

Integrated Fire Management: Towards developing landscape level wildfire resiliency in British Columbia, Canada

Evelyn H. Hamilton
Director, Bulkley Valley Research Centre
Principle, Hamilton Ecological Consulting
British Columbia, Canada

OUTLINE

1. Background – Imperative to change forest management practices
 - Global situation and predictions regarding wildfires
 - British Columbia's situation and predictions regarding wildfires
2. Integrated Fire Management – British Columbia's approach
3. Resiliency concepts
4. Management strategies to reduce wildfire impacts
5. Pilot projects to develop more wildfire resilient landscapes
 - Northern Wildfire Resiliency Initiative
 - Quesnel Forestry Initiatives Program (FIP)
 - Kootenays - SIFCo's Wildfire Resiliency Program
6. Lessons Learned
7. Acknowledgements and for further information

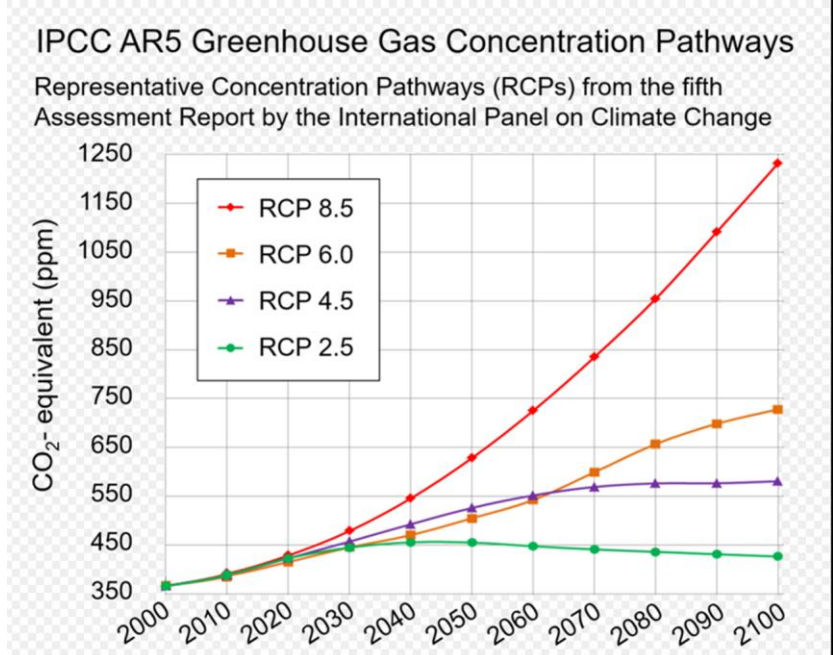


Background – Imperative to Change

1. Global situation and predictions regarding wildfires

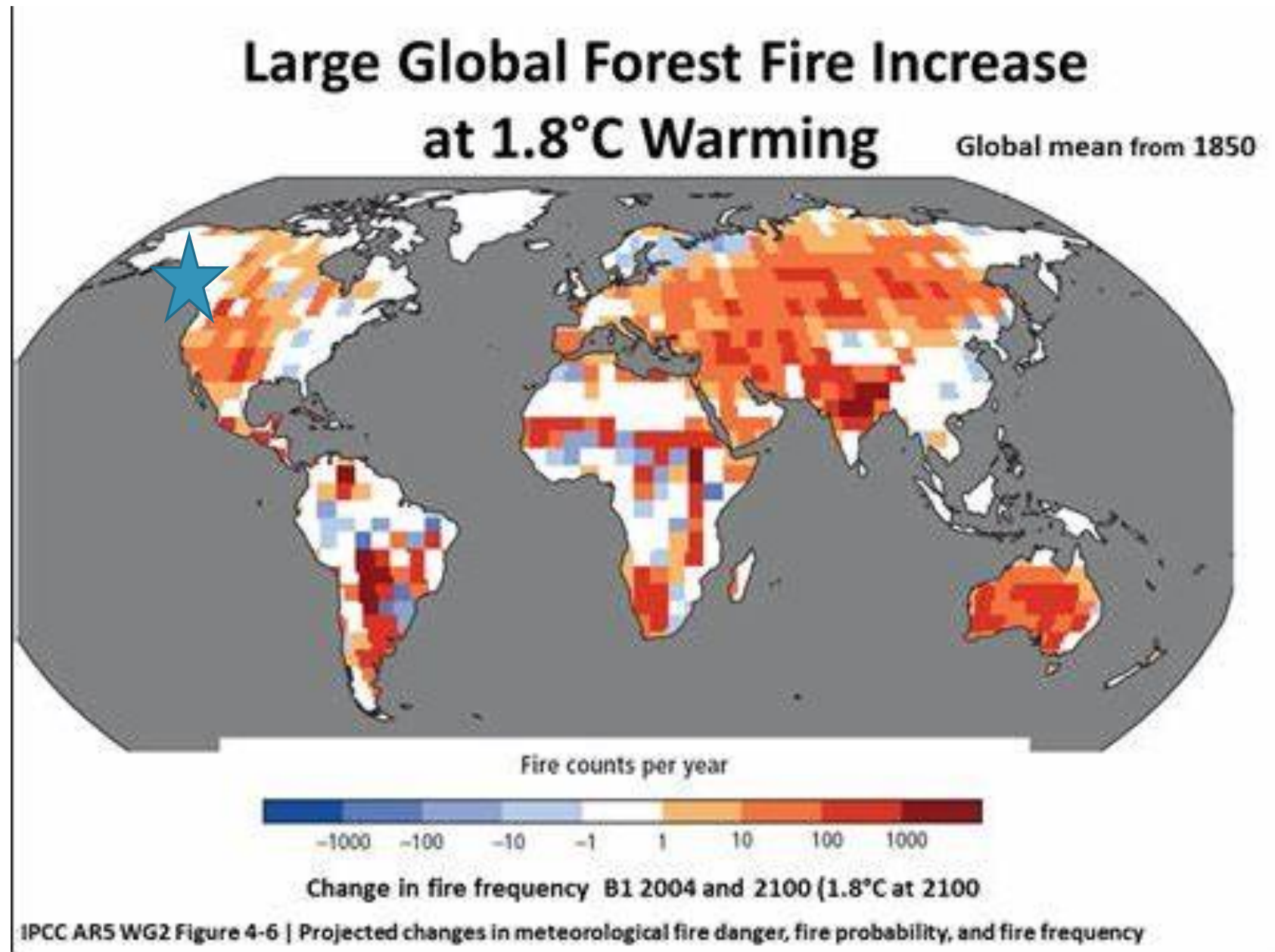
Greenhouse gases
Global temperatures
Wildfire risk

2. British Columbia's situation and predictions regarding wildfires



“Predicted increases in droughts and heatwaves increase the risk of **fire occurrence**”

“Projected impacts on forests as climate change occurs include **increases in the intensity** of storms, **wildfires** and pest outbreaks”



From IPCC 2014 report. available from
https://www.climateemergencyinstitute.com/ecosystems_and_species.html

IUFRO Occasional Paper No. 32

GLOBAL FIRE CHALLENGES IN A WARMING WORLD

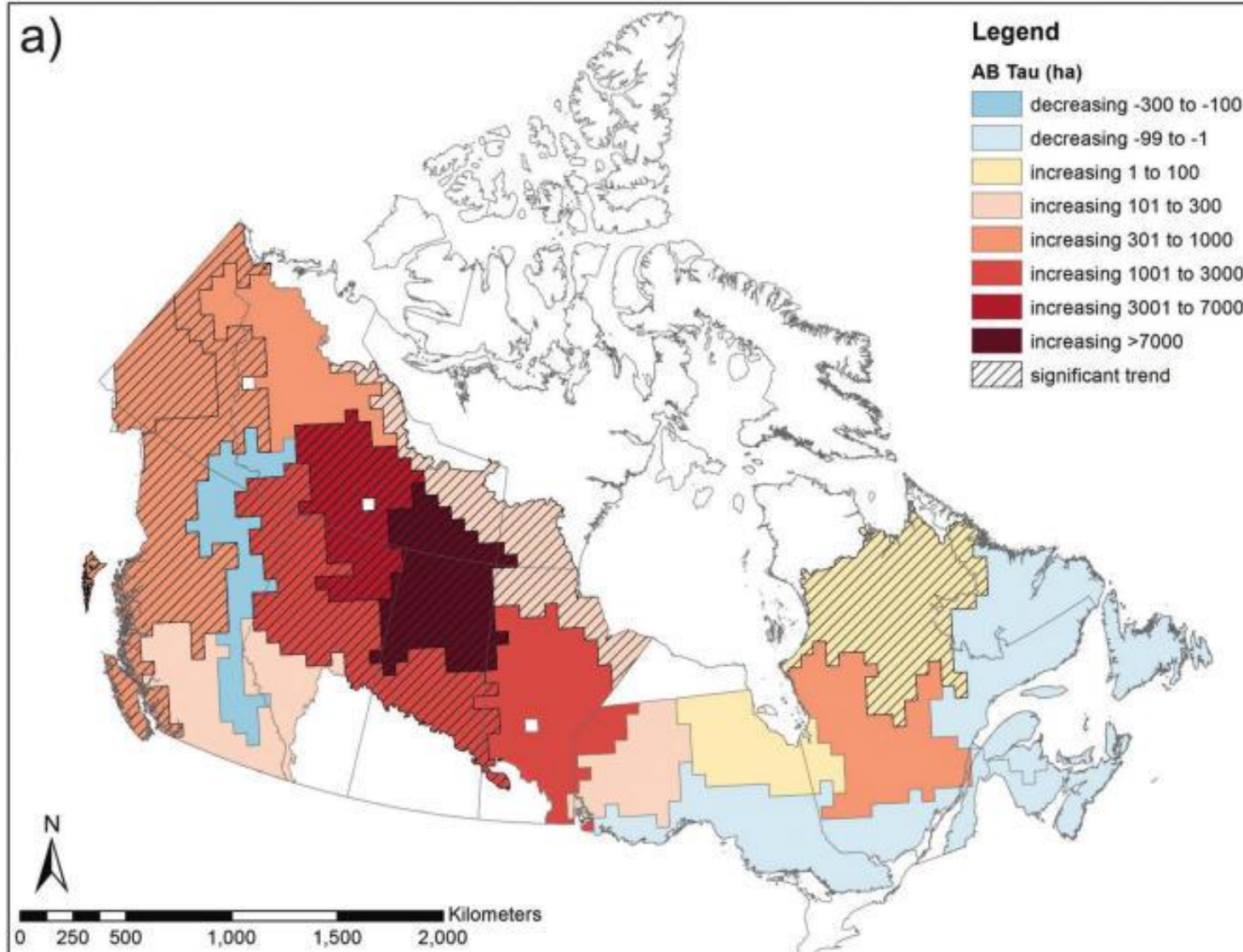
Summary Note of a Global Expert Workshop on Fire and Climate Change

Edited and coordinated by:
François-Nicolas Robinne, Janice Burns, Promode Kant,
Mike D. Flannigan, Michael Kleine, Bill de Groot, D. Mike Wotton.



“Available data shows a trend of **increasing frequency and intensity of uncontrolled fires** adversely affecting biodiversity, ecological services, human well-being and livelihoods and national economies”

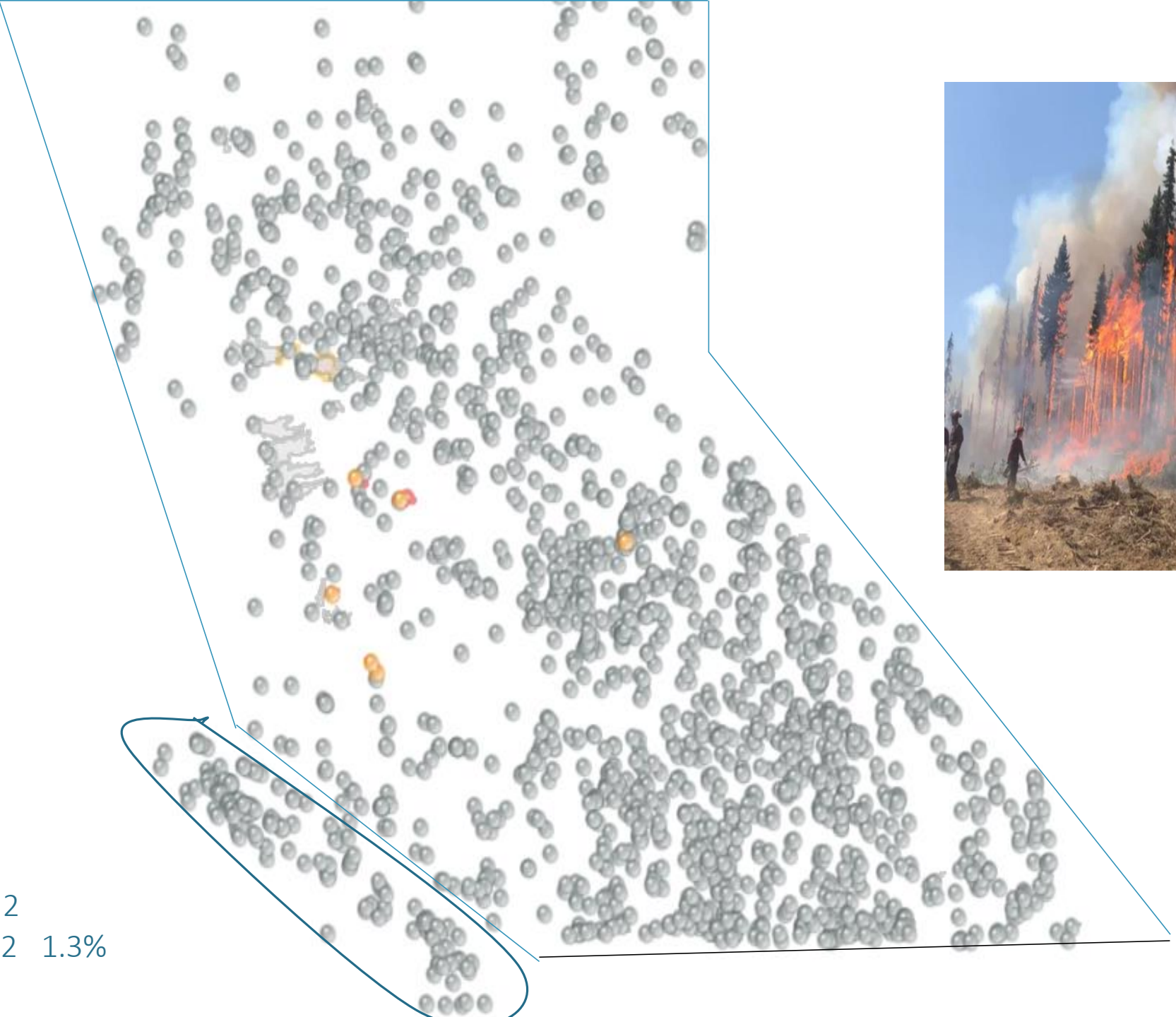
Increase in area burned (ha) in Canada (1959 to 2015).



“ Climate change is predicted to **worsen all three ingredients required for wildfire** (fuel, ignition, weather) across most of Canada, making global warming a triple threat to our forests’

From <https://climateatlas.ca/forest-fires-and-climate-change>

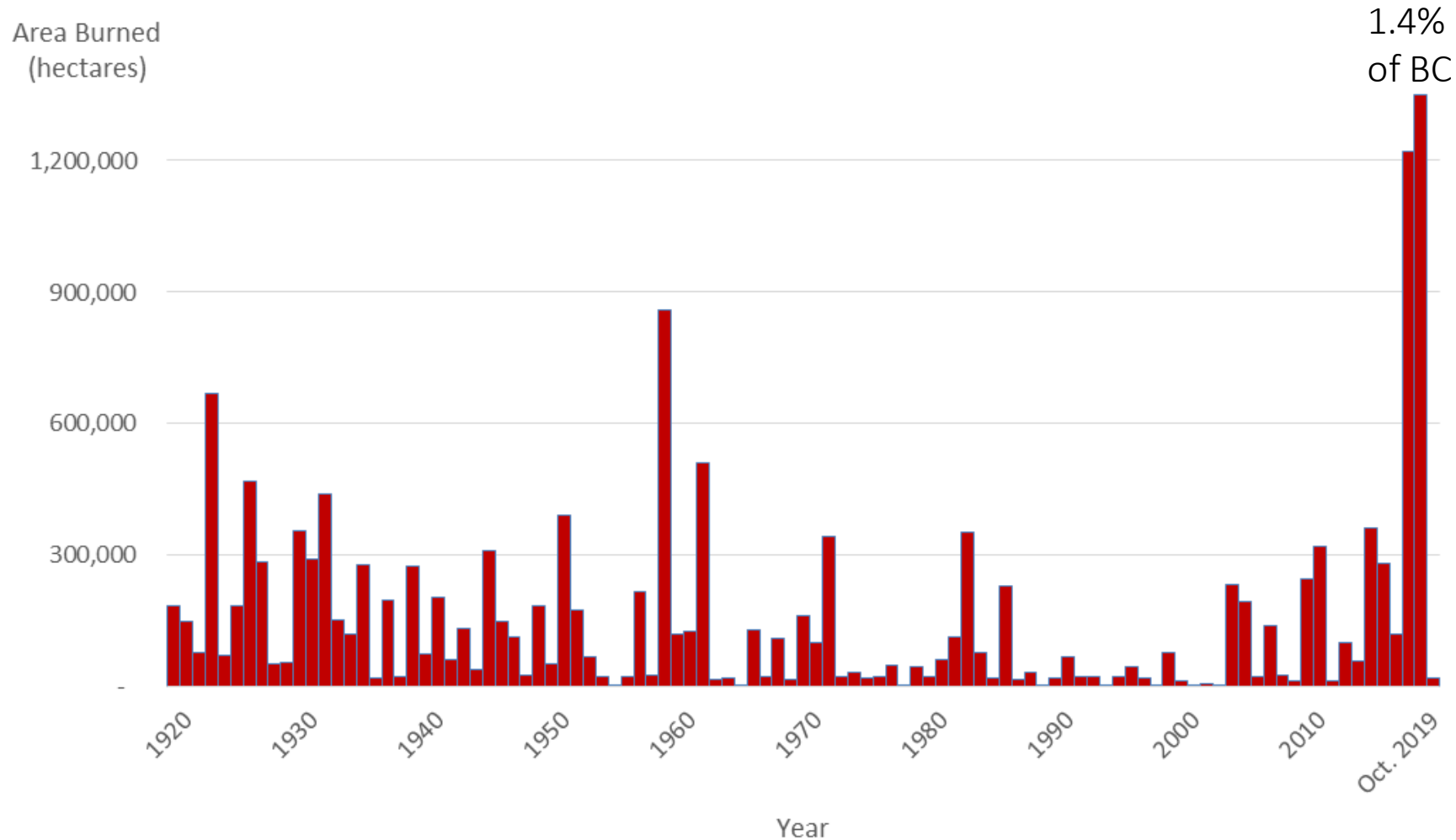
Distribution of Wildfires in BC 2018 fire season



Size of British Columbia
Area Burned in 2018/19

944,735 km²
13,000 km² 1.3%

Area (ha) burned in British Columbia by year (1920-2019)



1.4%
of BC

Over 1.3 M ha
burned in 2018

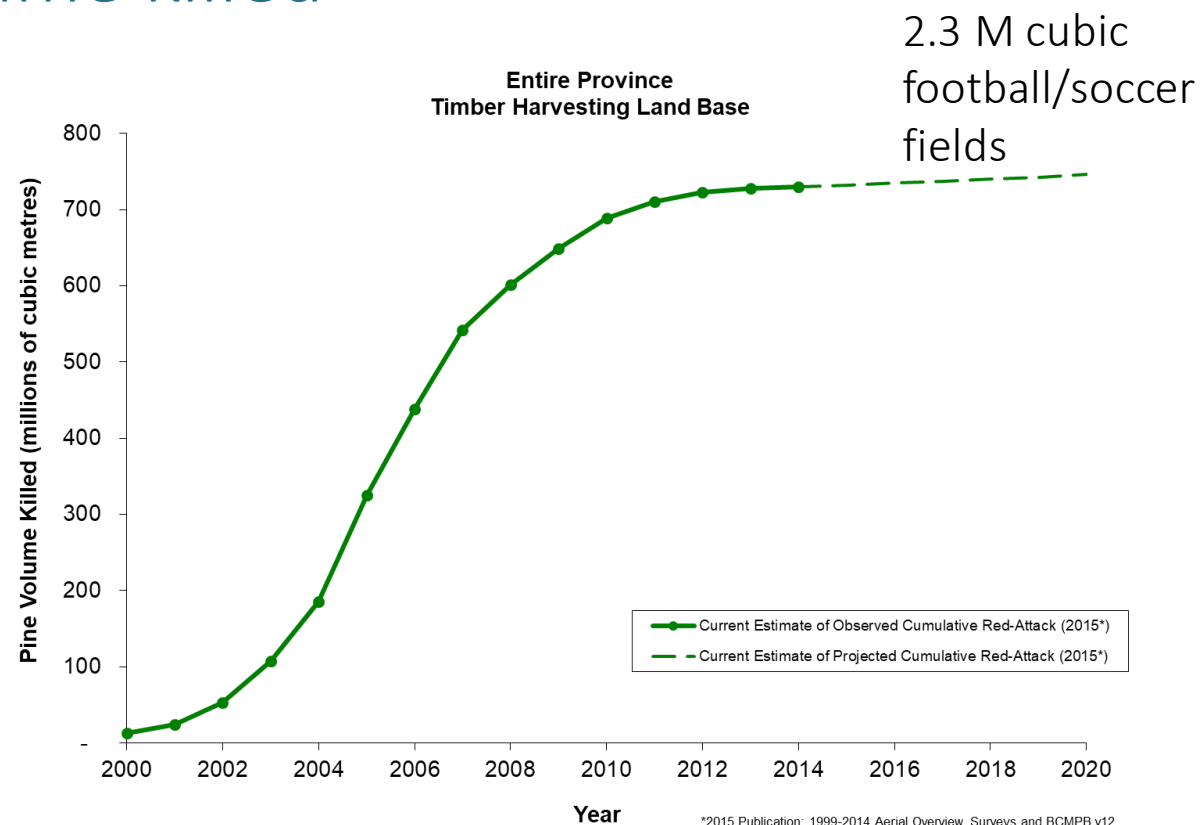
Over 1.2 M ha
burned in 2017

Mountain Pine Beetle (MPB) impact in British Columbia

Over 700 M cubic meters of pine volume killed



<https://forestinvasives.ca/Meet-the-Species/Insects/Mountain-Pine-Beetle>



<https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/forest-health/forest-pests/bark-beetles/mountain-pine-beetle/mpb-projections>

OUTLINE

1. Background – Imperative to change forest management practices
 - Global situation and predictions regarding wildfires
 - British Columbia's situation and predictions regarding wildfires
- 2. Integrated Fire Management – British Columbia's approach**
3. Resiliency concepts
4. Management strategies to reduce wildfire impacts
5. Pilot projects to develop more wildfire resilient landscapes
 - Northern Wildfire Resiliency Initiative
 - Quesnel Forestry Initiatives Program (FIP)
 - Kootenays - SIFCo's Wildfire Resiliency Program
6. Lessons Learned
7. Acknowledgements and for further information

Integrated Fire Management – British Columbia’s approach

Integrated Fire Management Components	British Columbia’s Approach	
Assessment and analysis of situation and issues	Ongoing	
Fire management goals and desired ecosystem condition	Evolving from suppression to management	
Laws, policy and institutional framework	Comprehensive, evolving	
Prevention and education	Comprehensive, expanding	
Fire use	Limited, increasing prescribed burning	
Preparedness and response	Significant and increasing	
Restoration, recovery and maintenance	Limited, increasing	
Adaptive management, research and information transfer	Adaptative management - early stages	
	Research – Considerable, evolving	
	Information Transfer – Significant	

Integrated Fire Management – British Columbia’s approach

Integrated Fire Management Components	British Columbia’s Approach	
Assessment and analysis of situation and issues	Ongoing	
Fire management goals and desired ecosystem condition	Evolving from suppression to protection	
Laws, policy and institutional framework	Comprehensive	
Prevention and education	Comprehensive	
Fire use	Limited, increasing prescribed burning	
Preparedness and response	Significant	
Restoration, recovery and maintenance	Limited, increasing	
Adaptive management, research and information transfer	Adaptative management – early stages	
	Research – Considerable, evolving	
	Information Transfer – Significant	

OUTLINE

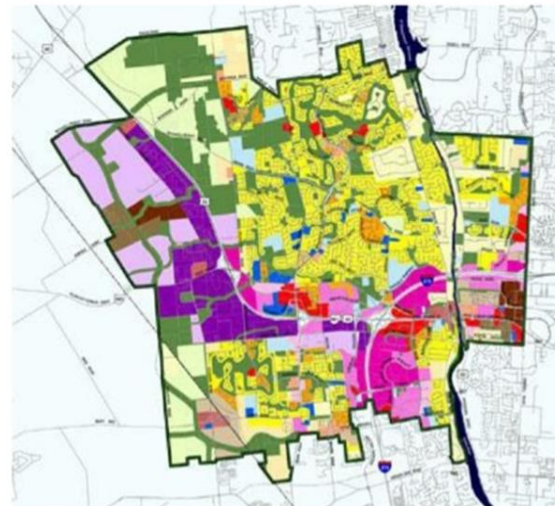
1. Background – Imperative to change forest management practices
 - Global situation and predictions regarding wildfires
 - British Columbia's situation and predictions regarding wildfires
2. Integrated Fire Management – British Columbia's approach
- 3. Resiliency concepts and goals**
4. Pilot projects to develop more wildfire resilient landscapes
 - Northern Wildfire Resiliency Initiative
 - Quesnel Forestry Initiatives Program (FIP)
 - Kootenays - SIFCo's Wildfire Resiliency Program
5. Lessons Learned
6. Acknowledgements and for further information

OUTLINE

1. Background – Imperative to change forest management practices
 - Global situation and predictions regarding wildfires
 - British Columbia's situation and predictions regarding wildfires
2. Integrated Fire Management – British Columbia's approach
3. Resiliency concepts
4. **Management strategies to reduce wildfire impacts**
5. Pilot projects to develop more wildfire resilient landscapes
 - Northern Wildfire Resiliency Initiative
 - Quesnel Forestry Initiatives Program (FIP)
 - Kootenays - SIFCo's Wildfire Resiliency Program
6. Lessons Learned
7. Acknowledgements and for further information

Management Strategies for Reducing Wildfire Risks

- Individual homeowners “FIRESMART” their homes on private lands
- Wildland urban interface (WUI) fuel reduction on public and private lands
- Landscape Fire Planning and Management – landscape level fire planning and management.



Landscape Level Fire Planning and Management Options

- Harvesting & commercial thinning of forests
- Large scale fuel breaks
- Alternative silviculture regimes
*e.g. less flammable hardwoods
- Increased prescribed fire
- Managed wildfire

<https://www.ubcm.ca/assets/Resolutions~and~Policy/Policy/Governance/Regional~Districts/CEO~CAO~Forum~2013/Wildfire%20Management%20handout%20bw.pdf>



UGA1210070

OUTLINE

1. Background – Imperative to change forest management practices
 - Global situation and predictions regarding wildfires
 - British Columbia's situation and predictions regarding wildfires
2. Integrated Fire Management – British Columbia's approach
3. Resiliency concepts and goals
4. Management strategies to reduce wildfire impacts
5. **Pilot projects to develop more wildfire resilient landscapes**
 - Northern Wildfire Resiliency Initiative
 - Quesnel Forestry Initiatives Program (FIP)
 - Kootenays - SIFCo's Wildfire Resiliency Program
6. Lessons Learned
7. Acknowledgements and for further information

Case Study 1. Northern Wildfire Resiliency Initiative

Overview

- A collaborative effort to increase wildfire resiliency in northern BC.
- Workshop March 2019 with wide range of participants
- Developed consensus on the need for a resiliency based approach to wildfire management and recommendations
- Provincial government committed to a landscape level pilot project - scoping out now



Case Study 1. Northern Wildfire Resiliency Initiative

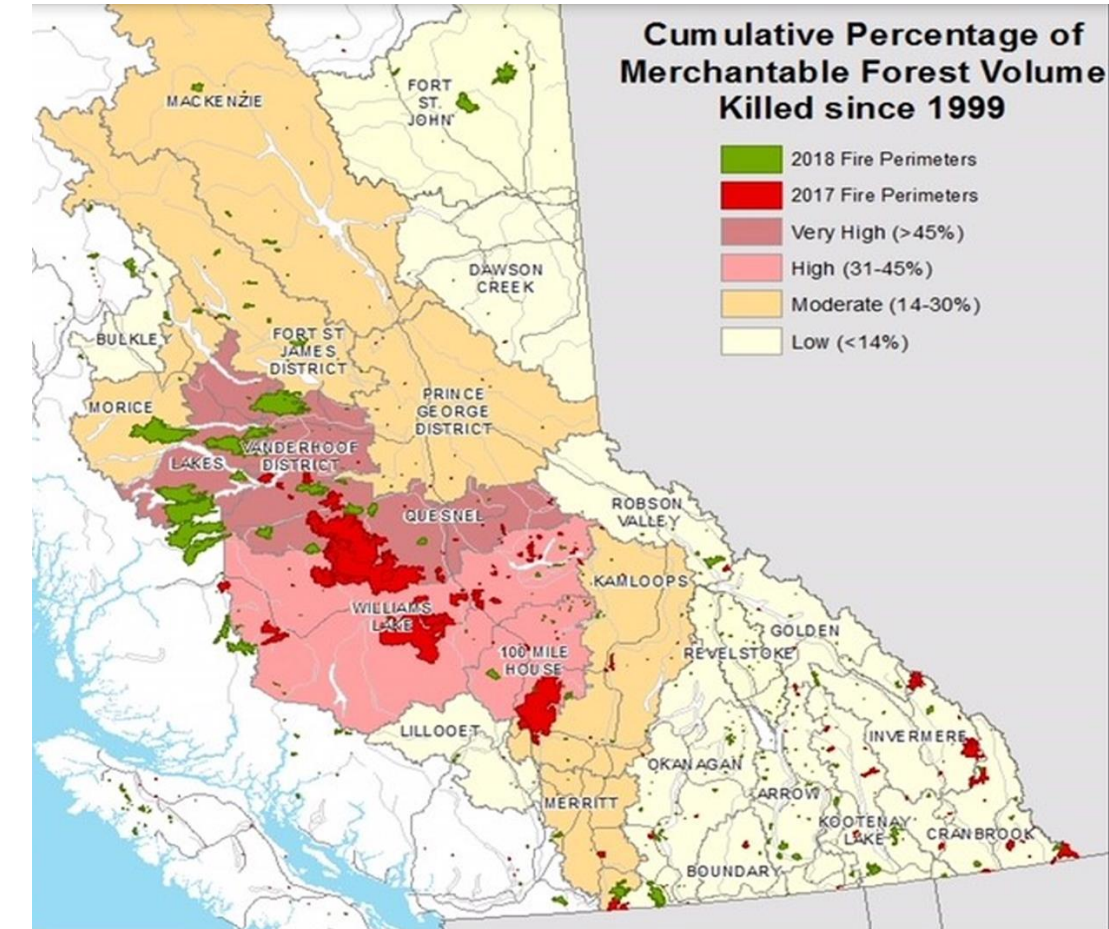
Recommendations

1. Promote **public engagement** to get needed **policy/practices**
2. Determine **opportunities and obstacles**
3. Initiate **planning** to develop resilient landscapes
4. **Coordinate** efforts from home to community to the landscape
5. Address **operational constraints** to wildfire risk mitigation
6. Use **broadcast burns** as a management tool
7. Identify what **expertise** is available/ **needed and how to get it**
8. Determine **research /information needs**



Case Study 2. The Quesnel Forestry Initiatives Program

- Workshops brought together local forest industry, researchers & governments to explore opportunities for alternate forest management in 2018.
- Community Wildfire Protection Plan (CWPP), FireSmart, managing the landscape for resiliency and encouraging new industries.
- Landscape level analysis and restoration work to support wildfire resiliency.
- Workshop for local people to discuss resiliency concepts and goals
- See www.quesnel.ca

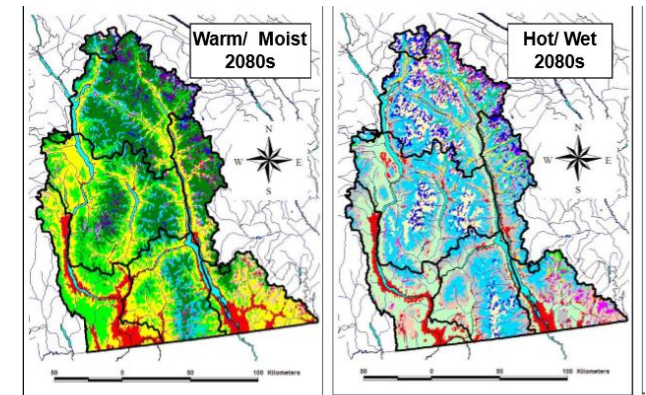


Case Study 3. Kootenays – SIFCo Wildfire Resiliency Program

- Team assessed climate change predictions and how forest ecosystems will likely be affected – including wildfires.
- Workshops with forest and land managers and public to share learning about climate change impacts.
- Determined potential management strategies for adapting to changes at various scales (e.g. tree species planted, provincial policies).
- Led to the Slokan Integral Forestry Cooperative (SIFCo) Wildfire Resiliency Program.
- See <http://www.kootenayresilience.org/>

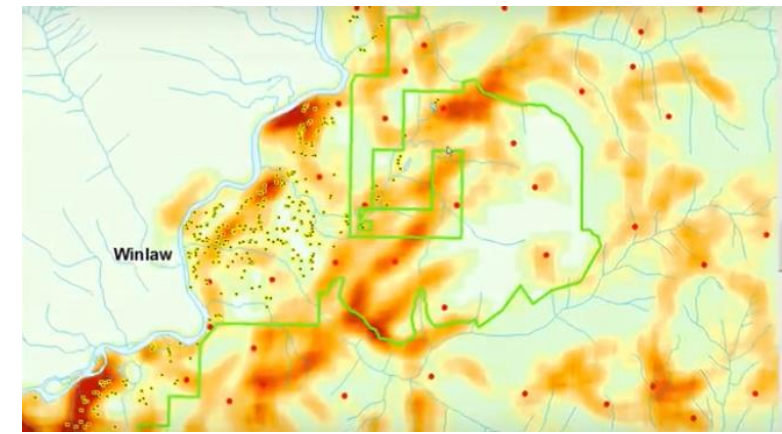


Predicted climates 2080



Case Study 3 Kootenays - Slocan Integral Forestry Cooperative (SIFCo) Wildfire Resiliency Program

- Demonstration of climate change adaptation & wildfire preparedness at landscape scale.
- Landscape level planning, consultation/education/training, cooperation, WUI Mitigation, Fire Smart & emergency
- Use FLAMMAP model to predict likely future fire behaviours and plan treatments.
- Fuel Managed Zones across main fire movement corridors to create large fuel breaks.
- Treatments used include timber harvesting, thinning, dead wood removal & prescribed burns.
- See <https://www.sifco.ca/>.



OUTLINE

1. Background – Imperative to change forest management practices
 - Global situation and predictions regarding wildfires
 - British Columbia's situation and predictions regarding wildfires
2. Integrated Fire Management – British Columbia's approach
3. Resiliency concepts
4. Management strategies to reduce wildfire impacts
5. Pilot projects to develop more wildfire resilient landscapes
 - Northern Wildfire Resiliency Initiative
 - Quesnel Forestry Initiatives Program (FIP)
 - Kootenays - SIFCo's Wildfire Resiliency Program
- 6. Lessons Learned**
7. Acknowledgements and for further information

Summary

- Increasing GHG emissions predicted to lead to increased frequency and intensity of wildfires.
- BC has experienced severe fires and expects more and is working to reduce future negative impacts.
- BC has a robust Integrated Fire Management approach. Working to enhance Adaptive Management by clarifying goals, identifying main obstacles & undertaking research and landscape pilot projects.
- Value of partnerships and working at local to landscape scale.

THANK YOU for your interest

For further information – visit

www.bvcentre.ca

www.db2020.net – for this and other talks and reports

Or contact Evelyn Hamilton at

ehhamilton16@gmail.com

Acknowledgements

Thanks to my collaborators Leigh-Ann Fenwick, Julia Chandler, Sybille Haeussler and others



Integrated Fire Management – British Columbia’s approach

Integrated Fire Management Components	British Columbia’s Approach	
	Current Approach	Possible Future Directions
Assessment and analysis of situation and issues	<ul style="list-style-type: none"> Several provincial assessments (Filmon 2004 , Abbott and Chapman 2018?) Climate Change and Wildfire Strategy Strategic Risk Assessments done and updated regularly 	Clear priorities and approach
Fire management goals and desired ecosystem condition	<ul style="list-style-type: none"> Evolving from fire suppression/protection to developing wildfire resilient landscapes and communities (e.g. BVRB Burns Lake workshops, Quesnel & Kootenay pilots) 	Clear goals wrt resilient landscapes and communities (i.e. desired future conditions, fire management goals) that account for climate change
Laws, policy and institutional framework	<ul style="list-style-type: none"> Revised Wildfire Act and Wildfire regulation 2016 - fire use, wildfire prevention & control, rehabilitation Open Burning Smoke Control Regulation Forest management legal framework (FRPA 2002 and Regulations) does not include resilience Emergency Program Act 	Legal framework that ensures wildfire resiliency
Prevention and education	<ul style="list-style-type: none"> Ongoing wildfire prevention & community protection (e.g. public announcements, FIRESMART in WUI, Community Resiliency Initiative consultations (6 workshops this fall)) 	More public dialogue around wildfires – positive and negative aspects etc. to gain acceptance for prescribed burning, & managed wildfires
Fire use	<ul style="list-style-type: none"> Prescribed fire used for restoration in dry open forests since 1980s Prescribed fire (logging slash burning) widely used in in 1980s and 90s and now being re-introduced. Slash pile burning done extensively in cutblocks to reduce hazard – now looking to reduce GHGs 	More education and training about how to use prescribed fire Adaptive management trials
Preparedness and response	<ul style="list-style-type: none"> Significant effort underway wrt fire suppression for many decades (e.g. Initial Attack, Field Stations) 	
Restoration, recovery and maintenance	<ul style="list-style-type: none"> Restoration in dry open forests initiated over 20 years ago Evolving concepts of resilience and role of fire 	Clear goals for management – wrt basic, adaptive and transformative resiliency
Adaptive management, research and information transfer	<ul style="list-style-type: none"> Adaptive Management – pilot studies in Lakes TSA, Quesnel, & Kootenays 	Implementation of pilots
	<ul style="list-style-type: none"> Research - Key BCWS questions Wildfire threat and risk – what are best assessment methods Historic fire regimes - relationship to forest/fuel structure & wildfire threat (Eng 2019) Wildfire risk modelling - how to improve fire weather inputs used Fuel management practices - determining most effective treatments (McCullock) Fuel loading - how to best determine across ecosystems & management practices 	More Research <ul style="list-style-type: none"> Define goals (e.g. resiliency) What role should fire be allowed to play in the landscape? Where? How? What constraints limit fire from playing an ecologically appropriate role? What mix of fire use, prevention and suppression strategies should be utilized? How will local communities be involved?
	<ul style="list-style-type: none"> Information Transfer – public consultation (BCWS) and extension (FIRESMART, Fraser Basin, ACT etc) 	Further public dialogue

Integrated Fire Management – British Columbia’s approach

Integrated Fire Management Components	British Columbia’s Approach	
	Current Approach	Future Directions ??
Assessment and analysis of situation and issues	Ongoing	Clear priorities and approach
Fire management goals and desired ecosystem condition	Evolving from suppression to protection	Resilient landscapes and communities accounting for climate change
Laws, policy and institutional framework	Comprehensive	Framework that ensures wildfire resiliency
Prevention and education	Comprehensive	More public dialogue to gain acceptance for prescribed burning & managed wildfires
Fire use	Limited, increasing prescribed burning	Education and training wrt prescribed fire
Preparedness and response	Significant	
Restoration, recovery and maintenance	Limited, increasing	Clear goals for management – wrt basic, adaptive and transformative resiliency
Adaptive management, research and information transfer	Adaptative management - early stages	Implementation of pilots
	Research – considerable, evolving	Appropriate goals, resiliency, effectiveness of treatments, modelling, role of communities
	Information Transfer – Significant	Further public dialogue