Indigenous Fire Methods/Knowledge

Traditional Knowledge and their Outcomes

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Introduction

- My name is Liam, I am from Edmonton, Alberta
- I am a member of the Métis Nation of Alberta
- My experience with forests and fire comes from the Parkland and Boreal forest regions of Alberta (primarily Aspen and Black Spruce) as well as the Lodgepole Pine of the Rockies
- I am a PhD student working on modeling ‘worst-case’ wildfire scenarios

Disclaimer!

- I am by no means an expert in the field of Indigenous Fire Methods
- My experience is limited primarily to readings and courses that I have taken
- I am hoping to participate in prescribed burn in the coming year

- This is an open discussion - if you have learned anything contradicting/different from what I am discussing please speak up! It benefits everyone involved

Outline

- Suppression
- Traditional Knowledge and Burning
- Outcomes
- Barriers

Suppression

Only you can prevent forest fires

- How does this video frame wildfires?

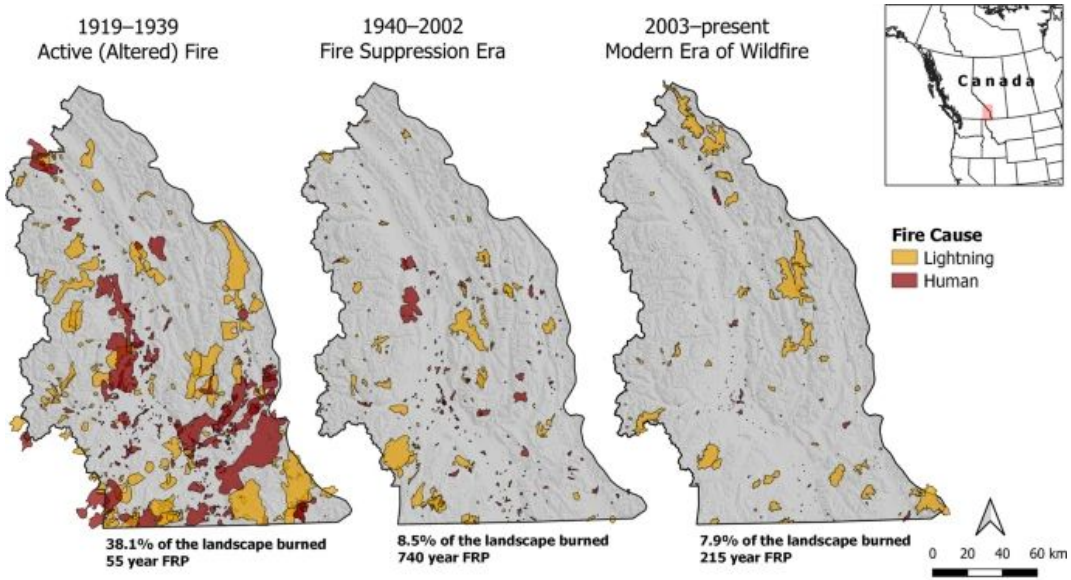
Withholding the right to burn

- Indigenous people across Canada (and the world) have been prevented from burning for decades
- The result has been a build-up of forest fuels and an increase in fire severity

- Can anyone describe what an old-growth forest looks like? What about a forest which has recently been planted or regrown?

Why is this important?

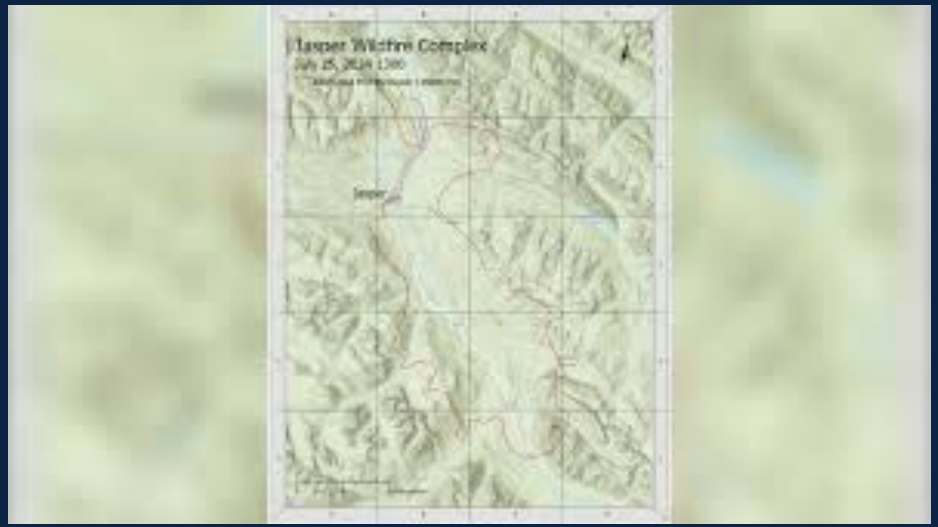
- **Citizens of the Peavine Métis settlement in Alberta noted that the forest had become more “unnatural and unhealthy” without regular burns**
- **That burning would result in a healthier forest**



Relative to historical fire frequency, fire exclusion has created a fire deficit in low- and mixed-severity fire regimes across 46.4% of the flammable landscape

Why is this important?

- A build-up of forest fuels has resulted in larger, more intense wildfires
- More wood to burn exacerbates the effects of climate change
- Does anyone here have a memorable wildfire event which comes to mind?



Withholding of Fire

- **The reasoning for Indigenous burning has changed - the spatial scope and traditional rationale has decreased**
- **Many Indigenous peoples were and are not allowed to burn**
- **The returning of this fire to the landscape is a slow (and necessary) process**

https://doi.org/10.1093/jofore/fvx007

An Onus on the Public

- Historically, the public have been the main focus for wildfire prevention.
- How have you been raised to view wildfire? How has your increased knowledge of wildfire changed this?

Traditional Knowledge and Indigenous Wildfire Methods

Indigenous Fire Methods

- **Proactive Fires!**
- **Many areas often viewed by the public as natural or unmanaged, including designated protected areas, were historically burned by tribal [Indigenous] peoples (Watson et al. 2011)**
- **“It depends on the fuels, if there are low fuels then you burn early so that the sun will lift them up in the burn, but if there are high fuels you want to burn in the afternoon when is it fresh”**

Indigenous Fire Methods

- Deliberately started fires to achieve specific goals
- These fire are low- to moderate-intensity: easy to control and extinguish once goals are met
- Indigenous wildfire methods incorporate specific needs of different people on a community and societal level

How many methods??

https://www.facetsjournal.com/doi/10.1139/facets-2021-0062

Traditional and Cultural Goals

- Improve the quantity, quality, and functionality of values, resources, and habitats (Lake et al. 2017)
- Fire use is associated with hunting, crop improvement, pest control, habitat diversity, range management, fireproofing, wood fuels, travel route maintenance, area clearing, growth of basket material, communication, and ceremonies
- The use of fire varies and varied widely between different nations and communities
- Frequent low severity fires coincident with areas of high land use

Traditional Knowledge

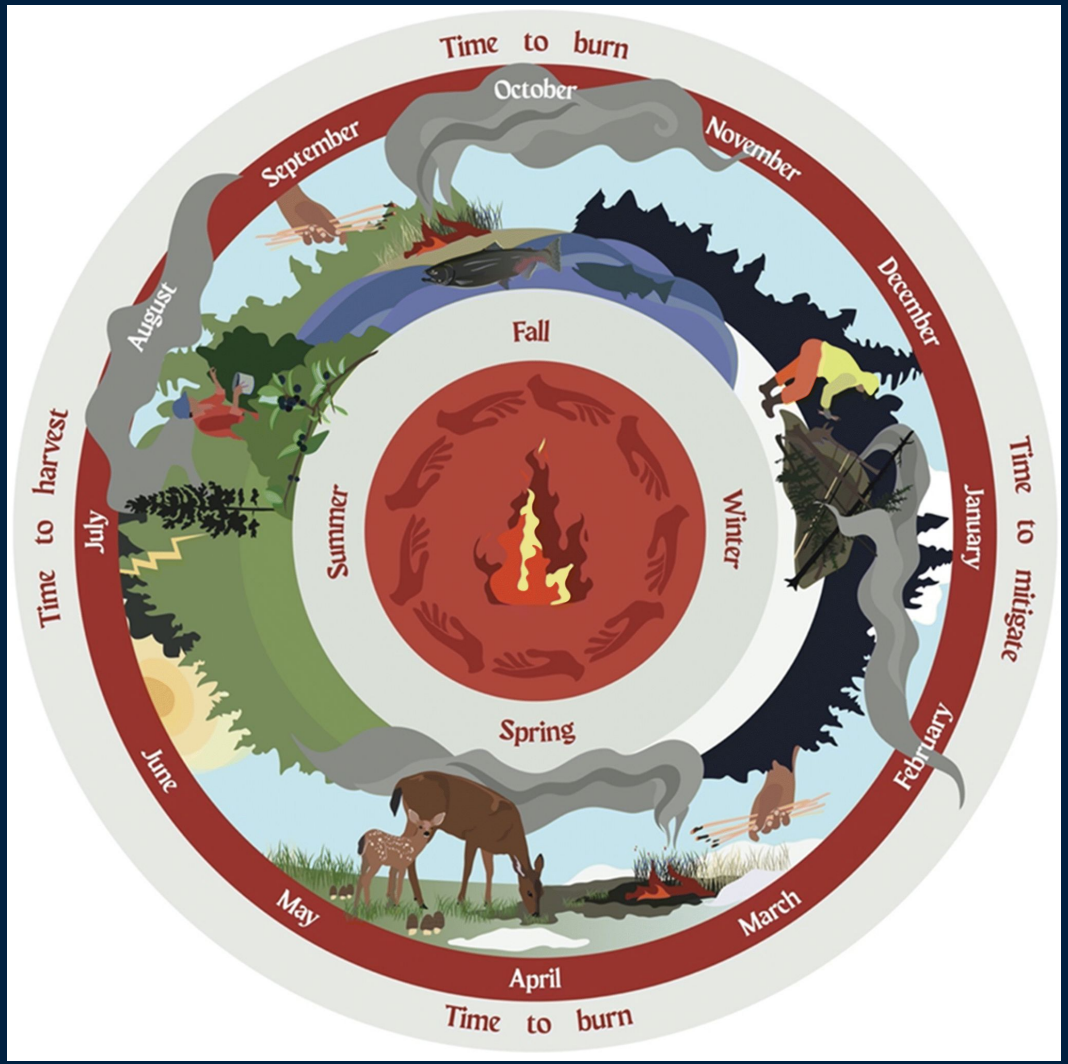
- **Traditional Knowledge is not solely based on outcomes it also includes when and how to burn**
- **This includes: the timing of fire (both seasonal and daily), timing of fire related to plant phenology, the fuel moisture required to burn, the timing since last burn, and even fire effects on fungi**
- **Finally, Traditional Knowledge extends to fire behaviour and spread**

Example of a Prescribed Fire

- https://www.grasslandfire.ca/fire-story-articles/prescribed-fire-at-last-mountain-lake-national-wildlife-area-may-4th-2022

Traditional and Cultural Goals

- Many elders view fire as either a tool to either promote or inhibit specific plant growth
- The goal of fire is then dependent on which of these plants are present, when they grow, and when they can be effectively removed
- Knowledge of when and how to do this requires an intimate relationship with the land and its continuous changes



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What about the who and where?

- Unique Indigenous fire methods have been observed across the globe across even more distinct cultures, communities and societies
- There are robust groups returning this fire to the landscape in Canada, the USA, Australia, and Brazil to name a few of the regions
- There are almost countless different knowledge systems on using fire on the landscape

How?

- Fires at this scale are lit by hand
- Flames can be fanned or smothered to meet the goals of the fire
- Ignition is weather and moisture dependent - often a community fire expert makes the call

Indigenous Fire Methods - Modern Context

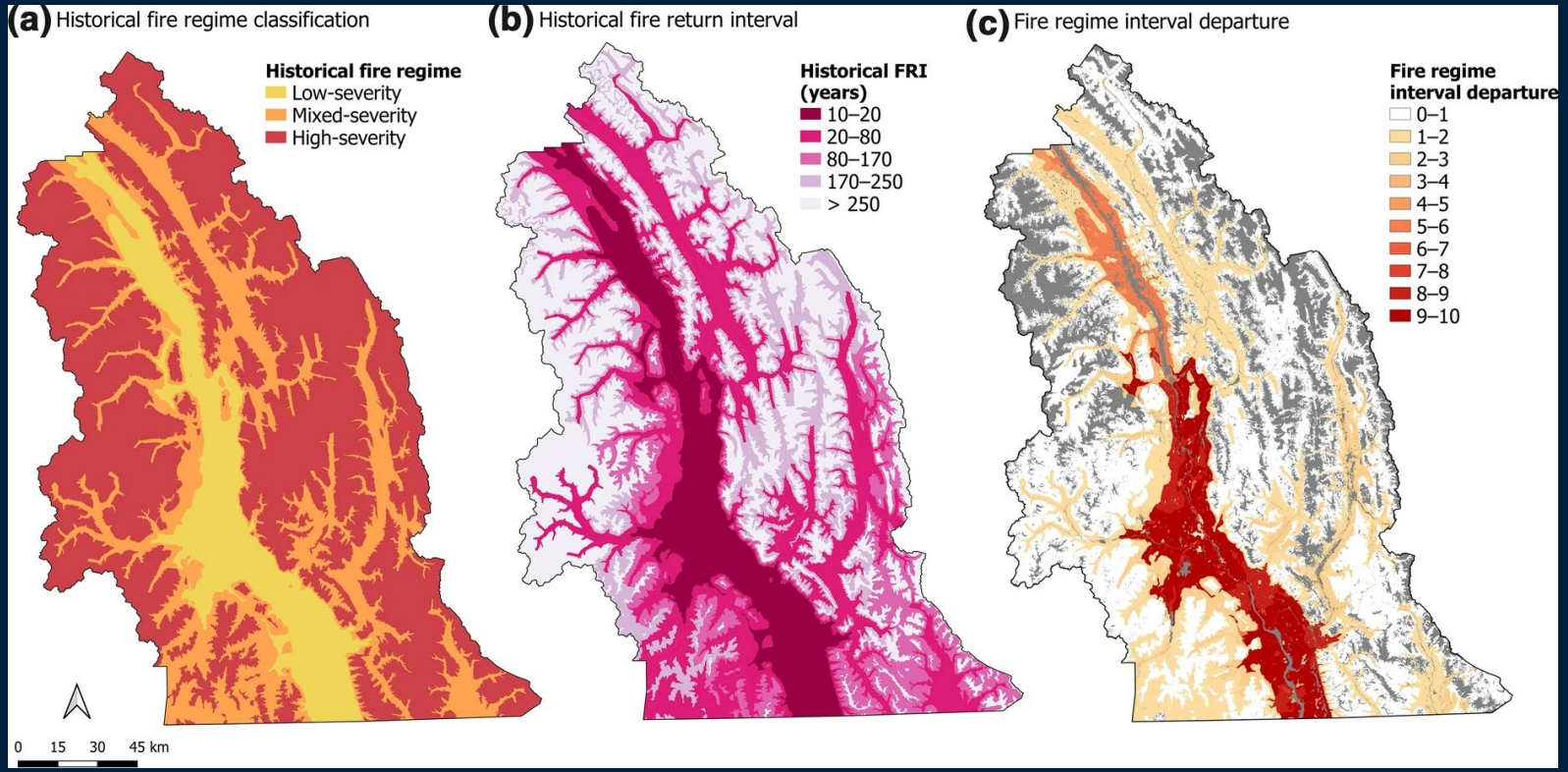
- Given the withholding of burning - Indigenous peoples around the world are not as in touch with their burning
- The goals of burning have changed - more recently the focus is on hazard mitigation protect property
- More intense wildfires are leading Indigenous people to want to do more mitigation work on culturally sensitive areas
- However, the methods and timing remain similar

Outcomes of Indigenous Fire Methods

Indigenous Fire Outcomes

- **“traditional practices that once provided substantive social and ecological benefits within elegant control”**
- **In BC it has been found that the historical abundance of native species and the density of western red cedars were only best explained by historical habitation sites of Indigenous peoples**
- **Indigenous land stewardship and mixed-severity fire regimes both promote landscape heterogeneity**

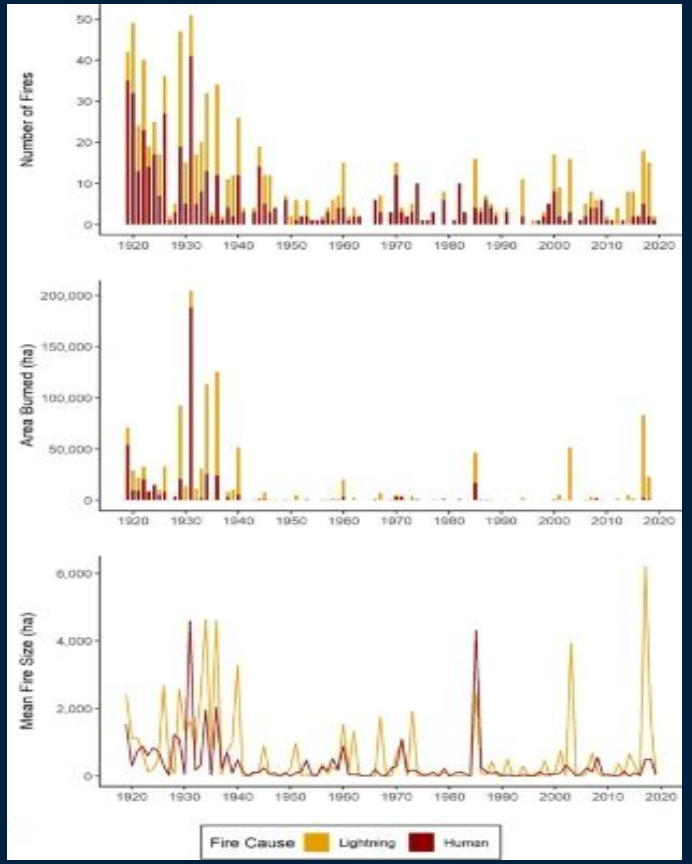
Outcomes - Results of a Fire Deficit



https://link.springer.com/article/10.1007/s10980-022-01506-9/figures/5

How can we determine outcomes?

- Oral histories from T’exelc (pronounced teh-huwl) near now Williams Lake, BC noted the absence of low-severity fire after colonization
- They also noted moderate-severity fire which promoted berry species, deer grazing, and other forest resources
- Southeastern BC has been noted to have a significant fire deficit, promoting high-severity fire and a build-up of fuels
- In Brazil, Indigenous fire bridges helped to reduce fire frequency by 80%, and this size of fires by 53%



https://link.springer.com/article/10.1007/s10980-022-01506-9

Outcomes

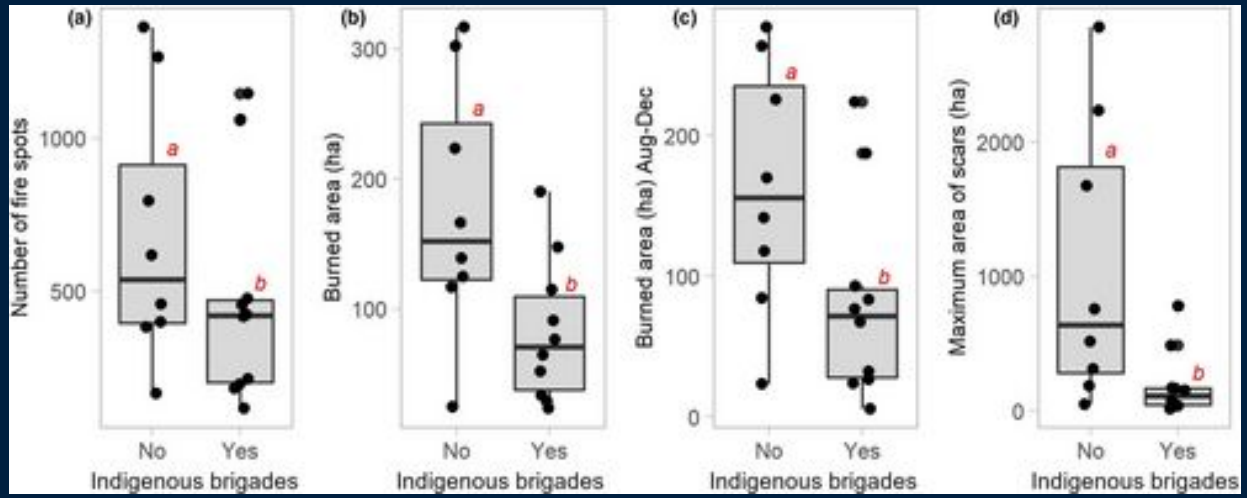
- **Overall, a reduced wildfire risk from a decrease in fuel build-up in a numerous Indigenous managed forests**
- **Largely a reduction in wildfire carbon emissions due to lower-severity fires**
- **An increased connection of Indigenous people to culture**
- **Healthier, more resilient forests!**

https://oregonforests.org/blog/healthy-forest-no-accident

https://www.frontiersin.org/journals/ecology-and-evolution/articles/10.3389/fevo.2021.676961/full

Outcomes

- **In Brazil, in the absence of Indigenous burning, fire is explained by rainfall totals (or the lack of) and climate change could not explain fires with Indigenous burning**



https://besjournals.onlinelibrary.wiley.com/doi/10.1111/1365-2664.14139

Outcomes

- Similar conclusions drawn in Australia - Indigenous burning resulted in a shift in the fire season
- Shifting from later in the dry season (higher severity fire) to early in the season, becoming more manageable
- A less variable fire regime
- Area of long (>5 years) unburnt vegetation increases
- Fire age diversity increased

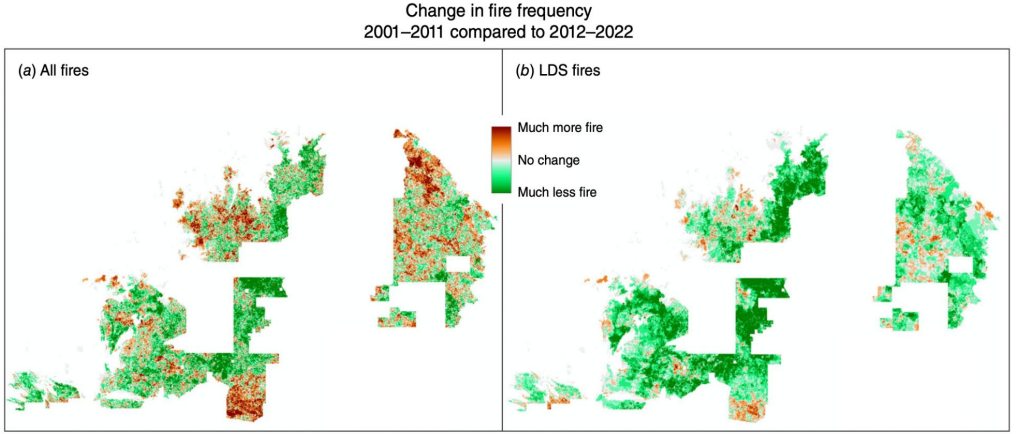


Fig. 3. Spatial representation of (*a*) increase (32.6% of project area) and decrease (42.6%) in fire frequency, and (*b*) increase (11.3%) and decrease (67.6%) in LDS fire frequency across the North Kimberley Fire Abatement Project for project period (2012–2022) compared with baseline period (2001–2011).

https://www.publish.csiro.au/wf/pdf/WF24092

Barriers - What is Preventing More Indigenous Burning?

Kira M. Hoffman, Amy Cardinal Christianson, Sarah Dickson-Hoyle, Kelsey Copes-Gerbitz, William Nikolakis, David A. Diabo, Robin McLeod, Herman J. Michell, Abdullah Al Mamun, Alex Zahara, Nicholas Mauro, Joe Gilchrist, Russell Myers Ross, and Lori D. Daniels. 2022. The right to burn: barriers and opportunities for Indigenous-led fire stewardship in Canada. *FACETS*. 7(): 464-481. https://doi.org/10.1139/facets-2021-0062

Barriers - Why do These Barriers Exist?

- **Indigenous communities face a unique and enhanced exposure to large wildfire in Canada**
- **They also lack the required funding to suppress this fire activity on their land**
- **A power imbalance between Indigenous peoples and those deemed wildfire authorities**

https://www.facetsjournal.com/doi/10.1139/facets-2021-0062
https://communityengagement.ubc.ca/news/lessons-learned-from-secwepemculecw/

Barriers

- Perception, authority and jurisdiction
- Governance, law, and action
- Access, accreditation, and training
- Liabilities and Insurance
- Capacity and Resources

Barriers - What can be Done?

- **Cross jurisdiction knowledge sharing and collaboration**
- **Prioritize Indigenous wildfire knowledge systems**
- **Reduce western wildfire-science gate-keeping**
- **Increase financial support for Indigenous burning**
- **Allow for Indigenous knowledge keepers to continue practicing their wildfire knowledge**

To Conclude

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- Indigenous peoples have been caring for the forest and managing it with wildfire for millenia
- Frequent low- to moderate-severity fires allowed them to achieve their goals
- The result is less of the high-severity, dangerous fires which we commonly are dealing with today
- Work needs to be done to allow this beneficial fire back on the land

https://www.nps.gov/yose/learn/nature/images/empire-fire-needles-web_2.jpg