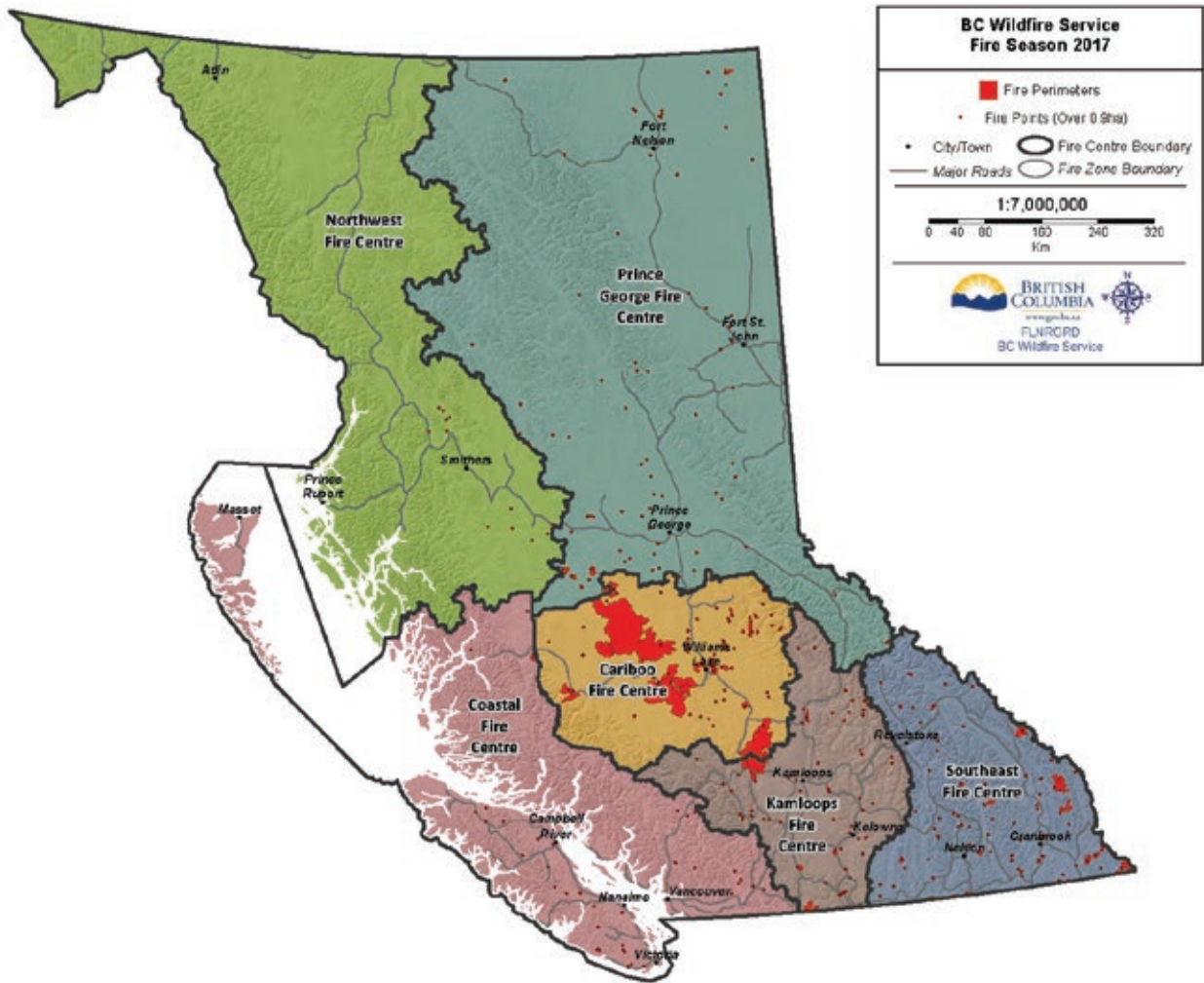


In fall 2017, the Province commissioned Associated Environmental Consultants, a Vernon-based company, to conduct a detailed technical study of events that happened in and around Okanagan Lake in spring 2017. The report, entitled *Review of 2017 Flood Response: Okanagan Lake Regulation System and Nicola Dam*, cites the impact of very unusual weather patterns throughout 2017:

In both the Okanagan and Nicola regions, weather conditions preceding and during spring 2017 were very unusual. Fall 2016 was substantially wetter than normal. Winter 2017 was drier and colder than usual, which combined to produce more than average snowfall in the populated low elevation areas, but less than average snowfall in upper elevation areas — the areas that typically produce the majority of the spring runoff. Accordingly, the first two inflow forecasts of the year, produced on February 1 and March 1, called for average or below average lake inflow during spring.

Spring 2017 was much wetter than average, producing rain in low elevation areas and snow in the uplands. By the end of April, the lakes were filling and the upper elevation snowpack had increased to between 10 per cent (Nicola) and 50 per cent (Okanagan) above average. In May, the wet weather continued, which combined with melting high elevation snow to produce very high inflows to the lakes. Both Okanagan and Nicola lakes experienced their highest May inflows on record (FLNRORD does not compute Kalamalka Lake inflows). In mid-June however, the weather changed dramatically, and the subsequent summer was one of the driest on record.⁴

⁴ Associated Environmental. *Review of 2017 Flood Response: Okanagan Lake Regulation System and Nicola Dam* (Report; 2017). Page ii. https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/integrated-flood-hazard-mgmt/2017_flood_response_report_final.pdf.



Beyond underscoring the impact of weather conditions in the immediate lead-up to flooding events of the Interior in 2017, these and other findings in that report also serve to highlight the unpredictable nature events before, during and after area flood events.

In turn, “Before the flood waters had subsided and with most of the freshet BCRs still in place, several significant wildfires ignited in the Cariboo and Southern Interior areas of the province. The fires burned the BC landscape on a massive scale and threatened many First Nations communities throughout the central interior [sic].”

A closer look at the 2017 wildfire season

The 2017 wildfire season was unlike any other experienced in recent memory, one of the worst in British Columbia’s history. According to figures from the Ministry of Forests, Lands, Natural Resource Operations & Rural Development (FLNRORD) that extends to the number of people displaced (approximately 65,000 evacuees), the amount of land burned (more than 1.2 million hectares) and the total cost

of fire suppression (estimated at more than \$568 million). The wildfires also resulted in the longest provincial state of emergency in BC history, at 70 days, and the first to be declared since the wildfires of 2003.⁵

For readers who may or may not be aware, as shown in the map above, it is important to underscore there were four distinct parts of our province affected by wildfires in 2017:

- Cariboo Fire Centre
- Kamloops Fire Centre
- Southeast Fire Centre
- Coastal Fire Centre

The map also illustrates the locations of the key fires, described in further detail later in this section.

Understanding what happened in 2017 also calls for a closer examination of when events happened. The table that follows provides a snapshot of the key milestones of the 2017 wildfire season.

Timeline of key milestones in the 2017 wildfire season

Date	Event	Date	Event
July 6–8	A major spike in new wildfires starts in the Cariboo and Kamloops Fire Centre areas, ⁶ largely due to widespread lightning strikes that resulted in more than 160 new fires beginning on the same day.	August 1	Near Clinton, the controlled burn of a fire on Elephant Hill escapes.
July 7	A provincial state of emergency is declared. On this day, campfire bans go into effect in the Cariboo, Coastal, Kamloops and Southeast Fire Centre areas. In/near Harrison Lake, a State of Emergency is declared on July 6.	August 2	To help prevent human-caused wildfires, off-road vehicles (ORVs) are banned in the Kamloops, Southeast and Coastal Fire Centre areas.
July 10	Campfires are banned province-wide, with the exception of Haida Gwaii and the Fog Zone (a swath of land two kilometres wide running from Owen Point near Port Renfrew to the district boundary of Port Hardy).	August 11	In the Cariboo Fire Centre area, a full backcountry closure is implemented. It is lifted August 23, downgraded to fire-specific area restrictions.
July 15	An evacuation order is issued for the city of Williams Lake (population 12,400). ⁷ It is lifted July 27.	September 2	A backcountry closure is implemented for the Rocky Mountain Natural Resource District. It is lifted September 15.
		September 15	The provincial state of emergency is lifted.
		September 20	ORV bans are lifted provincewide.
		September 22	Campfire bans are lifted provincewide

⁶ British Columbia is divided into six fire centre areas. Each centre coordinates wildfire management and response services within its geographic boundaries. The six Fire Centres are: Northwest, Prince George, Cariboo, Kamloops, Southeast, and Coastal. For more information see the *British Columbia Provincial Coordination Plan for Wildland Urban Interface Fires*. Page 15. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/bc-provincial-coord-plan-for-wuifire_revised_july_2016.pdf.

⁷ Statistics Canada. Census profile. See <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/details/page.cfm?Code1=1028&Geo2=PR&Geo1=POPC&Code2=59&SearchPR=01&Lang=E&Data=Count&Custom=&SearchType=Begins&SearchText=williams%20lake&TABID=1&B1=All>.

Summer 2017 was a long, hot and dry summer — particularly in the Cariboo. These conditions, which also contributed to a high build-up of fuel, ultimately laid the foundations for the devastation to come.

LEARN MORE

What is fuel?

When we think of fuel, we think of what powers an automobile or other mechanized device. That same principle applies to what powers a wildfire, effectively summarized by the Filmon report of 2004 as follows: “For a wildfire, a buildup of vegetation is a buildup of fuel. The more fuel there is, the harder the fire is to put out. “Ladder fuels are the most problematic. These include low branches, young trees and any other vegetation that allows the fire to climb like a ladder into the upper branches of the tree and become a ‘crown fire.’ Crown fires are the most dangerous and difficult to control, as burning embers can be spread by the wind to start new fires beyond the main fire perimeter.”⁸

The 2013 report (revised in 2016), *British Columbia Provincial Coordination Plan for Wildland Urban Interface Fires*, provides a useful definition of fuel management: “Fuel management is defined as the process of reducing vegetation (live and dead) fuel load in the forest (thinning, spacing, pruning and removal of debris from the forest floor) to diminish aggressive fire behaviour and the potential for devastating wildfires.”⁹

July 7 was a major milestone in the wildfire season, as more than 160 fires began on the same day — largely the result of ‘dry’ lightning strikes (strikes without rain). As one fire, and another, and another began, in some cases fires began merging together as one. The majority of these fires occurred in the Cariboo, as the following lists show. They outline the key fires that took place, by fire centre/region, summarized by FLNRORD and included here as follows.¹⁰

Kamloops Fire Centre

- **Fountain Valley Road** (30 hectares) — eight kilometres east of Lillooet; discovered May 28; prompted evacuation orders and alerts
- **Elephant Hill** (191,865 hectares) — covering an extensive area spanning from near Ashcroft (at the south end) to near BC Highway 24 (at the north end) discovered July 6; prompted evacuation orders and alerts. Within its first 24 hours, the fire grew to more than 1,000 hectares in size, burned through numerous properties on the Ashcroft Indian Band and in the Boston Flats mobile home park, and prompted the entire village of Cache Creek to evacuate
- **Princeton** (3,278 hectares) — 10 kilometres northeast of Princeton; discovered July 7, it prompted evacuation orders and alerts
- **Little Fort Complex (Thuya Lake)** (3,607 hectares) — three fires near Little Fort and Clearwater; discovered July 7, it prompted evacuation orders and alerts
- **Diamond Creek** (12,453 hectares on BC’s side of the border) — in the Ashnola Valley; discovered July 23, it was part of a larger fire in the U.S. that crossed over into BC with highly visible smoke impacts
- **Philpott Road** (465 hectares) — 20 kilometres east of Kelowna, near Joe Rich; discovered August 24, it prompted evacuation orders and alerts
- **Finlay Creek** (2,224 hectares) — 7.5 kilometres southwest of Peachland; discovered September 2, it prompted evacuation orders and alerts

8 Government of British Columbia. *Firestorm 2003: Provincial Report*. February 2004. Page 25. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/wildfire-management/governance/bcws_firestormreport_2003.pdf.

9 Government of British Columbia. *British Columbia Provincial Coordination Plan for Wildland Urban Interface Fires*. Revised July 2016. Page 23. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/bc-provincial-coord-plan-for-wuifire_revised_july_2016.pdf.

10 From/see <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary>.

Cariboo Fire Centre

- The **Plateau Complex** of fires on the Chilcotin Plateau — covered a combined area of 545,151 hectares, making it the largest fire in BC's recorded history (roughly the same size as Prince Edward Island); this fire was the result of nearly 20 separate fires merging together
- The **Hanceville Complex** of fires around Hanceville, Riske Creek, Alexis Creek and surrounding areas covered a span of 241,160 hectares
- The **West Chilcotin Complex** of fires in the Chilcotin region covered a combined area of 33,018 hectares; this complex extended into the Coastal Fire Centre and included the 7,368-hectare Precipice fire (52 kilometres east of Bella Coola)
- The **Central Cariboo Complex** of fires around Williams Lake, Soda Creek and surrounding areas, covered a span of 31,181 hectares; it included an evacuation order for the city of Williams Lake and surrounding areas
- **Gustafsen fire** (5,700 hectares) — just west of 100 Mile House; discovered July 6, it prompted evacuation orders and alerts

Southeast Fire Centre

- **Harrop Creek** (3,117 hectares) — 4.5 kilometres south of Harrop-Procter, east of Nelson; discovered July 27, it prompted evacuation alerts and was highly visible
- **Lamb Creek** (2,215 hectares) — 2.5 kilometres northwest of Moyie and 18 kilometres southwest of Cranbrook; discovered August 28, it prompted evacuation orders and alerts

- **Linklater Creek** (1,285 on BC's side of the border) — 18 kilometres southwest of Newgate; discovered August 22, it was part of a larger fire in the U.S. that crossed over into BC and prompted evacuation orders and alerts
- **White River** (12,000 hectares) — 37 kilometres northeast of Canal Flats; discovered July 29, it prompted evacuation orders and alerts
- **Kenow Mountain** (15,449 hectares) — in the Flathead Valley; discovered August 30, it burned into Alberta and the Waterton Lakes National Park

Coastal Fire Centre

- **Harrison Lake East** (202 hectares) — 30 kilometres north of Harrison Hot Springs near the mouth of Big Silver Creek; discovered July 1, it prompted evacuation alerts

As FLNRORD notes in its summary of 2017 wildfire events, most of the key wildfires across BC happened in early July. However, “a second wave of heightened fire activity was experienced, with several major fires cropping up throughout southeastern BC and the Southern Interior. The wildfire season remained active until near the start of fall, when cooler, wetter conditions finally gave crews the upper hand on the fire situation.”¹¹

In its summary, FLNRORD also notes that, “A number of these fires started in areas close to communities, such as (but not limited to) Williams Lake, 100 Mile House, Princeton, Cache Creek/Ashcroft, Clearwater, Quesnel, and many others.”¹²

In recent years, as people and communities have moved gradually closer to forests, they have ultimately come into greater contact with wildfires. This area, where forests

¹¹ From/see BC Wildfire Service website. <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary>.

¹² From/see BC Wildfire Service website. <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary>.

¹³ Forest Practices Board. *Fuel Management in the Wildland Urban Interface—Update*. May 2015. Page 1. <https://www.bcfpb.ca/wp-content/uploads/2016/04/SIR43-Fuel-Management-Update.pdf>.

¹⁴ British Columbia. Office of the Auditor General. *Managing Climate Change Risks: An Independent Audit*. February 2018. Page 73. https://www.bcauditor.com/sites/default/files/publications/reports/Climate_Change_FINAL_0.pdf.

meet human development, is known as the wildland urban interface (WUI).¹³ This includes “areas where human development is adjacent to or among undeveloped wildland areas that have flammable vegetation” such as trees, bushes and grasses.¹⁴

The Government of British Columbia estimates about 685,000 hectares of forests are at high risk, and 970,000 hectares are at moderate risk of sending embers into BC communities during a wildfire — the greatest risk to structures in communities.¹⁵

In 2004, the Filmon report recognized that such wildfires were going to increasingly become the norm:

The wildfire zone is not only getting closer to people, but people are getting closer to the wildfire zone. The major interface fires which occurred throughout the British Columbia Interior [in 2003] highlighted the fact that community development, home building and other human activity continues to push into these ecosystems most susceptible to frequent and severe fires. This places an increasing importance on the province’s forest management decisions.¹⁶

That same perspective was also echoed in other key reports published before and after the Filmon report, including a dedicated audit examining the Province’s preparedness for major interface fires prepared by the Office of the Auditor General of British Columbia in 2001:

British Columbia has the highest risk of interface fires in Canada because of its climate and topography. The risks are increasing as a result of two key factors — the continuing growth in the

number of people choosing to live in or near the forests and grassland areas and the significant build up of forest fuels resulting from years of successful fire suppression activities. Fire experts fear that, if actions are not taken soon to reduce the risks associated with interface fires, it is only a matter of time before these fires will exceed firefighters’ ability to contain them and that this might lead to significant loss of life and property.¹⁷

This perspective was further recognized in a July 2016 update of a Government of British Columbia publication, *British Columbia Provincial Coordination Plan for Wildland Urban Interface Fires*:

Typically each year between March and September there are significant risks of major WUI [wildland urban interface] fires throughout the province. BC experiences an average of 2,000 wildfires annually and although only a small percentage of them are interface, there may be significant impacts to affected communities or associated infrastructure. For example, in 2010 there were 1,672 wildfires in BC and approximately 27 of those were significant interface wildfires resulting in 11 evacuation orders and 16 evacuation alerts issued by local authorities and First Nations communities (through Band Council Resolution).¹⁸

In 2017, evidence of this foreshadowing was on display in communities large and small including Kamloops, Williams Lake, Clinton, Cache Creek and Ashcroft.

The three First-Hand Account stories and the Question-and-Answer that follow offer some clearer understanding on what happens when wildfires threaten people, property and land.

¹⁵ Forest Practices Board. Fuel Management in the Wildland Urban Interface—Update. May 2015. Page 1. <https://www.bcfpb.ca/wp-content/uploads/2016/04/SIR43-Fuel-Management-Update.pdf>.

¹⁶ Government of British Columbia. *Firestorm 2003: Provincial Report*. February 2004. Page 24. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/wildfire-management/governance/bcws_firestormreport_2003.pdf.

¹⁷ British Columbia, Office of the Auditor General. *Managing Interface Fire Risks*. (Report; 2001/2002: 1). |Page 5. <https://www.bcauditor.com/sites/default/files/publications/2001/report1/report/managing-interface-fire-risks.pdf>.



FIRST-HAND ACCOUNT

CRASH COURSE IN DISASTER MANAGEMENT: THE ASHCROFT INDIAN BAND

When the wildfires of 2017 struck the Ashcroft Indian Band near Cache Creek, all mobile service was cut when the nearby cellphone tower burned, the highways were closed and the community lost power. “It was only once the fire hit, that we quickly realized how unprepared we were,” says the Band’s administrator Jodene Blain, emergency operations director at the time.

That was only the beginning for Jodene, who was away from the community at that moment. Initially, she ended up coordinating efforts from a picnic table in Porteau Cove, then from North Vancouver, as she couldn’t immediately return to the community due to road closures. As she was the only person with cell access, she became the Band’s key point of contact — a tall order for someone who’d never been through a disaster, and suddenly had more than a dozen personnel from the same government agency contacting her daily for updates.

Getting an evacuation order issued for the community, an Emergency Management BC requirement, needed a Band Council Resolution (BCR) — a meeting of Chief and Council. This was a major challenge, says Jodene, in that “We couldn’t come to our Band office. The surrounding area was still smouldering, and with all the hydro lines down there was no way anyone could come close. With the fire still burning, it was impossible for us to formally declare an evacuation [though the community did end up evacuating for about four weeks].”

It quickly became clear to Jodene that managing in a disaster involves a whole different language and protocols

that were completely new to her. “I was getting calls from various agencies asking if I had my EOC and ESS open [Emergency Operations Centre, Emergency Social Services centre], and didn’t know what those acronyms were. I was completely lost. I just wanted someone to slow down and explain what all this was and what to do. I didn’t know what an EOC was, so how I do I set one up, how do I staff it, without knowing what it looks like?”

As this was happening, the Band was trying to track the whereabouts and well-being of its 77 community members. To ensure they had food and shelter, the Chief wrote a cheque to cover all costs at a nearby motel as, “We had people who were homeless, away from their community,” she says.

Key takeaways from 2017

Jodene describes the days and weeks that followed as a “blur,” when she was always responding to something. Part of her crash course in disaster management involved learning the ins and outs in the aftermath of disaster. She cites two examples as key learnings: trying to promptly get reimbursement for the Band for motel expenses it incurred and understanding how wages are handled in a crisis.



As Band staff quickly transitioned from their daily roles, the Band wanted to ensure they continued to be paid — especially given the long hours and hard work involved in protecting the community.

“Right away, our Band staff jumped into emergency operations as Band business no longer existed and we were in response mode. Afterwards, we found out our wages weren’t covered as regular band employees — only the overtime would be covered. Only had we all been laid off, or were we all working on contract, would our wages have been covered.”

She says it would have been good to know this in advance, but “we didn’t find that out for weeks and weeks,” and that sum (of between \$50,000 and \$60,000) all had to come from Band funds — in addition to the many other expenses the Band would need to absorb because of the wildfires.

She also believes advanced communication about emergency management protocols and rules, and better overall understanding about the differences between and among First Nations communities for all involved, would really help during a disaster going forward as “what works in

Kamloops doesn’t work here,” she says.

One recommendation she has for other communities is simply to have an emergency plan and ensure as many people know about it as possible. “Most Bands have an emergency plan in their office that nobody has read. Maybe a consultant has written it but failed to consult the community. I didn’t even know we had an emergency plan, so to get there, to train people, to talk about it ... include that material in [community] newsletters. If you have a handful of people who know what to do, that can really help.”

Moving forward

Though 12 structures were lost in the wildfire, including a triplex, Jodene says the Band will begin rebuilding four structures in late March 2018 — weather cooperating. The plan is to start with the homes of community members still living in hotels, many months after the fires, then rebuild the structures of community members billeting with others. Ultimately, she hopes most of the rebuilding will be complete by fall 2018.



FIRST-HAND ACCOUNT

JULY 7: THROUGH THE LENS OF THE BC WILDFIRE SERVICE IN WILLIAMS LAKE

For almost everyone impacted by the devastating 2017 wildfires, July 7 was a day that will forever be etched in memory: the day more than 160 wildfires began.

That holds true for Krista Dunleavey, fire centre manager with the BC Wildfire Service (BCWS) in Williams Lake. It was a day that saw she and her team of more than 100, not only tracking new wildfire sightings and responding to fires — but that also called for the evacuation of her fire centre, as “burning embers were falling over the building.” Members of the operations and logistics teams continued working from the building — ready to leave at a moment’s notice, while non-essential personnel went downtown to the regional office. Dispatchers worked from pickup trucks at an adjacent airstrip monitoring radio calls.

Other challenges that day included business continuity planning, should the team be forced to evacuate the airstrip. Communications were also very challenging, she says. “There were so many calls to the 1-800 number on July 7, to report wildfires, that the call centre reporting line went down. Our fire centre phones and computers went down intermittently because our power was flickering on and off.”

Making difficult choices

With everything going on that day, how did Krista and her team determine where to focus? In short, she says, “Public safety and critical infrastructure — that’s how we had to prioritize.” The sheer number of wildfires outstripped the capacity of BCWS to respond to all immediately. Beyond trying to protect communities, protecting and preserving critical infrastructure such as major transmission lines and cellphone towers was a must. “If we lost cellular

communications, that would have totally impacted all responders, including the RCMP and the BC Ambulance Service. It was a huge issue, very dynamic and changing quickly.”

Throughout it all, ensuring the public and first responders were safe was Krista’s top priority.

Reflecting on everything

Looking back, Krista says she can’t envision doing anything differently that day. Looking forward, however, she says there’s more everyone can be doing given that serious and sustained extreme wildfire behaviour and events are the new norm.

“Every year in BC, citizens are evacuated from their communities and homes, assets are destroyed and valuable resources are lost. Living in a forested area means, eventually, communities will need to contend with a wildfire. We must focus on preparedness, prevention and mitigation, to minimize wildfire impacts.” Also, she says, “We need to communicate, educate and implement. As we’ve seen on the news, from Portugal to California, Fort McMurray [Alberta], and now Cariboo, hazard abatement and community protection must be ramped up. I don’t believe any single method will be successful, but a comprehensive, integrated approach is necessary and all levels of government, industry and the public have a role to play.”



FIRST-HAND ACCOUNT

WELCOMING NEIGHBOURS IN A DISASTER

During the 2017 wildfires, the Tk'emlúps te Secwépemc (TteS), also known as the Kamloops Indian Band, took in more than 1,000 people from the surrounding area. For more than 27 days, not only did the community provide much-needed food and shelter in four weeks, but a place that evacuees could temporarily call home, says Kukpi7 (Chief) Fred Seymour in a brief online interview.

What did it mean to you and your community to take in evacuees?

We never thought twice about it. We got our staff together and started arranging personnel in all areas, such as meal preparation, cooking and serving. It took a lot of meetings to get organized, and assign duties, but we jumped in and never looked back.

Did the wildfires help build relationships between and among communities?

They sure did. We have to come together to support one another [at a time of crisis] and use the resources at hand. That includes using whatever the Band has to offer. I guess it is in our blood. When Mother Nature turns on us, we will be there for all — whatever the incident may be.

What was the biggest issue with taking in so many people?

You can never prepare yourself enough.

Kukpi7 Seymour says there remains “a lot of work at hand to better prepare ourselves for now and the future,” but is extremely proud of his community’s outreach in 2017, saying, “an excellent job was done by all involved” to unite

in disaster. Chief Seymour’s appreciation extends to the Central Provincial Regional Emergency Operations Centre, the City of Kamloops, and the Thompson Nicola and Cariboo regional districts, as the Tk'emlúps te Secwépemc shared in a written submission with the BC Flood and Wildfire Review.

BY THE NUMBERS

- 1,000 evacuees
- 1,500 meals per day
- 30 staff, 12 emergency hires
- 120 cots, 10 tents
- 120 loads of laundry
- 2 information sessions
- 2 movie nights
- 2 cakes served

Collectively, these stories help give some perspective on the devastating 2017 wildfire season. However, their inclusion in this report serves a much bigger purpose: to help readers better understand the challenges British Columbians faced, providing critical context for what follows in the remainder of this report — particularly the recommendations we are making in Section 6.0.

CLOSING THOUGHTS

The 2017 floods and wildfires were unprecedented. Many British Columbians experienced catastrophic impacts to their lives and communities, with First Nations traditional territories and communities facing disproportionate impacts. Fifteen First Nations communities were impacted by flooding in 2017, while 26 First Nations communities were impacted by wildfires.¹⁹ Several communities, including Cache Creek and many First Nations communities, were forced to face both flood and wildfire events in 2017.²⁰

Flooding and wildfires cannot be considered in isolation, and that linkages between the two events are not only possible but already happening. In 2017, for example, the Cache Creek community experienced both flood- and wildfire-related events. Or, consider the dramatic debris flow events of January 2018 in southern California which followed the devastating wildfires of December 2017. Previous research by the Province contends the Okanagan fires of 2003 occurred in areas where fuels had accumulated, and when impacted by dry, hot weather, resulted in significant wildfire activity.²¹ In turn, the report suggests, “Fires like this remove so much forest cover that soil productivity can be reduced and soil erosion can lead to flooding, landslides, decreased water quality and a variety of other negative consequences.”²²

As we are suggesting here and elsewhere in this report, and as others have also suggested, the effects of climate change can be linked to these extreme weather events of 2017.

¹⁹ BC Flood and Wildfire Review website. See bcfloodfirereview.ca/faqs/.

²⁰ BC Flood and Wildfire Review website. See bcfloodfirereview.ca/faqs/.

²¹ Government of British Columbia. *Wildland Fire Management Strategy: Achieving Global Excellence in Fire Management*. September 2010. Page 5. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/wildfire-management/governance/bcws_wildland_fire_mngmt_strategy.pdf.

²² Government of British Columbia. *Wildland Fire Management Strategy: Achieving Global Excellence in Fire Management*. September 2010. Page 5. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/wildfire-management/governance/bcws_wildland_fire_mngmt_strategy.pdf.



Recently, the Auditor General of British Columbia affirmed the same conclusion in her February 2018 report, *Managing Climate Change Risks: An Independent Audit*:

The summer of 2017 saw wildfires burning across the province, breaking records for the greatest number of hectares burned. This past spring, heavy rains combined with the snowmelt and flooded the Okanagan.

These events highlight the environmental, economic and social threats that climate change poses to the province. From 1900 to 2013, BC's average temperature has increased faster than the global average. Scientists predict that the province will face increases in extreme weather, rising sea levels, increasing risk of wildfire and flooding, as well as a change in the location of ecosystems and species that live there.²³

Recognizing not just the linkages between and among these extreme weather events, but the impact of climate change is critical to any real progress going forward. Indeed, this perspective has played a pivotal role in our thinking and in contributing to the overall mandate of this Review in providing a comprehensive understanding of the state of provincial emergency preparedness and management.

FOR FURTHER REFLECTION

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What lessons can be learned from the 2017 experience?

²³ Forest Practices Board. Fuel Management in the Wildland Urban Interface—Update. May 2015. Page 1. <https://www.bcfpb.ca/wp-content/uploads/2016/04/SIR43-Fuel-Management-Update.pdf>.



3.0

THE FOUR PILLARS OF EMERGENCY MANAGEMENT

Getting to the heart of this review, as outlined in the terms of reference governing our work, involves looking more closely at the four pillars of disaster management, namely, planning and preparedness, prevention and mitigation, response and recovery. This section aims to provide some of that context for readers. Those interested in learning more will find a wealth of more detailed information through the sources cited in the Works Consulted section of this report, and through other information published in print and online.

Equally important in framing this discussion is a brief examination of the organizations involved in disaster management and related decision making. Though

our focus is on the Province's response to flood/debris flow and wildfire events, providing that context also involves having a sense of the broader picture as managing disaster involves organizations from all levels of government.

Together, this context continues building on foundations already established in the first three sections of this report and sets the stage for the critical material that is to come: namely, what we heard from British Columbians and the recommendations we are making based on that valuable feedback. Everything, as the saying goes, is connected.



Organizations involved in managing disaster

Even outside the confines of a disaster scenario, understanding the number of government organizations and agencies, and the complex web of players involved in disaster management decision making, can be dizzying at the best of times.

Emergency Management BC (EMBC) plays the primary role in disasters that occur in our province:

Emergency Management British Columbia (EMBC) provides leadership in emergency management on behalf of the Province. EMBC works directly with local governments, provincial ministries, other jurisdictions and volunteers in a coordinated effort to prepare for, respond to and recover from emergencies.¹

Its mission statement suggests it is “... responsible to British Columbians for leading the management of provincial level emergencies and disasters and supporting other authorities within their areas of jurisdiction.”²

In managing disasters when they occur in British Columbia, EMBC is the coordinating agency within the Government of BC for cross-government emergency management activities. It provides executive coordination, strategic planning and multi-agency facilitation and maintains effective working relationships in an increasingly complex emergency management governance environment.³ With six regional emergency management offices, and headquarters in Victoria, responsibility for EMBC and its operations falls under the provincial Minister of Public Safety and Solicitor General. Within EMBC, are a series of sub-areas or departments as detailed in the chart that follows.

In addition to EMBC, other BC ministries and Crown corporations have legislated emergency management responsibilities. EMBC coordinates between and among these ministries and agencies to support local government response. Local governments access support from those ministries through the Provincial Regional Emergency Operations Centre (PREOC).⁴ The primary goal of the PREOC is to coordinate the Province’s overall response to emergencies and disasters. Among its many other functions, it also provides provincial and agency support for a local authority, First Nations or other provincial ministry or agency and prioritizes the regional deployment of provincial resources.⁵

Other BC ministries and agencies involved in disaster management could include, among others, the: Ministry of Forests, Lands, Natural Resource Operations and Rural Development; Ministry of Transportation and Infrastructure; Ministry of Environment & Climate Change Strategy; Ministry of Health; Ministry of Indigenous Relations and Reconciliation; Ministry of Agriculture; Ministry of Citizens’ Services; and, Ministry of Municipal Affairs and Housing.

LEARN MORE

What is the role of the BC Wildfire Service?

The BC Wildfire Service (BCWS) is a branch of the Ministry of Forests, Lands, Natural Resource Operations and Rural Development. “[It] is tasked with managing wildfires through a combination of wildfire prevention, mitigation and suppression strategies, on both Crown and private lands outside of organised areas such as municipalities or regional districts.”⁶ In the event of a wildfire in British Columbia, BCWS is the lead in fire suppression.

1 Government of British Columbia. Emergency Management in BC: Reference Manual. 2011. Chapter 1, Page 1. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.
2 Emergency Management BC. Emergency Management BC Strategic Plan 2014/15–2016/17. 2014. Page 2. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/embc_2014-17_strategic_plan.pdf.
3 Government of British Columbia. Emergency Management in BC: Reference Manual. 2011. Chapter 2, Page 9. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.
4 Government of British Columbia. Emergency Management in BC: Reference Manual. 2011. Chapter 2, Page 14. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.
5 Government of British Columbia. Emergency Management in BC: Reference Manual. 2011. Chapter 2, Pages 14–15. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.
6 Government of British Columbia. Public Safety & Emergency Services website. See <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/governance>.

In an emergency, other entities play a critical role with direct interaction with citizens and communities on the ground — particularly local governments. According to the publication *Emergency Management in BC: Reference Manual*:

When an emergency extends beyond individual capability, it becomes the responsibility of the local government (i.e., municipality or regional district). Most emergencies in BC are managed by local governments ... and do not require activation of the emergency management structure. The first level of emergency response is provided by fire and/or police services and may involve the activation of the Emergency Operations Centre (EOC). For specific hazards such as flooding, severe storms, and infrastructure failures, public works or engineering departments may provide a first level of response. Other first responders, such as the RCMP [Royal Canadian Mounted Police] and British Columbia Ambulance Service, have a provincial mandate but with a local presence through detachments or stations. These agencies are usually accessed through 9-1-1 and have internal dispatch arrangements.⁷

LEARN MORE

What is an Emergency Operations Centre?

“An Emergency Operations Centre (EOC) may be activated by a local government or private sector. The EOC provides communication with the site level, manages local multi-agency support to the site level and acquires and deploys additional resources. The local authority EOC is activated to oversee and coordinate all non-site activities in support of the Incident Commander.”⁸

Specifically, for managing land use in flood hazard area, it is local governments that are assigned first response to emergencies following legislative changes made by the Government of British Columbia in 2003–04 to the *Land Title Act*, the *Local Government Act* and three other provincial statutes in 2003 and 2004.⁹

First Nations governments also play a role in responding to emergencies, with responses being determined by each community. An overriding consideration, especially during an emergency, is that Indigenous peoples’ inherent jurisdiction over their lands, territories and resources must be respected.

Beyond British Columbia, ministries, agencies and societies from other orders of government play important roles in emergency management. This list includes but is not limited to: Public Safety Canada; Indigenous Services Canada (ISC);¹⁰ the Leadership Council comprised of the British Columbia Assembly of First Nations (BCAFN), the Union of BC Indian Chiefs (UBCIC), and the First Nations Summit; and the First Nations’ Emergency Services Society (FNESS).

FNESS is funded by Indigenous Services Canada to support First Nations in preparing for emergencies. FNESS assists First Nations with training and developing emergency plans.¹¹ More specifically, that includes providing programs and services in areas including: emergency planning, training, response and recovery; fire training, education and prevention; forest fuel and wildfire management; and leadership and collaborative relationships.¹²

FNESS’ origins are rooted in emergency management, and specifically the impact of wildfires on First Nations’ communities:

7 Government of British Columbia. *Emergency Management in BC: Reference Manual*. 2011. Page 15 (PDF). https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.

8 Government of British Columbia. *The All-Hazard Plan*. 2012. Page 64. <https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/embc-all-hazard-plan.pdf>.

9 Fraser Basin Council, Arlington Group Planning + Architecture Inc. *Flood Hazard Area Land Use Management*. December 2008. Page 1.

10 In August 2017, the federal government split the department formerly known as Indigenous and Northern Affairs Canada (INAC) into two: Indigenous Services Canada (ISC) and Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). Each of these ministries is overseen by different ministers. More information is available at, respectively, <https://www.canada.ca/en/indigenous-services-canada.html> and <https://www.canada.ca/en/indigenous-northern-affairs.html>.

11 Government of British Columbia. *Emergency Management in BC: Reference Manual*. 2011. Chapter 2, Page 15. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.

12 First Nations’ Emergency Services Society website. fness.bc.ca/about-us/.

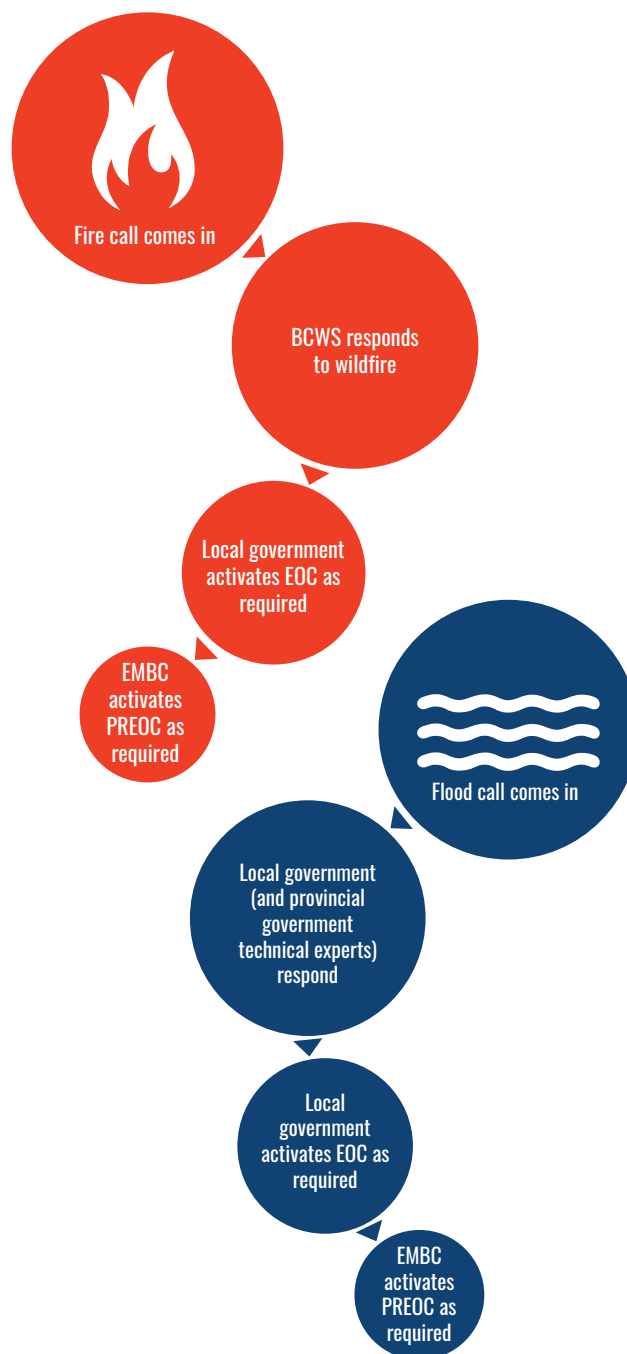
FNESS evolved from the Society of Native Indian Fire Fighters of BC (SNIFF), which was established in 1986. SNIFF's initial objectives were to help reduce the number of fire-related deaths on First Nation reserves but changed its emphasis to incorporate a greater spectrum of emergency services. In 1994, SNIFF changed its name to First Nations' Emergency Services Society of BC to reflect its growing diversity of services provided.¹³

Overall, understanding the many organizations involved in a disaster and the complexities between and among them is critical to better understanding the decision-making involved before, during and after a disaster, as well as the prescription for being better prepared going forward.

In 2001, the former auditor general of British Columbia had flagged the imperative of having clearly defined roles in the face of emergency situations, and specifically wildland urban interface wildfires or WUIs: "Because many government agencies are involved in interface fire management, each one's role must be clear. Only in this way can a safe, appropriate, cost-effective and coordinated approach be assured."¹⁴

A brief look at decision making in a disaster

The diagrams that follow offer a simplified overview of the governance structure of emergency management in British Columbia for floods and wildfires:



¹³ First Nations' Emergency Services Society website. fness.bc.ca/about-us/.

¹⁴ British Columbia. Office of the Auditor General. *Managing Interface Fire Risks*. Report; 2001/2002: 1. Page 34. <https://www.bcauditor.com/sites/default/files/publications/2001/report1/report/managing-interface-fire-risks.pdf>.

Understanding this complex web inherently helps better understand the four pillars of disaster management which agencies are critical in decision making.

Planning and preparedness

This initial pillar of emergency management, planning and preparedness, includes "... measures undertaken in advance to ensure that individuals and agencies will be ready to react, by developing emergencies [sic] plans, mutual aid agreements, resource inventories, training, exercises and emergency communications systems."¹⁵ An alternate definition, suggests that preparedness includes, "Effective policies, procedures, and plans for managing an emergency or other incident."¹⁶

Prevention and mitigation

Generally, Emergency Management BC defines prevention and mitigation, as "... actions taken to eliminate or reduce hazards and their impacts. Mitigation involves actions taken to protect lives and property, such as dike enhancements, land-use management and public education."¹⁷

A report published by the Canadian Council of Forest Ministers in 2005, but applicable to all disasters, defines mitigation as, "Long-term, sustained actions to reduce or eliminate the impacts and risks associated with natural and human-induced incidents or disasters."¹⁸

More specifically in the context of fires, as there has been far more published generally about wildfires than flooding/debris flow from our cursory overview of the literature in

these areas with the condensed timeframes under which we were operating, mitigation is seen as including:

Prevention programs designed to prevent or mitigate the effects of wildland urban interface fires include measures such as fire management planning, fuel management, public education, legislation and policy. Open fire prohibitions and forest use restrictions may be imposed if conditions meet specific thresholds.¹⁹

Also consider the view put forward by BC's former auditor general in his 2001 report, *Managing Interface Fire Risks*:

Mitigation means preventing or reducing the consequences of interface fires. It involves activities such as reducing excess vegetation (which provides fire fuel), adopting building codes that promote fire-resistant property development, adopting land use restrictions to control activities that increase fire risks, and implementing insurance incentives that promote the use of fire-resistant building materials and property maintenance. Many of these activities are the responsibility of local governments.²⁰

More simply, taken together these definitions and this understanding suggests mitigation is about being proactive — taking steps to prevent, as best we can, the impact of future disasters.

15 Government of British Columbia. *Emergency Management in BC: Reference Manual*. 2011. Chapter 1, Page 6 (PDF). https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf. 20 BC Flood and Wildfire Review website. See bcfloodfirereview.ca/faqs/.

16 Canadian Council of Forest Ministers. *Canadian Wildland Fire Strategy: A Vision for an Innovative and Integrated Approach to Managing the Risks*. Natural Resources Canada, 2005. Page 17. https://www.ccfm.org/pdf/Vision_E_web.pdf.

17 Government of British Columbia. *Emergency Management in BC: Reference Manual*. 2011. Chapter 1, Page 6.

18 Canadian Council of Forest Ministers. *Canadian Wildland Fire Strategy: A Vision for an Innovative and Integrated Approach to Managing the Risks*. Natural Resources Canada, 2005. Page 17. www.ccfm.org/pdf/Vision_E_web.pdf.

19 Government of British Columbia. *British Columbia Provincial Coordination Plan for Wildland Urban Interface Fires*. Revised July 2016. Page 23. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/bc-provincial-coord-plan-for-wuifire_revised_july_2016.pdf.

20 British Columbia. Office of the Auditor General. *Managing Interface Fire Risks*. Report; 2001/2002: 1. Page 56. <https://www.bcauditor.com/sites/default/files/publications/2001/report1/report/managing-interface-fire-risks.pdf>.

Response

The third pillar of disaster management, response “... begins when an emergency is imminent or as the event occurs. Response encompasses the activities that address the direct effects of an incident and are designed to limit the loss of life, personal injury and property damage.”²¹

In British Columbia, local governments are responsible for emergency response, though we learned this is a point of contention for some local governments. That is the case for flood/debris flow, as already identified earlier in this section. For wildfires, under the *Local Authority Emergency Management Regulation* local governments are “required to prepare and maintain emergency plans that detail how the community will respond to known hazards including how to engage mutual aid and contingencies for external support.”²²

Generally, the following happens in the response phase: information-gathering; assessing the disaster threat; prioritizing response activities; allocating resources (especially for life-saving functions such as evacuations, search/rescue and emergency medical assistance); restoring critical infrastructure; and ensuring community services continue being delivered in the aftermath of disaster.²³

Included in a definition of ‘response’ in The All-Hazard Plan, published by the Government of British Columbia in 2012, “Response measures address immediate and short-term effects of an emergency or disaster. The aim of these measures is to ensure that a controlled, coordinated and effective response is quickly undertaken to minimize its impact on public safety, environment and infrastructure.”²⁴

In his 2001 report on managing interface fires, BC’s former Auditor General makes a fire-specific observation about response that could be extended to flood/debris flow and other disaster scenarios:

In the context of fire management, response planning includes programs and activities designed to ensure that individuals and agencies will be ready to react effectively once a fire emergency starts. Response planning is critical to ensuring that imminent interface fire situations are recognized, that an appropriate level of fire protection is provided in interface zones, and that priorities are established and actions taken. The absence of carefully developed response plans can result in poor decisions and lead to costly operational mistakes or unsafe practices during an emergency.²⁵

From the information we learned in preparing this report, response is the pillar that tends to see the greatest investment by government.

Recovery

As described in *Emergency Management in BC: Reference Manual*, the fourth pillar of emergency management, “Recovery focuses on actions to restore a community to as close to pre-disaster state as possible.”²⁶ Actions in this phase are about addressing the aftermath of disaster, and include establishing resiliency centres, supporting evacuees, providing financial assistance and managing donations.

Another definition, suggested in a report published by the Canadian Council of Forest Ministers in 2005, but applicable

21 Government of British Columbia. *Emergency Management in BC: Reference Manual*. 2011. Chapter 1, Page 7. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.
22 Government of British Columbia. *British Columbia Provincial Coordination Plan for Wildland Urban Interface Fires*. Revised 2016. Page 33. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/bc-provincial-coord-plan-for-wuifire_revised_july_2016.pdf.
23 Government of British Columbia. *Emergency Management in BC: Reference Manual*. Chapter 1, Page 7. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.
24 Government of British Columbia. *The All-Hazard Plan*. 2012. Page 64. <https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/embc-all-hazard-plan.pdf>.
25 British Columbia. Office of the Auditor General. *Managing Interface Fire Risks*. Report; 2001/2002: 1. Page 63. <https://www.bcauditor.com/sites/default/files/publications/2001/report1/report/managing-interface-fire-risks.pdf>.

to disasters overall, defines recovery as, “Efforts to repair and restore communities (human and in some cases biological) and services after an emergency or other incident has occurred.”²⁷

Also worth considering is the view provided by BC’s former Auditor General in 2001, specifically related to fires: “In the context of fire management, recovery planning helps reduce losses associated with fires by speeding recovery of the community and helping individuals return to normalcy.”²⁸

In short, recovery is very much about looking ahead, about developing plans, programs and initiatives to mitigate the effects of future incidents.²⁹

CLOSING THOUGHTS

From the brief context we have attempted to provide, what should be clear to readers is the interconnectedness — not only of the four pillars but of the many organizations involved in managing emergencies which extends to the decision-making component.

Understanding how all these elements connect is critical, as we heard consistently from British Columbians that in the midst of disaster knowing who to call proved especially challenging in some cases, whereas those lines were very clear in other cases (see the Best Practice story in Section 5.0, ‘Working Together in Partnership as Communities and Neighbours in the East Kootenay’). Equally, understanding what channels to navigate following a disaster in the short, medium and long terms is just as important, and we heard from British Columbians that was far from clear in some cases (see the First-Hand Account story in Section 2.0, ‘Living Through a Debris Flow and its Aftermath’).

In his 2001 report about managing interface fires, BC’s former Auditor General highlighted some of these challenges — challenges which still exist more than a decade later:

[An] important problem is the lack of clarity in the allocation of roles and responsibilities among provincial agencies for managing interface fire risks. Provincial emergency legislation and policies indicate that local governments are responsible for managing risks within their boundaries, while the provincial government is expected to provide material support, advice, expertise or other assistance as requested. The provincial government is also responsible for managing the risks in unorganized areas. These arrangements work reasonably well when it comes to responding to an interface fire, but response is only one element of sound risk management. The remaining elements — prevention, preparedness and recovery — must also be addressed. At present, there is a lack of clarity about which government agency (or agencies) should do the work. The presence of federal and First Nations lands also add to the lack of clarity in roles and responsibilities. Overall, the number of agencies and levels of government involved makes managing interface fire risks a relatively complex task.³⁰

Even though these comments are now more than 15 years old, lack of clarity around roles and responsibilities remains an issue.

26 Government of British Columbia. Emergency Management in BC: Reference Manual. 2011. Chapter 1, Page 7. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.

27 Canadian Council of Forest Ministers. Canadian Wildland Fire Strategy: A Vision for an Innovative and Integrated Approach to Managing the Risks. Natural Resources Canada, 2005. Page 17. www.ccmf.org/pdf/Vision_E_web.pdf.

28 British Columbia. Office of the Auditor General. Managing Interface Fire Risks. Report; 2001/2002: 1. Page 63. <https://www.bcauditor.com/sites/default/files/publications/2001/report1/report/managing-interface-fire-risks.pdf>.

29 Government of British Columbia. Emergency Management in BC: Reference Manual. 2011. Chapter 1, Page 7. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.

30 British Columbia. Office of the Auditor General. *Managing Interface Fire Risks*. Report; 2001/2002: 1. Page 8. <https://www.bcauditor.com/sites/default/files/publications/2001/report1/report/managing-interface-fire-risks.pdf>.

We conclude with two observations.

In 2017, and in years past, we have found that the response phase tends to be where governments spend most — at the expense of the other three pillars. That is not to say that government should spend less in responding to floods, debris flows or wildfires, only that the growing gap between response and the other three pillars must shrink if British Columbia is to be better prepared for disasters in the future. With that also comes a need for much greater investment in those areas. Readers seeking to better understand this growing gap between 2003 and 2017 in the area of wildfires can consult Appendix B which includes a detailed table.

We need to think differently about recovery. In speaking with British Columbians, in many cases we learned that almost one year after the events, be they flood/debris flows or wildfires, those who lived through these life-altering events continue to rebuild. That rebuilding extends to homes and physical structures, as noted in the First-Hand Account story about the Ashcroft Indian Band (see Section 2.0), businesses and the subsequent livelihoods that may have been lost and the emotional trauma that lingers long after such events. This element of recovery goes far beyond any standard definitions that might reference restoring a community to its pre-disaster state. Recovery is far more deeply layered here given its social and emotional dimensions.

FOR FURTHER REFLECTION

—

In there a way to simplify understanding about disaster management so British Columbians can: a) better prepare for emergencies, and b) have a clear idea of what to expect before, during and after a disaster and where they can turn?





An aerial photograph of a residential area that has been severely flooded. The water is dark and covers most of the ground, submerging houses, trees, and a road. A red semi-transparent overlay covers the left and bottom portions of the image, creating a dark background for the text.

4.0

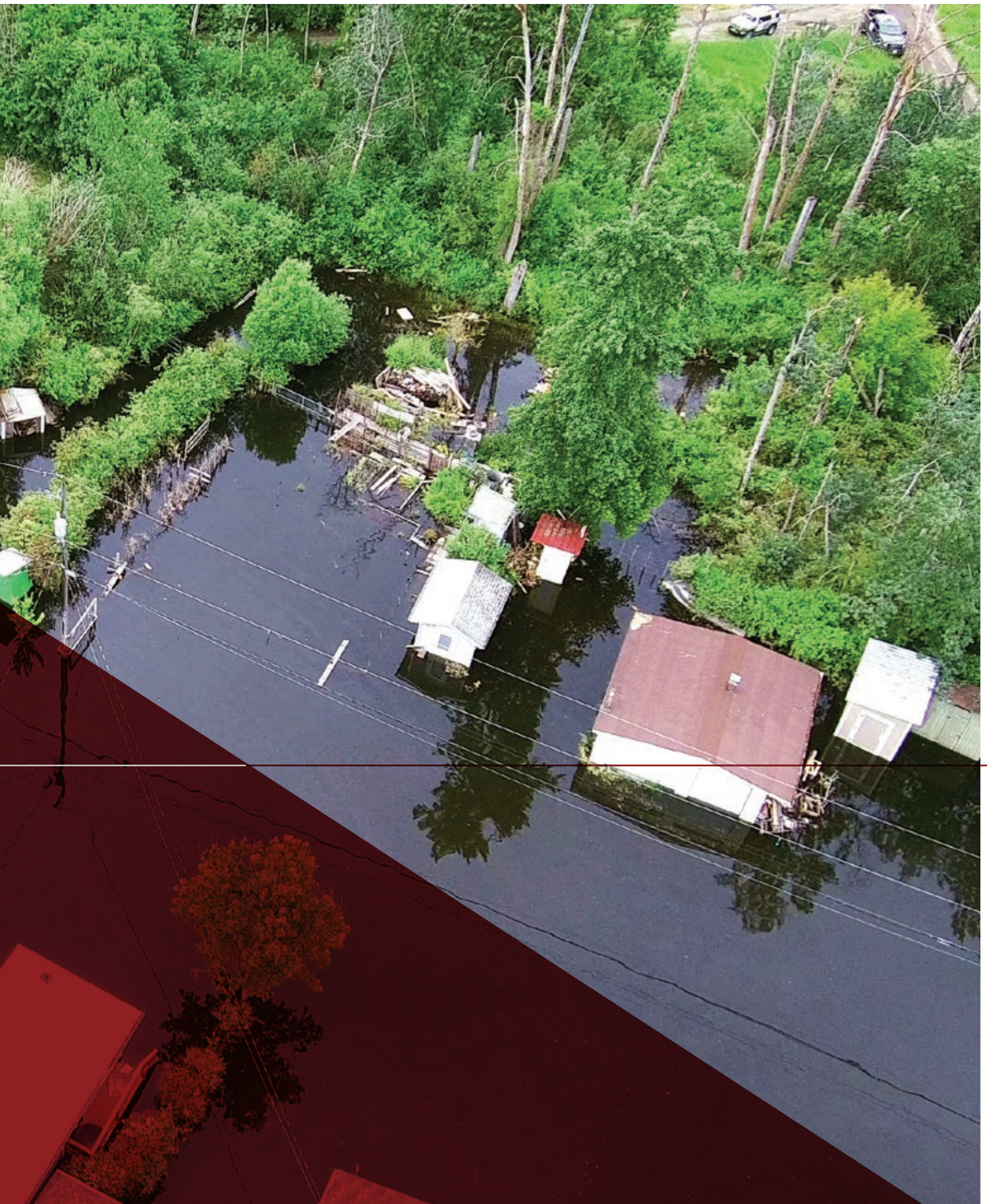
THE ENGAGEMENT PROCESS

To canvass the landscape and gather critical knowledge to better understand the experiences that individuals, families, communities and organizations faced during the devastating events of 2017, we embarked on a rigorous engagement process to capture as much of that information and first-hand perspective as possible.

In designing this process, we worked closely with the team at Context Research — a Vancouver-based consultancy that has been helping organizations design and run their community programs for more than 20 years. The Context team assisted with all stages of the process, including initial research and analysis; thorough planning and development of the in-person sessions held across the province; and

synthesizing the information we received from the various channels so that we, as co-chairs, would be best-positioned to make our recommendations.

As stipulated by the terms of reference, referenced more fully in Section 1.0 of this report, key focus areas for the Review's inquiry and public engagement included: planning and preparedness, prevention and mitigation, response, and recovery. Additionally, session attendees and those contributing written submissions were encouraged to share details about other feedback activities in their communities as well as key stakeholders that could be engaged in the Review process to ensure as many possible perspectives were captured.



Components of the engagement process

The BC Flood and Wildfire Review engagement process included five distinct components, as detailed in the table that follows. In addition to the in-person sessions, residents of communities we were not able to visit were invited to be part of the process — as were all British Columbians — so their input could inform this report and ultimately the recommendations we put forward to the Province. We invited submissions by both electronic and regular mail, and we developed a Submission Feedback Guide to assist contributors.

When people have to leave behind their homes, livestock, and businesses, not knowing if they will have anything to come back to, it's very impactful.

- Chief Maureen Chapman

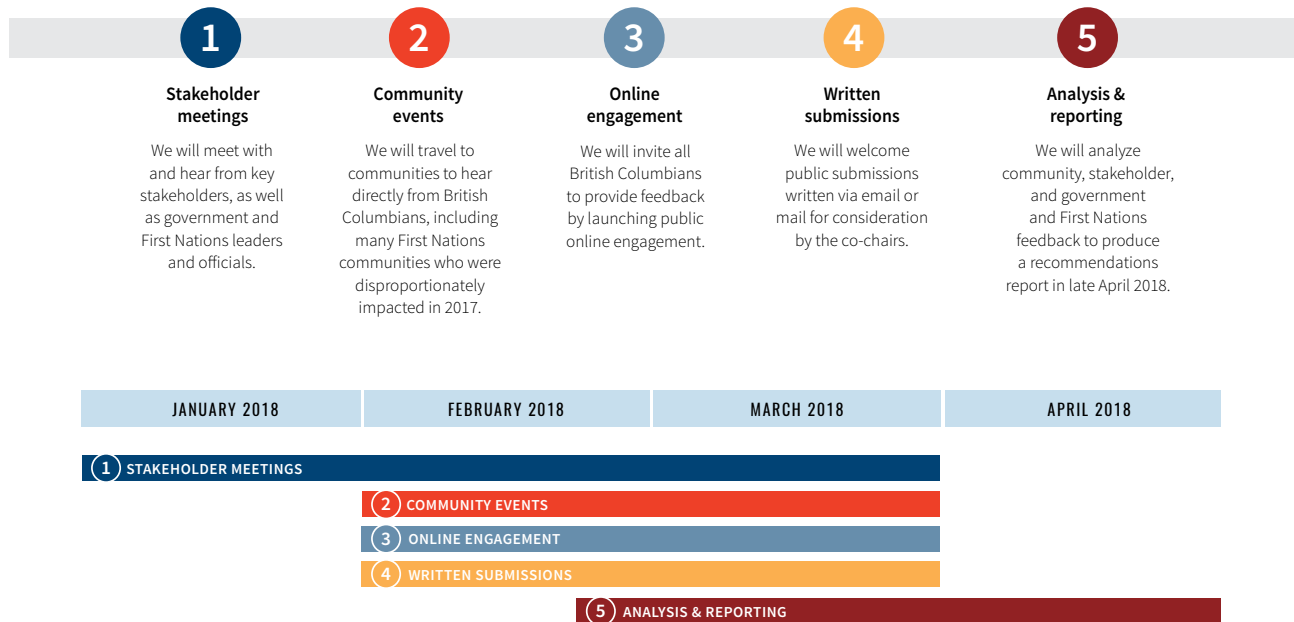
Components of the BC Flood and Wildfire Engagement Process	
One-on-one meetings	This included meeting with and hearing from key stakeholders, as well as government and First Nations leaders and officials
Community events	This involved travelling to communities to hear directly from British Columbians, including the many First Nations communities disproportionately impacted by events in 2017
Online engagement	We invited all British Columbians to provide feedback through a public online engagement platform launched in mid-February 2018
Written submissions	We welcomed public comments submitted by electronic or regular mail for consideration
Analysis and reporting	With community, stakeholder, government and First Nations feedback gathered, this stage of the Review then involved thoroughly assessing that input to produce this report and the series of recommendations we are putting forward, summarized in their entirety in Section 6.0 entitled 'Our Recommendations.'

Engagement session dates and locations

As determined by the Province of British Columbia and outlined in the terms of reference governing delivery of this report, this Review was commissioned in December 2017,



BC FLOOD AND WILDFIRE ENGAGEMENT TIMELINE



with the engagement process taking place between January and late March 2018 and delivery of the final report to the Province for late April 2018.

Due to the limited timeframe available for the Review's conduct, extended open house sessions were held in select, affected communities including:

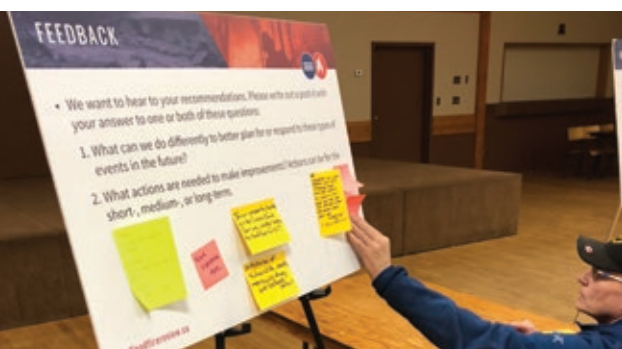
- Kamloops area, February 5, 2018 (2–8 p.m.)
- Cache Creek area, February 6, 2018 (2–8 p.m.)
- Williams Lake area, February 13, 2018 (2–8 p.m.)
- Alexis Creek area, February 15, 2018 (2–8 p.m.)
- Merritt area, February 26, 2018 (2–8 p.m.)
- 100 Mile House area, March 1, 2018 (2–8 p.m.)
- Cranbrook area, March 13, 2018 (2–8 p.m.)
- Kelowna area, March 28, 2018 (2–8 p.m.)

Taking a consistent approach, fostering participation

These sessions all unfolded similarly in that they functioned as open houses where community members could arrive and leave as best suited their schedules. To provide maximum flexibility for attendees, a variety of channels were available to elicit feedback. In one area, designed for quick responses, respondents were asked to post suggestions and recommendations on Post-it® notes to two specific questions on a centrally located board:

- What can we do differently to better plan for and respond to these types of events in the future?
- What actions are needed to make improvements? Actions can be in the short, medium or long term.

In another area at each open house, we gathered input on flipcharts — capturing a series of community-built recommendations in one place. Attendees who preferred to provide more detailed recommendations were invited



to sit and complete a written questionnaire that included the following questions:

- Do you have any recommendations you would like to make to improve planning and preparedness for yourself or your community in the future?
- Do you have any recommendations you would like to make to improve prevention and mitigation for yourself or your community in the future?
- Do you have any recommendations you would like to make to improve response efforts in the future?
- Do you have any recommendations you would like to make to improve recovery efforts in the future?

At each open house session, the co-chairs circulated the room, spoke with contributors and gathered information first hand on a more informal basis — an approach that also included sitting one-on-one with attendees for more thorough discussions.

Beyond these conversations, as they engaged local and First Nations governments the co-chairs received invitations to have further discussions around many of the issues related to planning and preparedness, prevention and mitigation, response and recovery. The co-chairs readily accepted these invitations to meet with local government officials and First Nations Chiefs, considering them real opportunities to gather important perspective. In select cases, and by invitation only, the co-chairs visited and spoke with affected First Nations communities, which afforded another opportunity to gain meaningful community input.

To maximize interest and promote community participation in each of the sessions, we used a number of channels. They included displaying posters in prominent spaces in each community, as well as FrontCounterBC;² working with local governments to inform community residents; advertising in local newspapers; and reaching interested community members online through Facebook Events, a powerful digital tool.

² FrontCounterBC is a single window service for clients of provincial natural resource ministries and agencies online, with 29 locations across British Columbia. For more information, visit www.frontcounterbc.gov.bc.ca/.

LEARN MORE

Gathering Additional Input

Prior to drafting this report and recommendations, beyond the open houses conducted, the informative conversations and the written feedback submitted by interested citizens, organizations, communities and others, and the many hundreds of conversations that took place over a 12-week period, the BC Flood and Wildfire Review sought opportunities to gain additional perspective through the BC Flood and Wildfire Review Technical Forum.

Over a 1.5-day period, beginning on March 22, 2018, a series of conversations were held with participants representing a variety of disciplines, governments, organizations and stakeholder groups. The purpose and outcome of the sessions was:

To develop considerations in support of the BC Flood and Wildfire Review. The co-chairs, Chief Maureen Chapman and George Abbott, will use this collection of considerations combined with others received during the Review to develop recommendations for the final report. To assist this work, participants will be provided a sampling of considerations the co-chairs have received through citizen, government and stakeholder engagement.

More specifically, two objectives were identified: i) to refine thinking and develop considerations that are meaningful and achievable, and ii) to frame a path forward for how local, provincial, First Nations and federal governments can work together with non-governmental partners to advance flood and fire management in BC. Specific questions posed to members of each breakout group included:

1. As you listened to the presentation by the co-chairs, and read the list of considerations related to this theme in your workbook, what stands out for you?

2. When you think about last year's flood and fire season, what surprised you?
3. What's the heart of the issue in terms of this theme?
4. To be successful, what do we need to understand better?
5. What changes do we need to make in terms of how we operate in coming years?
6. What's our most important next step?

Sessions were held at the Morris J Wosk Centre for Dialogue at the Downtown Vancouver campus of Simon Fraser University (SFU). The forum was framed by a series of small breakout discussion sessions divided into two areas, flood and wildfires, and then sub-divided into the four report themes, knowledge and tools, partnerships and participation, communication and investment.

CLOSING THOUGHTS

Gathering public input at any time, particularly in the aftermath of life-changing events such as those that occurred due to the flooding and wildfires of 2017, can be especially challenging. For the Review team, a major consideration involved determining how best to meet with as many British Columbians as possible in a limited timeframe — not only to gather information, but, more importantly, to give the residents of each community a forum for voicing their concerns, ideas and hopes for the future.

Across the eight open house sessions, the Review team heard from the many hundreds of interested and engaged citizens of all ages, First Nations communities, organizations and other stakeholders. Collectively, their ideas and their views are woven throughout the fabric of this report and have played an integral role in shaping all of our recommendations in Section 6.0. We sincerely hope they see their voices reflected here.

The conduct of Indigenous relations has changed in fundamental ways since the Filmon report was published in 2004. Indigenous leadership organizations have long demanded respect for their rights to and on the land. Several decisions rendered by the Supreme Court of Canada have confirmed and clarified those rights. It is unnecessary to further engage that debate here beyond observing that, much more than in 2003, First Nations must now be respected as equal partners in the mitigation of floods and wildfires. This is further underscored by the recommendations of the Truth and Reconciliation Commission (TRC) and the principles of the United Nations Declaration on the Rights of Indigenous Peoples. This understanding very much framed our thinking, both in designing the overall engagement process and in our findings.

FOR FURTHER REFLECTION

—
How can engaging British Columbians lead to better emergency solutions?







BEST PRACTICE

BEING EMERGENCY-READY: THE SKEETCHESTN INDIAN BAND

Not knowing when disaster could strike calls for being prepared if or when it does. In 2017, when wildfires threatened, one of the immediate steps the Skeetchestn community took was activating its emergency plan.

It was back in 2006 or 2007 that the Band first developed the plan, in response to a pandemic sweeping the globe at the time, says Don Ignace, Incident Commander with the Band's Emergency Operations Centre (EOC) during the 2017 wildfire season. That plan, which has been updated every few years since being first developed, is an all-hazards plan covering a wide range of situations beyond pandemics, including wildfires, floods and earthquakes. It extends to transportation- and pipeline-related incidents, as the Band's territory includes portions of the Trans-Canada Highway, two railways and a natural gas pipeline.

However, given how quickly disasters such as the 2017 wildfires happen and evolve, Don believes being prepared is not just about having a plan and ensuring it is up to date.

"Having the right people in place and making sure you have the right person attached to the plan, who knows it intimately, is key," he says. "Some people [in other communities] had an emergency plan, but they didn't know about it. Some people didn't even have time to open the document, the fire went through the community [that fast]. [Being prepared is about] having people who know about the plan, so they can activate it when it is time."

Having an emergency plan and being ready to activate it is especially critical for First Nations communities, he adds. "We're not a municipality, we are our own governments, so First Nations communities should definitely have their own

plans as they are on their own until they can get resources through Indigenous Services Canada (ISC) — so they must be able to look after themselves for a period of time."

Other elements of emergency preparedness

Beyond the emergency plan, the Skeetchestn drew on training that its emergency planning team had received from the Justice Institute of British Columbia — a leading Canadian public safety educator.

When it seemed like the fires might reach the community, the Band took critical steps to 'fireguard' key areas and buildings, including the school, two subdivisions (with 150 structures) and specific residences where owners could not fireproof their properties themselves, hiring a crew of 10 to urgently remove all grass and other fuel adjacent to this infrastructure and digging fireguards measuring five kilometres long and 60 feet wide so that if the fire reached these areas there would be no more fuel to propel it forward.

This approach was far more cost-effective than the alternative, says Vivian Simon, the Band's EOC director in 2017. "We knew there was a cost attached to fireguarding our community, but we opted to do it anyways. It would have cost millions of dollars to rebuild, if that was what it was going to be [should the wildfires have reached the community]."



Vivian cites another tool the Band relied on in the face of the crisis, when the decision was made to evacuate on August 4th (the evacuation lasted until August 21st), namely building a comprehensive list of identified adults, children and pets living at each residence, so “we had a scope of what we were responsible for in our community.” The list included contact details, so the team that remained behind to safeguard the community could keep evacuees updated. Like the community’s emergency plan, it is a list they plan to update regularly.

Leveraging multiple communications channels

Once the evacuation happened, the Skeetchestn emergency response team quickly realized there were gaps in reliable, available information. To meet this challenge, and keep people informed, the team relied on three quick-fix solutions: staffing an emergency telephone information line; sending daily updates on local conditions based on information gathered by its team (including GPS and GIS specialists), and distributing these updates by Facebook Messenger; and hosting a series of public information sessions. Available to First Nations and non-First Nations community members alike, ranchers and other area residents attended these sessions to get information. They also regularly contacted Don directly for updates after being evacuated — updates he was happy to be able to provide. “They’re part of our community,” he says. “They may not be living on our reserve or First Nations people, but they’re definitely our family.”



Additional perspective

Beyond emergency plans and tactics, Don believes local/ Indigenous knowledge of the land is invaluable in thinking about planning for wildfires and other emergencies.

“Who knows more than the people that actually lived on the ground and walked it — walked every little rocky outcrop and crevice. Ever since they were kids they were out there hiking, picking berries and hunting with their parents and grandparents, learning about these resources.” He adds, “They were very resourceful when it came to helping the RCMP navigate the area, as well as members of the BC Wildfire Service team and where they should be putting some fireguards, identifying the surrounding terrain and access points. Local knowledge was key, not only in-house here in our emergency operations centre but on the ground.”



5.0

WHAT WE HEARD

In this section, we aim to provide readers with an understanding of what we heard in our conversations with British Columbians. We have broken down what we heard first by flood and wildfire, then according to the four pillars of emergency management. Readers interested in learning more can turn to Appendix D for greater detail.

Public feedback reflects the priority areas identified by communities. Recovery-related comments were

noted more often than any other component of emergency management. Also, while the public was provided the opportunity to share feedback on flood events, wildfire events, or both flood and wildfire events, the overwhelming majority of respondents chose to comment specifically on wildfire events only. The major or most prominent public topic areas are noted below. For a review of all public considerations, please see Appendix D.



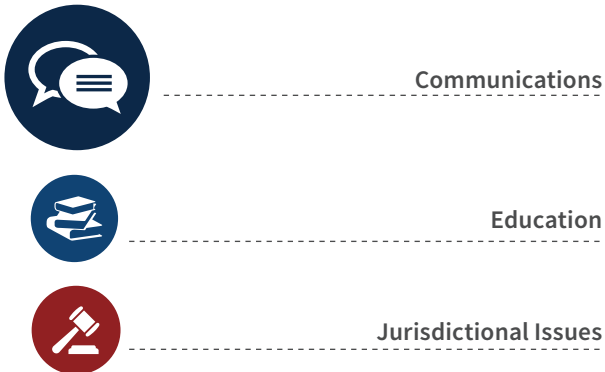
Open house and written submission feedback

Through the engagement process, feedback was collected from communities at open house events as well as those drafting written submissions. Open house and written submission feedback has been combined and is reflected below through each component of emergency management. Similar comments were grouped together to establish themes heard across all communities. Common themes and highlights are further reflected as they related to flood or wildfire events.

The icons below reflect the most prominent themes heard through the engagement process. Larger icons reflect themes that were heard to a greater extent. For a full break down of all themes, please see Appendix D.

1. Planning and preparedness

a) Flood events



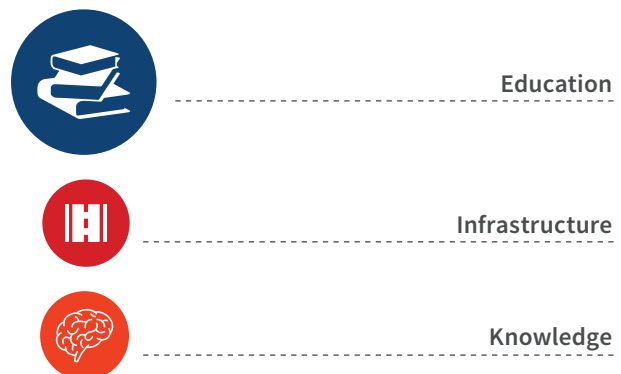
The majority of public feedback related to communications-related considerations. The most prominent themes referenced were the need for two-way communication and interagency considerations. Within these categories, respondents specifically referenced a hotline, cellphone infrastructure and interagency response to the public. Respondents also noted positive

feedback for government communication and annual community discussion considerations.

Other top community considerations related to education and jurisdictional issues. Expanding upon education, the overwhelming majority of participants cited a need for greater public information-sharing — particularly relating to preparation (home materials/building, insurance, emergency plans), responsibilities (personal vs. municipal/provincial responsibility) and evacuations (response, resources and risks). Participants also noted the need for more access to formal educational programs, for local responders, other emergency volunteers and students (including in-school programs that would see flood-related information embedded into curricula).

The most prominent jurisdictional theme referenced was the desire to see a policy on building homes and other infrastructure near flood areas. Participants were also concerned about intergovernmental cooperation and coordination, in terms of planning, emergency services and responsibility agreements. They also expressed an interest in seeing a standardized manual for all communities developed.

b) Wildfire events



In the area of planning and preparedness, the majority of public feedback on wildfires related to education-related

considerations. Under this umbrella, the most prominent theme was the desire for greater public information-sharing — particularly relating to wildfire preparation (home materials/building, insurance, emergency plans), responsibilities (personal vs. municipal/provincial responsibility) and evacuations (response, resources and risks).

Participants also noted the need for more access to formal educational programs, for local responders, other emergency volunteers, smokers and students (including in-school programs that would see wildfire-related information embedded into curricula).

Other top community considerations related to infrastructure and knowledge. Commenting on infrastructure, respondents highlighted four main themes: equipment for local teams; staffing, especially in small communities; planning and preparation; and air filtration in schools. For staffing considerations, participants questioned whether sharing resources was feasible and/or practical, and whether those responsible for staffing wildfires were trained, available and/or physically equipped to respond.

With respect to knowledge, the overwhelming majority of respondents indicated a need to incorporate local knowledge — from First Nations and local residents alike — into wildfire planning, to better prepare communities for emergency. Many also noted the need to focus evacuation plans on emergency routes, and to make plans easier to follow/understand.

2. Prevention and mitigation

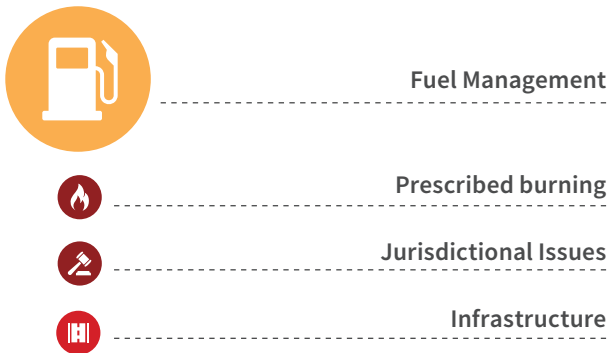
a) Flood events



The overwhelming majority of flood-related comments addressed prevention and mitigation, specifically referencing infrastructure. On this topic, respondents expressed keen interest in seeing greater proactivity in the area of flood prevention/mitigation. Under this umbrella, suggestions included the need for clear creeks and local drainage, earlier lowering of lake levels, building up riverbanks, dredging, dam control, barriers, overlogging, aging infrastructure, damage to private property and ecosystems, and downstream consequences. A small number of respondents cited the need to move infrastructure and buildings away from at-risk locations, and greater access to protective services and materials, such as sandbags.

Other top considerations related to knowledge and jurisdictional issues. Regarding knowledge, most respondents identified the need to incorporate local knowledge — from First Nations and local residents alike — into wildfire planning and preparation. As far as jurisdictional issues, the primary theme was the need for greater interagency coordination. In their concerns, respondents also noted public-private property considerations and the implication of emergency responders damaging private property.

b) Wildfire events



In the area of prevention/mitigation, comments on wildfire events cited fuel management as the top consideration. The overwhelming majority of respondents referenced fuel removal, including low brush, dryfall, dead timber, flood debris and communal chippers. Respondents also noted jurisdictional/regulation considerations, including the spread of pine beetles, fuel density, management techniques, fuel management enforcement/incentives, and livestock grazing.

Other top prevention and mitigation considerations included support for prescribed burning, jurisdictional issues and infrastructure. With respect to prescribed burning, most respondents indicated that reducing risk was their primary reason for favouring prescribed burning. Topics also arising under this theme included planning, command structures, small backburns, communications and ecosystem restorations. Respondents also noted the need to target areas, including interface areas, Crown lands, parks, protected areas and private land.

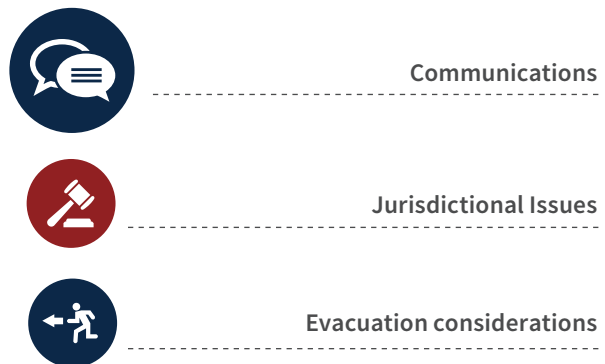
As far as jurisdictional issues, the main themes referenced were interagency coordination and public-private considerations. Within these themes, topics included logging industry policy, vacant land management, preventative action responsibility, enforcement of fire bans,

review of logging practices, intergovernmental cooperation, water management and earlier backcountry closure.

Within the infrastructure considerations noted, most respondents expressed a need for greater focus on fire prevention infrastructure. Within this category, they spoke to the need for more buffering/breaks, fireproofing, fire bans, fireguards and fire-resistant building materials. They also cited location-specific considerations.

3. Response

a) Flood events



Public feedback on response focused largely on communications-related considerations, followed closely by jurisdictional issues and evacuation-related considerations.

For communications, the main focus was the need for access to up-to-date information. In this area, feedback addressed greater use of emergency broadcast systems, community channels, cellphone alerts, website communications, call centres, newspapers, door-to-door warnings, signage, locally relevant information and radio. Under this umbrella, another theme was positive feedback for emergency responders; that feedback referenced first responders, provincial communications and evacuation support.

With respect to jurisdictional issues, the overwhelming majority of comments focused on intergovernmental coordination. Within this theme, respondents noted issues including: emergency services coordination between communities, evacuation, lack of hierarchical authority, federal government roles/responsibilities, the potential for a common provincial mapping/operating system, and the need for all levels of government to meet.

The three main evacuation-related themes raised by respondents included animal- and communications-related considerations, and the necessity of evacuation/ non-evacuation community considerations.

b) Wildfire events



In the area of response, two major considerations emerged: evacuation considerations and communications. The most prominent wildfire-related evacuation issue was evacuation order communications, with the public noting the need for local knowledge, up-to-date information, access to information and better public awareness. Respondents also cited the need for greater compassion, and noted feelings of bullying

by RCMP officers. Other evacuation-related feedback referenced consideration for vulnerable populations, ensuring the necessity of evacuations, and considerations for those remaining after an evacuation order. Other common topics of public feedback included: a focus on the continued delivery of essential services; funding support for evacuation communities; evacuation centres; the closing of at-risk public areas; access to supplies and medical care; the security of properties; and freedom of movement.

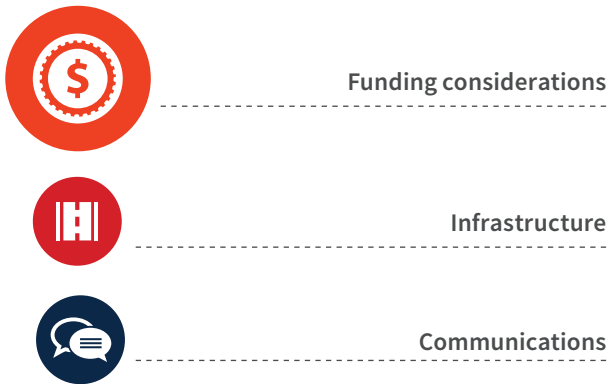
The overwhelming majority of respondents addressing wildfire response communications suggested the need for greater access to up-to-date information. Topics within this area referenced live-streaming meetings, radio updates, proactive communications and a central information source. They also mentioned the establishment of a toll-free information line, emergency-oriented website, emergency broadcast systems, community channels, cellphone alerts, newspapers notices, display boards and social media notifications.

The other two major areas of participation-related feedback covered two main themes: local equipment and response teams and volunteers. Within these topics, respondents spoke to the need for certification clarification, ensuring volunteer suitability, reducing barriers for participants to volunteer, showing appreciation for volunteers, and using local supply/ irrigation systems.

With respect to knowledge, the main themes that arose included: proactive firefighting that takes advantage of early morning and nighttime starts, when the power of wildfires may be lessened; firefighting that focuses on suppression rather than wildfire management; 24/7 staffing of frontline firefighters; and leveraging the power of local infrastructure and knowledge — especially the knowledge of First Nations and local residents.

4. Recovery

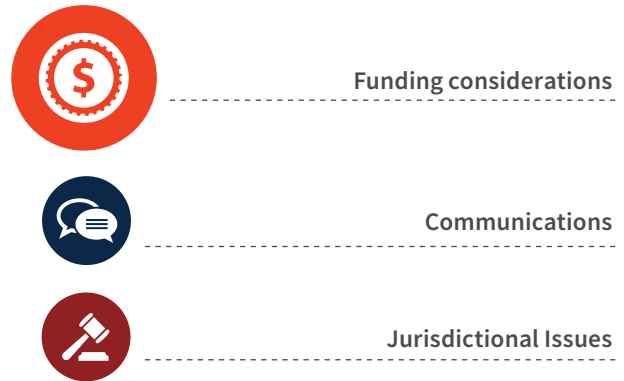
a) Flood events



For recovery, the largest component of emergency management identified for flood events was funding. The most prominent funding themes were supports for business and compensation for private property damaged during response efforts. Specific supports that could be provided for businesses include financial support for the direct and indirect financial impacts of flood events and no-interest loans designated for recovery efforts.

Two other major topics for public feedback included infrastructure and communication. The majority of comments regarding recovery infrastructure considerations focused on community remediation, including cleanup, debris/sandbag removal and compensation for flood-caused property damage. The most prominent communications themes were event debrief and review and local government transparency — specifically around damage reporting.

b) Wildfire events



Funding considerations were the main topic of public feedback, with the most prominent themes being the need for simplified processes, supports for businesses and farms and better support/coverage. Within these themes, topics included: coverage of insurance gaps and claim processing speed; zero or low-interest loans for rebuilding farms; returning to property and rancher-specific issues; home replacement; back-burn implications; the indirect implications of wildfires; and better supports for small communities and non-profit organizations.

Other key wildfire-related topics included communications and jurisdictional issues. The most common theme arising was event debrief/review considerations, including public meetings and gag orders during emergency events. A secondary theme was transparency-related, specifically regarding the release of back-burn reports, Freedom of Information requests and Red Cross spending. The primary jurisdictional theme that arose was the need for intergovernmental cooperation in wildfire recovery. Participants also cited concerns about emergency services, ensuring supports and assistance were provided to all those affected, the coordination of recovery efforts, and accommodations for evacuees.

First Nations' community feedback

The engagement process included specific outreach to First Nations communities, including meetings with Chiefs and councils, community members and presentations and meetings through organizations such as the Union of British Columbia Indian Chiefs, the INAC Joint Gathering 2018 and the First Nations Summit. Feedback from these meetings was collected primarily through designated notetakers and feedback forms completed by Review co-chairs. Similar comments from those meetings and notes were subsequently grouped to establish themes heard across communities. As in the previous section, comment themes and highlights have been delineated across the four components of emergency management and between flood and wildfire events.

Feedback from First Nations communities, summarized in this section, reflects topics heard through the engagement process. While planning/preparedness and response emerged as the more dominant components of emergency management feedback, wildfire events (rather than floods) tended to dominate the discussion topics. The extensive geographic impact of wildfire events in 2017 most likely accounts for why wildfire events were more widely noted. The most prominent topic areas for each component of emergency management are noted below, and specifically delineated for flood and wildfire events. For a review of all consideration areas identified by First Nations communities, please see Appendix D.

1. Planning and preparedness

a) Flood events



Knowledge



Education



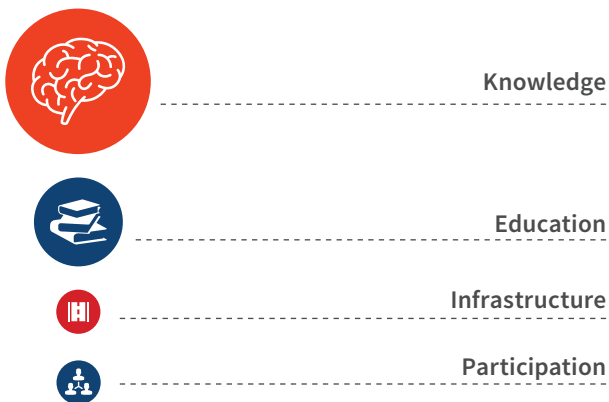
Jurisdictional Issues

Most feedback from First Nations communities related to planning and preparedness for flood events related to knowledge, with primary themes being emergency preparedness planning and incorporation of local knowledge. Communities noted the need for broad disaster coverage, greater planning and plans that include First Nations' content. Further to this last point, participants expressed the need to incorporate cultural considerations and First Nations knowledge into planning and response coordination.

Other major considerations were education and jurisdictional issues. The most common education-related theme was the importance of competent and trained local teams — and specifically the need to provide first responder and emergency management training. Secondary themes included community training provided by the First Nations' Emergency Services Society of British Columbia (FNESS), youth education considerations (including incorporating traditional knowledge into flood-related education) and cultural awareness/sensitivity training for volunteers, responders and government representatives.

The most prominent jurisdictional theme was interagency considerations, namely successful cooperation and infrastructure-building. Additional themes cited mutual aid considerations [particularly Indigenous Services Canada (ISC) agreements with First Nations], the creation of regional/provincial emergency operations centres (EOCs), inclusion considerations that would lead to greater First Nations involvement through all stages of emergency management, and clearly defined roles/responsibilities. With respect to inclusion, specific reference was made to the absence of First Nations involvement in local government communication plans.

b) Wildfire events



Among the members of the First Nations communities the Review team met with, the most prominent planning and preparedness consideration for wildfire-related events was knowledge. Within this theme, the overwhelming majority of respondents cited the need for emergency preparedness plans that specifically include First Nations; this extended to topics including lists of supplies, region-specific evacuation plans and broad disaster coverage. Participants also noted the need to incorporate local knowledge (land base, archaeology, culture and traditions) into planning, and the need for updated lists of community members and assets.

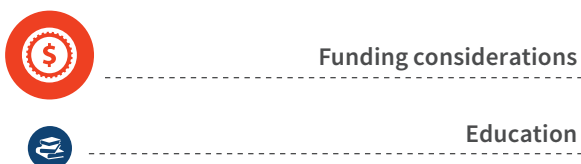
The second major consideration for wildfire events was education. The most prominent education theme referenced was the desire to educate local teams about carrying out emergency response and management. Communities suggested incorporating this learning into the Aboriginal Skills and Employment Training Strategy, in addition to establishing emergency management training within First Nations communities. Additional responses cited the need for community first aid training; further consultation that includes needs assessments; local first responders with geography-specific training, rather than a reliance on non-local first responders (as per the current situation); youth education considerations (including incorporating traditional knowledge into wildfire education); and cultural awareness/sensitivity training for volunteers, responders and government representatives.

Infrastructure and participation were two other prominent considerations that emerged from our meetings with First Nations communities. Respondents had many varied comments about infrastructure for wildfire events. Concerns focused on: equipment for local teams; insufficient local resources, including the lack of dedicated, local emergency personnel; the inaccessibility/unaffordability of insurance; the perceived weight placed on response rather than planning; improved technology to predict fire locations and collect data; human resource considerations, such as strengthening emergency response teams; and archaeological considerations, particularly placing value on cultural and historic sites.

Under the participation umbrella, for the planning/preparedness component of emergency management for wildfire events, the overwhelming majority of respondents indicated the need for local involvement in planning — particularly in terms of the partnerships between First Nations and local governments.

2. Prevention and mitigation

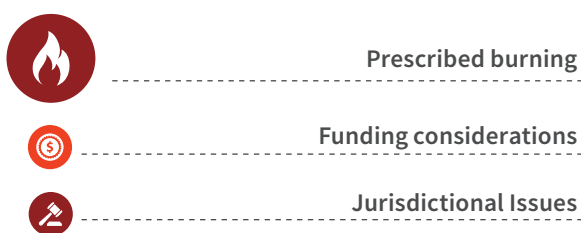
a) Flood events



The most prominent consideration for prevention/mitigation was funding. Specifically, First Nations communities noted the possibility of using the Traditional Language Revitalization Fund to support program development in First Nations languages. Communities also discussed the insufficiency of dedicated prevention funding.

In the area of prevention/mitigation, the other top consideration was education. Particularly, First Nations communities noted the need for greater discussion and awareness-building around prevention efforts that could be undertaken before and during emergency events.

b) Wildfire events



Among the First Nations communities providing input, the top consideration was support for prescribed burns. The majority of respondents in favour of prescribed burning indicated their support was due to the perception that prescribed burning would help reduce the risk of future wildfires. Topics arising within this theme included the use of prescribed burns as a landscape management tool; the deficiencies with current prescribed burning policies;

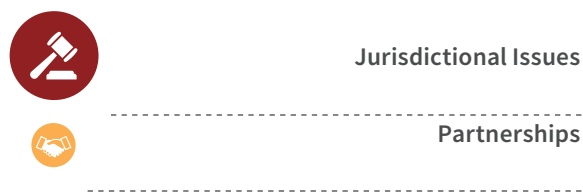
the need for regular and scheduled burns; and the role of First Nations people as natural firekeepers.

For prevention and mitigation, other top feedback areas included funding and jurisdictional considerations. The most prominent funding theme cited was the insufficiency of existing funding to support prevention as an emergency management goal — particularly in terms of fuel mitigation and the role of Indigenous Services Canada as funder. Additional comments referenced the potential of return funding through the Southern Interior Beetle Action Coalition; incentivizing positive forestry practices, such as silviculture and debris cleanup; and the potential for using the Traditional Language Revitalization Fund for project/program development.

Policy considerations were the main theme around jurisdictional issues, with specific topics including the need to diversify wood use, legislation, the insufficiency of the Forest Stewardship Plan and forest restocking standards. Additional considerations included interagency coordination, such as the need for support and funding from all levels of government, and preventative measures.

3. Response

a) Flood events

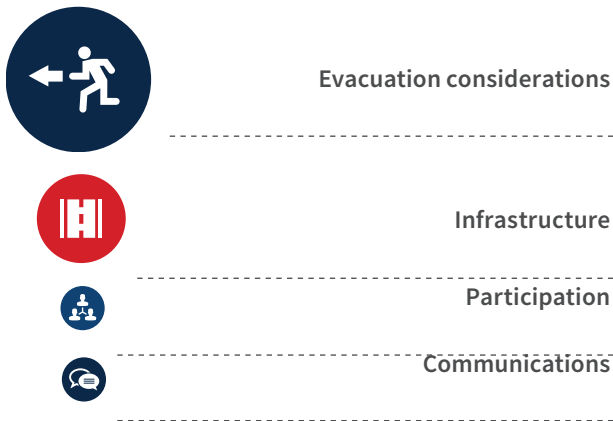


In the area of response, the most prominent consideration was jurisdictional issues. Most flood response-related comments focused on self-governance — particularly the need for First Nations to manage flood events in their own communities. Additional comments suggested greater clarification around interagency considerations such as responsibility and accessibility is

required.

The other major area for feedback on the flood event emergency management response is partnerships. More specifically, respondents spoke to the impropriety of out-of-nation incident management teams responding to First Nations communities. Communities communicated a preference for FNESS to provide response support. Communities also noted the need for regional emergency management agreements. The Tsilhqot'in National Government tri-partite agreement was cited as an example.

b) Wildfire events



The greatest consideration the Review team heard from communities on wildfire response concerned evacuation. One of most prominent themes respondents noted was post-evacuation considerations — including the return to communities, miscommunication when evacuation orders were lifted, premature evacuation, and community access during the evacuation order period. Another key evacuation-related factor cited heavily was communication; respondents referenced hostile communications, the need for RCMP sensitivity training and the need to provide evacuees with regular updates. Evacuee lodging considerations also emerged as a prominent theme. Specifically citing instances

where hotels were full and community centres served as temporary lodging, members of First Nations communities noted the parallels between the temporary lodging and the experience of residential school survivors. The resulting mental health implications of the triggering effects from this lodging were emphasized, as was the need for general mental health supports during emergency. Finally, respondents noted the generally poor treatment of First Nations evacuees throughout the emergency management response process.

Infrastructure was another major feedback topic. The main theme referenced was road network considerations, particularly roadblocks and access to communities. Considerations also noted sufficient local response and staffing continuity — both in terms of ensuring knowledge transfer and providing sufficient reprieve for those overworked.

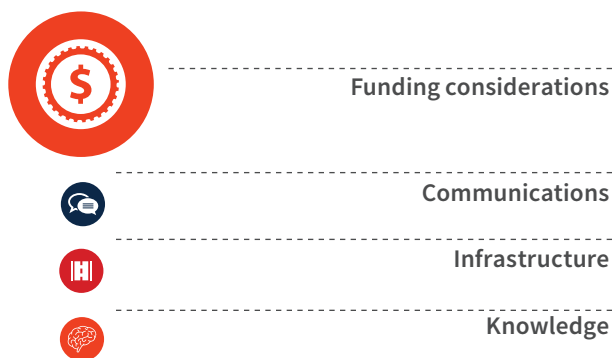
Participation and communication considerations emerged as other top areas of feedback. Under participation, three main themes arose. The first was internal/external cooperation, such as resource-sharing, greater intergovernmental collaboration and the need for a regional emergency planning model. The second concerned volunteer considerations, particularly the use of local volunteers and gaining permission to access private areas and local equipment. The third main theme was local response team considerations, including the permissions process for locals to fight fires, BC Wildfire Service process considerations and barriers for local volunteerism — including training and driver's licence requirements.

Most respondents citing communications-related considerations for wildfire events in the area of response suggested the need for greater access to up-to-date information and better interagency communications. Participants noted that communications in 2017 were poor, and that improvements were needed for

Incident Management Teams, emergency services and local governments. Feedback also cited the need for communications to be available in languages beyond English.

4. Response

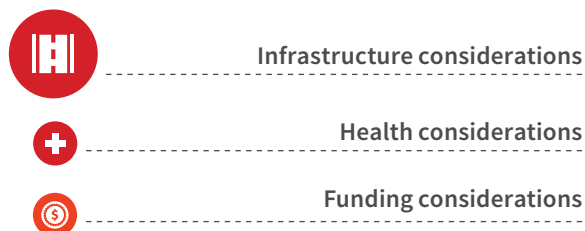
a) Flood events



Funding was the top response consideration, with the most prominent funding themes being the need for faster reimbursements from Emergency Management BC (EMBC) and the cumbersome process of writing community recovery plans.

Other key response considerations were communications, infrastructure and knowledge. The most prominent communications-related themes were continued communications following an emergency, and gratitude from some communities that received critical support at the time. Most comments regarding infrastructure focused on ecosystem recovery, particularly regarding deer, moose and fish habitats. Finally, respondents whose comments focused on knowledge noted the lack of a focus and strategy for remediation work. Remediation was noted as a knowledge gap in terms of flood recovery.

b) Wildfire events



For recovery, the most prominent consideration noted by First Nations communities was infrastructure. The primary theme was ecosystem recovery, including notes for grazing land, biodiversity, waterway diversion and traditional food sources (such as hunting, fishing and berry collection). Additional themes included rebuilding and upgrading damaged infrastructure, and temporary recovery measures such as cattle guards and livestock relocation.

Other top recovery considerations were health and funding. Regarding health, the overwhelming majority of respondents noted the need for mental health supports after wildfires — particularly around acknowledging mental health struggles and counselling availability. Additional health considerations included recognition and support for emotional trauma, students returning to schools and support for responders.

The most prominent funding themes cited the need for faster EMBC reimbursements, the cumbersome process of writing community recovery plans and difficulties accessing Red Cross funds.

Online engagement survey feedback

The online engagement survey provided all British Columbians with an opportunity to provide feedback to the BC Flood and Wildfire Review. Engagement survey respondents could submit feedback on flood events, wildfire events or both. Just over two-thirds of survey respondents chose to provide feedback on wildfire events only. The vast majority of remaining respondents commented on flood and wildfire events, while only a small percentage commented on flood events only.

A summary of key survey responses is included below. In total, 929 individuals completed the BC Flood and Wildfire Review online engagement survey. Readers interested in reviewing all survey data in greater detail should see Appendix D.

1. Flood events

The following questions and summaries provide a snapshot of survey responses on flood events:

Question: Prior to the 2017 floods, to what degree did you feel your community was prepared for a future flood event?

Reflecting back, before the 2017 flood events, nearly one-half of all respondents felt their community was unprepared. Approximately one-third of respondents felt prepared.

Question: Does your household currently have a plan to act on an evacuation alert and/or order?

Nearly two-thirds of respondents indicated they do not have a plan to act in the event of an evacuation alert and/or order in their community.

Question: Do you have access to insurance for overland flooding?

Nearly one-third of respondents indicated they do not have access to insurance for overland flooding, while one-fifth of respondents did not know about their ability to access such insurance. Finally, approximately one-tenth of respondents identified insurance as being unaffordable.

Question: My community should have regulations preventing development from occurring on floodplains.

More than three-quarters of respondents agreed with this statement.

Question: My community would benefit from land-use planning on floodplains.

An overwhelming majority of respondents agreed with this statement.

Question: What improvements to communication about floods could be made?

Responses to this open-ended question fell into six primary themes: education; awareness; tools; better live updates and action; government or authority action; and better services/infrastructure preparation.

The comments from two-thirds of respondents related to tools. The majority of these responses indicated a desire for more direct contact, and more social media and web-based information. Many suggested more face-to-face or door-to-door communication to better reach the elderly and those without web access or knowledge. Numerous respondents also felt there was a lack of consistency between and among information sources of information, which heightened confusion, distrust and stress.

The other major theme among respondent comments was preparation. While these comments did not directly relate to communication activities, they were strongly

noted. Comments around preparation cited the greater need for sandbags and community emergency response plans and efforts.

Question: What challenges did you experience in evacuating from a flood event?

The majority of comments related to respondents feeling they received unclear directions for evacuation. One-quarter of comments related to the financial burden of evacuating, while just under one-quarter related to respondents having physical difficulty moving through the evacuation process.

Question: Are there any additional comments or recommendations you'd like to provide?

The overwhelming majority of comments related to infrastructure and tools, while the second-largest number of comments addressed jurisdictional issues.

Many respondents cited aging infrastructure as well as a lack of proactive flood prevention, including dredging lakes or drainage issues, as a consideration for their community. Respondents from many regions indicated their respective municipalities did not do enough to prepare for or inspect flood risks and felt action is often taken too late to prevent damages.

A number of respondents also used 'additional comments' in the online engagement survey to express gratitude to emergency responders and volunteers, and to compliment authorities on their emergency response.

2. Wildfire events

The following questions and summaries provide a snapshot of survey responses on flood events:

Question: Prior to the 2017 wildfires, to what degree did

you feel your community was prepared for a future wildfire event?

Reflecting back, before the 2017 wildfire events, one-half of respondents felt their community was unprepared, with just one-third suggesting they felt their community was prepared.

Question: Does your household currently have a plan to act on a potential evacuation alert and/or order?

Three-quarters of respondents have a plan to act on in the event of an evacuation alert and/or order.

Question: Do you have access to fire insurance?

More than three-quarters of respondents have access to fire insurance. The remaining respondents were evenly split between not having access to fire insurance, being unsure about their coverage and identifying insurance as being unaffordable.

Question: Are you familiar with FireSmart activities that can be undertaken at your residence, neighbourhood or community?

Nearly eight in 10 respondents are familiar with FireSmart activities.

Question: Buildings or structures in high-risk wildfire areas should be required to utilize fire-resistant building materials.

Nearly three-quarters of respondents agreed that buildings in high-risk areas should be required to use fire-resistant materials. The majority of remaining respondents were neutral on the topic.

Question: Fuel management includes the removal of excess timber and reducing underbrush. I feel my community could

benefit from fuel management activities.

The overwhelming majority of respondents (more than nine in 10) strongly agreed their community could benefit from fuel management activities.

Question: Prescribed fires or burns are a method to minimize wildfire threats. I feel my community could benefit from prescribed burning.

Just over three-quarters of respondents agreed their community could benefit from prescribed burning. A small percentage of respondents (fewer than one in 10) disagreed.

Question: What improvements to communication about wildfires could be made?

Responses to this open-ended question fell into six primary themes: education; awareness; tools and engagement; better live updates and action; government or authority action; better services/infrastructure preparation; more trusted information; and more detailed coverage.

The most popular response areas were tools and engagement, better live updates and action and more trusted information.

Respondents indicated the need for greater information about areas outside urban centres, more consistent information sources and more accessible information for those not well connected via the internet and social media. Several respondents expressed an interest in receiving information from trusted local sources — people in their communities — and the need for more timely information.

Question: What challenges did you experience in evacuating from a wildfire event?

More than one-third of respondents felt they received unclear directions and information regarding evacuation. One-quarter of respondents cited difficulty with logistics, with recurrent mentions of particular difficulty finding lodging/accommodations for pets. As with flood respondents, many wildfire respondents also had physical difficulties with the evacuation process.

Question: Are there any additional comments or recommendations you'd like to provide?

While spanning a variety of subject areas, the majority of comments suggested that respondents want to feel as though their communities and the Province were more proactive in preparing for wildfires. They indicated a desire for better/more robust communication systems (that would require pre-event development/implementation), more and better information about how people can make their homes more fire-resistant, and better planning to help ensure that essential services and critical businesses, such as those involved in providing food and medical services, stay operational for those working on the fires.

3. Demographic overview

Question: I have been directly affected by flood and wildfire events in previous years in B.C.

More than one-half of respondents (nearly six in 10) had not been directly affected by flood or wildfire events prior to 2017.

Question: I live in the following region:

One-half of all respondents identified as living in the Cariboo Chilcotin Coast area, one-quarter identified as being in the Thompson Okanagan, while the remainder indicated living in (in descending order) the Kootenay Rockies, Northern BC, Vancouver Coast & Mountains, and

Vancouver Island.

Question: What community do you live in, or what is the closest community you visit regularly?

The 10 most popular communities (in descending order) were:

- Williams Lake
- 100 Mile House
- Quesnel
- Kamloops
- 108 Mile Ranch
- Kelowna
- Cranbrook
- Vernon
- Clinton
- 70 Mile House

The remaining communities had fewer than 15 responses.

CLOSING THOUGHTS

To make best sense of what we heard, it is useful to return to the four key themes we have cited throughout this report, namely:

- **Partnerships and participation** — In First Nations and non-First Nations communities alike, we heard consistently that citizens want a greater sense of involvement when emergencies affect their lives. This is not surprising. For most people, their life's work is in their homes and properties. Fuel reduction in wildland urban interface areas is critical to mitigating risk in BC's communities.
- **Knowledge and tools** — We consistently heard that local and Indigenous knowledge of roads, watercourses and weather patterns was often offered but rarely used to advantage in 2017. We also heard from frontline responders about the enormous challenges involved

in attempting to understand, assess and incorporate First Nations and local knowledge as they responded to emergency events. We believe 'plugging into Indigenous and local knowledge' will only be successful if it occurs naturally, as part of relationship-building before emergency events occur. Role clarification in emergency situations is another vital aspect of planning/preparedness currently under-resourced;

- **Communication and awareness** — Our world has changed in many ways since the Filmon report. Among them is the power and reach of social media. Unfortunately, we heard on many occasions about how erroneous reports about losses from fire and flood were terribly upsetting to families and communities. Just as quick response can be critical in mitigating potential disaster, current and accurate information from credible sources is critical in the battle against misinformation; and,
- **Investment** — Since 2003 there has been a growing gap between expenditures for the first two pillars of emergency management (planning/preparedness and prevention/mitigation) and the last two pillars (response and recovery). We believe senior governments must provide a predictable and sustainable stream of funding for planning/preparedness and prevention/mitigation.

In keeping with these four themes, what we heard from British Columbians directly shaped the recommendations we are proposing in the next section of this report.

FOR FURTHER REFLECTION

—
How can what we heard around emergency management be turned into practical, workable solutions?



BEST PRACTICE

BEING PROACTIVE ABOUT WILDFIRE IN LOGAN LAKE

For communities and British Columbians contemplating how to better prepare for wildfires, Dan Leighton, Fire Chief/ Emergency Coordinator of Logan Lake says, matter-of-factly, “Get started. Stay with it. And be prepared to stay with it.”

Situated about one hour southwest of Kamloops, the District of Logan Lake (population 1,900) has taken a multi-pronged approach to mitigating wildfires. This proactive thinking began in the aftermath of BC’s 2003 wildfires and has been consistently advanced by all mayors and councils since that time. Today, it includes a robust mix of low- and high-tech solutions.

“If we don’t do anything, and wait for somebody else, the risk is only going to increase, and the probability of wildfire or wildfire threatening our community infrastructure and our homes will only increase,” says Dan. “Why would we want to increase our risk when we can take initiative and reduce that risk?”

Employing various solutions

One plank in the community’s approach has included a yearly, months-long clean-up of fuel on Logan Lake’s Community Forest¹ adjacent to the community. This is done using contract and local First Nations crews, as well as high-school students. The high-school crew is a strategic initiative funded through the Logan Lake Community Forest, a collaboration involving the Community Forest, the Logan Lake Wellness, Health and Youth Society, and the District. Though only equipped with manual tools, including handsaws and pruning saws, the students make a big contribution to the effort while learning about forestry, their natural surroundings and fire principles.

“[With the high school students] it’s more of a long-term strategy. What we’re looking for is succession planning with

community forests. Ideally, we’re hoping someone in that high school will go through the program and decide they want to be in forestry and become a professional forester and work for the community forest,” says Garnet Mierau, a registered professional forester who has been working closely with Logan Lake since 2014 to further advance the community’s mitigation efforts.

Also yielding big wins is another low-tech approach that has involved bringing herds of cows and goats into area fields each summer to eat large patches of dried grass and weeds (cows only eat grass while goats only eat weeds). Though the noisy herds sometimes annoy nearby residents, Dan says it’s a small price to pay to have the terrain naturally cleared of the fuel that could propel a major wildfire.

Dan’s efforts to get community residents onboard with wildfire mitigation also involves selling low-cost sprinklers — a first line of defense for individual homes. He or one of his firefighters will even install those sprinklers for homeowners unable to climb a ladder to access the roof, such as seniors.

Then, there are his efforts to introduce FireSmart initiatives to Logan Lake residents. Dan regularly visits with homeowners, running through a checklist of potential vulnerabilities and practical solutions they can implement. “We don’t tell them what they have to do, but we tell them what their risks are,” he says. “Some landowners don’t fully understand [the consequences of not being FireSmart], so we do our best to help them out.” Dan’s outreach also includes hosting

1 According to the British Columbia Community Forest Association, “A community forest can be described as any forestry operation managed by a local government, community group, First Nation or community-held corporation for the benefit of the entire community. Community forestry involves the three pillars of sustainable development: social, ecological, and economic sustainability.” See <http://bccfa.ca/what-is-community-forestry>.



FireSmart community information sessions, and events where residents can bring dried wood cleared from their properties to a central location for wood-chipping. By reducing the fuel on each property, everybody wins.

LEARN MORE

What is FireSmart?

“FireSmart is a national initiative to help property owners and communities understand the ways in which wildfire might threaten structures and property located in, and close to, forested and wildland areas, and the steps individuals and communities can take to reduce the susceptibility of buildings and property to fire.”²

FireSmart involves reducing the potential impacts of wildfire on individual homes by following simple, preventative steps — such as clearing all plants and other vegetation from within 10 metres of a structure, ensuring no trees or other vegetation are overhanging the roof and carefully choosing tree species less susceptible to burning such as birch and aspen.³

Logan Lake’s “forward-thinking approach” to forest stewardship also includes creating a wildfire risk management plan (in development) and surveying the surrounding area using “sophisticated and high-level technology such as LIDAR (high-resolution information), web-mapping tools and geographic system information (GIS) data,” says Garnet.

With a career spanning more than 30 years, his advice for communities interested in replicating the Logan Lake model is to find a champion in the community and get buy-in from decision makers. He also cites the need for working

with qualified professionals. “I see many communities trying to ‘cheap out,’ and it doesn’t work,” he says. “When you don’t hire the right people, you don’t get the results you’re looking for.” Like Dan, he strongly believes being better prepared involves being committed over the long term.

Given his lengthy career, when asked if he’s surprised by today’s wildfire behaviour Garnet says what truly shocks him is how little has been done since the 2003 wildfires.

“What surprises me is that we haven’t learned from 2003. The Filmon report was very clear on many strategic initiatives. We could have had 15 years of implementation under our belts, but we don’t, and that’s disappointing to me as a professional — when we’re aware of the situation but don’t act and do something about it. I really hope whatever comes out of this learning is that we actually take action and do something about it.”

For his part, Dan Leighton is already excited about a new mitigation initiative he plans to introduce in Logan Lake. Still very much in its infancy, he’s taking steps to see the community develop a smartphone app (application) that would offer localized alerts and information to community residents year-round. Should a major wildfire or other disaster happen, he would be able to quickly communicate trusted, reliable updates to all subscribers — and know how many people were receiving those alerts.

Ultimately, he believes mitigating wildfires is about two main principles: “It’s all about education, and it’s about thinking of ways to be proactive.”

² Government of British Columbia. Public Safety & Emergency Services website. See <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/for-your-home-community>.

³ See Government of British Columbia. Public Safety & Emergency Services website. <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/for-your-home-community>.

BEST PRACTICE

WORKING TOGETHER IN PARTNERSHIP AS COMMUNITIES AND NEIGHBOURS IN THE EAST KOOTENAY

“Knowing your neighbours is important. Working together to find opportunities to create efficiencies and leverage resources helps small communities and municipalities deal with common issues and challenges, creating a win/win for everyone involved,” says the director of operations for the Aq’am community.

During the 2017 wildfire, specifically the fast-moving St. Mary’s River Fire, the Aq’am (population 391 in July 2017) needed to quickly evacuate 37 homes. For three days, approximately 110 people were displaced from their homes. With fire at its doorstep, the community’s first call was to 911, then the City of Cranbrook Fire Department — which immediately dispatched its crew to fight the blaze threatening the homes. BC Wildfire Service (BCWS) was also contacted and arrived quickly, with crews from both organizations working together to control the fire. With aircraft in the area, and given the community’s proximity to the nearby airport, air support was available in 30 minutes or less.

Ultimately, the fire damaged some of the community’s residential infrastructure and 400 surrounding hectares, says Michelle Shortridge, the Aq’am’s Director of Operations. “However, those losses would have been much higher were it not for the immediate response of the City of Cranbrook and the BC Wildfire Service.”

As the fires were being fought, the Regional District of East Kootenay (RDEK) provided staff support while members of the Aq’am checked evacuated households and set up accommodations for evacuees. As events unfolded, the community’s Emergency Operations Centre (EOC) and

the RDEK’s EOC were in constant communication. This coordination, of resources and information, played an important role during the emergency.

Planning for emergency

Communities across the East Kootenay have been working more closely together since the 2003 wildfires, gradually taking steps to unite in emergency situations recognizing there is strength in numbers and that resources can quickly be overwhelmed in a disaster — especially in rural communities, says Sanford Brown, Building and Protective Services Manager with the Regional District of East Kootenay. He cites the development of a revised regional emergency operations plan, released in November 2016, as a major achievement for all area communities. Whether those communities had service agreements with the Regional District or not, consulting directly with them in developing the revised plan was a must.

“These are our partners in the area, so we consulted with them and we wrote the program so everybody was part of it and that worked really well.” Though Cranbrook is the region’s largest community, Sanford believes working together is essential as, “We’re all too small to do this on our own.”



Relationship-building through the wildfires and beyond

Nearly one year after the 2017 wildfires, all involved agree the bonds between and among government and communities have improved.

“This event demonstrated our willingness and ability to work together on a government-to-government level,” Michelle says. “It has since opened the dialogue about how we can continue working together and how we can make changes to further improve our working relationships and create efficiencies.”

Wayne Price, Director of Fire and Emergency Services for the City of Cranbrook, believes managing disasters is a collective effort. “We are all in this together, no matter what those jurisdictions might be. Sometimes, you have to really look beyond jurisdictional boundaries.” He adds, “If we can be part of a win/win relationship or partnership, as a regional service provider, we should do as much as we can to provide that service.” Wayne invites anyone who reads this story and is interested in learning more about what they might do in their own communities to reach out to him directly.

From a Regional District perspective, Sanford credits earlier relationship-building for facilitating the conversations that

happened amid disaster about where and how the RDEK could best offer support. At the time, he knew that support was welcomed by the Aq’am. In the fall, after the fires, it was recognized more formally through a special celebration that held great meaning for all involved.

“[The Aq’am] put on a gathering of gratitude evening where they invited everybody involved to an evening celebration — they were just so grateful. That has further built our relationships in other areas already,” he says, adding that members of the Aq’am are now taking part in joint emergency preparedness meetings and training. “[As these relationships deepen], it’s just going to get better and better.”

These deepening bonds of collaboration and the importance of being true neighbours and partners, stemming from the 2017 wildfires, is perhaps best captured by Nasu?kin (Chief) Joe Pierre of the Aq’am. “Relationships need to be worked on all the time. Neighbours that know each other help each other.”



FIRST-HAND ACCOUNT

LASTING IMPACT OF THE 2017 WILDFIRE SEASON ON CANADA'S LARGEST FORESTRY FIRM

Quesnel-based West Fraser saw four of its mills threatened by the 2017 wildfires. Though the mills ultimately remained unharmed thanks to protective measures taken by the company's employees working closely with firefighting personnel and specialists, almost one year later West Fraser is still very much dealing with the impact of the wildfires on its business operations — far from business as usual.

In his 25-year career in the forestry industry, Jeff Mycock, Chief Forester with West Fraser, says he has never experienced anything like the summer of 2017. “The magnitude of events interrupted our business in the South Cariboo in a measurable way, and we’re still not back to normal business almost a year later.”

Trying to recover after the wildfires

To date, the biggest challenge has been trying to source alternate wood to replace the timber permitted and ready for harvesting (called standing timber inventory) that was lost in the fires. Standing timber inventory is a crucial way companies manage log flows and support operations scheduling for the mills. Like any business, the sudden loss of this inventory has had a big impact. Lower-than-ideal log inventories remain a challenge for mills in the wildfire zones.

West Fraser has been directing its forest development resources towards the recovery of timber within the burn

areas, with an initial focus on those areas burned most heavily. “We’ve had a very difficult time developing timber for harvest authorization. It has caused us to really scramble to manage log inventory for some of our mills so they can maintain their operations,” adds Jeff.

While there are no easy solutions, Jeff believes it would have been helpful if the forest industry, the Province, First Nations and resource stakeholders had met sooner to coordinate the approach to timber salvage.

West Fraser recognizes how the unprecedented scale of wildfire events in 2017 exacerbated problems securing timber authorizations. “Typically, a wildfire might be a few hundred to a few thousand hectares. We move quickly, recovering and salvaging valuable timber and subsequently reforesting areas to promptly green them up again. That has not been the case with this situation.”



The way forward

Jeff Mycock and West Fraser believe there are key learnings and important opportunities to take away from the unprecedented 2017 experience.

In his view, its time to expect and plan for wildfire events of a similar scale and severity in the future. Large wildfires may become a new norm that will demand a major shift in thinking and overall approach to resource management in this province. Critical to that equation is partnership and working collaboratively to plan for a new paradigm.

“Industry has a lot of resources and expertise along with communities and other resource stakeholders. The wildfire service is a specialized professional organization. I feel there are opportunities to integrate resourcing and find synergies across multiple sectors and agencies, to develop more robust, coordinated and effective response to emergencies like this.”

In this, he envisions a future involving shared partnership on disaster essentials such as more effective communications protocols, defined roles and responsibilities and joint training exercises that would enable all actors in the equation (including government, industry, First Nations, communities and stakeholders) to function cohesively.

Ultimately, he says, “Fire will continue to occur in our forests, and we need to manage our forests understanding that fact. We can influence the type and severity of fire we have, along with its influence and impact on the many values we manage in our forests. Our key focus in forest management requires a recognition that fire is a key disturbance agent, and therefore our management approaches need to prioritize ecosystem resiliency and sustainability. If we don’t make this shift in our forest management paradigm, this will happen again, and the impacts to our resource values, our communities, and our business will be greater than necessary.”



6.0 OUR RECOMMENDATIONS

Through over 8 community open houses, 12 weeks of government and stakeholder meetings, 31 days of online feedback, hundreds of hours of conversation and meaningful dialogue and many hundreds of thoughtful written submissions, we heard a broad range of constructive ideas. Those views, outlined in greater detail in Section 5.0, greatly informed our thinking on perhaps the most critical piece of the work of this Review: our recommendations to Government.

This section includes 108 recommendations, broadly captured under the four pillars of emergency management (discussed in greater detail in Section 3.0) and the four themes we have developed throughout the report:

- partnerships and participation
- knowledge and tools
- communication and awareness
- investment

Under each theme, we have further sub-divided the recommendations. With each recommendation, readers will find a statement clearly identifying what we are proposing. They will also find a rationale statement for each recommendation that speaks to why we are suggesting Government take action in that area. Fourteen of these proposed recommendations, those that may substantially alter public policy direction, are labelled 'Strategic Shift.' A complete list of recommendations, in statement form only (without rationale), is included in the Executive Summary accompanying this report.

Before covering the recommendations, we provide some additional context — with some brief words about each of our four themes, as they serve as the foundation of everything we are presenting here.



Partnerships and participation

In large and complex events, governments need partners on the ground as it is not always possible or practical to have sufficient resources on the ground when emergencies occur. For example, when more than 160 wildfires began from a massive lightning storm on July 7 in the Cariboo, BC Wildfire Service (BCWS) resources were stretched beyond their limits. We advocate a balanced approach which draws on the expertise and resources of local citizens on the ground. Throughout our consultations, participants consistently expressed their wish to be part of the solution when major events happen.

We heard that citizens — First Nations, ranchers, farmers, logging contractors and others — responded spontaneously, without official direction, to limit the spread of wildfires threatening their communities until BCWS teams could assist. In numerous cases, this intervention prevented small wildfires from becoming very large fires. Local citizens brought not only energy and resources, but also an intimate knowledge of their lands. Such initiatives complemented existing partnerships built across time between and among loggers, forest licensees and the Province. During a disaster, we believe that enhanced, on-the-ground partnerships could prove extraordinarily valuable in a range of emergency events. We believe these informal partnerships of 2017 should be strengthened and formalized through registration and training.

Knowledge and tools

In our conversations with British Columbians, we repeatedly heard a frustration that Indigenous and local knowledge was not effectively incorporated into firefighting efforts. Many also suggested that the frequent rotation of incident management teams into and out of wildfire zones further contributed to limiting the use of that knowledge.

Firefighting teams would become familiar with the local area over a two-week period, only to be reassigned to another region of the province. To maximize local knowledge and enable greater consistency in approach, we believe incident management teams (IMTs) should be reassigned to the same wildfire whenever possible.

We also heard that disaster response should be better informed by scientific knowledge and enhanced technology. Since the Filmon report of 2004, government-funded scientific research around climate change, wildfire and flood has declined dramatically as response costs have escalated. We heard, consistent with the recent findings of the BC Auditor General (2018), that response efforts could be greatly enhanced by contemporary technological tools such as LiDAR to better protect British Columbia from the impact of wildfires, flood and debris flow.¹ We believe that scientific knowledge and tools can better inform our preparedness and prevention strategies, our response to flood, debris flow and wildfire events, and our recovery efforts following a disaster.

Communication and awareness

We heard concerns about the timeliness and accuracy of public communications around wildfire and other disasters. After evacuation, people are rightly concerned about the condition of their homes and properties. In 2017, obtaining reliable information in real time proved extraordinarily challenging for some evacuees. In the absence of timely and accurate information, some turned to social media for updates — only to be confronted by misinformation. Our recommendations in this area are aimed at seeing more effective strategies developed for information-sharing between response authorities and the public. This also extends to improving communication between and among levels and agencies of government during an emergency.

¹ British Columbia. Office of the Auditor General. *Managing Climate Change Risks: An Independent Audit* (Report; February 2018). Page 70.

Investment

Many respondents called attention to the growing gap between investment in the first two pillars of emergency management (planning/preparedness, prevention/mitigation) and spending on response. This, in our view, would also extend to the fourth pillar: recovery. We believe that should greater investment be made in the first two pillars, less may ultimately be required for the last two.

We recognize that demands on government are significant, extensive and ongoing, and that the demand on government funds will always outstrip available resources. However, in an era of climate change and extreme weather events, we cannot afford *not* to make the necessary investments to prevent or, at the very least, mitigate disaster. The public purse always opens in response to emergency, as we saw in 2017. We are not proposing the Province limit spending on response, but simply underscore that planning in advance of disaster is vital.

Preparedness and planning

1. Partnerships and participation

Working with Indigenous governments and communities

1. 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.

Rationale — First Nations have had governance structures dating back to time immemorial. Past practice of federal and provincial governments has been to ignore these structures. To create true partnership, First Nations must be part of all processes from the beginning.



2. Provide support to First Nations governments and communities to enhance their role and capacity through the development and, where necessary, adaptation of emergency plans which consider the impacts of potential changes in their internal governments.

Rationale — To be equal partners, monetary and human resources must be provided to allow full participation at every level.

3. Ensure emergency services available to First Nations are provided in a way that is comparable to other communities of similar size and location.

Rationale — Equity must be the norm, not the exception; we are all human beings that require the same services in emergencies.

4. Governments recognize First Nations jurisdiction in their traditional territories and support capacity development through training and accreditation.

Rationale — We all live together and must complement each other's strengths and teachings to protect all citizens in BC.

5. Renegotiate existing Canada-BC bilateral agreements, including the 10-year Canada-BC Emergency Management Services Funding Agreement, to ensure inclusion of seamless and integrated support for First Nations communities, and determine a suitable timeframe to transition to a tri-partite agreement, including provisions for communities to self-determine how they will establish Emergency Operations Centres.

Rationale — We recommend inclusiveness through tripartite agreements between and among the First Nations, federal and provincial governments.

6. Governments should commit the time and resources to finalizing and exercising the provisions of the Canada-BC Emergency Management Services Funding Agreement by spending the time required, with communities in their communities, to develop and sustain relationships.

Rationale — During the engagement process for this Review, we heard that the First Nations' Emergency Services Society (FNESS) played an essential role in assisting First Nations communities. We believe that FNESS should play an even more important role in the future, which requires sustained and committed resources to support its work.

7. Develop an emergency management First Nations youth leadership program to foster leadership skills in emergency management for First Nations youth.

Rationale — In keeping with mentorship, the skills and knowledge of existing First Nations personnel in emergency services must be recorded and shared. Retired emergency service workers are another vital source of knowledge and experience.

8. Establish a First Nations Health Authority senior executive role at the Health Emergency Management BC (HEMBC) table to ensure First Nations interests are represented.

Rationale — Fostering partnerships with organizations and agencies that assist during emergencies ensures all appropriate support is in place when required.

9. Governments build cultural sensitivity training and awareness of racism and discrimination into emergency management plans.

Rationale — Bias has no place in any situation, especially emergencies when communities and lives may be at risk.

10. Develop an online system with text and audio of names of all First Nations communities in BC, both in English and Indigenous languages.

Rationale — This recommendation aims to enhance communication, avoid misunderstanding and confusion during emergency events and ensure all emergency responders and community members can understand updates being provided.

11. Develop a toolkit for Indigenous communities and rural and remote communities to assist during emergencies.

Rationale — We heard that in 2017 many communities did not know who to call or where to turn when disaster struck. We believe a toolkit with core information, including telephone numbers and a list of government agencies and their acronyms, could help communities take initial steps when emergencies arise.

12. All Indigenous and non-Indigenous governments should ensure they have common understanding of roles, responsibilities and procedures in the event of an emergency.

Rationale — All personnel, in various levels of government, must be aware of the protocols and processes in place to conduct an orderly and safe approach to an emergency.

13. Strengthen and support the mandate of the First Nations' Emergency Services Society (FNESS) to advise and guide provincial emergency services policy and delivery.

Rationale — We heard the FNESS played an essential role in assisting First Nations communities. We believe it should play an even more important role in the future, which requires sustained and committed resources to support its work.

14. First Nations Health Authority and regional health authorities work collaboratively towards a seamless emergency response system that defines roles, responsibilities and procedures.

Rationale — To be most effective in an emergency, all health personnel must have a clear understanding of roles and responsibilities. Health touches all aspects of our lives — physically, mentally, emotionally and psychologically. Trained teams with the ability to coordinate and work with other emergency services is key to the survival of community members.



15. Create a volunteer training requirement, as part of Emergency Social Services, to participate in cultural awareness.

Rationale — This recommendation is about ensuring that volunteers are fostering the nationwide commitment to mutually respectful relationships with Indigenous People in BC. First Nations respond most positively to those organizations and individuals that demonstrate concerted interest in their communities and have made efforts to fully understand and appreciate the cultural diversity and dynamics in those communities.

Jurisdiction

16. Review and assess the decision-making process related to the establishment of evacuation alerts and orders. Ensure the process considers whether highway corridors should be exempt from the order, has provisions to recognize ranching or farming operations located within an evacuation area, and other local considerations as required.

Rationale — We believe the current decision-making process requires greater flexibility around re-opening highway corridors in a timely way that further recognizes the unique needs of ranching and farming operations during evacuations. To provide necessary services in an orderly and efficient manner, all involved must understand their roles and responsibilities.

17. Review and assess the decision-making process related to lifting evacuation orders. Ensure the process includes coordination with the First

Nations Health Authority (FNHA), regional health authorities, Ministry of Transportation and Infrastructure, and the RCMP.

Rationale — Returning to community once evacuation orders have been lifted can be complex and challenging, particularly re-opening hospitals and other critical infrastructure. Early access for key personnel may be required to effectively facilitate return of patients and others.

Coordination

18. **(Strategic Shift #1)** Develop strategic partnerships and operational agreements with key community members, forest professionals, First Nations, tenure holders (forest, range, guide outfitters and others), as suitable to provide increased response capacity and promote resilience across the land base. As part of this arrangement, BC should consider training and registering partners.

Rationale — The contribution of land-based partners must be formalized, regularized and enabled by a consistent approach to training and registration so incident management teams and on-the-ground partners understand what each can deliver.

19. Provide support to local and First Nations governments in self-assessing their emergency plans (for completeness and effectiveness) and each community's ability to implement those plans fully and effectively.

Rationale — First Nations must be treated as full partners in managing emergencies in BC. Having emergency plans that are regularly updated and

effectively coordinated with, between and among adjacent communities is critical to effective partnership.

20. BC, First Nations, local governments and emergency responders develop jurisdictional protocols, agreements and undertake annual tabletop exercises to ensure roles and procedures are fully understood.

Rationale — Events of 2017 demonstrated that, in some cases, available emergency plans were outdated and untested; annual tabletop exercises would yield opportunity to test the viability of such plans.

21. BC Wildfire Service design a preferred contractor procurement model to be offered as an option to standing offer participants.

Rationale — Subject to demonstrating appropriate skills and training, we believe British Columbians should have the first opportunity to contribute to emergency management in their home province.

22. Develop a partners' program where, prior to wildfires, local resources are assigned to containment line teams consisting of heavy equipment, forest professionals, technicians and workers who use their local knowledge and expertise to establish containment lines as part of tactical operations.

Rationale — Construction of effective fireguards requires a range of skills, equipment and expertise that must be identified, assessed and planned before wildfire events occur.

23. Create a roles and responsibility framework with the flexibility to adapt to each unique emergency situation. The framework must clearly define the primary, secondary and tertiary responsibilities for each organization in the event of disaster and be immediately operational. Encourage the integration of local and First Nations knowledge in the framework, and support the opportunity for communities to contribute to fire suppression operations.

Rationale — Roles and responsibilities must be established through coordinated planning processes before emergency events happen, not during such events. First Nations have the best and most intimate knowledge of their communities and territories. That knowledge should be embedded in emergency plans.

24. **(Strategic Shift #2)** Establish emergency centres of excellence in Interior locations to support large-scale disaster response.

Rationale — An emergency centre of excellence must be of sufficient size, capacity and organization to manage a large influx of evacuees on short notice. Events of 2017 demonstrated the need for such high-capacity and high-functioning centres.

25. BC establish annual, intergovernmental preparedness workshops with First Nations and local governments to support consistent understanding of emergency operations, roles and responsibilities.

- Ensure workshops are held in local communities

- Consider and plan for the impact of multi-jurisdictional emergency events
- Provide consistent training
- Ensure egress (evacuation) routes are established and that the status of alternate roads is known and communicated

Rationale — Partnerships among multiple levels of government must be well-defined, articulated and exercised regularly, outside disaster events, to be most effective in an emergency.

26. Deliver annual emergency management forums that:

- Bring together BC, First Nations and local governments and partners
- Identify provincial operational and policy gaps
- Promote shared information and learning, through best practices and success stories
- Evaluate progress against the BC Flood and Wildfire Review final report, *Addressing the New Normal: 21st Century Disaster Management in British Columbia*

Rationale — Recognizing that disaster-related dynamics evolve across time, we believe annual forums could be an effective way to evaluate progress, ensure continuous improvement and better overall preparedness.

27. Ensure compensation mechanisms exist for residents who support evacuees by providing shelter for people and/or livestock.

Rationale — When residents and communities open their doors to evacuees, any expenses associated with welcoming evacuees into their

homes and communities should be covered in the aftermath of disaster so that they do not have to absorb those costs.

28. Indigenous and non-Indigenous communities establish mutual aid agreements to optimize resource-sharing in the areas of operational response and volunteer capacity.

Rationale — Events of 2017 demonstrated the critical importance of having mutual aid agreements in place in advance of emergency events.

Integration

29. BC enhance integration across government and among governments, particularly in the natural resource sector and within Emergency Management BC, to:
 - Foster better collaboration among land-based decision makers
 - Promote joint forest/grassland management and wildfire preparedness

Rationale — Enhancing integration between and among government departments and branches could include training, information-sharing, integrated land use management planning and zoning to facilitate fuel management planning.

30. The Ministry of Health, in partnership with the First Nations Health Authority and regional health authorities, create a provincial primary health care response team that works in crisis zones and evacuation areas.

Rationale — Patients are among the most vulnerable British Columbians, particularly during disaster. This recommendation aims to foster greater collaboration among those responsible for providing care in emergencies.

2. Knowledge and tools

Indigenous, community and professional knowledge

31. Establish pathways for collaboration with First Nations to enable the integration of traditional ecological knowledge with Western science. Ensure risk modelling is built upon a greater understanding of the land base, values and practices of First Nations.

Rationale — We believe that traditional and local knowledge can complement and strengthen Western science.

Local resources

32. Canada and/or BC equip First Nations communities and rural and remote communities so they can respond to wildfires through training and development of equipment caches.

Rationale — These small communities would be much stronger and better equipped to handle disaster situations.

33. Through BC Bid, BC leverage economies of scale to provide a lower-cost opportunity for residents and communities to purchase external sprinkler systems for their homes.

Rationale — Sprinkler technology has proven effective as a barrier to fire ignition on homes. This recommendation stems from the constructive initiative undertaken by the District of Logan Lake.

34. Canada provide ongoing funding to on-reserve volunteer fire departments to cover annual operating costs associated with the purchase and maintenance of capital infrastructure and equipment. Canada to establish an ongoing program to fund administration and training for volunteer fire departments to assist with wildland urban interface response.

Rationale — The creation of on-reserve volunteer fire departments would protect and strengthen First Nations communities against both structural and interface fires. We believe that Canada should fund such services.

35. BC provide ongoing funding to volunteer fire departments to assist with wildland urban interface response. Funding provided to cover annual operating costs associated with the purchase and maintenance of capital infrastructure and equipment, as well as training for that purpose. BC to consider the Insurance Premium Tax as a funding source.

Rationale — Interface fire response serves both provincial and local interests. Costs should not be borne entirely by local governments.

Land stewardship

36. **(Strategic Shift #3)** BC review and clarify roles and responsibilities for flood management, specifically the transfer of responsibility from

provincial to local governments, including through the amendment of the Emergency Program Act, The BC Flood Response Plan, and other applicable statutes and regulations.

Rationale — The experience of the Columbia Shuswap Regional District in 2017 suggests there is not a common understanding around roles and responsibilities when flood or debris flows occur. If costs for response and recovery ultimately rest with the Province, it may wish to reconsider the delegation of responsibility around local flood elevations and setback requirements.

37. Review operating plans for the Okanagan Lake Regulation System and Nicola Lake, and any other provincially owned and managed water management infrastructure, and adapt these plans to explicitly include consideration of uncertainty in streamflow forecasts.

Rationale — Widespread flooding in both the Okanagan and Nicola regions in 2017 demonstrated the unpredictability of extreme weather events and the need to recognize that uncertainty in operating plans.

38. Re-evaluate all 200-year return-period flood elevations in BC, as well as all associated flood construction levels and horizontal setbacks.

Rationale — Extreme weather patterns associated with climate change demand that British Columbians have the best possible understanding and modelling of what may occur in the years ahead.

Technology

39. Ensure streamflow forecast data provide sufficient accuracy and precision to manage flooding in BC. Assess and evaluate the adequacy of data networks, including snow, weather, streamflow, groundwater level and lake level, used to provide information to run provincial streamflow forecasting models.

Rationale — Recent patterns of extreme weather events, including high-density rains, demand accuracy and precision in predicting and managing potential floods in BC.

40. Evaluate and upgrade the models used by the BC River Forecast Centre for forecasting streamflow and flooding:
- Develop backup models for use when any of the required model input data is missing
 - Increase the frequency at which models are run
 - Investigate the utility of including weather forecasts in models
 - Regularly review and update models

Rationale — Extreme weather events associated with climate change call for having the best information available.

41. Build and provide sustained funding for a coordinated environmental data hub that organizes and disseminates information from the many data networks currently operating in BC. Provide equal access to information for Indigenous and non-Indigenous communities.



Rationale — The long-term management of data networks must be improved so they can operate effectively on a sustainable basis, which would include ensuring they receive increased and predictable funding. It should also include regularly evaluating network density, identifying and filling gaps and converting manual stations into real-time automated stations.

42. Develop values and risk modelling tools to support decision making and advance planning:
- Invest in generating quality data to support modelling, through the use of LiDAR, inclusion of Indigenous knowledge and recognition of cumulative effects
 - Invest in ongoing training for users
 - Ensure common data collection and provide access to the system for all users
 - Effective monitoring of snowpack

Rationale — We believe that strengthening available planning tools is essential to meeting this objective.

43. Identify and assess new equipment, machinery and their configurations that might strengthen ongoing land-based resource management, including emergency planning, prevention, response and recovery.

Rationale — During our engagement, we heard a number of presentations from entrepreneurs who believed their products could be effective in emergency response. Governments should be considering, assessing and testing such solutions.

Infrastructure

44. Evaluate the capacity of provincially owned water management infrastructure to pass flows and modify the infrastructure as needed to keep it functioning as intended.

Rationale —The 2017 flood season in the Okanagan and its subsequent impact on the Okanagan Lake Regulation System suggests system capacity may be stretched to its limits, or beyond, during critical periods. This challenge may also extend to other provincial infrastructure.

45. Governments at all levels annually review and monitor drainage infrastructure to ensure its adequacy in an extreme weather event, such as high-intensity rain.

Rationale — Extensive property damage can sometimes be traced to a cause as simple as a blocked culvert. For prevention, regular inspections during critical periods are essential.

3. Communications and awareness

Education

46. Strengthen public understanding of the risks and personal responsibilities associated with living in a fire-dependent ecosystem. Provide a summary of incentives to encourage public participation in emergency preparedness behaviour and provide information on government responses during emergency situations.

Rationale — We believe effective emergency management requires the support and participation of individual citizens as well as all levels of government. Encouraging citizens to be proactive about emergencies involves creating better awareness and understanding of issues and solutions.

Tools

47. **(Strategic Shift #4)** Build a central hub or ‘one-stop shop’ emergency communications website to provide the public with reliable, responsive, adaptive, real-time and customer-focused information. This hub should collect information from provincial departments and agencies, First Nations and local governments and relevant stakeholder agencies, including media. It should also provide emergency updates for evacuees and include citizen information on how to assist, volunteer or donate.

Rationale — In our engagement, past evacuees told us about the urgent need for accurate, real-time information during emergencies. In the absence of such information, especially in the age of social media, misinformation tends to fill the vacuum and heighten anxiety.

48. Create a communicators’ toolkit for use during emergencies with specific resources such as wording for alerts and orders, and clarity for the roles and responsibilities of communication leads.

Rationale — During an emergency, the use

of common language and approaches across jurisdictional boundaries is of mutual benefit to both communicators and recipients.

Engagement

49. BC, First Nations and local governments, either individually or jointly, host readiness and post-freshet (flood) and wildfire season open houses to share information, knowledge and experiences, as well as develop best practices.

Rationale — Having conversations between and among community members and their governments before and after flood and wildfire seasons provides an opportunity to identify and mitigate potential issues beforehand and to reflect on improvements that could be made.

4. Investment

Training and capacity-building

50. Improve succession planning within emergency response organizations by developing a knowledge management system that includes formal and experiential training provided by subject matter specialists, including individuals from within and outside government.

Rationale — This recommendation is aimed at ensuring the Province is continuously able to meet its wildfire and water management obligations.

51. Expand the provision of prescribed fire training and



extend the provincial certification program to non-agency personnel:

- Training and certification must include all support positions within agencies
- Evaluate the applicability of Parks Canada burn planning course and the US RX-310 Fire Effects course

Rationale — Further to Recommendation #18, this recommendation suggests leveraging the power of partnership by extending training and certification to a wider range of community partners, such as First Nations communities, logging contractors, ranchers, farmers, guide outfitters and others. Partnerships may support and inform prevention and mitigation as well as response.

52. Increase the number of basic firefighters by providing open access to S-100 training for all natural resource sector staff, industry, First Nations, communities, ranchers and other tenure holders.

Rationale — With a focus on mentorship and preparedness planning, this recommendation could be facilitated through emergency management education and training programs at trade institutions.

53. Increase the competency and effectiveness of containment teams by creating a training course, mentoring program and assessment system that emphasizes the role of professional forestry, the need for fire behaviour knowledge and the value and capacity of heavy equipment teams. Ensure courses are available to equipment operators, line

locators, strike team leads and others involved in fire containment and fireguard construction.

Rationale — Containment is a critical part of all successful firefighting efforts. This recommendation is about creating opportunities for advanced training for all those involved in containment, which can benefit both response and recovery.

Funding

54. Mandate the insurance industry to create an incentive program to encourage a proactive approach to emergency preparedness, such as insurance-saving for building structures with fire-resistant materials.

Rationale — Property losses stemming from wildland urban interface fires remain a major vulnerability in BC communities. We must find ways to reward those who follow FireSmart principles and take steps to fireproof their homes and properties.

55. Increase and sustain funding for wildland fire research and applied research in the fields of ecology, fire science, social science and economics to provide up-to-date, BC-focused information as the basis for land management decisions and strategies.

Rationale — In recent decades, pure and applied research in the field of wildfire science has declined. Given the ongoing threats produced by extreme weather events, we believe that

reinvesting in this area will yield knowledge to better equip our province and country in preparing for and fighting wildfires.

56. Canada be encouraged, during its 2019 review of gas tax criteria, to permit the use of gas taxes for fire service infrastructure and equipment.

Rationale — Fire service infrastructure and equipment is often beyond the reach of small communities. This recommendation would offer a potential revenue stream to these communities.

Prevention and mitigation

1. Partnerships and participation

Working with Indigenous communities

57. BC and Indigenous governments review traditional First Nations burning practices for their applicability and suitability for future forest and fuel management.

Rationale — This recommendation aims to assist in the prevention and management of forest and landscape fires and broaden the pool of on-the-ground expertise. Traditional burning practices address the intersection of ecological enhancement, fuel management, community protection, habitat preservation and wildlife populations by incorporating Indigenous fire-keeper knowledge.

58. Canada, BC and Indigenous governments collaborate to ensure reserve lands qualify for funding for forest fuel management and

flood mitigation activities. Ensure a shared understanding of opportunities is built among eligible communities.

Rationale — Protecting lives, property and infrastructure is as critical on reserve lands as any other part of British Columbia. We encourage all parties to ensure that protection and mitigation flows equitably to reserve lands.

Jurisdiction

59. As part of the broader shift to a more coordinated, portfolio approach to risk reduction, identify the Forest Enhancement Society of BC (FESCB) as the primary public agency for the delivery of publicly-subsidized fuel management initiatives and, through Union of BC Municipalities' representation on the FESBC board, draw on Strategic Wildfire Prevention Initiative experience.

Rationale — We believe it would be more efficient and effective to have a single agency, FESBC, lead fuel mitigation initiatives.

Coordination

60. Canada, BC, and First Nations and local governments collaborate to reduce vulnerability and incentivize the building of more resilient structures by adjusting building codes, regulations, bylaws and development permit requirements to encourage the use of fire-resistant building materials.

Rationale — In keeping with FireSmart principles, we believe governments need to encourage and/or mandate proactive use of such materials.

61. The Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Ministry of Environment and Climate Change, Ministry of Health and other applicable ministries reconcile existing statutes limiting more extensive use of traditional and prescribed burning.

Rationale — We believe that achieving community safety at both the local and landscape levels must embrace greater use of traditional and prescribed burning.

62. BC Wildfire Service eliminate the rotation of Incident Management Teams (IMTs) to various fires prior to containment. Support IMTs by creating specialized respite teams to transition and backfill IMTs or develop an alternate respite strategy.

Rationale — We heard repeatedly that rotation of IMTs severely limited the use of Indigenous and local knowledge in wildfire response in 2017.

Integration

63. BC Wildfire Service (BCWS) to be operationally reintegrated into regional operations of the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD). Ensure land management in the areas of prevention and preparedness are achieved by maximizing the collective focus on initiatives and results.

Rationale — We believe closer integration of BCWS within FLNRORD would enhance organizational effectiveness and coordination, and would also assist in reconciling competing economic, social,

industrial and environmental objectives on the land base.

2. Knowledge and tools

Land stewardship

64. **(Strategic Shift #5)** Undertake a portfolio approach to prevention where all possible partners are identified, collaborate to reduce risk, and assess performance and success at the portfolio level, including:

- Forest licensees
- Partnerships between BC Wildfire Service and First Nations communities
- Private land owners
- Federal, First Nations and local governments
- Ministry of Environment and Climate Change, including BC Parks
- Ministry of Forests, Lands, Natural Resource Operations and Rural Development
- Funding partners (current examples include: Forest Enhancement Society of BC and Strategic Wildfire Prevention Initiative)

Rationale — An active partnership among all those who work on the land or regulate land uses contributes to better overall land stewardship.

65. **(Strategic Shift #6)** Encourage the establishment of area-based tenures adjacent to Indigenous reserves and non-Indigenous communities, where not already established as community forests, woodlots, tree farm licences, or First Nation woodland licences.

Rationale — This recommendation encourages

an expansion in the number of community forest tenures in areas adjacent to communities.

66. **(Strategic Shift #7)** Fire be established as a management objective in the Forest and Range Practices Act and other applicable legislation and regulation to encourage fire as a part of land management.

Rationale — In areas sensitive to community safety, a fire objective rather than a timber objective should drive restocking requirements on those areas where fuel mitigation has taken place.

67. Create mechanisms to encourage fire prevention activities such as thinning, bio-mass utilization, targeted grazing and alternate species and densities.

Rationale — The experience of communities like Logan Lake suggests that a multi-pronged approach to interface fuel management is a promising model for other BC communities.

68. **(Strategic Shift #8)** Expand FireSmart community objectives to become broad-based objectives for all of British Columbia. Establish a governance structure to support implementation, monitoring and continuous improvement of FireSmart objectives.

Rationale — We believe that FireSmart objectives should include planning, education, vegetation management, development considerations, interagency cooperation, cross-training and emergency planning.

69. Review existing land use plans to ensure that the location of Old Growth Management Areas, ungulate winter ranges, visual corridors and other land-use designations does not preclude the reduction of wildfire risk adjacent to communities.

Rationale — In some land use plans, spatially-designated areas have experienced high mortality from insects and disease. Particularly when located adjacent to communities, such areas can pose a serious risk to community safety.

70. BC review the effectiveness and utility of existing fire management plans and adjust accordingly to meet the needs for use during emergencies.

Rationale — To be effective in an emergency, fire management plans must be current, regularly reviewed and broadly understood.

71. Encourage existing licensees to participate in risk reduction and treatment of interface areas by addressing existing disincentives and creating opportunities through statute, regulation or other mechanisms.

Rationale — Some current statutory and regulatory requirements inadvertently discourage licensee participation in interface treatments. For example, silviculture treatments make sense at the landscape level, but may make no sense adjacent to communities.

72. Support Ministry of Forests, Lands, Natural Resource Operations and Rural Development initiatives related to bioenergy. Encourage and

accelerate their implementation with a strong consideration to promoting fuel management.

Rationale — Greater use of all remaining residual fibre (wood waste) following harvest could help improve fuel mitigation on the land base.

73. BC expeditiously determine the condition, vulnerability and effectiveness of the Province's 500 kilometres of dikes through use of leading-edge technologies and expertise. In collaboration with Indigenous governments, Canada and BC assess and reconcile the absence of dikes in First Nations communities.

Rationale — As noted in and consistent with the BC Auditor General's 2018 report and recommendations, tools such as LiDAR could be used to identify vulnerabilities within BC's diking system.

74. As part of overall emergency management, BC undertake hazard risk mapping exercises and educational campaigns in communities vulnerable to crisis situations along major transport routes, such as pipelines, railways and highways.

Rationale — We repeatedly heard from communities that partners must be prepared for emergencies arising from major infrastructure and a range of emergencies beyond flood and wildfire.

75. **(Strategic Shift #9)** BC increase the use of traditional and prescribed burning as a tool to reduce the risk associated with landscape and local-level hazards, and to regenerate ecosystems.

BC expand the window for traditional and prescribed burns by modifying how the venting index determines burn windows, including recognizing the difference between burns following timber harvest and burns as part of a wildfire risk-reduction prescription.

Rationale — Many respondents supported the expanded use of traditional and prescribed burning as effective means of mitigating potential large-scale wildfires.

76. BC investigate and assess the possibility of a prescribed burn statute that would offer protection for responsible and permitted burners.

Rationale — The model adopted by the State of Florida, the Prescribed Burning Act, provides an initial reference point.

77. BC re-evaluate the position of carbon-loading counts, specifically the exemption of carbon released by wildfires and the inclusion of carbon released from prescribed burning.

Rationale — We believe there are limitations to the current way of counting carbon, which includes prescribed burning, but does not consider the impact of wildfires. In 2017, wildfires emitted approximately 190 million tonnes of carbon into the environment, six times the total from all other sources.



3. Communications and awareness

Awareness

78. BC Ministry of Transportation and Infrastructure incorporate additional fire prevention messaging into digital message signage, particularly during times of extreme fire danger.

Rationale — We believe motorists should be reminded when they are driving through areas of severe drought and/or potential wildfire that even the smallest of actions, such as disposing of cigarette butts, can have significant consequences for the surrounding forest and communities.

79. Increase disaster awareness among British Columbians by leveraging existing resources, such as PreparedBC and expanding its reach to be more prominent, interactive and dynamic.

Rationale — The better prepared citizens are, equipped with reliable information about emergencies beforehand, the more likely they will be to share this knowledge with their families and surrounding communities.

4. Investment

Funding

80. **(Strategic Shift #10)** To increase the resiliency of BC's ecosystems and communities against climate change, BC establish a predictable and stable revenue stream to provide enhanced investment in prevention and preparedness. BC consider a new carbon tax revenue stream as a source of funds.

Rationale — Climate change has been a reality for many years and financial resources are required to address approaches that individuals, communities, regions and districts can take.

81. BC develop integrated wildfire risk management strategies to guide and prioritize the expenditure of funds through a single source and ensure that expenditures reflect community risk rather than a community's ability to participate financially.

Rationale — Currently, two programs exist for wildfire mitigation: the Strategic Wildfire Prevention Initiative (SWPI) and the Forest Enhancement Society of BC (FESCBC). Uniting these under one umbrella would increase efficiency and effectiveness and reduce unnecessary duplication.

Response

1. Partnerships and participation

Working with Indigenous communities

82. Collaborate with local Indigenous and non-Indigenous communities in response efforts. Local support could include additional capacity of forest professionals on containment teams, local knowledge liaisons, equipment operators and firefighters.

Rationale — The massive lightning storm of July 7, 2017, and the many wildfires that followed it confirmed the need for partnerships with local and First Nations communities that stepped in when BC Wildfire Service resources were stretched well beyond their limits.

83. When circumstances allow, emergency managers and responders should consider having First Nations stay in their traditional territories, or with nearby Indigenous communities that can provide culturally appropriate assistance and support, with specific attention paid to Elders and those with special needs.

Rationale — Displacement of citizens in any emergency comes with enormous challenges. In First Nations communities, understanding these challenges and paying careful attention to cultural practices and traditions and the needs of Elders and the most vulnerable community members is essential.

Jurisdiction

84. The Office of the Fire Commissioner, in conjunction with the BC Wildfire Service, be encouraged to develop a strategy that supports First Nations communities and rural and remote communities that lack capacity for fully resourced fire departments but seek emergency training and response capacity.

Rationale — Many small communities do not have a sufficient tax base to support volunteer fire departments. This recommendation urges capacity-building where local communities demonstrate interest.

Coordination

85. **(Strategic Shift #11)** BC improve interagency operations by developing a single, integrated

system for identification and access permits at roadblocks. Ensure corridor routes during states of emergency remain open for as long as possible and reopen as quickly as possible following emergency events.

Rationale — Citizens were kept out of their communities and separated from their families, adding to the confusion and stress. This recommendation calls for interagency coordination that includes the RCMP, First Nations and local governments, and all related provincial ministries.

86. BC assess and evaluate the provincial Flood Response Plan for its use during emergencies. Assess and plan for gaps, with specific attention paid to supporting Plan implementation during floods.

Rationale — Prevention before a flood or debris flow event allows for improved preparedness and safety.

87. BC Wildfire Service adjust policies and procedures to enable the earliest possible commencement of fire suppression activities without compromising worker safety.

Rationale — We learned that the late night to mid-morning period was generally when wildfires were least active. Leveraging those windows to their fullest could enable BCWS teams to get ahead of wildfires.



88. BC Wildfire Service, in partnership with other ministries, create a stronger linkage during emergencies between Incident Management Teams and local sector agency managers to support the transfer of local information to the Incident Commander.

Rationale — Consistent, accurate information keeps everyone informed and safe.

Integration

89. **(Strategic Shift #12)** Support a ‘BC first’ model for employment during emergencies where, as additional resources are required, qualified Indigenous and non-Indigenous companies, contractors and consultants from BC are selected first. Resources from other provinces and countries to be deployed after readily available BC employees have been deployed.

Rationale — With training provided to the BC citizens interested in employment in emergencies, we draw upon those with local and traditional knowledge first.

2. Knowledge and tools

Technology

90. Increase use of technology by frontline workers during response by incorporating the use of drones, real-time mapping and synchronization and the use of LiDAR technology to assess and assist with planning in all phases of emergency management.

Rationale — Additional technology complements available tools but does not diminish the value of “boots on the ground.”

3. Investment

Funding

91. Develop a basic disaster response financing fund for communities to immediately access once an Emergency Operations Centre has been activated.

Rationale — We believe this recommendation will ensure resources are in place for Indigenous and non-Indigenous communities and people who need to evacuate, if required.

Recovery

1. Partnerships and participation

Working with Indigenous communities

92. BC Ministry of Health, in collaboration with regional health authorities and the First Nations Health Authority, develop stable and sustainable mental health recovery programs that acknowledge cultural linkages to the land and the compounding challenge of historical trauma.

Rationale — Generally, members of the mainstream population are unaware of the historical trauma that has shaped the lives of many First Nations people. Successful holistic mental health recovery programs must occur on the land, steeped in tradition and culture.

Jurisdiction

93. In partnership with First Nations and local governments, BC review the legislative framework supporting recovery, identify gaps and ensure they are addressed.

Rationale — We frequently heard concerns that recovery programs are varied, application timelines are “inconsistent” and the overall application process is “confusing” for citizens on the ground due to the complexity of government structures and the multiple levels of government involved in recovery. This recommendation is about ensuring recovery is achieved in as timely a manner as possible for those re-establishing their lives following disaster.

Coordination

94. Canada, BC, regional health authorities, First Nations Health Authority and other agencies collaborate to identify and implement mental health resources and support for residents both during and after disasters.

Rationale — Having effective and available mental health resources for residents is essential for a return to healthy, thriving communities after a disaster.

95. BC host post-emergency debriefing exercises at local, regional and provincial levels to support proactive planning and recovery.

Rationale — Sharing experiences and best practices will help communities and the Province be better prepared for the next emergency.

96. BC, through Emergency Management BC, Indigenous Services Canada, the First Nations' Emergency Services Society, and First Nations and local governments develop an online system for registration of evacuees, and for the management and reimbursement of appropriate expenses incurred through emergency response and recovery.

Rationale — The unprecedented evacuation of 65,000 British Columbians exposed weaknesses in the paper-based system for registration and management, highlighting the need for greater use of electronic solutions to provide more coordinated and efficient service.

2. Knowledge and tools

Local resources

97. BC provide a clear point of contact for evacuees and those facing relocation during recovery, restoration or rebuilding of homes or other infrastructure within Indigenous and non-Indigenous communities.

Rationale — Safety of people is the top priority and families need to stay together, whenever possible. Knowing your loved ones are safe and taken care of brings peace of mind.

Land stewardship

98. Salvage fire-damaged timber in a manner that maximizes economic, ecological and other values, and is well-coordinated and communicated with licenced resource users on the land base.

Rationale — We believe salvaging this timber will help clear the fuel from the land, a preventative measure that also provides an opportunity for some financial recovery.

99. BC remove disincentives for property owners to remove burned timber from their properties and support efforts to reduce the risk of reburn.

Rationale — Property owners, preferring a proactive approach, were frustrated by what they thought were unnecessary delays in salvaging timber from their own properties.

100. BC develop a protocol following wildfires to monitor negative impacts on natural regeneration of trees, native plant species and traditional food sources.

Rationale — Post-wildfire recovery involves many careful considerations, including a mixed approach to revegetation that will assist in healthy re-growth efforts.

101. BC develop and apply innovative post-fire management strategies for ecosystems in the driest climates (such as Ponderosa Pine and Interior Douglas-Fir biogeoclimatic zones) where contemporary and future climate, combined with fire damage to soils, may render sites unable to support coniferous trees.

Rationale — Assessing the new conditions of an area will determine what will survive and thrive.

102. BC develop and apply post-fire replanting strategies for dry forests that enhance resilience

rather than optimize timber production, for example, adjust preferred species and reduce stocking standards.

Rationale — This recommendation aims to achieve best use of the land in its current condition. Future land use and post-fire replant strategies should not solely be guided by timber production.

103. **(Strategic Shift #13)** BC co-develop timber salvage harvest plans with all forest tenure holders, including the joint planning and allocation of available timber for harvest.

Rationale — Inclusive of all stakeholders, we believe this is a way to promote landscape level management of critical values and accelerate use of timber fibre. Critical values include, but are not limited to, slope stability, archaeology, wildlife habitat and hydrology.

104. Following wildfire events, promptly undertake timber supply reviews to enable industry response and adaptation to a new annual allowable cut, and to allow BC to better understand and respond to impacts on habitat, fibre availability and community stability.

Rationale — This recommendation is about improving stewardship of the land and forests for today and future generations.

Infrastructure

105. **(Strategic Shift #14)** Consistent with the Sendai principle of Build Back Better, the Disaster Financial Assistance (DFA) and Disaster Financial

Assistance Arrangements (DFAA) programs provide greater flexibility to restore damaged sites in ways that reduce the likelihood of repeat events. BC create a fund for the acquisition of lands and properties which, while legally created and/or constructed, are no longer viable given disaster or climate-related events.

Rationale — Current DFA and DFAA programs tend to simply replace inadequate infrastructure with more of the same. Building back better is about building smartly to reduce future losses and should extend to helping citizens start over in other locations.

3. Communication and awareness

Engagement

106. Following an evacuation, provide support and resources to Indigenous and non-Indigenous communities to host meetings to discuss the evacuation as part of the recovery and healing process.

Rationale — This recommendation aims to strengthen the community as a whole and encourages relationship-building between and among Indigenous and non-Indigenous community members.

4. Investment

Training and capacity-building

107. Provide an open source training opportunity for Indigenous and non-Indigenous communities

to learn how to navigate the financial recovery system.

Rationale — This recommendation supports providing meaningful information that will help communities understand the financial recovery system *before* disaster happens so there is less confusion and stress in the aftermath of an emergency.

Funding

108. Create a bridging program to aid people during recovery in meeting their needs from the land, such as traditional food gathering, haying and grazing for livestock, and access to guiding areas while restoration is underway.

Rationale — We believe such a program could provide stability and hope to families affected by disaster-related loss.

CLOSING THOUGHTS

We believe the recommendations presented in this report provide a roadmap to future public policy in emergency management.

FOR FURTHER THOUGHT

—
How can we all work together to bring these recommendations to life?







7.0 LEARNING FROM THE 2017 EXPERIENCE

Synthesizing what we learned and what we heard about flood and wildfire during the course of this Review is no small feat — for reader or reviewer. Countless British Columbians shared with us their

valued insights, perspectives, ideas and stories, greatly contributing to the richness of material available to us in writing this report.

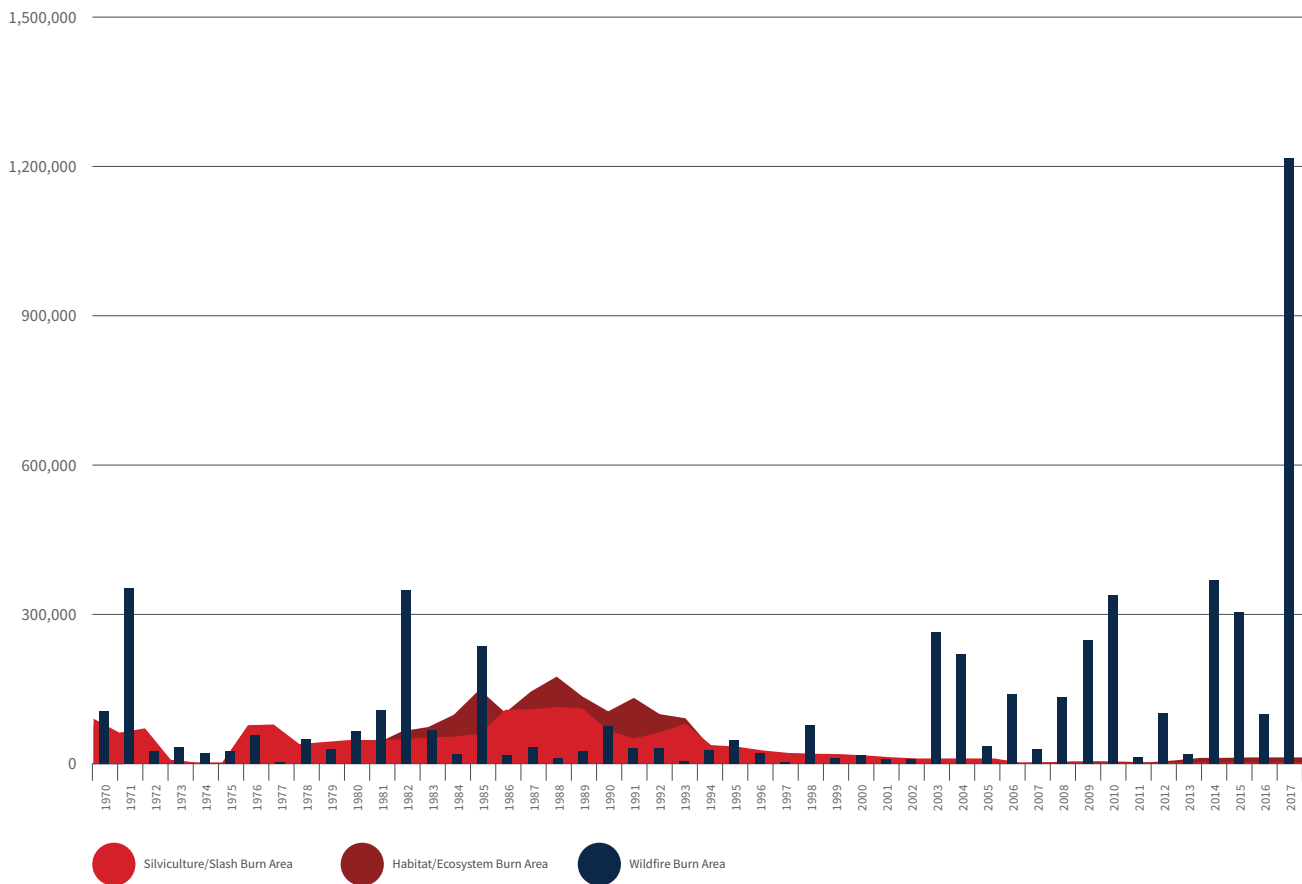


Learning from the 2017 experience so that we, as a province, can better address the challenges posed by climate change and extreme weather events requires accepting that there is a new normal, and that our planning for related events must change. This strategic shift in thinking — as governments, communities and individuals — involves being open to new ideas, leveraging new technologies where and when they are feasible, and making new small- and large-scale investments. Some of these measures, including recommendations we have included in this report, may cost more in the short term but may save greatly in the longer term. In this, we are not simply speaking about investments

and funding but the physical, emotional and psychological toll that events of 2017 took on those who lived through flood, debris flow and wildfire events.

Some of the best measures for future-proofing our homes, our properties and our province do not necessarily come with a high price tag. Finding ways to share best practices, including some of those we have highlighted in this report — and finding opportunities to share those best practices with one another — is crucial. In the case of individual property owners living near the wildland urban interface, the simple act of picking up a rake and clearing dead leaves, branches

Prescribed burning over time graph



The chart shows a potential relationship between wildfires (gray bars) and the temporary reintroduction of fire (prescribed fire) for silviculture (preparing sites for tree planting) and slash burning (hazard reduction). Although many factors contribute to wildfire challenges, the graph shows that one of the most significant periods of reduced wildfires in BC followed years of extensive prescribed fire.

Many scientists have recently encouraged the reintroduction of managed fire, including prescribed fire and allowing low impact wildfires to burn; managed fire has the potential to reduce the broad risk of unwanted wildfires. The loss of managed fire as a land management option is likely one of several key factors contributing to recent dramatic increases in unwanted wildfires.

and other small fuels from the yard could help limit the severity and intensity of wildfire.

Fourteen years after the Filmon report was completed, hundreds of large and small communities across British Columbia remain vulnerable to wildfire. Though much good work has been done in response to the Filmon report recommendations, not nearly enough has been accomplished to meet the magnitude of the threat our province faces today.

Ultimately, though we are all different, what unites us is that we are all human beings with good ideas and a willingness to act. In the face of disaster, we also find the strength to move forward as we heard from the many individuals, families and communities who graciously gave of their time to speak with us. Indeed, we learned that since last year's devastating events much good work has already been carried out to improve the situation by governments, communities and individuals in the areas of both flood/debris flow and wildfires.

While the work of this Review, and this report, has focused exclusively on flood/debris flow and wildfires, citizens we spoke with underscored the need to apply our learnings to other emergency events, such as earthquakes. In our view, being better prepared for all emergencies is vital and involves improving our collective awareness and education. In the case of wildfires, for example, we should not only be more

aware of FireSmart and FireSmart principles, but we should be following as many FireSmart prescriptions as possible.

As we have seen in BC, climate change and the effects of climate change are not going away — as also witnessed most recently in southern California, which was recently devastated by wildfires, flood and debris flow. As we have stated throughout this report, we believe the extreme weather events of 2017 may reflect a new normal.

As human-caused 21st century threats intersect with those posed by Mother Nature, it is increasingly clear that no single solution can or will address the vulnerability faced by communities large and small across our province.

Being better prepared for emergencies in the months, years and decades ahead returns full circle to our core themes in this report: leveraging partnerships and participation; harnessing knowledge and tools; and improving communication and awareness before, during and after disaster. What is also required is concerted, consistent, ongoing and proactive investment by all governments.

FOR FURTHER THOUGHT

—
Where do we go from here?

GLOSSARY OF TERMS

This brief glossary includes select terms that may help readers gain further insights into key areas discussed in this report, including emergency management, flood, debris flow and wildfires.

Contained — The status of a wildfire suppression action signifying that a control line has been completed around the fire, and any associated spot fires, which can reasonably be expected to stop the fire's spread.

Crown land — Crown land is owned by the people of British Columbia, also known as public land. Approximately 92 per cent of the province is Crown land, managed by the Province.

Fire danger — A general term used to express an assessment of both fixed and changeable factors of the fire environment that determine the ease of ignition, rate of spread, difficulty of control and fire impact.

Fireguard — A strategically planned barrier, either manually or mechanically constructed, intended to stop or slow the rate of spread of a wildfire, and from which suppression action is carried out to control a fire.

Fire hazard —

1. The risk of wildfire starting, and
2. The hazard associated with an industrial activity, and
3. If a fire were to start,
 - the volatility of the wildfire's behaviour
 - the difficulty of controlling the fire
 - the potential threat to values at risk

Fire risk — A term that combines the probability of fire occurring against expected potential impacts. Though the impacts of fire can be positive, such as when used in prescribed burning to reduce available fuel, the term 'fire

risk' is generally associated with the negative consequences of fire — or fires that are unplanned.

Fire season — The period(s) of the year when fires are likely to start, spread and damage values at risk such that organized fire suppression is needed. Fire season is also a period commonly referred to in fire prevention legislation.

Forest service road — A road on Crown land that has been declared an FSR, is constructed/maintained by the Province, has historically been a forest service road or meets the prescribed requirements for an FSR.

Fuel — Any organic matter, living or dead, in or on the ground, or in the air, that can ignite and burn.

- **Available fuel** — The quantity of fuel (in a particular fuel type) that would actually be consumed under specified burning conditions.
- **Fine fuels** — Fuels that ignite readily and are consumed rapidly by fire (such as cured grass, fallen leaves, needles and small twigs). Dead, fine fuels also dry very quickly.
- **Ground fuels** — All combustible materials below the litter layer of the forest floor that normally support smouldering or glowing combustion associated with ground fires (such as duff, roots, buried punky wood, peat).
- **Ladder fuels** — Fuels that provide vertical continuity between the surface fuels and crown fuels in a forest

stand, thus contributing to the ease of torching and crowning (including tall shrubs, small-sized trees, bark flakes, tree lichens).

- **Medium fuels** — Fuels too large to be ignited until after the leading edge of the fire front passes, but small enough to be completely consumed.
- **Surface fuels** — All combustible materials lying above the duff layer between the ground and ladder fuels that are responsible for propagating surface fires (such as litter, herbaceous vegetation, low and medium shrubs, tree seedlings, stumps, downed-dead roundwood).

Fuel break — A barrier or a change in fuel type or condition to one that is less flammable than what surrounds it, or a strip of land modified or cleared to prevent fire spread. In the event of fire, a fuel break can serve as a control line from which suppression operations can be carried out.

Fuel management — Fuel management is about modifying forest structure to reduce fuel accumulations which can increase the intensity of wildfires. Improving public safety is the main objective of fuel management, which may include treatments such as thinning/spacing/pruning trees and removing needles and woody debris from the forest floor.

Landscape-level — Landscape-level is what might be seen from a higher level, engaging the expanse from mountain-top to mountain-top. See also ‘wildland urban interface.’

Silviculture — Silviculture is the growth and management of trees to meet BC’s resource management objectives.

Wildfire — An unplanned fire, including unauthorized human-caused fires, occurring on forest or range lands, burning forest vegetation, grass, brush, scrub, peat lands, or a prescribed fire set under regulation which spreads beyond the area authorized for burning.

Wildland — An area in which development is essentially non-existent except for roads, railroads, powerlines and other/similar transportation facilities. Structures, if any, are widely scattered.

Wildland urban interface — The area where forests meet human development is called the wildland urban interface. See also ‘landscape-level.’

Wildfire Act — On March 31, 2005, the *Wildfire Act* replaced the forest fire prevention and suppression provisions of the *Forest Practices Code of British Columbia Act* by moving those provisions into a standalone act and more clearly defining the specific responsibilities of all users of the forest with respect to fire.

WORKS CONSULTED

Associated Environmental. *Review of 2017 Flood Response: Okanagan Lake Regulation System and Nicola Dam*. 2017

BC Community Forest Association. bccfa.ca/

British Columbia Office of the Auditor General. *Managing Interface Fire Risks*. 2001/2002.

British Columbia Office of the Auditor General. *Managing Climate Change Risks: An Independent Audit*. February, 2018.

BC Forest Practices Board. *Fuel Management in the Wildland Urban Interface — Update*. May 2015.

BC Forest Practices Board. *Managing Forest Fuels in the Wildland Urban Interface*. February 2010.

BC Forest Service — Protection Program. *FireSmart Manual*, B.C. Edition.

British Columbia Legislative Assembly. *The Silver Creek Fire Review*. Office of the Ombudsman. Public report; no 39, 1999.

Brown, Juanita, and David Isaacs. *The World Café: Shaping Our Futures through Conversations That Matter*. Berrett-Koehler Publishers, 2005.

Canadian Council of Forest Ministers. *Canadian Wildland Fire Strategy: A Vision for an Innovative and Integrated Approach to Managing the Risks*. Natural Resources Canada, 2005.

CBC. *It's alarming: wildfire emissions grow to triple BC's annual carbon footprint*. August 24, 2017. www.cbc.ca/news/canada/british-columbia/it-s-alarming-wildfire-emissions-grow-to-triple-b-c-s-annual-carbon-footprint-1.4259306.

CBC. *Kamloops experiencing worst air quality in its recorded history*. August 3, 2017. www.cbc.ca/news/canada/british-columbia/kamloops-air-quality-1.4234720.

Emergency Management BC. *Emergency Management BC Strategic Plan 2014/15–2016/17*. 2014.

Environment and Climate Change Canada. *Pan-Canadian Framework on Clean Growth and Climate Change: Canada's plan to address climate change and grow the economy*. 2016.

First Nations' Emergency Services Society. <http://fness.bc.ca/>.

Forest Enhancement Society of British Columbia. *Annual Report 2016*.

Forest Enhancement Society of British Columbia. *Application Guide 2017–18*.

Fraser Basin Council, Arlington Group Planning + Architecture Inc. *Flood Hazard Area Land Use Management*. December 2008.

Government of British Columbia. <https://www2.gov.bc.ca/gov/content/safety>

Government of British Columbia. *The All-Hazard Plan*. 2012.

Government of British Columbia. *Firestorm 2003: Provincial Review*. February 2004.

Government of British Columbia. *Wildland Fire Management Strategy: Achieving Global Excellence in Fire Management*. September 2010.

Government of British Columbia. *British Columbia Provincial Coordination Plan for Wildland Urban Interface Fires*. Revised July 2016.

Government of British Columbia. *Emergency Management in BC: Reference Manual*. 2011.

Government of British Columbia. Public Safety & Emergency Services website.

Gray, Robert W. and Daniels, Lori D. *Additional Information for BC Flood and Wildfire Review*. Submission to the BC Flood and Wildfire Review.

Kelowna Now. *What the Province learned from the flood so far*.

https://www.kelownanow.com/watercooler/news/news/Kelowna/What_the_Province_learned_from_the_flood_so_far/

United Nations. *United Nations Declaration on the Rights of Indigenous Peoples*.

<https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html>

United Nations Office for Disaster Risk Reduction. *Sendai Framework for Disaster Risk Reduction 2015–2030*. 2015.

APPENDIX A

TERMS OF REFERENCE

Terms of Reference for 2017 Flood and Wildfire Strategic Review (Jan 9, 2018)

The strategic review of the Province's emergency management system will examine and assess the provincial and local government response to the 2017 flooding and wildfire events, including the provision of recommendations that can assist the Province in improving upon its systems, processes and procedures.

Specifically, the review will focus on the governance aspects of the system, including statutes, regulations, policy and leadership practices that define the context within which the emergency management system operates. To accomplish this, the review team will engage with British Columbians to understand the Province's tactical and strategic response to the floods and wildfires of 2017.

The review will consider the spectrum of activities that are undertaken across the four phases representing the lifecycle of the BC Emergency Management System, as represented below.

The review and recommendations will provide guidance and illuminate opportunities for improvement to the Province on the following key focus areas:

Planning and Preparedness

- Status of assessment of hazard, risk and vulnerabilities
- Status of provincial governance, planning and preparedness levels, including tactical and strategic considerations
- Capacity of the Province to plan for and ensure support to local governments, regional districts, First Nation communities, and rural and remote communities
- Status of local government, regional district and First Nation communities' governance, policy, planning and preparedness levels
- Resourcing requirements for flood and fire events for all key capability assets
- Review and status of actions taken from the Filmon Report to identify progress and determine whether there are any remaining gaps in implementing the recommendations
- High level overview of emergency preparedness, response and approaches to disasters in other jurisdictions in Canada and internationally

Prevention and Mitigation

- Current activities and opportunities for new activities by government and partners, including activities at the landscape level, that could contribute to enhanced prevention and mitigation for natural hazards, including but not limited to development approvals in the wildland urban interface, FireSmart, and public education programs
- Review of current forest management legislation and policies that affect planning, prevention and mitigation, including but not limited to ecosystem management, spatial planning, reforestation, cut block size, hazard abatement and harvest age
- Economic costs and benefits associated with existing practices and possible enhanced mitigation practices for natural hazards

Response

- Execution of the 2016 BC Emergency Management System
- Province's ability to respond effectively and sustain operations over a longer term during major emergency events of provincial significance, including resourcing requirements for all key capability assets
- Province's ability to effectively support local government response during significant emergencies
- Province's ability to quickly and effectively secure required resources during critical incidents
- Capacity of local governments, regional districts, First Nations communities, and rural and remote communities to respond effectively during major emergency events and provide needed assistance to the people affected
- State of co-ordination and communication structures and processes in place within the provincial government
- State of co-ordination and communication structures and process with other levels of governments and external partners including but not limited to First Nations, Canada, local governments and regional districts, communities and the public
- Examination of private and public sector best practices to respond to major emergency events of provincial significance, including the identification of tools and approaches that may be effective in the BC context

Recovery

- Gain a better understanding of the role of all levels of government in recovery following floods and fires
- Assess the current capacity for the Province to assist and support communities, businesses and individuals in recovery efforts

The terms of reference are designed to be as comprehensive as possible and the reviewers have the discretion to consider other items that may be brought forward in the context of emergency preparedness, response and recovery.

A final report and recommendations are due to government by April 30, 2018, to help inform government's actions in advance of the 2018 freshet and wildfire seasons. If more time is needed, government will use interim recommendations.

APPENDIX B

TABLE: WILDLAND FIRE EXPENDITURE VS. AREA BURNED/TREATED IN BC (2003–2017)

Table 2. Wildland fire expenditure and area burned/treated statistics since 2003. Data provided by the BC Wildfire Service, April 2018.¹

Year	Suppression expenditure (\$)	Area burned (hectares)	Prevention expenditure (\$)¹	Prevention area treated (hectares)
2017	568,000,000	1,216,046	3,028,290	245.2
2016	129,000,000	100,366	14,297,105	456.1
2015	277,000,000	280,605	3,570,483	406.4
2014	297,900,000	369,168	3,723,375	653.2
2013	122,200,000	18,298	6,951,454	1,332.0
2012	133,600,000	102,122	4,622,321	1,125.2
2011	53,500,000	12,604	7,312,059	1,523.6
2010	212,200,000	337,149	7,698,877	1,360.7
2009	382,100,000	247,419	10,871,019	2,041.4
2008	82,100,000	13,240	5,090,966	656.9
2007	98,800,000	29,440	3,129,038	861.6
2006	160,000,000	139,265	2,142,072	867
2005	47,000,000	34,588	1,040,925	149.2
2004	165,000,000	220,518	283,361	
2003	371,000,000	265,053		
Totals	3,099,000,000	3,385,881	73,761,344	11,678.5

¹ Taken from the document "Additional Information for BC Flood and Wildfire Review prepared by Robert W. Gray and Lori D. Daniels." Submission to the BC Flood and Wildfire Review.

PUBLIC ENGAGEMENT SESSIONS

Kamloops-area Open House

February 5, from 2-8 PM

Colombo Lodge (814 Lorne Street)

Cache Creek-area Open House

February 6, from 2-8 PM

Cache Creek Community Hall (1270 Stage Road)

Williams Lake-area Open House

February 13, from 2-8 PM

Pioneer Complex (351 Hodgson Road)

Alexis Creek-area Open House

February 15, from 2-8 PM

Alexis Creek Community Club (2620 Stum Lake Road)

Merritt-area Open House

February 26 from 2-8 PM

Merritt Civic Centre (1950 Mamette Ave)

100 Mile House-area Open House

March 1 from 2-8 PM

100 Mile House Community Hall (240 3rd Street)

Cranbrook-area Open House

March 13, from 2-8 PM

Ktunaxa Nation Government Building (220 Cranbrook Street N.)

Kelowna-area Open House

March 28, from 2-8 PM

Coast Capri Hotel (1171 Harvey Ave)

APPENDIX D

OPEN HOUSE AND WRITTEN SUBMISSION ENGAGEMENT SUMMARY

Planning and Preparedness – Floods

Communications

The most prominent communication themes referenced were the need for two-way communication, and interagency considerations. Within these categories, respondents specifically referenced a hotline, cell phone infrastructure and interagency response to the public. Respondents also noted positive feedback for government communication and annual community discussion considerations.

Education

The overwhelming majority of participants expressed a need for greater public information sharing, particularly as it relates to preparation (home materials/building, insurance, emergency plans), responsibilities (personal vs. municipal/provincial responsibility) and evacuations (response, resources and risks). Participants also talked about the need for more access to formal educational programs, including in schools (embedding flood information into curriculum) and for local responders and other emergency volunteers.

Funding

The primary concern of participants in regards to funding was that municipalities and the province set realistic budgets and spending targets for flood response.

Infrastructure & Tools

In terms of infrastructure and tools, the overwhelming majority of comments centered on concerns around environmental considerations and expressed a need for a greater focus on planning for flood-related infrastructure in their communities. Examples of this infrastructure included culverts, roads/road networks, hydrometric stations, mountain reservoirs and anti-dyke enhancement.

Additionally, participants were concerned with the qualifications of staff responsible for flood programming.

Jurisdictional Issues

The most prominent jurisdictional theme referenced was a desire for a policy on building homes and other infrastructure near flood areas. Participants were also concerned about inter-governmental cooperation and coordination in terms of planning, emergency services, responsibility agreements and developing a standardized manual for all communities.

Knowledge

Participants expressed a desire to have local knowledge integrated into planning and also referenced a desire to know more about the implications of the 2017 fire event, including information about lost trees and agricultural land and debris from backburns.

Climate Change

Participants had two concerns/areas of comment regarding climate change and its relationship to flooding: the fact that severe events are becoming normalized and that they would like to be more aware of the overall effects of climate change.

Planning and Preparedness – Wildfire

Communications

The most prominent communications themes referenced were the need for better two-way communications infrastructure (cellphone and internet) and communications around evacuation routes. In terms of the latter, participants specifically referenced a need for more communication

around policy, practices and infrastructure as well as a desire for better signage.

Education

The most prominent education theme referenced was a desire for greater public information sharing, particularly as it relates to wildfire preparation (home materials/building, insurance, emergency plans), responsibilities (personal vs. municipal/provincial responsibility) and evacuations (response, resources and risks). Participants also talked about the need for more access to formal educational programs for schools (embedding wildfire information into the curriculum), local responders and volunteers, and smokers.

Funding

The majority of comments on funding centered on whether provincial and municipal funding is ongoing and whether the investment in infrastructure, education and wildfire assessment/mitigation/management is sufficient.

Infrastructure & Tools

Participants had many varied comments about wildfire infrastructure and tools. Their concerns focused on four main themes: equipment for local teams; staffing (particularly in small communities); planning and preparation; and air filtration in schools. In terms of staffing considerations, participants questioned whether sharing resources was feasible/practical and whether those responsible for staffing wildfires were trained, available and/or physically equipped for responding.

Jurisdictional Issues

The primary jurisdictional theme referenced was inter-governmental cooperation – particularly in terms of communications, planning, emergency services, standardizing emergency manuals across communities, community connections and collaboration.

Knowledge

The overwhelming majority of respondents indicated a need to incorporate local knowledge – including First Nations and local settlers’ knowledge – into wildfire planning as preparation. As well, many noted a need to focus evacuation plans on emergency routes and also to make plans easier to follow/understand.

Partnerships

Respondents indicated a need for partnerships in the development of emergency plans and also in terms of creating a system for individuals to register themselves and their equipment to support fire suppression.

Participation

Participants indicated a need for greater local involvement, particularly in tiny communities.

Climate Change

The majority of respondents indicated they feel a societal normalization of severe climate events and noted a correlation between this and wildfires.

Prevention and Mitigation – Floods

Communications

The three themes discussed regarding communications and prevention/mitigation were the need for prevention plan transparency, concerns about misinformation and positive feedback toward FLNRORD actions.

Education

In regards to prevention and mitigation education, participants discussed the desire for a public awareness campaign surrounding preventative infrastructure.

Infrastructure & Tools

The overwhelming majority of respondents talked to the theme of proactive considerations for flood prevention and mitigation. Within this topic, a number of suggestions arose including the need for clear creeks, local drainage, earlier lowering of lake levels, building up riverbanks, dredging, dam control, barriers, overlogging, addressing aging infrastructure, resolving damage to private property, evaluating effects on ecosystems and downstream consequences. A small number of respondents also spoke to the need to move infrastructure and buildings away from at-risk locations and also the need for greater access to protective services like sandbags and purchasable resources.

Jurisdictional Issues

Once again, the primary theme discussed in relation to jurisdictional issues was the need for greater interagency coordination. Additionally, respondents talked about public-private considerations and the implication of responders damaging property and how any damages are communicated.

Knowledge

The overwhelming majority of respondents indicated a need to incorporate local knowledge – including First Nations and local settlers’ knowledge – into wildfire planning and preparation.

Climate Change

One respondent indicated the need to reduce the effects of global warming to potentially reduce the risk of further flooding.

Prevention and Mitigation – Wildfire

Communications

The most prominent communications theme referenced was the need to better communicate human-started fire considerations such as the direct impacts of negligence and fines for cigarettes in high-risk areas.

Education

A large portion of education-related comments centered on the need for greater public awareness campaigns, particularly as they relate to cigarettes, prevention, property and response responsibilities. An equal number of people talked about greater education on FireSmart – that it become mandatory and what incentives are offered by insurance companies in exchange for participation be publicized.

Funding

The most prominent funding theme referenced was the need for greater spending on preventative action considerations such as fire breaks, fuel management and water systems. A small number of respondents also talked to the fact that funding for small communities seems insufficient.

Infrastructure & Tools

The majority of respondents expressed a need for a greater focus on fire prevention infrastructure. Within this category, respondents specifically spoke to a need for more buffering/breaks, fireproofing, fire bans, location-specific considerations, fireguards and fire-resistant building materials.

Jurisdictional Issues

The main themes referenced were interagency coordination and public-private considerations. Within these themes, topics included logging industry policy, managing vacant land, preventative action responsibility, enforcement of fire bans, review of logging practices, neighbouring governments, water management and earlier backcountry closure.

Knowledge

The majority of respondents indicated a need to incorporate local knowledge – including First Nations and local settlers’ knowledge – into wildfire prevention and mitigation.

Partnerships

The only comment regarding partnerships in relation to prevention and mitigation indicated the inefficiency of bringing in out-of-province firefighters.

Prescribed Burning (Pro)

The majority of respondents in favour of prescribed burning indicated that their support was to reduce risk of severe wildfires. Topics that came up within this theme included planning, command structure, small backburns, communications and ecosystem restorations. Additionally, respondents highlighted a need to target specific area, including: interface areas, crown land, parks, protected areas and private land.

Prescribed Burning (Con)

The majority of respondents opposed to prescribed burning indicated concerns with backburns, particularly in terms of frequency, monitoring, weather considerations, resource squandering, insufficient warning and damage to property and ecosystems.

Fuel Management

The overwhelming majority of respondents speaking to fuel management as it relates to wildfire prevention and mitigation indicated concerns with removal considerations. Specifically, concerns with low brush, dryfall, livestock grazing, dead timber, flood debris, communal chippers, jurisdictional/regulation considerations, pine beetle spread, density, techniques, enforcement and incentives.

Response – Floods

Communications

The main communications themes referenced were a desire for access to up-to-date information and positive feedback about 2017 flood-related communications. Within the first topic, respondents spoke to wanting more utilization of emergency broadcast systems, community channels, cell phone alerts, website communications, call centres, newspapers, door-to-door warnings, signage, locally relevant information and radio. In terms of positive feedback, topics mentioned included first responders, provincial communications, TNRD (Thompson-Nicola Regional District) and evacuation support.

Infrastructure & Tools

Three themes emerged within the discussion of infrastructure and tools in relation to response: insufficient support, the need for greater human resources – particularly experienced leaders and staffing in at-risk zones – and positive feedback regarding equipment and firefighter support.

Jurisdictional Issues

The overwhelming majority of jurisdictional issues-related comments focused on intergovernmental coordination. Within this theme, respondents talked about coordinating emergency services between communities, evacuation considerations, lack of hierarchical authority, federal supports, potential for a common provincial mapping/operating system and the need for all levels of government to meet together.

Knowledge

The overwhelming majority of respondents indicated a need to incorporate local knowledge – including First Nations and local settlers’ knowledge – into flood response.

Participation

Respondents spoke to volunteer considerations when talking about participation in flood response. Particularly, they indicated the need to utilize locals and show appreciation to volunteers.

Evacuation Considerations

The three main evacuation consideration themes discussed were animal considerations (pets and livestock), communications considerations, and the necessity of evacuation and non-evacuated community considerations.

Response – Wildfire

Communications

The overwhelming majority of respondents talking about wildfire response communications indicated a need for greater access to up-to-date information. Topics within this included meeting livestreams, radio updates, proactive communications, central-source information, setting up a toll-free line, website, emergency broadcast systems, community channels, cell phone alerts, newspapers, display boards and social media. A smaller number of respondents also shared positive feedback on 2017 wildfire response-related communications.

Education

The main education theme as it related to wildfire response was the need for more information on locations of community assets such as infrastructure and geography.

Funding

Four comments were made on funding as it relates to wildfire response: that more provincial and federal support is needed; that funding is sufficient as it stands; to utilize community centres and halls as emergency centres; and that compensation is needed for search and rescue volunteers.

Infrastructure & Tools

Two main themes arose around wildfire response infrastructure and tools: firefighting technology and the need for greater human resources. In terms of the former, specific types of equipment suggested included water bombers, rooftop sprinklers, fire bozz, ironmule, ditches, buffer zones and Martin Mars aircraft. Topics discussed in regards to the latter included hot spot crews, local responders, initial fire attack crews, lookout persons, fire wardens, hours of work, experienced leaders, reporting considerations and military use.

Jurisdictional Issues

The overwhelming majority of jurisdictional issues-related comments focused on intergovernmental coordination. Within this theme, respondents talked about communication, internal organization, emergency services, coordination between communities, sharing plans and best practices, equipment sharing, decision-maker identification, jurisdictional boundary considerations, common mapping systems, mutual aid agreements, allocation of resources, chain of command and permitting.

Knowledge

Three main knowledge themes arose: proactive fighting that utilizes early-morning and nighttime starts, management versus suppression and round-the-clock coverage, and utilizing local knowledge, particularly locations of infrastructure, fire warden knowledge and First Nations and settlers' knowledge.

Partnerships

One respondent noted the need for agreements with local contractors when responding to wildfires.

Participation

Two main themes arose in terms of participation: local equipment and response teams and volunteer considerations. Within these topics, respondents spoke to clarification on certifications, ensuring fitness of volunteers, reducing barriers such as the cost to participate, showing appreciation to volunteers and using local supply/irrigation systems.

Evacuation Issues

The most prominent wildfire evacuation issues were evacuation order communications (particularly local knowledge, perception of RCMP bullying, up-to-date information, the need for compassion, access to information and public awareness), vulnerable population considerations, ensuring necessity of evacuation and stay-behind considerations. Within the latter three, common topics included continuation of essential services, funding supports, evacuation centres, closing at-risk public areas, access to supplies and medical care, security of properties, and freedom of movement.

Recovery – Floods

Communications

The most prominent communications themes were event debrief and review (particularly in terms of local governments maintaining a presence) and transparency (especially when it comes to reporting damages).

Education

The only comment mentioned in terms of education on flood recovery was managed grazing.

Funding

The most prominent funding themes were supports for business and compensation for private property damaged during response efforts. Specific supports for business included small business and farming/ranching concerns, the direct and indirect financial impacts and the potential of zero-interest loans designated for recovery efforts.

Infrastructure & Tools

The majority of comments regarding recovery infrastructure and tools focused on community remediation considerations, including cleanup, debris removal, sandbag removal and compensation for property damage caused directly by floods.

Jurisdictional Issues

The primary jurisdictional theme that arose was the need for intergovernmental cooperation in flood recovery. Participants noted concerns regarding emergency services, ensuring supports and assistance were provided to all affected, coordination of recovery and identifying which parties were taking responsibility for damages.

Knowledge

Responses included themes of local knowledge, evaluation of needs, practice standards enforcement and the need for science-based recovery plans.

Health

The primary health theme referenced was the need for mental health support for those affected, particularly in terms of providing counselling, ensuring adequate funding and helping manage the stress associated with flooding and its consequences.

Recovery – Wildfire

Communications

The most prominent communications theme that arose was event debrief/review considerations including public meetings and gag orders. A secondary theme was transparency as it relates to release of backburn reports, Freedom of Information requests and Red Cross spending.

Education

The only comment mentioned in terms of education on wildfire recovery was managed grazing.

Funding

The most prominent funding themes were simplified processes, supports for businesses and farms and better support/coverage. Within these themes, topics included insurance gap coverage and the speed of claims processing; zero or low-interest loans for rebuilding farms, returning to property and rancher-specific issues; and better overall support (including for home replacement, backburn implications, indirect implications of wildfires and support for small communities and non-profit organizations).

Infrastructure & Tools

The primary infrastructure themes that surfaced were artificial ecosystem recovery and restoration of blocked or damaged infrastructure.

Jurisdictional Issues

The primary jurisdictional theme that arose was the need for intergovernmental cooperation in wildfire recovery. Participants noted concerns regarding emergency services, ensuring supports and assistance were provided to all affected, coordination of recovery and accommodations for evacuees.

Knowledge

The two primary knowledge themes that arose were integrating local knowledge (particularly how/when/where/who to recover) and knowledge-sharing/continuity between wildfire events and cooperating agencies.

Partnerships

Regarding partnerships, participants suggested leveraging networks for needs assessments.

Participation

Four themes that came out of discussions on participation included volunteer considerations, evacuee support, community involvement in policy discussions and community funding lobbies for local non-profits.

Health

The overwhelming majority of respondents spoke to the need for mental health support in the wake of wildfires, particularly acknowledgement of mental health struggles, funding and counsellors. Additionally, respondents spoke to the consequences of air quality being compromised and vulnerable population considerations.

FIRST NATIONS ENGAGEMENT SUMMARY OF FEEDBACK

Planning and Preparedness – Floods

Communications

The most prominent communication themes referenced were the need for community command centres to facilitate communication and information sharing, as well as a tsunami alert system and communications options such as an app for evacuees.

Education

The most common theme relating to education was the importance of competent, trained local teams – particularly in terms of first response training and emergency management training. Secondary themes included FNESS training, youth education considerations (including incorporating traditional knowledge into flood education) and cultural awareness/sensitivity training for volunteers, responders and government representatives.

Funding

The primary concern of participants in regards to funding was ensuring FNESS education was properly supported.

Infrastructure & Tools

In terms of infrastructure and tools in relation to floods, three topics came up: improved data collection technology (particularly drones); archaeological considerations (valuing cultural and historic sites); and the lack of sufficient local resources.

Jurisdictional Issues

The most prominent jurisdictional theme referenced

was interagency considerations, specifically successful cooperation and infrastructure building. Additional themes included mutual aid considerations (particularly an INAC sharing contract with First Nations), creation of regional/provincial EOCs, inclusion considerations (participants referenced the fact that the RD report on increased communications did not include First Nations) and clearly defined roles and responsibilities.

Knowledge

The primary knowledge themes referenced were emergency preparedness planning and incorporating local knowledge. In terms of the former, participants noted the need for broad disaster coverage, greater planning and plans that include First Nations content. Regarding the latter, participants expressed the need to incorporate cultural considerations and First Nations knowledge into planning and coordination of response.

Partnerships

The two themes referenced were resource-sharing considerations and the need for an all-chiefs meeting to review the BCFWR (British Columbia Flood and Wildfire) report.

Participation

The majority of respondents noted the need for local involvement in planning (with RDs) and shared positive feedback regarding volunteers and donors.

Climate Change

Three themes came up in relation to climate change: that the glacial melt is affecting salmon habitats; water supply considerations (Canada's role as a world supplier); and, recognition of the risk/consequences of climate change.

Planning and Preparedness – Wildfire Communications

The most prominent communications themes referenced were the need for designated spokespeople for emergency events – particularly local representatives who can speak on behalf of First Nations and regions – and the potential benefit of community command centres to facilitate streamlined information sharing.

Education

The most prominent education theme referenced was a desire to educate local teams to carry out emergency response and management. Participants suggested incorporating this into the Aboriginal Skills and Employment Training Strategy and also creating on-location emergency management training within First Nations communities. Additional responses included the need for community first aid training, further consultation that includes a needs assessment, local (rather than existing non-local) first responders with geography-specific training, FNESS training, youth education considerations (including incorporating traditional knowledge into wildfire education) and cultural awareness/sensitivity training for volunteers, responders and government representatives.

Funding

The primary concern of participants in regards to funding was ensuring FNESS education and EMBC are sufficiently supported.

Infrastructure & Tools

Participants had many, varied comments about wildfire infrastructure and tools. Their concerns focused on seven main themes: equipment for local teams; insufficient local resources (the lack of dedicated emergency personnel); the inaccessibility/unaffordability of insurance; the perceived weight placed on response rather than planning; improved technology to predict fire locations and collect data; human resources considerations such as strengthening the emergency response teams; and archaeological considerations (particularly valuing cultural and historic sites).

Jurisdictional Issues

The primary jurisdictional theme referenced was interagency considerations – particularly the need for successful cooperation and infrastructure building. Additional considerations included mutual aid agreements, creation of regional and provincial EOCs and the fact that the RD report on increased communications did not include a First Nations voice.

Knowledge

The overwhelming majority of respondents indicated a need for an emergency preparedness plan that applies to all areas including First Nations communities, supplies lists, region-specific evacuation plans, broad disaster coverage and a First Nations voice. Additionally, participants noted the need to incorporate local knowledge (land base, archaeology, culture and traditions) into planning, as well as a need for an updated list of community members and assets.

Partnerships

Respondents indicated a need for partnerships in terms of resource sharing, an AFN Special Chiefs Assembly (as an opportunity for wildfire prevention resolutions) and an all-chiefs meeting to review the BCFWR report.

Participation

The overwhelming majority of respondents indicated a need for local involvement in planning (particularly in terms of partnerships between First Nations and RDs).

Prevention and Mitigation – Floods

Education

In regards to prevention and mitigation education, participants discussed a need for greater awareness surrounding disaster prevention.

Funding

Participants noted the possibility of using the Traditional Language Revitalization Fund to support program development in First Nations language, and also discussed the insufficiency of funding if prevention is the goal.

Prevention and Mitigation – Wildfire

Education

In terms of wildfire education, participants noted a need for both fuel management training and greater widespread prevention awareness efforts, potentially through social media and traditional television advertising.

Funding

The most prominent funding theme referenced was the insufficiency of existing funding if prevention is the goal, particularly in terms of fuel mitigation and DISC (Department of Indigenous Services Canada). Additional comments included the potential of return funding through the Beetle Action Coalition, incentivizing positive forestry practices such as silviculture and debris cleanup and the potential of using the Traditional Language Revitalization Fund for project and program development.

Infrastructure & Tools

Three themes emerged in discussions of infrastructure and tools as they relate to wildfires: ecosystem considerations (such as fisheries, forests, vegetation and environmental impacts), fire prevention initiatives in larger populations (with federal support) and the need for greater prevention rather than response programming.

Jurisdictional Issues

The main theme referenced was policy considerations, particularly diversifying utilization of wood; legislation; the insufficiency of the Forest Stewardship Plan and forest restocking standards. Additional considerations included interagency coordination (support and funding from all levels of government) and preventative measure considerations (off-reserve lands, safety concerns and liability).

Knowledge

The majority of respondents indicated a need to incorporate local knowledge into first responders' training and also to recognize the traditional thinking that animals entering town is a bad sign. Participants also suggested research into traditional burns through FNESS.

Participation

The only two comments regarding participation in relation to prevention and mitigation suggested engaging CP rail in wildfire prevention and involving First Nations in mitigation planning.

Prescribed Burning (Pro)

The majority of respondents in favour of prescribed burning indicated their support to reduce risk. Topics that came up within this theme included recognizing First Nations people as natural fire keepers, a landscape management tool, the

insufficiency of the FLNRORD policy and the need for regular, scheduled burns.

Fuel Management

The majority of respondents speaking to fuel management as it relates to wildfire prevention and mitigation indicated concerns with removal considerations.

Response – Floods

Infrastructure & Tools

The main theme referenced in relation to flood response infrastructure and tools was road network considerations, particularly roadblocks and access to communities.

Jurisdictional Issues

The majority of flood response-related jurisdictional issues comments focused on self-governance considerations, particularly the need for First Nations to manage flood events in their own communities. Additional comments indicated the need for clarifying interagency considerations such as responsibility and accessibility.

Partnerships

In terms of flood response partnerships, respondents spoke to the impropriety of out-of-nation incident management teams rather than FNESS responding, and the need for regional agreements.

Participation

Participants noted that Type 1, 2 and 3 response crews could be assembled.

Response – Wildfire

Communications

The majority of respondents talking about wildfire response communications indicated a need for greater access

to up-to-date information as well as better interagency communications. In terms of the latter, participants noted that communications thus far have been poor and need improvements with IMTs, emergency services and governments. Communications also need to be available in non-English languages.

Infrastructure & Tools

The main theme referenced in relation to wildfire response infrastructure and tools was road network considerations, particularly roadblocks and access to communities. Additional considerations included sufficient local response and continuity of staffing, both in terms of ensuring knowledge transfer and – conversely – providing sufficient breaks for those who become stressed from long periods of work.

Jurisdictional Issues

The overwhelming majority of jurisdictional issues-related comments focused on interagency coordination. Within this theme, topics included responsibility, local accountability, lack of clarity, fire centre support, slow response, communications, EMBC support and regional EOCs/ground crews. A secondary topic was self-governance considerations, particularly the need for First Nations to manage events within their own territories.

Knowledge

Two main knowledge themes arose: the ability of First Nations to predict/read weather patterns and the need for widespread knowledge of traditional-use sites to enable site protection.

Partnerships

Respondents spoke to the impropriety out-of-nation incident management teams rather than FNESS responding, and the need for regional agreements. Additionally, one

participant suggested a First Nations archaeology liaison to ensure cultural boundaries are respected.

Participation

Three main themes arose for participation. The first was internal/external cooperation, such as sharing resources, greater intergovernmental collaboration, and the establishment of a regional model for emergency planning. The second was with respect to volunteer considerations, particularly utilizing locals and gaining permission to access private areas and local equipment. The third main theme was local response team considerations, including the permission process for locals to fight fires, BCWS process considerations, and barriers for local volunteerism, including driver's licenses and training requirements.

Evacuation Issues

One of most prominent themes respondents noted for evacuation issues was post-evacuation considerations, including the return to communities, miscommunication when evacuation orders were lifted, premature evacuation, and access to communities during evacuation orders. Another key theme of evacuation issues is communication, including the noting of hostile communications, the need for RCMP to undergo sensitivity training, and the need to provide evacuees with regular updates. Evacuee lodging considerations also emerged as a prominent theme, specifically instances where hotels were full and community centres were utilized as temporary lodging. First Nations communities noted the parallels between the temporary lodging provided in these circumstances and the experience of residential school survivors. The resulting mental health implications of the triggering effects from this lodging were emphasized, along with the need for general mental health supports. Finally, respondents noted the generally poor treatment of First Nations evacuees through the emergency management response process.

Recovery – Floods

Communications

The most prominent communications themes were continued communications following the emergency event and appreciation of support.

Funding

The most prominent funding themes were the slowness of EMBC reimbursement and the cumbersome process of writing community recovery plans.

Infrastructure & Tools

The majority of comments regarding recovery infrastructure and tools focused on ecosystem recovery considerations, particularly in relation to deer, moose and fish.

Knowledge

Respondents indicated a lack of remediation framework as a knowledge gap in terms of flood recovery.

Recovery – Wildfire

Communications

The most prominent communications theme that arose were engagement considerations (over-engagement with a lack of results), appreciation of support and continued post-emergency communications considerations.

Funding

The most prominent funding themes in relation to wildfire recovery were the slowness of EMBC reimbursement, the cumbersome process of writing community recovery plans and difficulties accessing Red Cross funds.

Infrastructure & Tools

The most prominent consideration noted by First Nations communities for wildfire recovery was infrastructure

considerations. The primary infrastructure theme that surfaced was ecosystem recovery, including notes for grazing land, biodiversity, waterway diversion, as well as traditional food sources such as hunting, fishing, berry collection. Additional themes included rebuilding and upgrading damaged infrastructure, and temporary recovery measures such as cattle guards and livestock relocation.

Knowledge

Respondents indicated a lack of remediation framework as a knowledge gap in terms of wildfire recovery, as well as a need for awareness of continued risk and inclusion considerations (particularly the perception that the Filmon Report ignored First Nations).

Health

The overwhelming majority of respondents spoke to the need for mental health support in the wake of wildfires, particularly in relation to acknowledgement of mental health struggles, and availability of counselling, recognition of trauma, students returning to school abruptly and support for responders.

ONLINE ENGAGEMENT SUMMARY

The BC Flood and Wildfire Review online engagement was completed by 929 individuals.

Q1: The following pages explore questions on each of the four phases [of emergency management]. Please let us know which set of questions you'd like to answer: flood events, wildfire events, or flood and wildfire events.

Over two-thirds of survey respondents chose to provide feedback on wildfire events only. The vast majority of remaining respondents commented on both flood and wildfire events, while only a small percentage commented just on flood events.

Flood Event Questions:

Q2: On a scale of 1 to 10, how vulnerable do you feel your community, neighbourhood, or residence is to future flood events?

The average of all responses was 7, where 1 is not at all vulnerable and 10 is very vulnerable.

Q3: Prior to the 2017 floods, to what degree did you feel your community was prepared for a future flood event?

Reflecting back before the 2017 flood events, nearly half of respondents felt their community was unprepared. Approximately one-third of respondents felt that their community was prepared.

Q4: Does your household currently have a plan to act on an evacuation alert and/or order?

Nearly two-thirds of respondents do not have a plan to act on an evacuation alert and/or order.

Q5: Do you have access to insurance for overland flooding?

Nearly one-third of respondents do not have access to insurance for overland flooding, while a fifth of respondents did not know about their access. Finally, approximately one-tenth identified insurance as being unaffordable.

Q6: Do you feel there are sufficient public education opportunities to help you prepare for flood events in your community?

Nearly two-thirds of respondents did not feel they had sufficient opportunities to be educated on flood preparation in their community. Remaining responses were split almost evenly between those who felt they had sufficient opportunities to engage in public education and those who said they didn't know.

Q7: My community should have regulations preventing development from occurring on floodplains.

More than three-quarters of respondents agreed with this statement.

Q8: My community would benefit from land-use planning on floodplains.

An overwhelming majority of respondents agreed with this statement.

Q9: During the 2017 flood events, who did you primarily seek flood information and guidance from?

Just over one-third of respondents sought flood information and guidance from local government, with the provincial government, sources not listed, emergency responders, neighbours and First Nations government comprising the remaining responses (in descending order). The majority of those who selected “other” turned to either news or social media for information.

Q10: During 2017 events, I felt that flood information was communicated in a timely manner.

Almost half of respondents agreed with the above statement, while just shy of one-third disagreed.

Q11: During the 2017 events, I felt that flood information was communicated accurately and consistently.

Agreement with the above statement was almost identical to the previous question, with a swing of just one response towards disagreement. Almost half of respondents agreed with the statement, while just over one-third disagreed.

Q12: What improvements to communication about floods could be made?

Responses to this open-ended question fell into six primary themes: education; awareness; tools and engagement; better live updates and action; government or authority action; and better services/infrastructure preparation.

Two-thirds of respondents’ comments related to tools and engagement. The majority of these responses indicated a desire for more direct contact as well as more social media

and web-based information, many also suggested more face-to-face or door-to-door communications to better reach the elderly and others without web access or savvy. A number of respondents felt there was a lack of consistency between sources of information, which led to confusion and distrust.

The other major theme among respondent comments was preparation. While these comments did not directly relate to communication activities, they were strongly noted. Comments around preparation cited the greater need for sandbags and community emergency response plans and efforts.

Q13: Have you ever been evacuated from your community as a result of a flood event?

The overwhelming majority of respondents had not been evacuated. Of those who had been evacuated (just one-tenth of respondents), one-third either stayed behind or returned during the order.

Q14: What challenges did you experience in evacuating from a flood event?

The majority of comments related to respondents feeling they received unclear directions for evacuation. One-quarter related to the financial burden of evacuating, while just under one-quarter related to respondents having physical difficulty moving through the evacuation.

Q15: If you utilized government supported lodging, how satisfied were you with the accommodations offered?

All but one respondent who utilized lodging were either satisfied or neutral on their accommodations.

Q16: If you have ever accessed the Disaster Financial Assistance Program due to a flood, how satisfied were you with it?

Almost half of respondents who had accessed the Disaster Financial Assistance Program were dissatisfied. One-third were satisfied.

Q17: How satisfied were you with the health care services you were provided, or had access to, following a flood event? Please consider emergency services, the return of local health services, the increased demand on local services, and the capacity of local services to provide mental health support.

Respondents were almost evenly divided, with approximately one-third of respondents each satisfied, dissatisfied and neutral with health care services they were provided or had access to.

Q18: If you have experienced the disruption and/or loss of critical infrastructure (ie: road access, power, medical services, school), how satisfied were you with the timeframe in which it was restored?

Nearly half of respondents who experienced disruption in or a loss of critical infrastructure were satisfied with the timeframe in which their services were restored. Almost a third were dissatisfied.

Q19: Have you ever experienced a disruption in your employment, or business operations as an owner, because of a flood event?

More than three-quarters of respondents have not experienced a workplace disruption.

Q20: Please select the timeframe that best describes how long it took for you to return to work.

Just over half of respondents whose work was disrupted resumed working less than two weeks after the evacuation order was lifted. A small percentage started back at work between two weeks and three months after the order was lifted.

Q21: Please select the extent to which your work resumed.

More than half of respondents whose work was disrupted returned to work at the capacity as before the evacuation. One-quarter began in a reduced capacity but eventually returned to normal, while the remainder either returned to work, but never returned to normal or did not return to work at all.

Q22: Are there any additional comments or recommendations you'd like to provide?

The overwhelming majority of comments related to infrastructure and tools, with the second-largest volume of comments relating to jurisdictional issues.

Many respondents cited aging infrastructure as well as a lack of proactive flood prevention (dredging lakes, drainage issues, etc.) as an issue for their area. Respondents from many regions indicated their respective municipalities do not do enough to prepare for or inspect flood risks and felt action is taken too late to prevent damages.

A number of respondents used the comments area to express gratitude to emergency responders and volunteers and also to compliment authorities on their response.

Wildfire Event Questions

Q25: One a scale of 1 to 10, how vulnerable do you feel your community, neighbourhood or residence is to future wildfire events?

The average of all responses was 8, where 1 is not at all vulnerable and 10 is very vulnerable.

Q26: Prior to the 2017 wildfires, to what degree did you feel your community was prepared for a future wildfire event?

Half of respondents felt their community was unprepared when reflecting on the time before the 2017 wildfires. Just one-third felt their community was prepared.

Q27: Does your household currently have a plan to act on a potential evacuation alert and/or order?

Three-quarters of respondents have a plan to act on an evacuation alert and/or order.

Q28: Do you have access to fire insurance?

More than three-quarters of respondents have access to fire insurance. The remaining respondents were evenly split between not having access to fire insurance, being unsure about their coverage and identifying insurance as being unaffordable.

Q29: Are you familiar with FireSmart activities that can be undertaken at your residence, neighbourhood or community?

Nearly eight in 10 respondents are familiar with FireSmart activities.

Q30: Please select all the FireSmart activities you are familiar with.

Nine in 10 respondents were familiar with the practice of clearing excess debris, branches and trees immediately surrounding structures. Eight in 10 knew to mow their grass and keep fields free of flammable materials, while six in 10 knew to use fire resistant building materials. Half of respondents recognized the importance of working with their neighbours and also to plant fire resistant trees, bushes and plants.

Q31: Buildings or structures in high-risk wildfire areas should be required to utilize fire-resistant building materials.

Nearly three-quarters of respondents agreed that buildings in high-risk areas should be required to utilize fire-resistant materials. The majority of remaining respondents were neutral on the topic.

Q32: Fuel management includes the removal of excess timber and reducing underbrush. I feel my community could benefit from fuel management activities.

The overwhelming majority of respondents (more than nine in 10) strongly agreed that their community could benefit from fuel management activities.

Q33: Prescribed fires or burns are a method to minimize wildfire threats. I feel my community could benefit from prescribed burning.

Just over three-quarters of respondents agree that their community could benefit from prescribed burning. A small percentage of respondents (fewer than one in 10) disagree.

Q34: Where do you feel the greatest public education opportunities are to help prevent and mitigate wildfire events?

More than half of respondents felt home and community – i.e. FireSmart information – provided the greatest opportunity to prevent and mitigate wildfire events. Nearly one-quarter felt outdoor recreationalists presented an opportunity, while a small percentage selected “other.” Write-in options pointed to the fact that some respondents felt all options were equally important.

Q35: During the 2017 wildfires, who (primarily) did you seek information and guidance from regarding appropriate action and response?

Just over one-third of respondents sought information from their local governments, while nearly a quarter turned to their provincial government. A small percentage sought information from emergency responders and neighbours.

Q36: During the 2017 events, I felt that wildfire information was communicated in a timely manner.

Just over half of respondents disagreed that wildfire information was communicated in a timely manner during the 2017 events, while just under half agreed.

Q37: During the 2017 events, I felt that wildfire information was communicated accurately and consistently.

Respondents were split almost equally between agreeing and disagreeing that wildfire information was communicated accurately and consistently during the 2017 events. Almost five in 10 respondents disagreed, while just over four in 10 agreed.

Q38: What improvements to communication about wildfires could be made?

Responses to this open-ended question fell into eight primary themes: education; awareness; tools and engagement; better live updates and action; government or authority action; better services/infrastructure preparation; more trusted information; and more detailed coverage.

The most popular response areas were tools and engagement, better live updates and action and more trusted information.

Respondents indicated a need for greater information about areas outside the urban centres, more consistent information sources and more accessible information for those not well connected via internet and social media. A few respondents noted a desire to receive information from trusted people local to their communities and also a need for more timely information.

Q39: Have you ever been evacuated from your community as a result of a wildfire event?

More than half of respondents had been evacuated from their community as a result of a wildfire event. Of those, approximately eight in 10 left their community as instructed, while the rest stayed behind or returned during the order.

Q40: What challenges did you experience in evacuating from a wildfire event?

More than one-third of respondents felt they received unclear directions and information regarding evacuation. A quarter of respondents cited difficulty with logistics, with recurrent mentions of particular difficulty finding lodging/accommodations for pets. As was the case with flood

respondents, many wildfire respondents also had physical difficulty with the evacuation process.

Q42: If you utilized government supported lodging, how satisfied were you with the accommodations offered?

The vast majority of respondents had not utilized government supported lodging. Of those who had, nearly two-thirds were satisfied with the accommodations offered.

Q43: If you have accessed the Disaster Financial Assistance Program due to the impacts of a wildfire event, how satisfied were you with it?

Nearly two-thirds of respondents who had accessed the Disaster Financial Assistance Program due to the impacts of a wildfire event were satisfied with the program. Just a small percentage of those who had accessed the program expressed dissatisfaction.

Q44: How satisfied were you with the health care services you were provided, or had access to, following a wildfire event? Please consider the provision of emergency services, restoration of local health services, the ability of local services to meet increased demand, and the capacity of local services to provide mental health support.

Of those who chose to answer the question (fewer than half of total survey respondents), the majority were satisfied with health care services they were provided or had access to following a wildfire event.

Q45: If you have experienced the disruption and/or loss of critical infrastructure (i.e. road access, power, medical services, school), how satisfied were you with

the timeframe in which it was restored?

Half of respondents who had experienced a disruption or loss of critical infrastructure were satisfied with the timeframe in which their services were restored. Nearly one-third were dissatisfied, while the remainder were neutral.

Q46: Have you ever experienced a disruption in your employment, or business operations as an owner, because of a wildfire event?

Nearly six in 10 respondents had not experienced a disruption to their work because of a wildfire event.

Q47: Please select the timeframe that best describes how long it took you to return to work.

Nearly two-thirds of respondents whose work was disrupted resumed working less than two weeks after the evacuation order was lifted. One-third started back at work between two weeks and three months after the order was lifted, while a small percentage either started more than three months after the order was lifted or never resumed working.

Q48: Please select the extent to which your work resumed.

One-third of respondents whose work was disrupted returned to work at the capacity as before the evacuation. Just shy of one-quarter began in a reduced capacity, but eventually returned to normal, while the remainder either returned to work, but never returned to normal or did not return to work at all. A small percentage of respondents' pre-event workforce did not return to the community.

Q49: Are there any additional comments or

recommendations you'd like to provide?

The majority of comments – while spanning a variety of subject areas – boiled down to respondents wanting to feel as though their communities and the province were more proactive in preparing for wildfire events. They indicated a desire for better/more robust communication systems (that would require pre-event development/implementation), more and better information about how people can make their homes more fire resistant and plans to help essential services and critical businesses (food, medical, etc.) stay operational for those working on the fires.

Demographic Questions

Q50: I was directly affected by 2017 flood and wildfire events in B.C.

More than three-quarters of respondents were directly affected by 2017 flood and wildfire events.

Q51: I have been directly affected by flood and wildfire events in previous years in B.C.

More than half of respondents (nearly six in 10) had not been directly affected by flood and wildfire events prior to 2017.

Q52: I live in the following region:

Half of all respondents identified as living in the Cariboo Chilcotin Coast area. One-quarter live in Thompson-Okanagan, while the remainder live in – in descending order – Kootenay Rockies, Northern BC, Vancouver Coast and mountains, and Vancouver Island.

Q53: What community do you live in, or what is the closest community you visit regularly?

The 10 most popular communities were (in descending order):

- Williams Lake
- 100 Mile House
- Quesnel
- Kamloops
- 108 Mile Ranch
- Kelowna
- Cranbrook
- Vernon
- Clinton
- 70 Mile House

The remaining communities had fewer than 15 responses.

APPENDIX E

QUESTIONS FOR FURTHER THOUGHT

This appendix includes those questions posed at the end of each section, captured here in one place.

SECTION 1.0 INTRODUCTION

Why should government take this report and recommendations seriously?

SECTION 2.0 THE 2017 SEASON: SETTING THE CONTEXT

What lessons can be learned from the 2017 experience?

SECTION 3.0 THE FOUR PILLARS OF EMERGENCY MANAGEMENT

Is there a way to simplify understanding about disaster management so British Columbians can: a) better prepare for emergencies, and b) have a clear idea of what to expect before, during and after a disaster and where they can turn?

SECTION 4.0 THE ENGAGEMENT PROCESS

How can engaging British Columbians lead to better solutions in emergency management?

SECTION 5.0 WHAT WE HEARD

How can what we heard around emergency management be turned into practical, workable solutions?

SECTION 6.0 OUR RECOMMENDATIONS

How can we all work together to bring these recommendations to life?

SECTION 7.0 LEARNING FROM THE 2017 EXPERIENCE

Where do we go from here?



