Total Fire Cost: the Rationale and Value of Increased Investment in Prevention

Climate Extremes in BC: a New Environmental Reality

Vancouver, BC

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Climate Outlook

- More of what we experienced in 2017 and worse,
- Some models suggest wetter winters, which leads to abundant herbaceous growth,
- Higher temperatures over longer periods of the spring and summer (i.e., longer fire seasons),
- Higher incidence of stationary "blocking" high pressure systems,
- Increased incidence of strong wind events,
- Increased lightning – latest research suggests for every 1°C increase in temperature there will be a corresponding 12% increase in lightning activity,

Climate Outlook (cont'd)

- Result is more fires escaping initial attack and becoming large, project fires,
- Higher burn severity with dryer fuels.

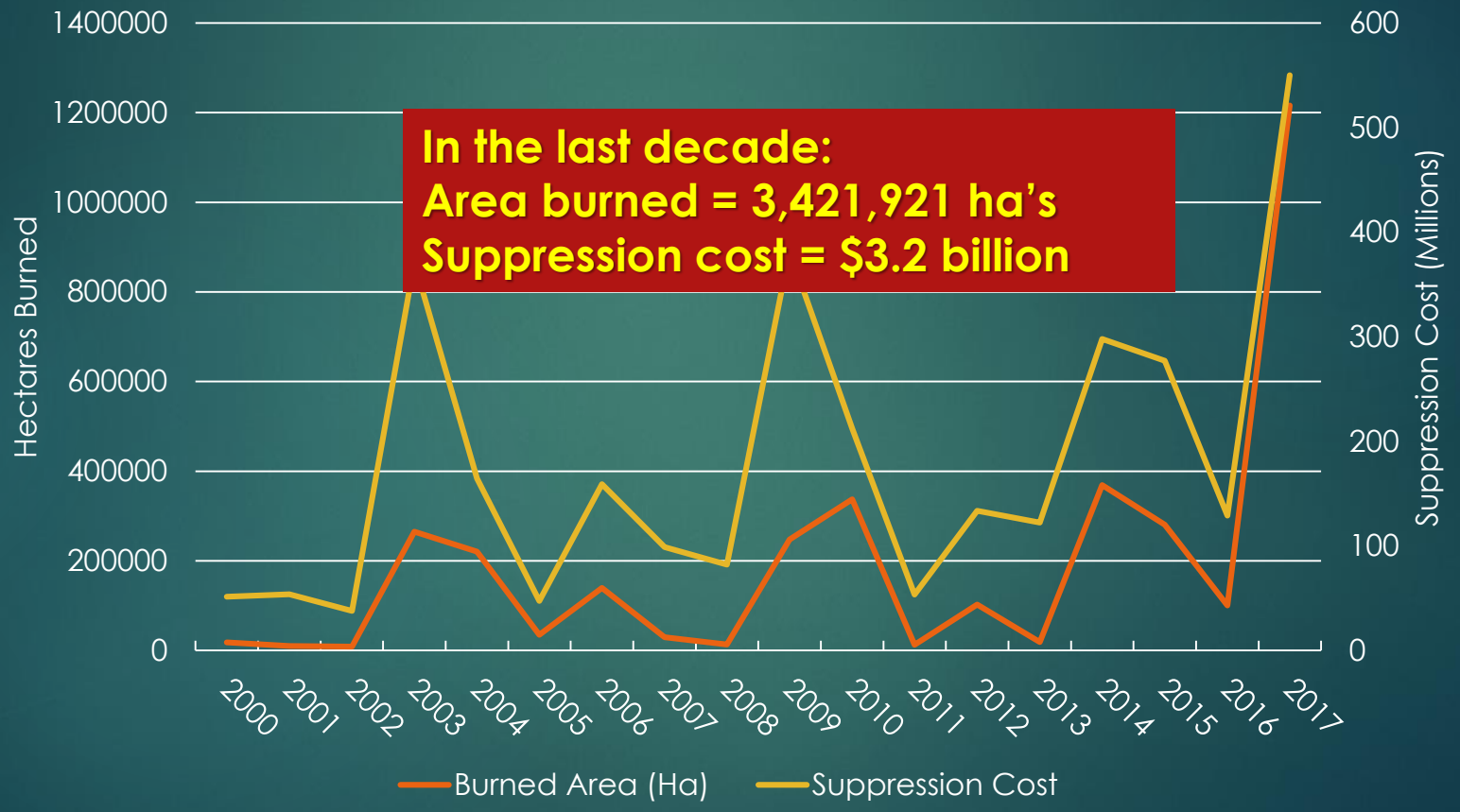
Impacts of the 2017 wildfires

- Current estimate of direct costs is $550 million – likely to continue to rise,
- Indirect and additional costs have been estimated to run 2 to 32 times the suppression costs (direct costs) and take upwards of a decade to realize (at 2 years post-fire the total cost of the Fort McMurray fire is estimated to be $9.8 billion),
- Some examples of indirect and additional costs:
  - Infrastructure damage due to soil erosion,
  - Additional water treatment,
  - Business losses,
  - Reduced property values,
  - Physical and emotional health impacts.

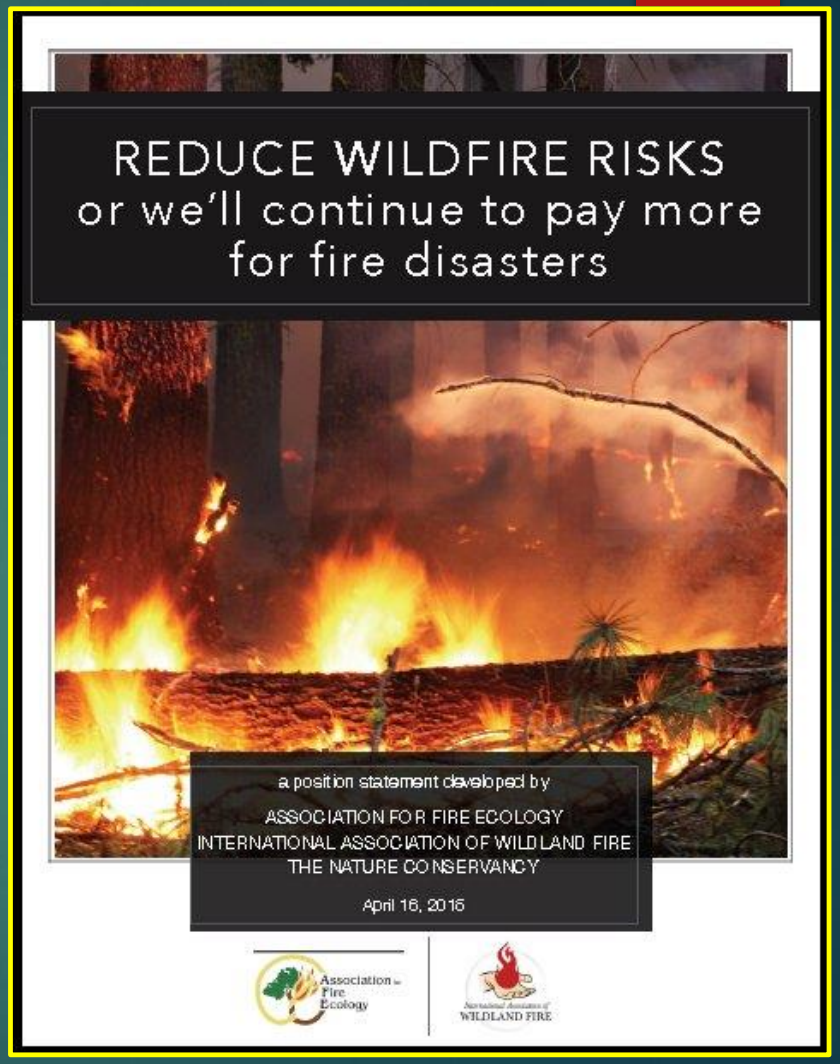
Impacts of the 2017 wildfires

- Natural resource impacts include:
  - Large areas of high burn severity leading to site productivity impacts,
  - Large areas susceptible to soil erosion (wind and water),
  - Wildlife and wildlife habitat significantly impacted,
  - High vulnerability to non-native, invasive plants.

Wildfire Burned Area and Provincial Suppression Cost Trends



Recent collaborative position paper by the Association for Fire Ecology, International Association of Wildland Fire, and The Nature Conservancy advocates for significantly increased mitigation activities



http://fireecology.org/Reduce-Wildfire-Risks-or-Well-Pay-More-for-Fire-Disasters

What does a fuller accounting include?

- Considers long-term and complex costs, including:
  - Impacts to watersheds, ecosystems, infrastructure, businesses, individuals, and the local, provincial, and national economy,
- Can be broken down into two analytical categories:
  - Direct and rehabilitation costs (fairly immediate),
  - Indirect and additional costs (longer-term costs that evade quantification).

Source: The true cost of wildfire in the western U.S. Western Forestry Leadership Coalition, 2009.

Direct Costs

Rehabilitation Costs

Indirect and Additional Costs

Long-term human health

Emotional problems

Firefighter fatalities

Ecosystem services

Property values

Case Studies:

- 2003 Old, Grand Prix, and Padua Complex Fires
- 2011 Flat Top Complex (Slave Lake Fire)
- 2016 Horse River Wildfire (Fort McMurray Fire)
- Evacuating a small, rural community in BC

2003 Old, Grand Prix, and Padua Complex Fires in California

Complex of wildfires burned over 50,000 ha's and forced the evacuation of over 100,000 residents

Property owners filed claims for 787 total losses and 3,860 partial losses

Suppression cost estimated at $50 million

Estimated "true" cost of the fire complex is over $1.2 billion; much of this is attributed to post-fire recovery and water mitigation expenditures

2011 Flat Top Complex (Slave Lake Fire)

- 22,000 ha burned in the complex of wildfires,
- 491 residences and 19 non-residential structures lost,
- 1 fire fighter fatality injured (helicopter pilot),
- Over 15,000 residents evacuated,
- $700 million in damage,
- $289 million in disaster recovery, community stabilization, interim housing and long-term projects,
- Fire caused a significant contraction in the Canadian economy ($300 million impact on oil and gas industry),

2016 Horse River Fire (Fort McMurray Fire)

- Wildfire burned 589,552 ha's,
- 1 citizen fatally injured during the evacuation,
- Suppression and immediate rehabilitation $615 million,
- Insured losses (27,000 personal property claims, 12,000 automobile claims, 5,000 commercial claims) totaling $3.98 billion*,
- Conference Board of Canada estimates total losses from shutdown oil sands sector were $1.7 billion*,
- Estimate of all direct and indirect costs after two years is $9.77 billion*.

*Alam, R. et al. [in press]. Rapid assessment and monetization of impacts from the Fort McMurray Wildfire. Institute for Catastrophic Loss Reduction.

Evacuating a small, rural community in BC

- A wildfire does not need to directly impact a community for it to have grave social, ecological and economic impacts,
- At height of 2017 fires almost 62,000 people on evacuation with evacuations lasting over 5 weeks,
  - Approximately 30,000 households,
  - Approximately $6.9 million/day in travel, shelter and food expenses,
- In Cariboo-Chilcotin, 11 wood processing facilities shuttered at approximately $2 million/day/facility,
- Businesses have re-opened by can't find staff,
- Rates of anxiety, depression, and PTSD are rising rapidly.

Fire costs impact all departments at the federal/provincial level

....as well as at the municipal government level

Why can't we get ahead of the problem?

Wildfire mitigation compared to other natural disturbances

Earthquakes cost the US economy $5.6 billion/year* in damage mitigation expenditures – and most people consider them to be the most expensive natural disturbance.

Wildfire suppression alone costs the US economy $4.7 billion/year; with the addition of indirect and additional damage costs wildfires become the most expensive natural disturbance.

* FEMA and USGS

Example of Typical Funding Disparity

- Major earthquake predicted for the west coast (according to many scientists we are over-due),
- Damage estimates for southwest BC range from $17 to $34 billion,
- Based on the risk government has spent over $20 billion on damage mitigation (mostly seismic upgrades),
- Funding ratio of risk to mitigation is close to 1:1

- Over the same time period the province has spent $2.5 billion on wildfire suppression but has only invested $120 million in damage mitigation,
- Funding ratio of risk to mitigation is close to 20:1 and doesn't include indirect and additional costs of these fires.

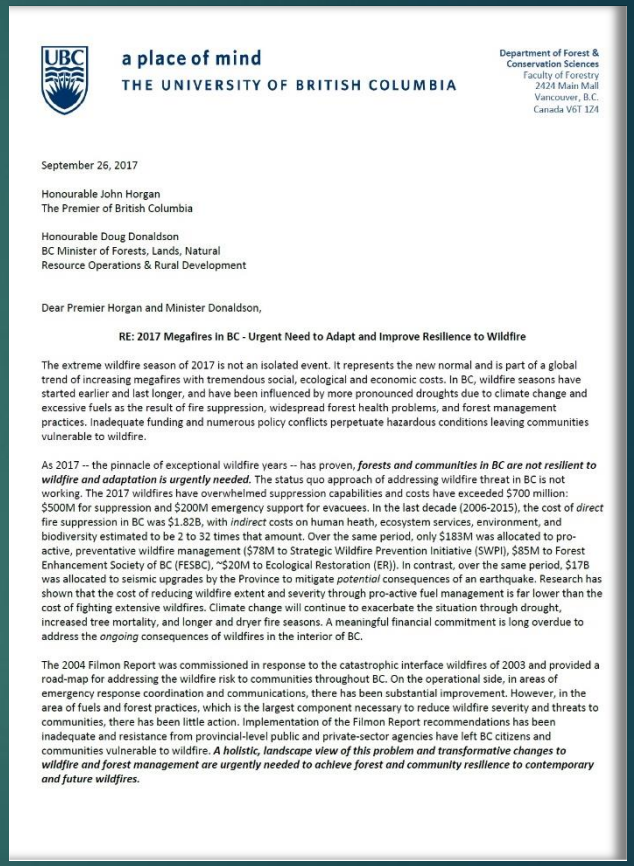
Wildfires compared to other natural disturbances (cont'd)

- Governments regularly raise taxes and even deficit spend on hazard mitigation for natural disturbances such as earthquakes, hurricanes, and floods,

- Investments are at a clear economic loss.

Wildfire Resilience White Paper

- Wildfire Resilience White Paper written by Dr Lori Daniels, R.W. Gray, and Dr Phil Burton,
- Signed by over 30 First Nation's leaders, mayors, regional district director's, and academics,
- Lists 46 recommendations in four key areas:
  - Initial attack and emergency fuel reduction treatments
  - Integrated wildland-urban interface zoning and pro-active landscape planning
  - Forest restoration and adaptive forest management
  - Research to inform adaptive wildfire management



a place of mind
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Honourable John Horgan
The Premier of British Columbia

Honourable Doug Donaldson
BC Minister of Forests, Lands, Natural
Resource Operations & Rural Development

Dear Premier Horgan and Minister Donaldson,

RE: 2017 Megafires In BC - Urgent Need to Adapt and Improve Resilience to Wildfire

The extreme wildfire season of 2017 is not an isolated event. It represents the new normal and is part of a global trend of increasing megafires with tremendous social, ecological and economic costs. In BC, wildfire seasons have started earlier and last longer, and have been influenced by more pronounced droughts due to climate change and excessive fuels as the result of fire suppression, widespread forest health problems, and forest management practices. Inadequate funding and numerous policy conflicts perpetuate hazardous conditions leaving communities vulnerable to wildfire.

As 2017 -- the pinnacle of exceptional wildfire years -- has proven, ***forests and communities in BC are not resilient to wildfire and adaptation is urgently needed.*** The status quo approach of addressing wildfire threat in BC is not working. The 2017 wildfires have overwhelmed suppression capabilities and costs have exceeded $700 million: $500M for suppression and $200M emergency support for evacuees. In the last decade (2006-2015), the cost of *direct* fire suppression in BC was $1.82B, with *indirect* costs on human heath, ecosystem services, environment, and biodiversity estimated to be 2 to 32 times that amount. Over the same period, only $183M was allocated to pro-active, preventative wildfire management ($78M to Strategic Wildfire Prevention Initiative (SWPI), $85M to Forest Enhancement Society of BC (FESBC), ~$20M to Ecological Restoration (ER)). In contrast, over the same period, $17B was allocated to seismic upgrades by the Province to mitigate *potential* consequences of an earthquake. Research has shown that the cost of reducing wildfire extent and severity through pro-active fuel management is far lower than the cost of fighting extensive wildfires. Climate change will continue to exacerbate the situation through drought, increased tree mortality, and longer and dryer fire seasons. A meaningful financial commitment is long overdue to address the *ongoing* consequences of wildfires in the interior of BC.

The 2004 Filmon Report was commissioned in response to the catastrophic interface wildfires of 2003 and provided a road-map for addressing the wildfire risk to communities throughout BC. On the operational side, in areas of emergency response coordination and communications, there has been substantial improvement. However, in the area of fuels and forest practices, which is the largest component necessary to reduce wildfire severity and threats to communities, there has been little action. Implementation of the Filmon Report recommendations has been inadequate and resistance from provincial-level public and private-sector agencies have left BC citizens and communities vulnerable to wildfire. ***A holistic, landscape view of this problem and transformative changes to wildfire and forest management are urgently needed to achieve forest and community resilience to contemporary and future wildfires.***

Lessons from Horse River Fire

- *"A cost-avoidance business case approach should be taken to quantify the estimated future savings from prevention and preparedness investments using statistical analysis and empirical research…"*

- *"Disaster prevention programs cannot be viewed as "discretionary" and must receive an appropriate proportion of investment relative to the impacts these programs are intended to mitigate."*

KPMG. 2016. Wood Buffalo Wildfire: Post-Incident Assessment Report.