
WILDFIRE CRISIS IN BRITISH COLUMBIA

A system analysis of the economic,
environmental and socio-cultural impacts of
wildfires

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EXECUTIVE SUMMARY

Wildfires are becoming the "new normal" across the world. Many fire regimes across the globe are seeing an increase in devastation due to wildfires.[1] In Canada alone, wildfires are increasing with an average of 8000 fires and 2 million hectares of land burned annually, while in northern European countries, 20 to 200 times the normal area have burned.[2]

We are a team of SFU and UBC students working to better understand the factors and constraints influencing wildfire management in our province, British Columbia (BC). Through extensive research, we've explored the challenges within the wildfire landscape in BC, mapped the existing solutions effort, identified gaps and levers of change and learned key lessons on the complexity of this growing challenge.

Climate Change

Global average temperatures are expected to rise between 2 °C and 6 °C by the end of the 21st century.[3] The average mean temperature in Canada has increased by 1.7 °C from 1948 to 2016, double the global rate.[4] Canada's west coast will expect a 50% increase of more extreme wildfires as temperatures continue to rise.[5] Other places, like the United Kingdom, are expected to see a 30 - 50% increase in wildfires in the next 60 years.[6] The change in temperature and precipitation alters habitable environments that create perfect dry conditions for fires to spread. The results of the changing climate forges wildfires that have economic, environmental and socio-cultural impacts.

[1] Lui, Y., John Stanturf, & Scott Goodrick. "Trends in global wildfire potential in a changing climate." Elsevier, September 1, 2019. https://www.srs.fs.fed.us/pubs/ja/2010/ja_2010_liu_001.pdf.

[2] B.J. Stocks Wildfire Investigations Ltd. "Evaluating Past, Current and Future Forest Fire Load Trends in Canada." B.J. Stocks Wildfire Investigations Ltd., January, 2013. <https://www.ccfm.org/pdf/2%20Fire%20Load%20Trends.pdf>.

[3] Nasa Earth Observatory. "How much more would will Earth Warm?" Nasa Earth Observatory. June 3, 2010. <https://earthobservatory.nasa.gov/features/GlobalWarming/page5.php>.

[4] Government of Canada. "Changes in Temperature." Government of Canada, (Accessed April 16, 2019) <https://www.canada.ca/en/environment-climate-change/services/climate-change/canadian-centre-climate-services/basics/trends-projections/changes-temperature.html>

[5] Ibid.

[6] Tracy Ollerenshaw. "Wildfires: why they start and how they can be stopped." BBC News, October 13, 2017. <http://www.bbc.co.uk/newsbeat/article/41608281/wildfires-why-they-start-and-how-they-can-be-stopped>

Why Research Wildfires in BC

In order to understand the global crisis, we believed it was best to narrow our research to our home province. As of August 2018, BC ranks sixth globally, after districts in Australia and Congo, in the greatest number of fire alerts by district. [7] In BC, wildfires were not seen as a significant crisis until 2003 when more than 265,000 hectares of land was burned and the community of Barriere was destroyed.[8] [9] Despite the destruction, the BC Government did not improve the prevention, response or recovery systems of fire management. Fourteen years later, the 2017 wildfire season confirmed how unprepared BC was; prompting the longest Provincial State of Emergency.[10] BC's 2018 wildfire season surpassed its own record from the year before, when more than 1.35 million hectares of land was burnt.[11]

Research Methods

Our research was compiled through:

- 26 in-depth interviews with forest professionals, forest industry, government organizations, fire fighters, Office of the Fire Commissioner, volunteers of non-government organizations, victims of the wildfires, and an UBC environmental law professor
- Government publications, academic journals, and a variety of news articles
- Surveying 100 people across BC

[7] Global Forest Watch Fires. "Fire Report for All." Global Forest Watch Fires, Accessed May 17, 2019. <https://fires.globalforestwatch.org/report/index.html#aoitype=ALL&reporttype=globalcountryreport&dates=fYear-2018!fMonth-8!fDay-1!tYear-2019!tMonth-5!tDay-12>.

[8] Interviewee 0001, Ministry of FLNRORD representative. Interviewed by Vanessa Sun, March 15, 2019.

[9] The University of Lethbridge. "The McLure Fire 2003." UoL, The Faculty of Health Science, August 2010.

[10] Government of B.C. "Wildfire Season Summary." Government of B.C., (Accessed February 25, 2019). <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history>.

[11] Bethany Lindsay. "2018 now worst fire season on record as BC extends state of emergency." CBC News, August 29, 2018. <https://www.cbc.ca/news/canada/british-columbia/state-emergency-bc-wildfires-1.4803546>.

PROBLEM LANDSCAPE

RECENT IMPACTS OF BC

Economic

The BC wildfires costed \$568 million for fire suppression and caused over \$127 million in insured damages.[12] Local businesses closed due to little insurance coverage.[13] Many of BC's core industries were negatively impacted. The forest industry faced a tremendous loss of economic value for their resources and operations were forced to shut down.[14] The tourism industry struggled due to air quality concerns affecting outdoor activity. Affected hydroelectric dams had difficulty producing sufficient hydroelectricity.[15] For the transportation industry, The Canadian National Railway and Dan Chambers Trucking were forced to halt or reroute, costing jobs and millions of dollars.[16] Lost jobs during and after the wildfires pushed people to leave their community.[17]

Environmental

1.2 million hectares of land was burnt in 2017.[18] Severe fires negatively impact the recovery of vegetation, alters nutrient cycles, creates an abundance of invasive pests, and increases tree mortality.[19] Additionally, wildfires scorch soil layers, producing a hydrophobic layer that makes areas susceptible to erosion and flooding.[20]

[12] Insurance Bureau Canada. "British Columbia wildfires cause more than \$127 million in insured damage." September 27, 2017. <http://www.ibc.ca/bc/resources/media-centre/media-releases/british-columbia-wildfires-cause-more-than-127-million-in-insured-damage>.

[13] Interviewee 0014, Restaurant Owner in Fort McMurray. Interviewed by Devan Parmar, March 28, 2019.

[14] 0009, Export Market Sales. Weyerhaeuser. Interviewed by Joanne Nellas, March 12, 2019.

[15] 0001, Ministry of FLNRORD representative. Interviewed by Vanessa Sun, March 15, 2019.

[16] Liz Brown. "How B.C.'s wildfires are impacting transportation lines." July 13, 2017.

https://www.kelownanow.com/watercooler/news/news/Provincial/How_B_C_s_wildfires_are_impacting_the_transporting_of_goods_and_services/#fs_73507.

[17] Interviewee 0001, Ministry of FLNRORD representative. Interviewed by Vanessa Sun, March 15, 2019.

[18] Government of BC. "Wildfire History." Government of BC: BC Wildfire Service, (Accessed February 25, 2019) <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/remembering-2017>.

[19] Stone, Carter and Andrew Hudak and Penelope Morgan. "Forest Harvest Can Increase Subsequent Forest Fire Severity." Proceedings of the Second International Symposium on Fire Economics, Planning, and Policy: A Global View, (2004), 531.

[20] Keller et al., Natural Hazards: Earth's Processes as Hazards, Disasters and Catastrophes.

The hydrophobic soil creates sediments that makes the waters undrinkable and increases landslides in burned areas.[21] Smoke from fires increase the concentration of particles in the atmosphere for weeks to months, negatively impacting human and wildlife health.[22] In the summer of 2017, people in Metro Vancouver were breathing in the equivalent of 7 cigarettes everyday.[23]

Socio-cultural

The wildfires displaced over 65,000 people and prompted the longest Provincial State of Emergency since 2003.[24] Wildfires impacted the mental health of communities. Evacuations are “one of the most stressful events that people can experience.”[25] Affected communities are still “struggling to rebuild their homes, restore the environment and revive local economies.”[26] Other residents face long periods of poor air quality which increases anxiety.[27]

Wildfires affect First Nations (FN) communities who have a 33 times greater chance of facing evacuation due to their location in remote areas surrounded by forests.[28] Evacuations force FN to relocate to urban areas for school and employment, making it hard to rebuild and retain cultural activities.[29] Long term displacement has negative consequences for community cohesion, mental health and psychosocial well-being.[30]

[21] Interviewee 0001. Ministry of FLNRORD representative. Interviewed by Vanessa Sun, March 15, 2019.

[22] Jesse Ferreras. “BC wildfire smoke isn’t just floating across Canada.” August 25, 2018. <https://globalnews.ca/news/4406758/bc-wildfire-smoke-canada-ireland/>.

[23]

[24] Government of BC. “Wildfire Season Summary.” Government of B.C., (Accessed February 25, 2019). <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history>.

[25] Clare Henning. “Stressed and tired? It may be lingering mental health impacts from 2017 wildfires.” July 28, 2018.

<https://www.cbc.ca/news/canada/british-columbia/wildfires-2017-mental-health-impacts-1.4764269>.

[26] Globe and Mail. “Communities still recovering one year after worst wildfire season on record in B.C.,” The Globe and Mail, Published July 8, 2018. <https://www.theglobeandmail.com/canada/british-columbia/article-communities-still-recovering-one-year-after-worst-wildfire-season-on/>.

[27] Tiffany Crawford. “BC Wildfires 2018: Mental health a concern as smoke chokes province.” August 23, 2018. <https://vancouversun.com/news/local-news/mental-health-a-concern-as-wildfire-smoke-continues-to-choke-province> (accessed February 03, 2019).

[28] Indigenous Corporate Training Inc. “Forest Fires and Indigenous Communities” Indigenous Corporate Training Inc. Published September 27, 2018. <https://www.ictinc.ca/blog/forest-fires-and-indigenous-communities>

[29] Indigenous Corporate Training Inc. “Forest Fires and Indigenous Communities” Indigenous Corporate Training Inc. Published September 27, 2018. <https://www.ictinc.ca/blog/forest-fires-and-indigenous-communities>

[30] Ibid.

Restrictive Policies and Legal Structure

Since 1945, policies have emphasized suppression instead of mitigation with limited understanding of fuel management.[31] BC's four-year electoral based government prolongs the rate at which policy and legislation are passed. This stagnation restrains fire prevention programs like FireSmart, who provide education and resources, from being widely enforced throughout vulnerable communities.[32]

BC has one of the strictest forest regulations in the world due to strong concerns from communities about extensive logging. This leads to firm reforestation procedures and dense forests with excess fuel for fires to spread rapidly.[33] Thus, government organizations involved in wildfire management like the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) have to work within a restrictive legislative framework to create a fire resilient landscape.[34]

Perspectives on Wildfires and Prescribed Burning

Media campaigns from the 1940s such as "Smokey the Bear," villainized fire and created a public perception that all fire is detrimental to forest health. This resulted in a cultural belief that fails to recognize that forests are dynamic and that fire is a natural regenerative tool for forests.[35] Due to this anti-fire culture, prescribed burning, an Indigenous fuel management solution, has become contentious despite its past successes. Although BC Wildfire Services (BCWS) attempts to let benevolent fires extinguish themselves, communities pressure them to enhance fire suppression because of air quality concerns. Forest professionals are urging FLNRORD to adopt more prescribed burning to manage the level of fuel available for the fires.[36] Two core arguments have emerged regarding wildfire suppression and prescribed burning. One

[31] Lori Daniels, Robert Gray and David Bowman. "We created BC's wildfire problem and we can fix it." The Globe and Mail, Published July 13, 2018. <https://www.theglobeandmail.com/opinion/we-created-bcs-wildfire-problem-and-we-can-fix-it/article35686104/>.

[32] FireSmart. "FireSmart Communities: British Columbia." FireSmart. (Accessed February 28, 2019 <https://www.firesmartcanada.ca/firesmart-communities/british-columbia/>

[33] Interviewee 0005, General Manager of Forestry for the Council of Forestry Industry. Interviewed by Joanne Nellas, March 26, 2019.

[34] Interviewee 0003, Land and Resource Coordinator Okanagan Shuswap Natural Resources District. Interviewed by Vanessa Sun, March 14, 2019.

[35] Ibid.

[36] Brend, Yvette. "Forget Smokey the Bear: How First Nation fire wisdom is key to megafire prevention." CBC News, Published July 15, 2017. <https://www.cbc.ca/news/canada/british-columbia/fire-fighting-first-nations-firekeepers-annie-kruger-penticton-bc-wildfire-mega-fire-1.4205506>.

argument supports reactive measures like fire suppression because they protect the livelihoods of communities. The second argument is that proactive measures like prescribed burning are more effective and have long term benefits.

The divide affects all stakeholders: forest professionals, government agencies (FLNRORD, fire departments, Emergency Management BC (EMBC)), FireSmart, communities, FN reserves, and industries.

Our team surveyed 100 people in BC's lower mainland area, located southwest of most fires, to understand how the cities with BC's largest population perceived and understood the wildfire crisis. 87.9% felt affected by the wildfires due to air quality related issues: smoke and health. 62% felt only a little informed about the crisis, and 73% were not knowledgeable about any policy and or practices put in place by the Governments for wildfire prevention and recovery efforts. A problem therefore arises when over 50% of BC's population are not educated enough to make informed voting decisions when electing politicians that can pass wildfire legislation.

Lack of Funding and Resources

In 2017, BC budgeted \$63 million to fire management, but spent more than \$649.5 million.[37] Premier Horgan recently upgraded the budget to \$101 million for 2019 wildfire response. Many critics argue this is still not sufficient. [38]

A vicious cycle begins when most of the budget is spent on firefighting, reducing the funds available to manage the forest and prevent fires from occurring in the first place.[39] Furthermore, municipalities have to compete against each other to win grants for their forest management projects or compete for funding programs such as the Forest Enhancement Society and the Forest Carbon Initiative.

[37] Government of BC, "Budget and Fiscal Plan 2016/17 - 2018/19." Government of BC, (Accessed March 23, 2019) https://bcbudget.gov.bc.ca/2016/bfp/2016_budget_and_fiscal_plan.pdf.

[38] Thom, Shelby. "More money in BC budget for wildfire response as natural disaster costs soar." Global News, Published February 20, 2019. <https://globalnews.ca/news/4981568/bc-budget-wildfire-costs/>.

[39] Interviewee 0016, Forest Professional, Forestry Ltd. Interviewed by Devan Parmar, March 25, 2019.

Inefficient Emergency Response

As wildfire seasons become longer, there is an increased need for more volunteers to assist in Emergency Social Services (ESS). Elongated evacuation orders induce volunteer burnout and there is trouble incentivizing people to replace them. Over 4,700 personnel were engaged in fighting wildfires across BC in 2017 and around 800 troops from the Canadian Forces were involved.[40] The 2017 wildfire season revealed a lack of well-trained leaders on task forces and demonstrated how a firefighter's performance decreases when responding to disasters outside of their typical urban environment.[41] A new structure was created to resolve these issues but it uncovered jurisdictional challenges in coordinating response efforts between the separate entities of BCWS and municipal fire departments. If one party requires support from the other, there are lengthy procedures that involve writing up transactions, tracking time, and filling out proposals—delaying response time.[42] In addition to this inefficient transactional relationship, the “after action report” produced by the military revealed a lack of resources and equipment,[43] such as military ambulances and communication devices that were ‘unreliable’ or not serviceable.[44]

[40] Laura Kane. “225 Canadian Armed Forces members headed to B.C.” Global News, July 20, 2017. <https://globalnews.ca/news/3613115/225-canadian-armed-forces-members-headed-to-b-c/>

[41] Interviewee 0017, Office of the Fire Commissioner. Interviewed by Michael Simoes, March 13, 2019.

[42] Interviewee 0018 interviewed by Michael Simoes, March 17, 2019.

[43] Patrick Cain. “‘Unusable’ radios plagued troops fighting 2017 B.C. Wildfires.” Global News, August 8, 2018. <https://globalnews.ca/news/4364688/bc-wildfire-2017-radios-military/>

[44] Patrick Cain. “‘Unusable’ radios plagued troops fighting 2017 B.C. Wildfires.” Global News, August 8, 2018. <https://globalnews.ca/news/4364688/bc-wildfire-2017-radios-military/>

SOLUTION LANDSCAPE

After the 2017 wildfires, communities were able to voice their judgements and requests for the future in community open house events, outlined in the comprehensive Government Action Plan: Responding to Wildfire and Flood Risks (2017) by Abbott and Chapman.[45] The main concerns were: greater information sharing from the government, efficient fuel management practices and greater evacuation resources during and after an order is lifted. [46] The BC Government took these requests into consideration when planning for the following year.[47]

COMMUNITY PLANNING

Wildfire Education and Awareness

Communities are provided with education and awareness programs like FireSmart, to aid in household emergency preparedness. EMBC is establishing a “Master of Disaster” Grade 6 program across BC.[48] With communities more educated and knowledgeable about their personal risks and potential fire-caused damages, they are more willing to plan, prepare and minimize the amount of fuels around their yards.

First Nations (FN)

The recent collaborative emergency management agreement between Canada, BC, and the Tsilhqot’in National Government strengthened the relationship with FN. FLNRORD is employing FN liaison contractors to provide traditional knowledge and advice.

[45] Government of BC. Emergency Management British Columbia and Ministry of Forests, Land, Natural Resource Operations and Rural Development, “Government’s Action Plan: Responding to wildfire and flood risks” Government of BC, October 31, 2018.

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

[46] Abbott and Chapman, “Addressing the New Normal: 21st Century Disaster Management in British Columbia.”

[47] Ibid.

[48] Government of BC. Emergency Management British Columbia and Ministry of Forests, Land, Natural Resource Operations and Rural Development. “Government’s Action Plan: Responding to wildfire and flood risks.” Government of B.C., EMBC, FLNRORD, October 31, 2018.

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

A First Nations Health Authority senior executive role was established at the Health Emergency Management BC to represent FN interests.[49] BCWS is also presently training and employing FN emergency firefighter crews.[50] BC can look to Australia's West Arnhem Land Fire Abatement Project as a guide on how to effectively incorporate the First Nations communities. The project works collaboratively with Indigenous fire managers who earn carbon credits by engaging in fuel management projects. With fuel management, they reduce widespread intense fires and reduce carbon emissions while employing Indigenous people.[51]

Funding

The BC Government is dedicating \$72 million in funding for three years of wildlife recovery and reinforcing communities' resilience to wildfires.[52] The funding is two-fold, in which \$50 million is provided for the new Community Resiliency Investment Program (CRI) that aims to minimize risks of wildfires around FN and other communities. The remaining \$22 million is set aside to support land-based recovery in heavily impacted areas, such as rehabilitating rangelands and initiating reforestation.[53]

The Strategic Wildfire Prevention Initiative, managed by First Nations' Emergency Services Society, FLNRORD and Union of BC Municipalities, is funded by the BC Government to support communities in mitigating risks from wildfires.[54] The Community Wildfire Protection Plan Program will assist local governments and FN in identifying the levels of wildfire risk to their communities and providing resources for reducing those risks.[55]

Additionally, EMBC has partnered with the Canadian supermarket chain, Save-On-Foods, and retail store chain, London Drugs, to develop a complete yet affordable emergency preparedness kit.[56]

[49] Government of BC. Emergency Management British Columbia and Ministry of Forests, Land, Natural Resource Operations and Rural Development. "Government's Action Plan: Responding to wildfire and flood risks." Government of B.C., EMBC, FLNRORD, October 31, 2018. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/action_plan.pdf.

[50] *ibid*.

[51] Gerster, Jane. "Forest Fires Forest Management." Global News, Published August 26, 2018. <https://globalnews.ca/news/4406900/forest-fires-forest-management/>.

[52] Government of BC. Emergency Management British Columbia and Ministry of Forests, Land, Natural Resource Operations and Rural Development. "Government's Action Plan: Responding to wildfire and flood risks." Government of B.C., EMBC, FLNRORD, October 31, 2018. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/action_plan.pdf.

[53] Government of BC. Emergency Management British Columbia and Ministry of Forests, Land, Natural Resource Operations and Rural Development. "Government's Action Plan: Responding to wildfire and flood risks." Government of B.C., EMBC, FLNRORD, October 31, 2018. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/action_plan.pdf.

[54] Union of B.C. Municipalities. "Community Wildfire Protection Plan & CWPP Update Program." Strategic Wildfire Prevention Initiative: UNBC, FNES, January 2018. <https://www.ubcm.ca/assets/Funding-Programs/LGPS/SWPI/Applications2017/swpi-2017-update-cwpp-program-guide.pdf>.

[55] *Ibid*.

[56] *Ibid*.

Prescribed Burning

Prescribed burning is a tool that restores fire maintained ecosystems through an application of controlled fires within a contained area.[57] Currently, there is a vicious suppression cycle where the increase in fire suppression has caused flammable debris to accumulate, thus increasing the likelihood of uncontrollable wildfires.[58] BCWS is currently trying to use prescribed burning to alleviate this cycle.[59]

Strategic Fuel Breaks

Strategic fuel breaks are techniques that remove trees and create gaps in the forests to minimize the spread of wildfires and reduce the property damage that may impact communities, businesses, and commercial industries. In doing so, the BC Government administers and encourages forest tenures to harvest or salvage dead, dry trees, especially those near communities. However, this solution has a recruitment challenge because implementing strategic fuel breaks is both mentally and physically exhausting.[60] Another challenge is that harvesting is not always effective in reducing the intensity or severity for subsequent fires, as salvage harvesting adds fine fuels to the forest floor.[61]

RECOVERY EFFORTS

Recovery Services

EMBC updated ESS policy framework for hosting displaced communities and providing additional human resources during peak disaster periods.[62] ESS is a temporary public aid to support evacuees with 72 hours of lodging, food, clothing, basic toiletries, prescriptions and emotional support.[63]

[57] Government of BC. "Prescribed Burning." Government of B.C., (Accessed March 11, 2019). <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/prescribed-burning>.

[58] Charlie Shield and Ruby Russell, "Climate change sets the world on fire," DW, August 24, 2018 <https://www.dw.com/cda/en/climate-change-sets-the-world-on-fire/a-40152365>

[59] Interviewee 0003, Land and Resource Coordinator Okanagan Shuswap Natural Resources District. Interviewed by Vanessa Sun, March 14, 2019.

[60] Interviewee 0003, Land and Resource Coordinator Okanagan Shuswap Natural Resources District. Interviewed by Vanessa Sun, March 14, 2019.

[61] Carter Stone, Andrew Hudak and Penelope Morgan. "Forest Harvest Can Increase Subsequent Forest Fire Severity." Proceedings of the Second International Symposium on Fire Economics, Planning, and Policy: A Global View. (2004), 531.

[62] Government of BC, Emergency Management British Columbia and Ministry of Forests, Land, Natural Resource Operations and Rural Development, "Government's Action Plan: Responding to wildfire and flood risks." Government of BC, EMBC, FLNROD. October 31, 2018. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/action_plan.pdf

[63] Government of BC, Emergency Management BC. "Emergency Social Services." Government of BC., EMBC. (Accessed February 26, 2019) <https://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery/volunteers/emergency-social-services>.

In addition, homeowners or tenant insurance may provide evacuees with greater support than public aid, such as private accommodations.[64] New resources such as interactive maps of evacuations, the locations and hours of ESS centres, safety and preparedness information and advice on returning home were created.

The Canadian Government is offering two main programs for financial assistance and resources to small businesses as they begin to rebuild. The Canada Small Business Financing Program helps make loans easily accessible to smaller businesses.[65] The Employment Insurance Work Sharing Program offers workers income support when business activity is reduced beyond the employer's control.[66]

Mental Health

In 2017, the federal and provincial governments and regional health authorities developed Wildfire Mental Health and Wellness funding plans to provide mental health resources and support for disaster victims.[67] Talk in Tough Times, was designed by the Canadian Mental Health Association for those experiencing stress and trauma by BC's 2017 wildfires.[68] Additionally, Mental Health and Wellness Working Groups were implemented in several communities in BC such as Williams Lake, Quesnel, 100 Mile House and Ashcroft.

64] Ibid.

[65] Government of Canada. "Helping small businesses get loans." Government of Canada. (Accessed March 04, 2019). http://www.ic.gc.ca/eic/site/csbfp-pfpec.nsf/eng/h_la02855.html

[66] Small Business BC. "BC Wildfire Resources For Small Business." Small Business BC. August 22, 2017. <https://smallbusinessbc.ca/article/bc-wildfire-resources-for-small-business/#Q2>

[67] Government of BC. Emergency Management British Columbia and Ministry of Forests, Land, Natural Resource Operations and Rural Development. "Government's Action Plan: Responding to wildfire and flood risks." Government of B.C., EMBC, FLNRORD, October 31, 2018. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/action_plan.pdf.

[68] Canadian Mental Health Association. "Talk in Tough Times." CMHA, May 24, 2018. <https://cmha.bc.ca/programs-services/talk-in-tough-times/>.

GAPS AND LEVERS OF CHANGE

GAPS

1

Lack of collaboration amongst stakeholders:

Stakeholders compete for resources

LEVERS OF CHANGE

1. BCWS and municipal fire departments should work conjointly to fight fires rather than having a transactional relationship. We suggest BCWS and every municipal fire department adopt an agreement similar to the one between BCWS and the Penticton fire department.[69] The two parties combine their resources and delay administrative paperwork until the fire season is over. This may improve the current system, as seen in Penticton, by creating a quicker wildfire response. This would limit the amount of necessary evacuations alleviating the underlying driver of many mental health issues.

2. Through our research we learned that BC can benefit from traditional Indigenous fuel management practices. Canada and BC can model themselves after Australia's West Arnhem Land Fire Abatement Project, which is credited with cutting down carbon emissions from forest fires by about 122,000 tonnes/year and for providing a source of income for the Indigenous communities.[70]

[69] Interviewee 0013, Penticton Fire Department. Interviewed by Michael Simoes, March 11, 2019.

[70] Jane Gerster. "Forest Fires Forest Management." Global News, August 26, 2018.

<https://globalnews.ca/news/4406900/forest-fires-forest-management/>.

2

Disjointed communication across stakeholders:

Stakeholders hold different values and concerns about how to manage the forest.

1. Communication through education and awareness. We found that there is a need to re-educate people on the severity of wildfires and the harmful nature of excessive fire suppression.

- We suggest to create media and event campaigns that are tailored towards the diverse cultural and environmental terrains of BC. Two cultural groups in BC that need to be educated include:

1. Homeowners in high-risk areas who are unaware of the risks they face from wildfires, and believe wildfires are a once-in-a-lifetime event.[71]

2. Metro Vancouverites who are ignorant to the severity of the wildfire crisis, despite being impacted significantly by poor air quality.[72]

- By understanding wildfires, communities may contribute to effective wildfire risk management by engaging in micro-level fuel management programs, such as FireSmart, around their homes and educating family and friends about counterproductive legislations. [73] Collectively, everyone may vote for and pressure governments to enact more effective wildfire management policies.[74]

[71] Forest Steward Guild. "Increasing Wildfire Awareness and Reducing Human-Caused Ignitions in Northern New Mexico." Forest Steward Guild, March, 2018.

http://www.forestguild.org/publications/research/2018/Wildfire_awareness_2018.pdf.

[72] Survey by Joanne Nellas, Devan Parmar, Michael Simoes, Vanessa Sun (Team Inferno), "How do you feel about the wildfire?"

[73] Interviewee 0012. BC FireSmart. Interviewed by Devan Parmar, March 11, 2019.

[74] Interviewee 0018. BC Wildfire Services. Interviewed by Michael Simoes, March 17, 2019.

GAPS

LEVERS OF CHANGE

3

Lack of capital towards proper funding:

Discrepancy of money spent on responding to wildfires and money invested into prevention, preparedness, and recovery.

1. Governments (Provincial and Federal) should budget realistically for emergency disaster response.

- Need for better allocation of resources and expenses before and after wildfires. For example, helicopters are cost intensive for the minimal support they provide.[75] Therefore, they are an expense that may need a lower priority.
- Similar to Alberta, BC could allocate funds to hiring full-time year-round fire crews, instead of recruiting firefighters every season. With the trend that the fire season is prolonged each year, this might help with the efficiency of training firefighters, cutting down response time and increasing preparedness.[76]
- Many local businesses in the communities struggle to recover due to a lack of insurance. This drives away a local grown economy, pushing people to find jobs in other communities. Thus, more emphasis on small business disaster funding is needed.

2. There is a market opportunity to provide in-person consulting services for local businesses and large industries (forestry and tourism), in high risk areas, for post wildfire recovery.[77] Along with consulting businesses, there is also a need to find new solutions that can alleviate the extra costs incurred from wildfires such as electricity and transportation.[78]

[75] Gerry Burch (Retired Vice President of Forestry, B.C. Forest Products Ltd.). Interviewed by Devan Parmar, March 24, 2019.

[76] Interviewee 0001, interviewed by Vanessa Sun, March 11, 2019.

[77] Interviewee 0015, Emergency Management BC (Prince George). Interviewed by Michael Simoes, March 4, 2019.

[78] Interviewee 0014, Restaurant Owner in Fort McMurray. Interviewed by Devan Parmar, March 28, 2019.

KEY INSIGHTS & LESSONS LEARNED

Initially, we assumed that our diverse background in environmental systems, business and political science provided us with a holistic understanding of the wildfire crisis. However, we quickly learned through our challenge analysis that we had a microscopic understanding. Like many, we assumed that fire suppression was the most effective way to manage wildfires when in fact, suppression exacerbates wildfires.

Our understanding of the problem is limited by gaps in our research, particularly our insufficient knowledge regarding BC's climate change adaptation solutions and how they will alleviate severe wildfires. With climate change heightening the severity of wildfires, it is crucial for us to understand the solutions.

Our focus on BC's wildfires constrains our levers of change to only our province. Different underlying drivers like ecological terrains, political systems, and cultures, are variables that make it impossible for a single solution to address the wildfire crisis globally. However, our system analysis can be used as a global model for other landscapes when tailored to their own variables.