

# Living with Wildfire: A FireSmart Forum

Presentations – June 16, 2024





UNIVERSITY OF ALBERTA  
DEPARTMENT OF  
RENEWABLE RESOURCES



WILDFIRE ANALYTICS

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Associate Professor

Presented at the *Living with  
Wildfire: FireSmart forum*

Canmore, June 16th, 2024


# Results of Canmore's Wildfire Exposure Assessments



EWF-031 near Edson, AB  
May 4, 2023

## Connect

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 [wildfireanalytics.org](http://wildfireanalytics.org)

 [@fireanalytics](https://twitter.com/fireanalytics)



(Photo: Alberta Wildfire PWF034-2018)

# Black spruce, lodgepole pine were built to burn



(Photo: Alberta Forestry and Parks, July 2023)



# It takes a perfect storm...



**3** that receives an ignition  
(human, lightning, fire)

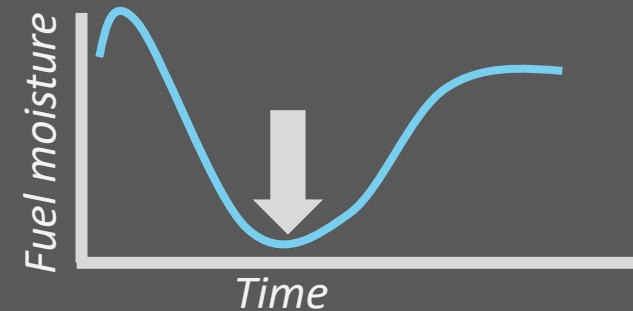


**4** Upwind of more places fire can transmit to  
(fuel aligned along wind trajectory)

**5** Leading to a vulnerable location  
(potential negative impacts)

**1** a place fire can transmit to  
(fuel proximate to possible ignition sources)

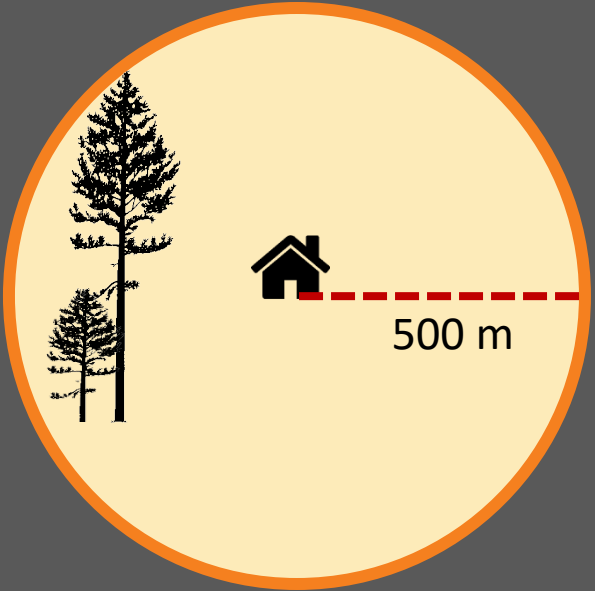
**2** at a time when its receptive  
(fuel moisture is low – its dry)



# Exposure based on transmission distances

*International Journal of Wildland Fire* **2010**, 19, 299–313

Beverly et al. (2010)



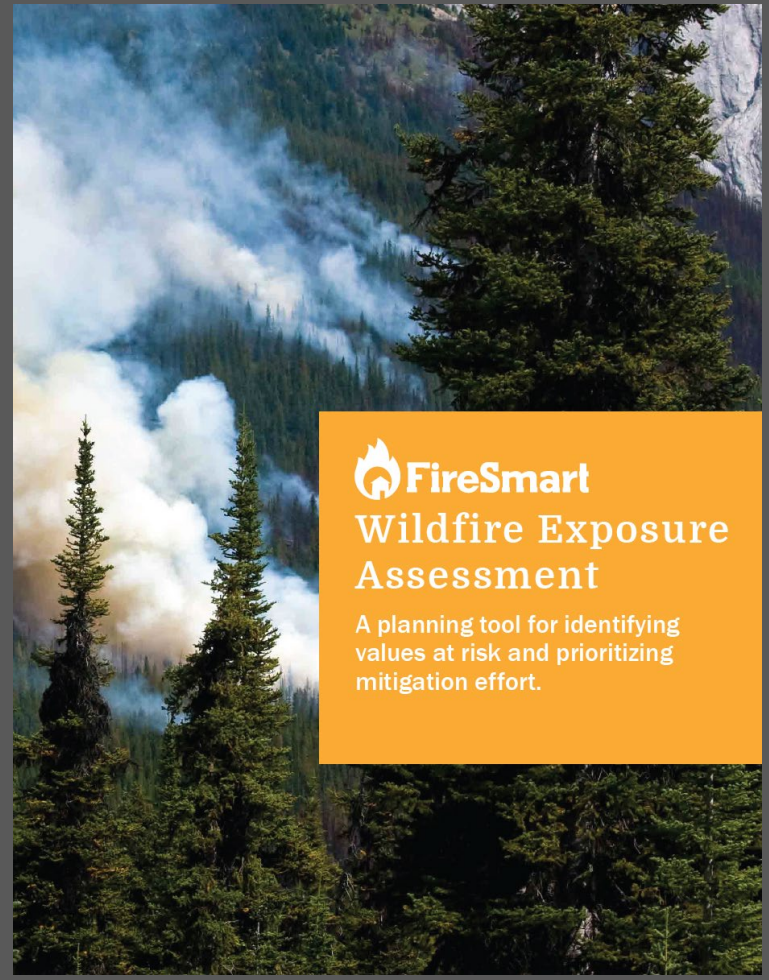
Longer range embers



Shorter range embers



Radiant Heat



 **FireSmart**  
Wildfire Exposure  
Assessment

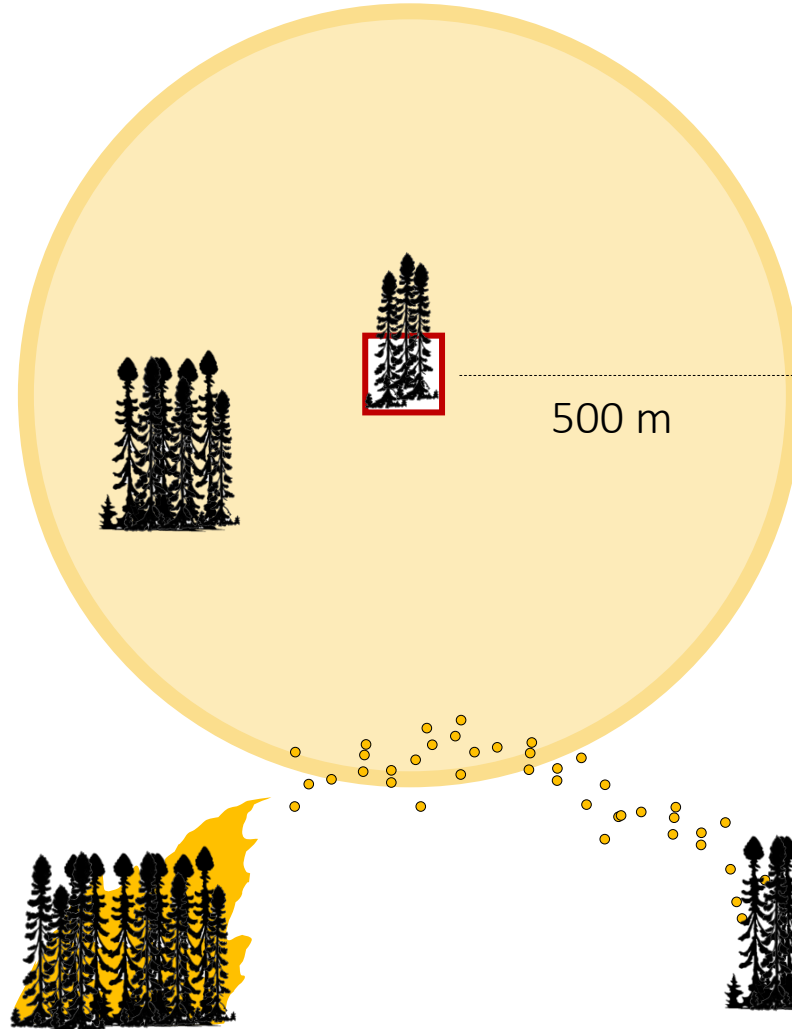
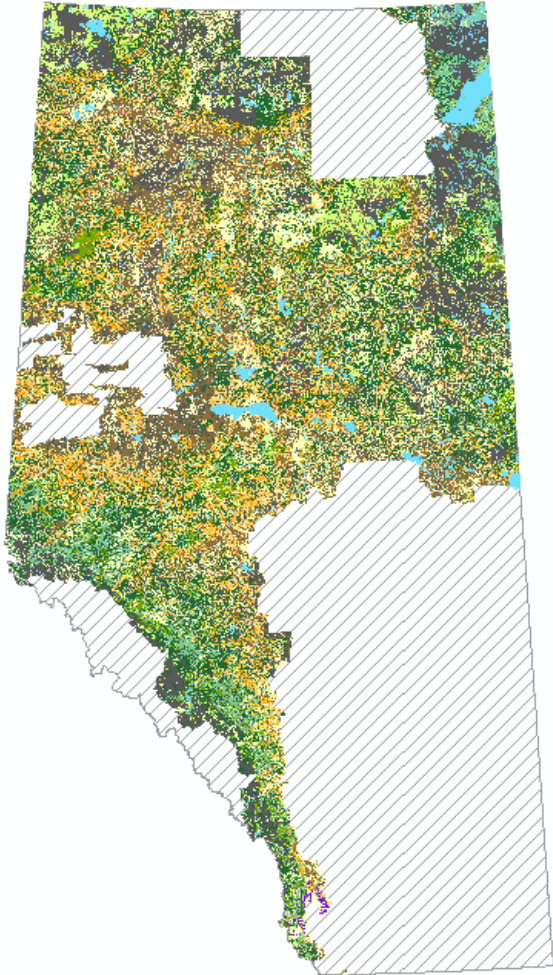
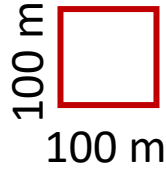
A planning tool for identifying values at risk and prioritizing mitigation effort.



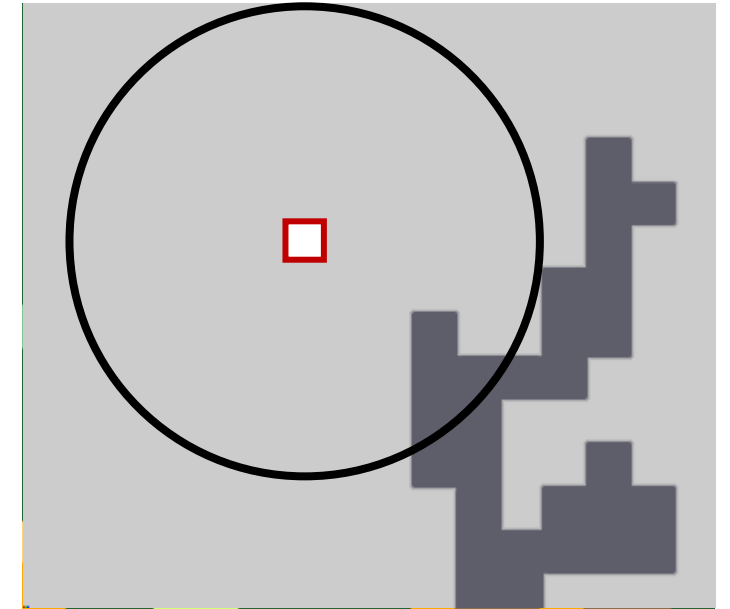
Funded by Forest Resource Improvement Association of Alberta (FRIAA)

# Simple metric of exposure (Beverly, McLoughlin, Chapman 2021)

Forest Protection  
Area land cover




- Hazard Fuel (1)
- Other land cover types (0)

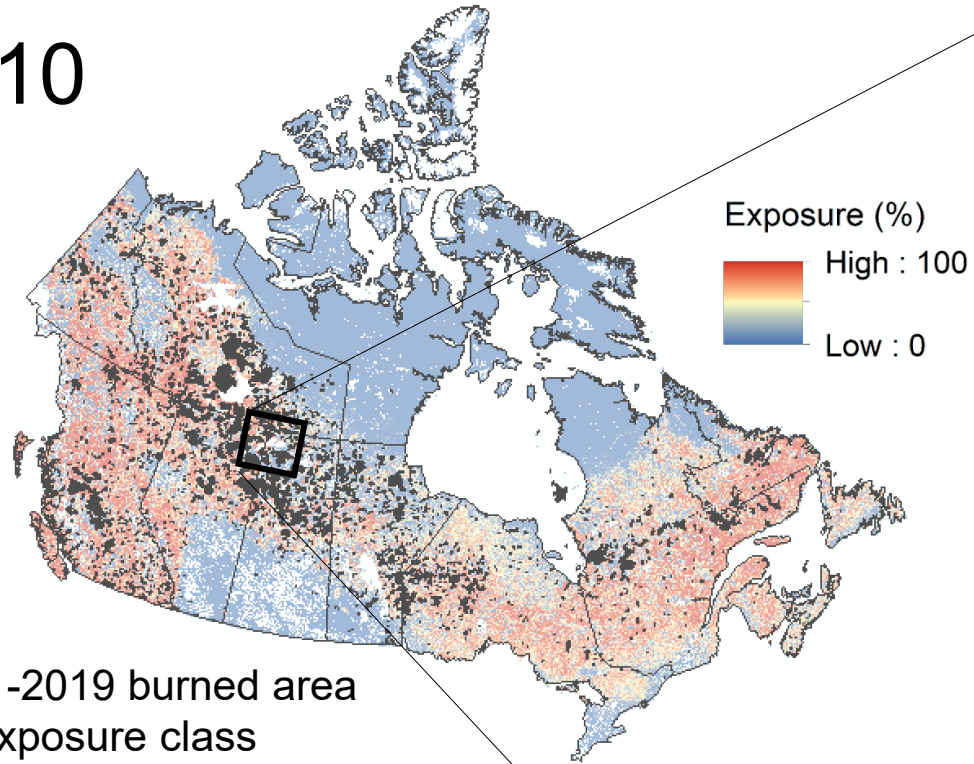


There are 80 pixels within 500 m –  
how many can transmit fire to me?

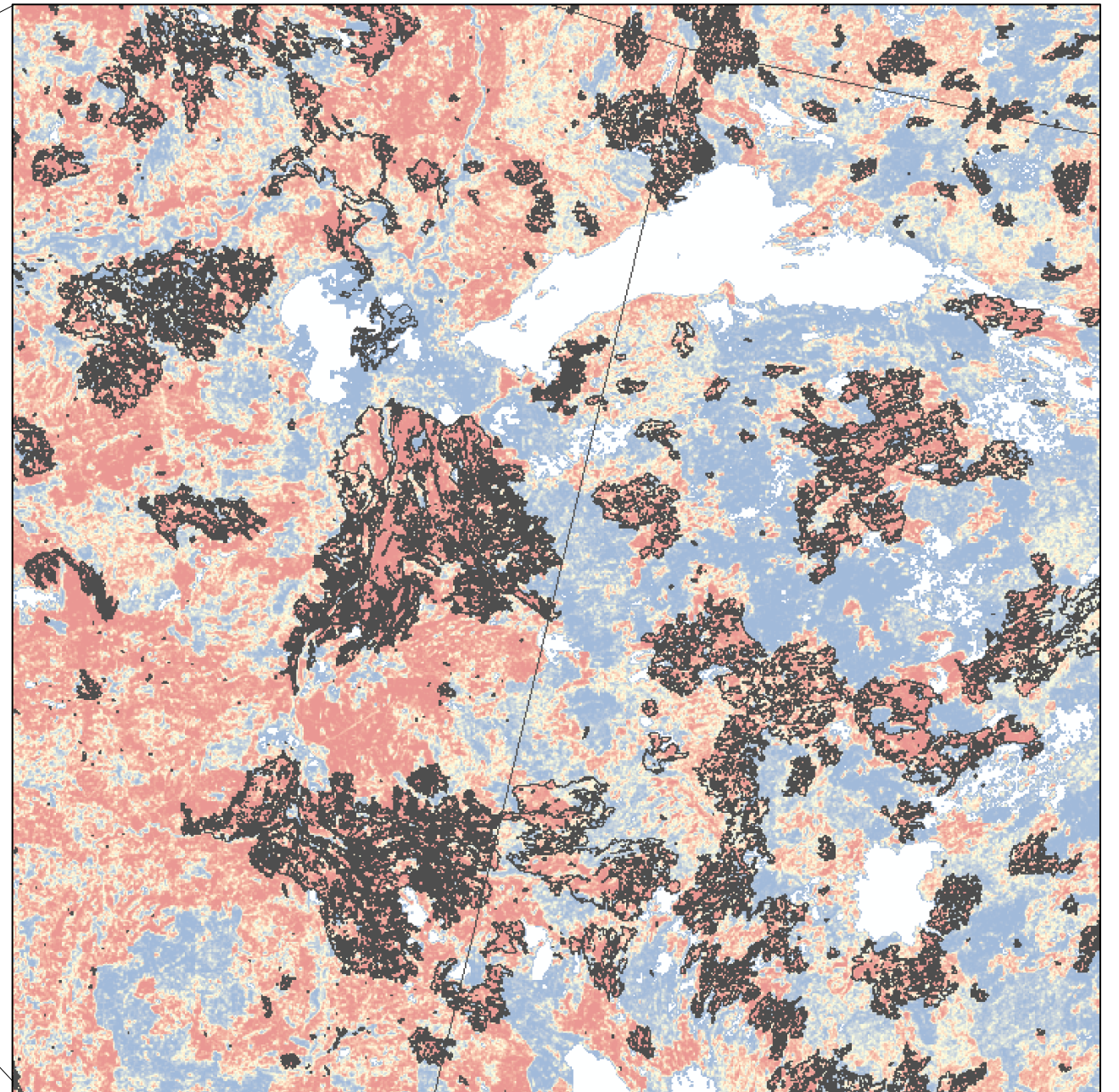
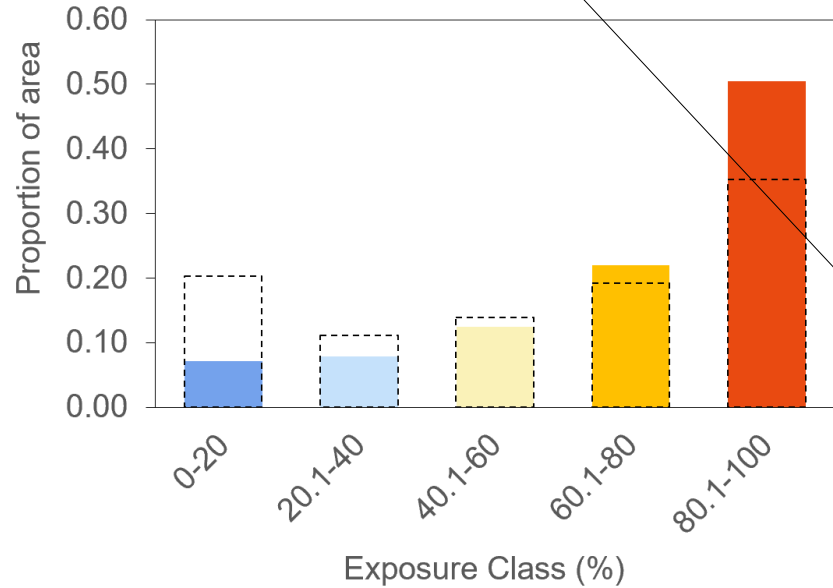
$$\frac{\sum \text{hazard fuel pixels}}{\text{total pixels}} = \frac{75}{80} = 0.94$$

 94% exposure

# 2010



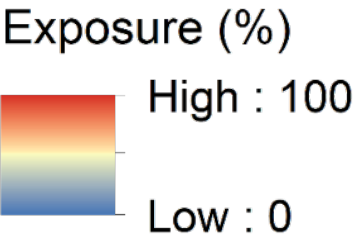
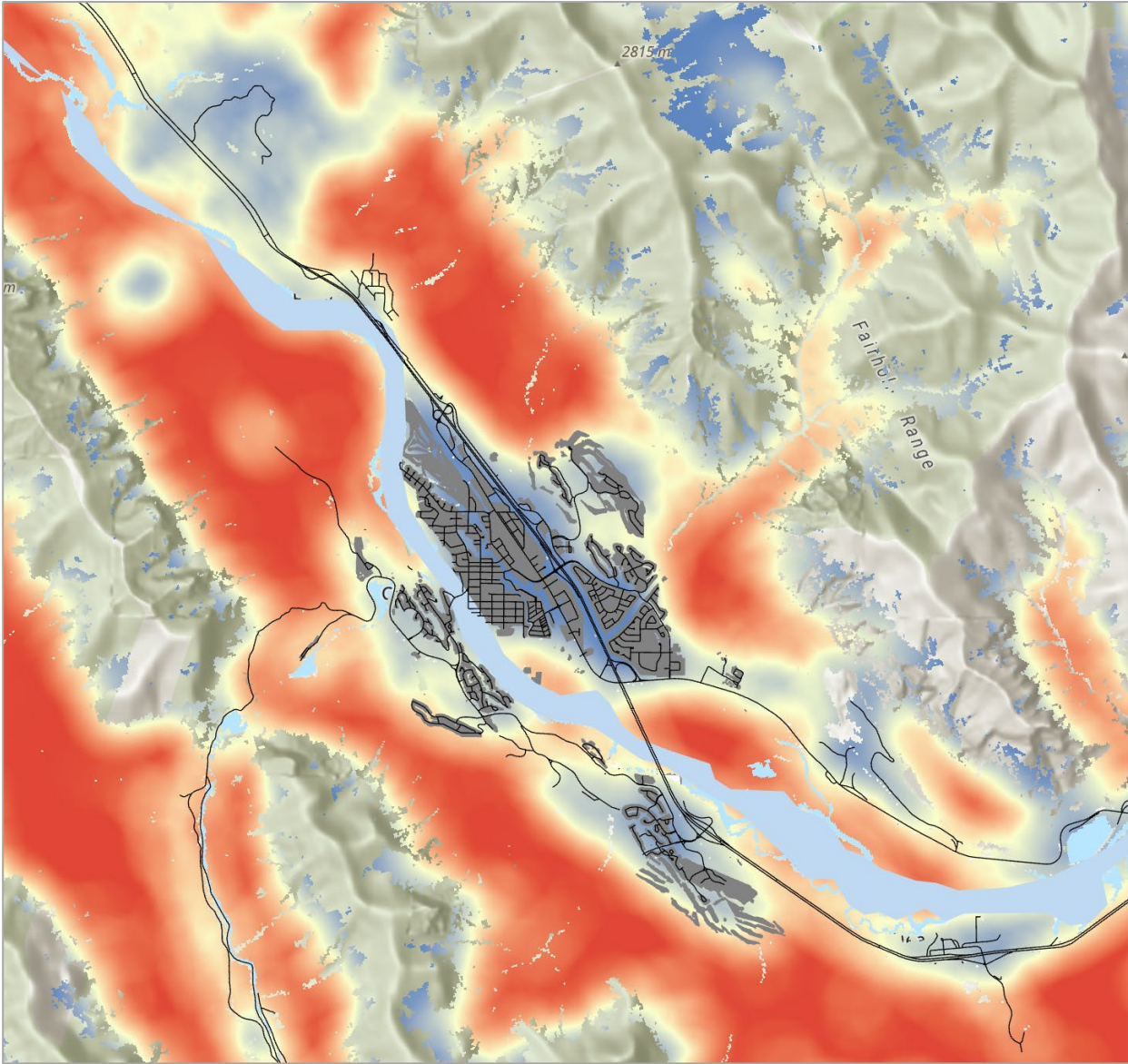
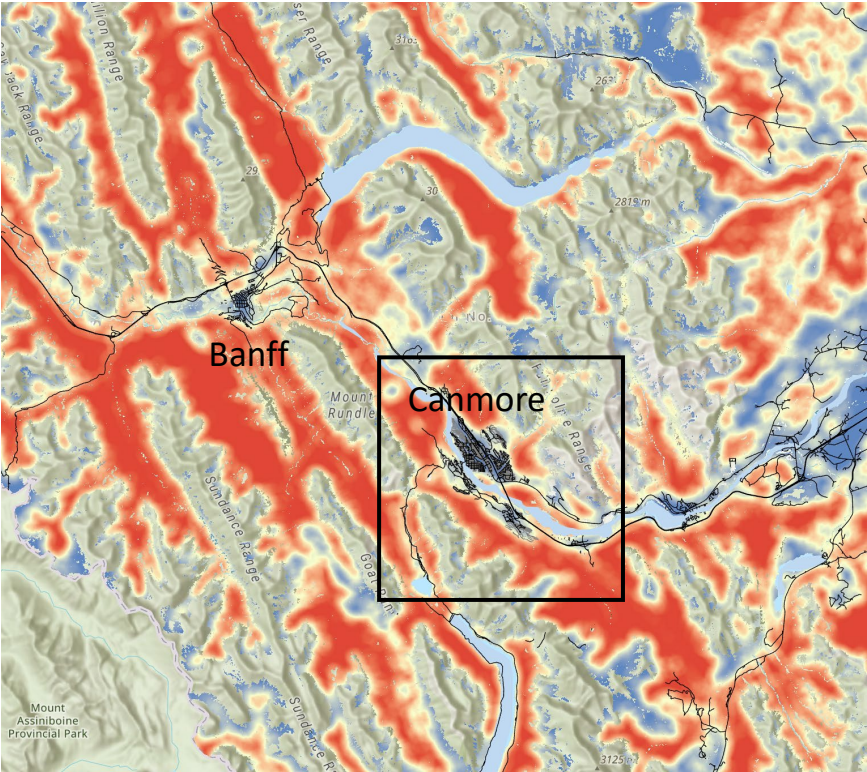
2011-2019 burned area by exposure class



Based on method in Beverly et al. (2021). Input data: Landcover of Canada (Latifovic et al. 2020, North American Land Change Monitoring System (NALCMS))



# Landscape fire exposure around Canmore

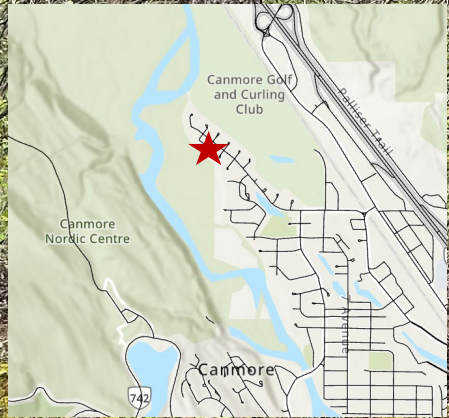


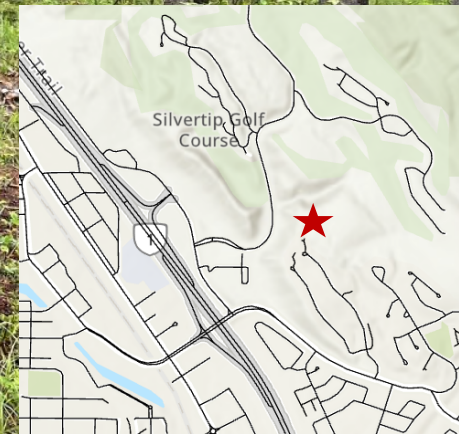
# Fuel amount and arrangement (vertical and horizontal) dictates fire behaviour – **target of proactive mitigation**



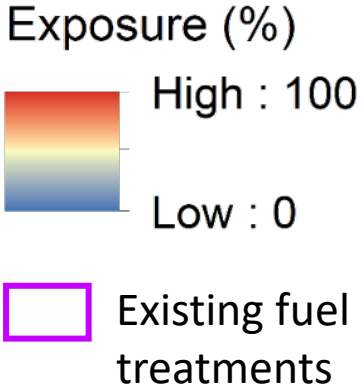
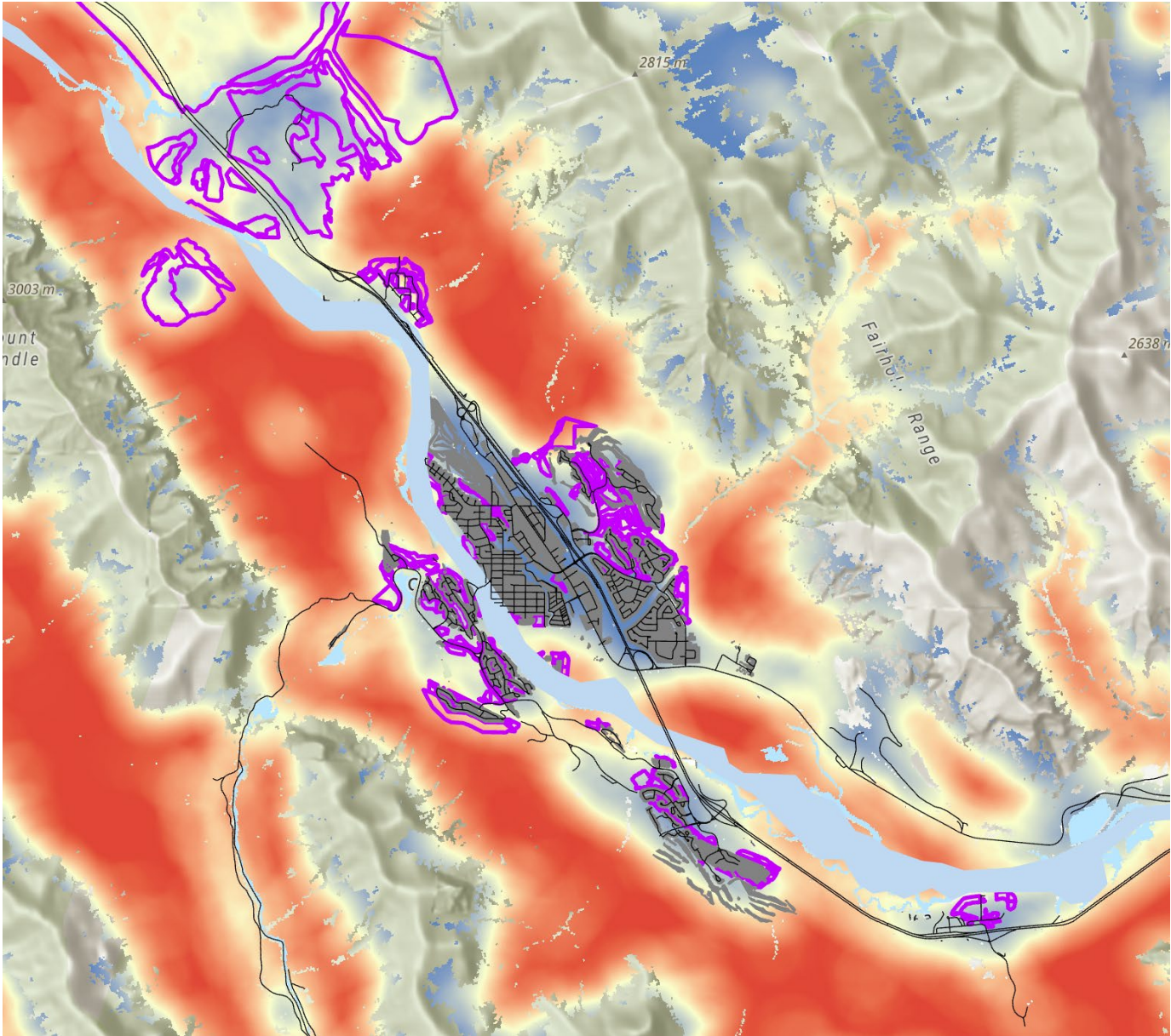
- 1 Remove
- 2 Reduce
- 3 Convert
- 4 Isolate

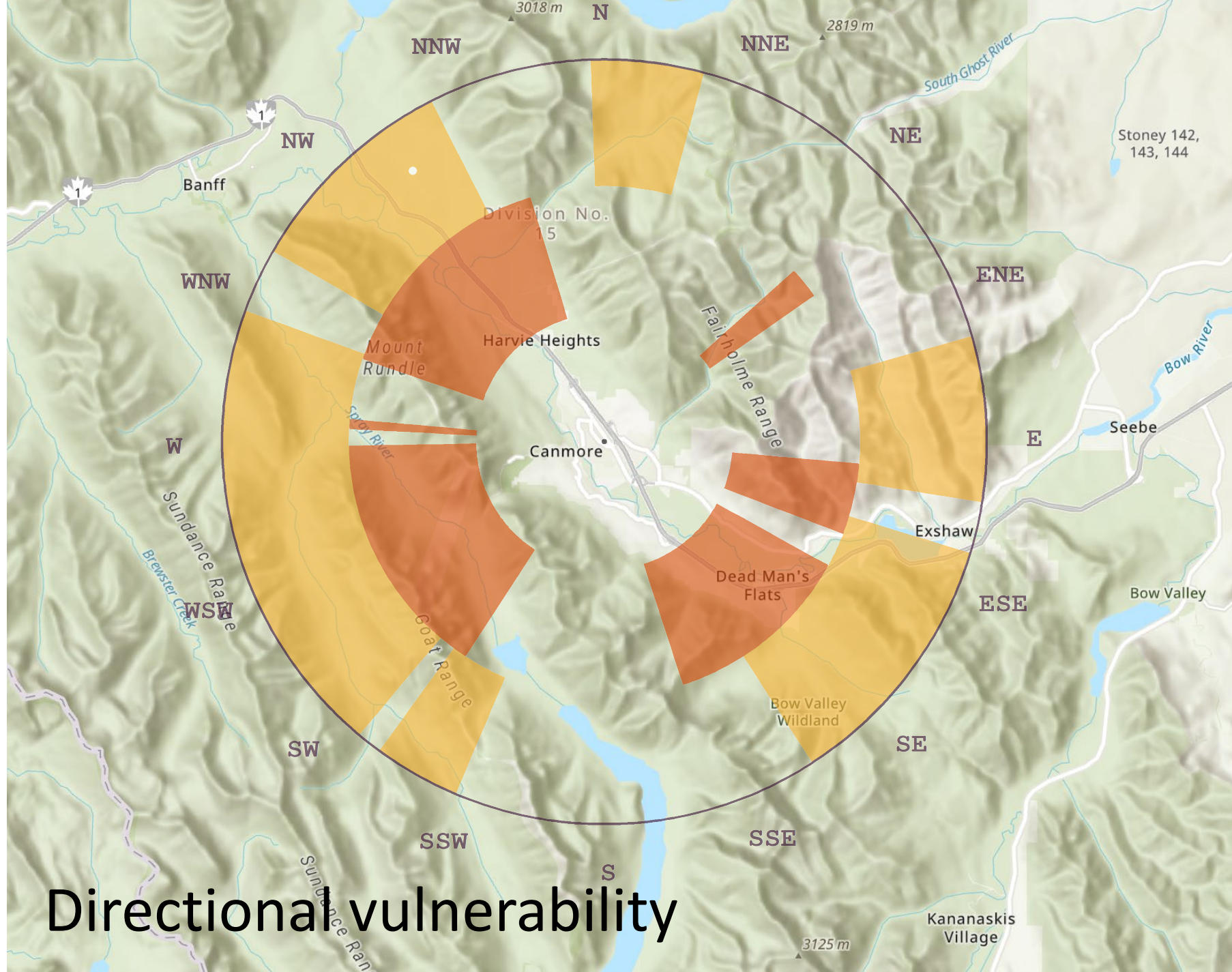
Also used during  
response operations



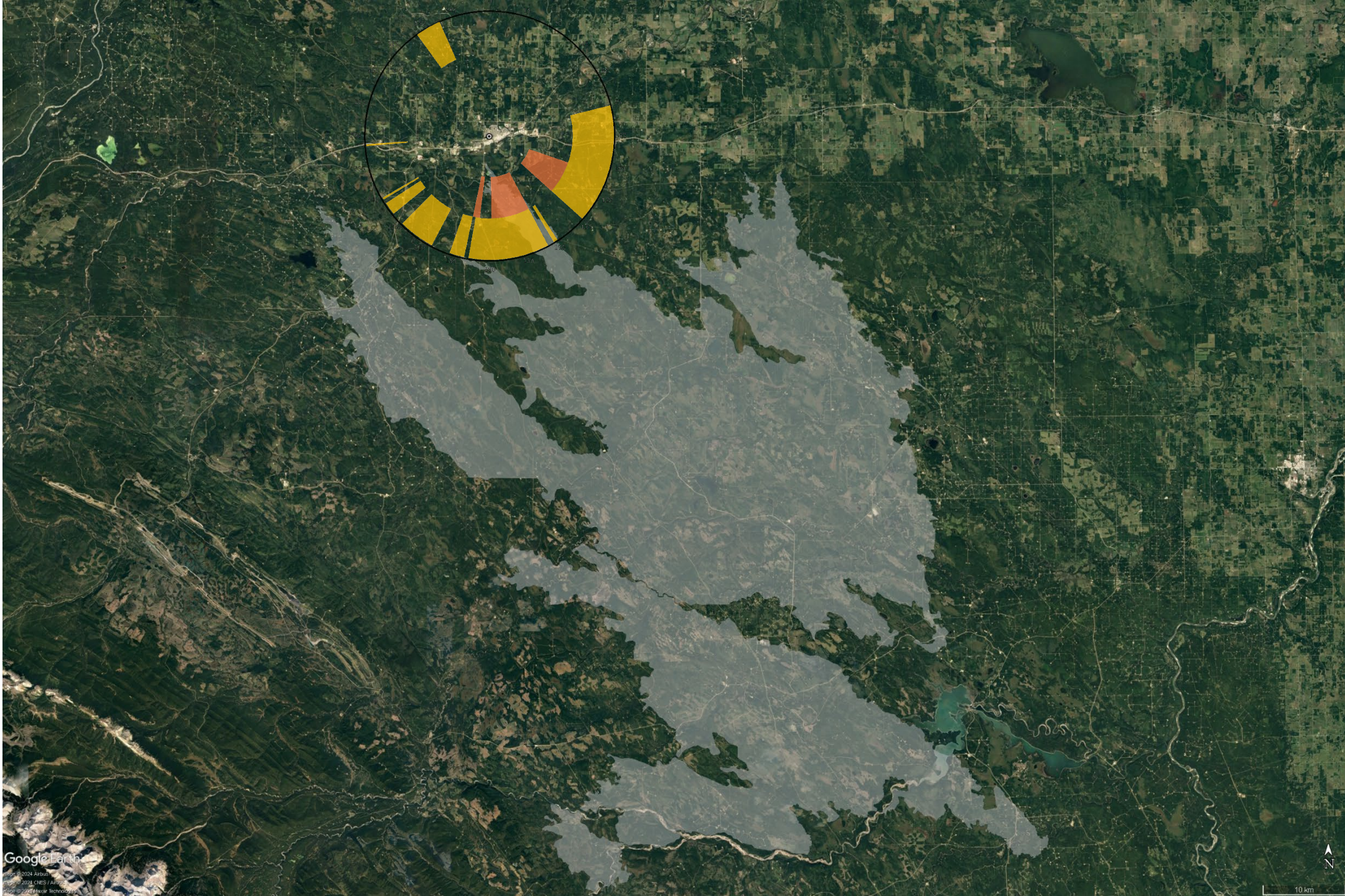


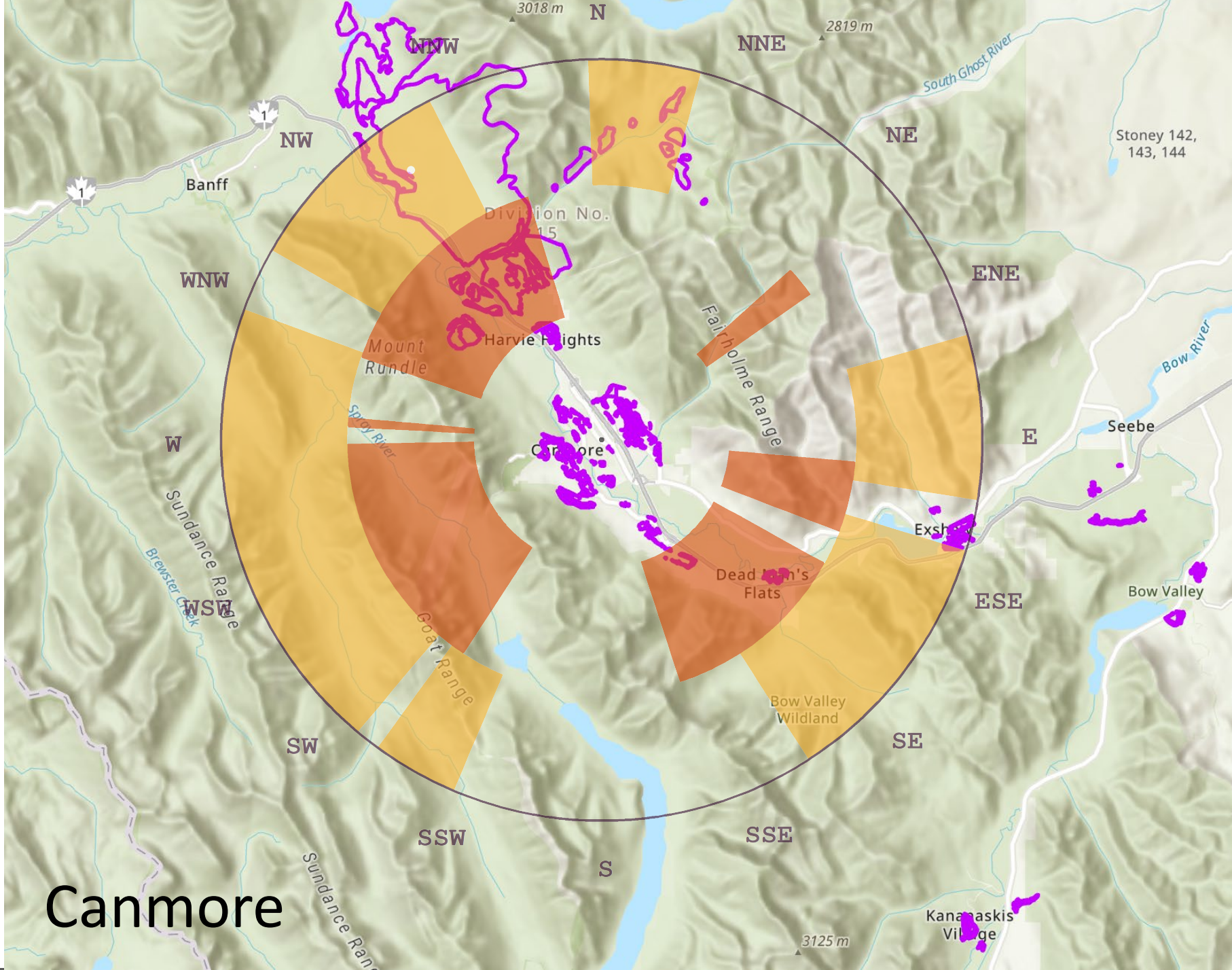
# Canmore fuel treatments





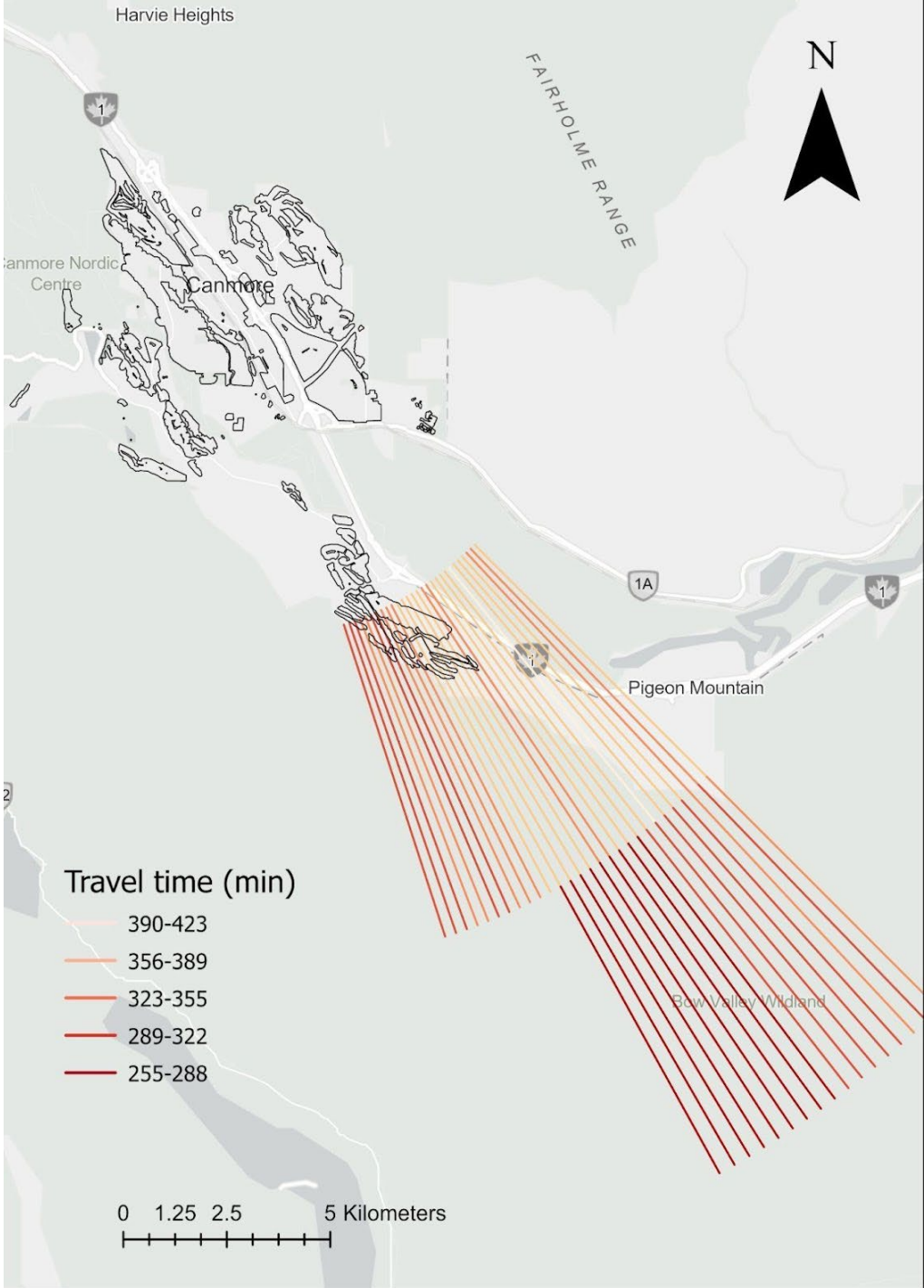
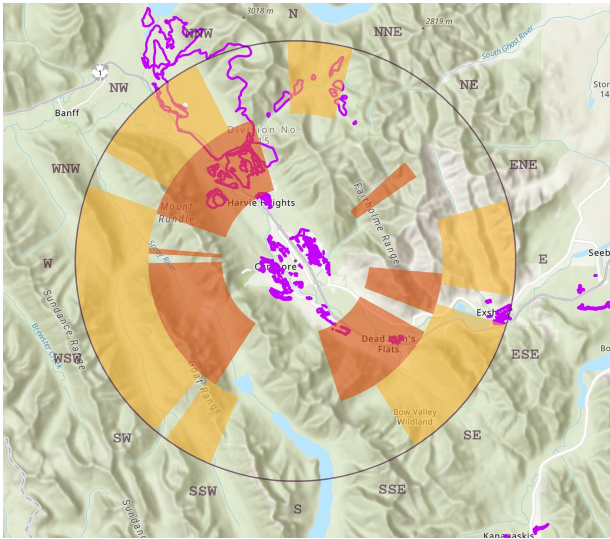
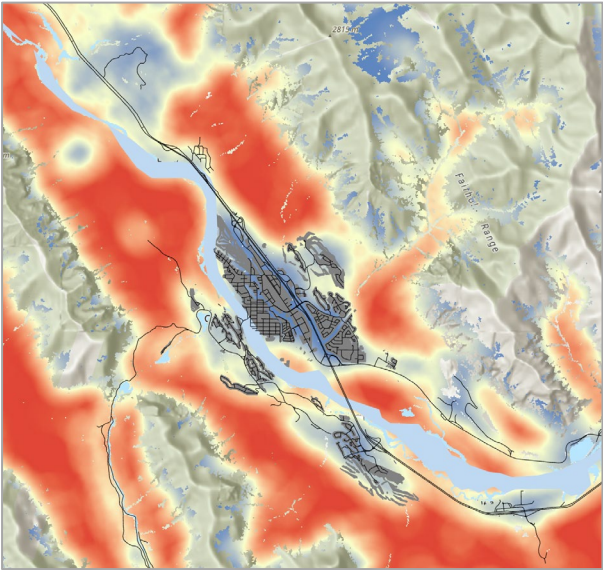
# Directional vulnerability







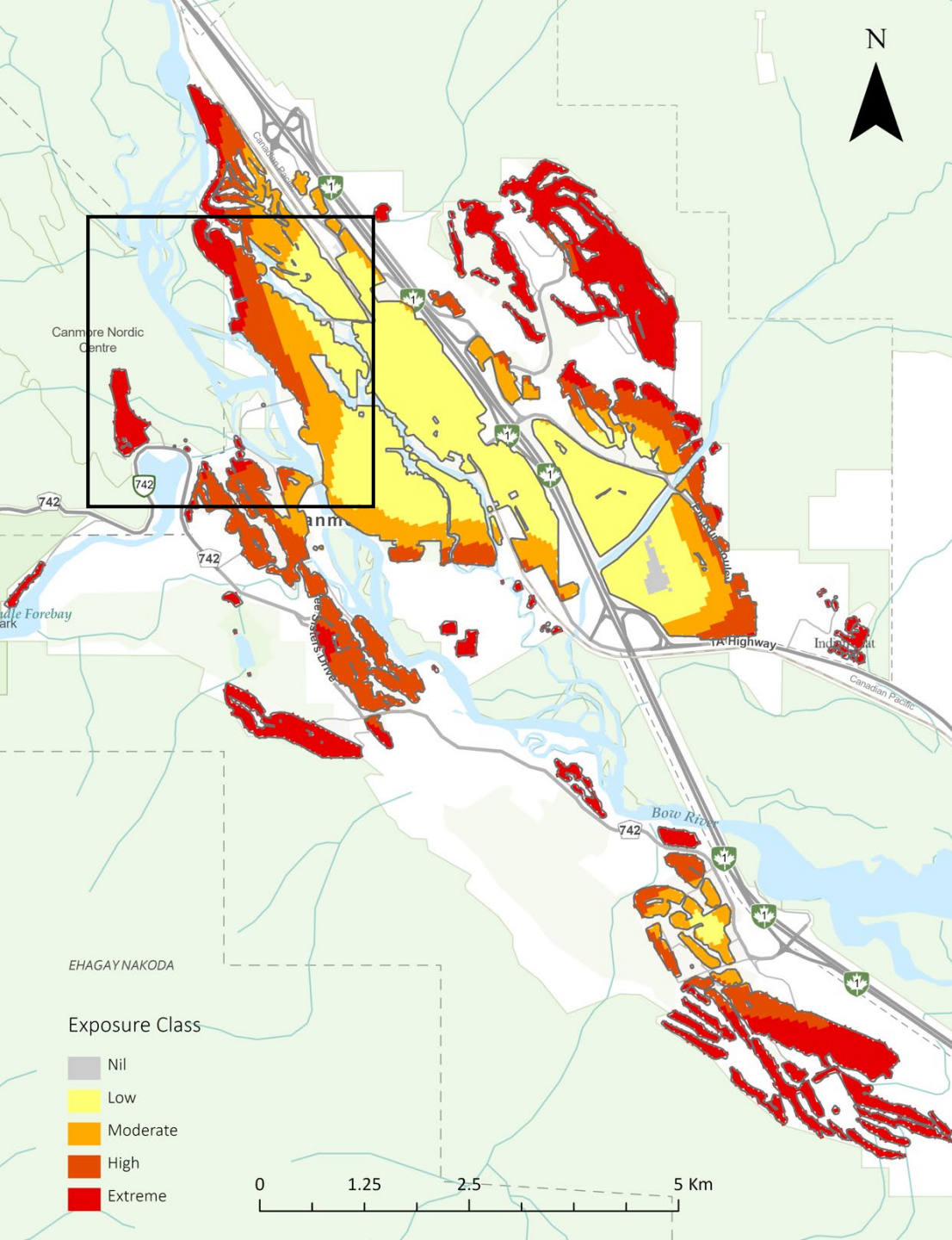
# Evacuation Vulnerabilities



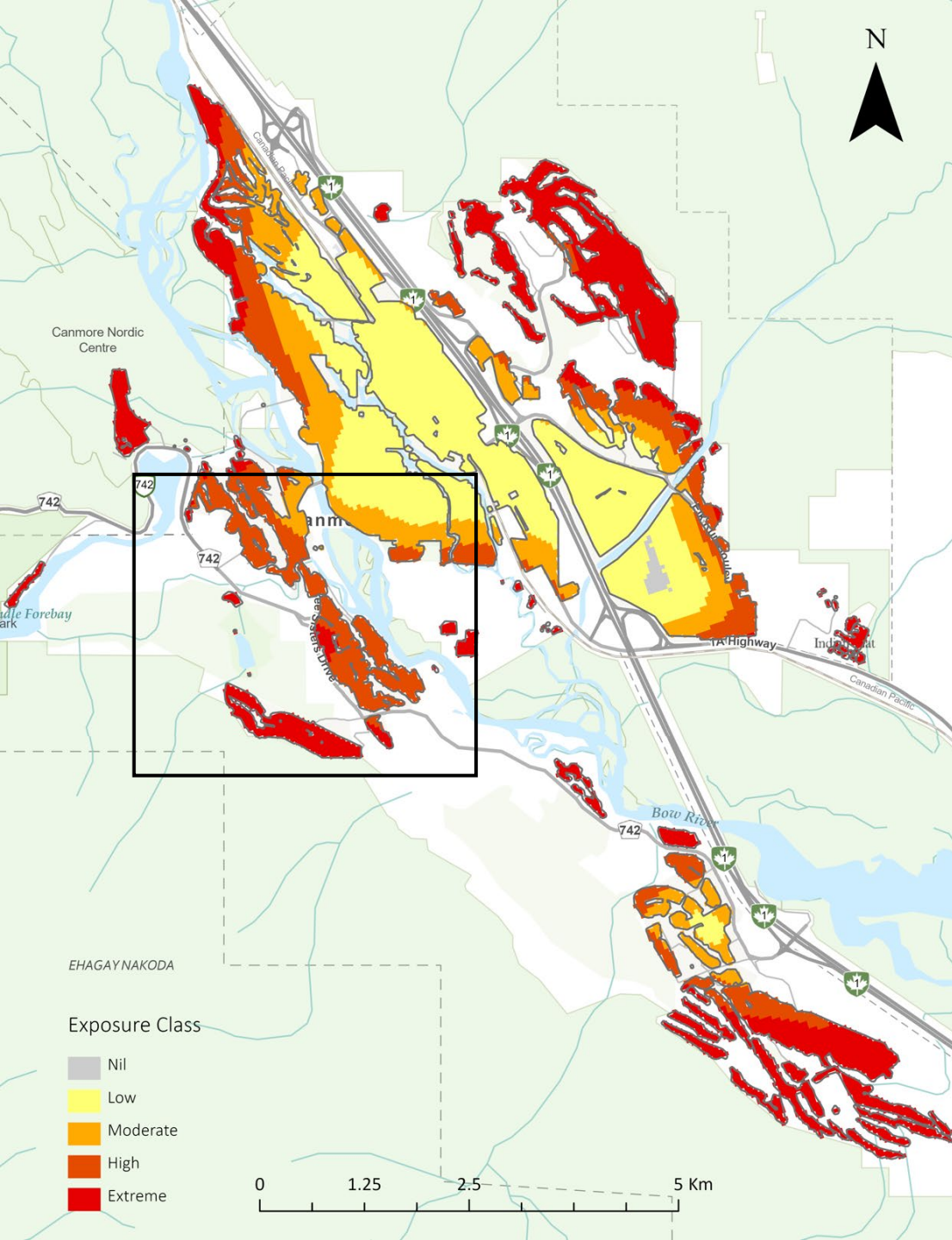
Funded by



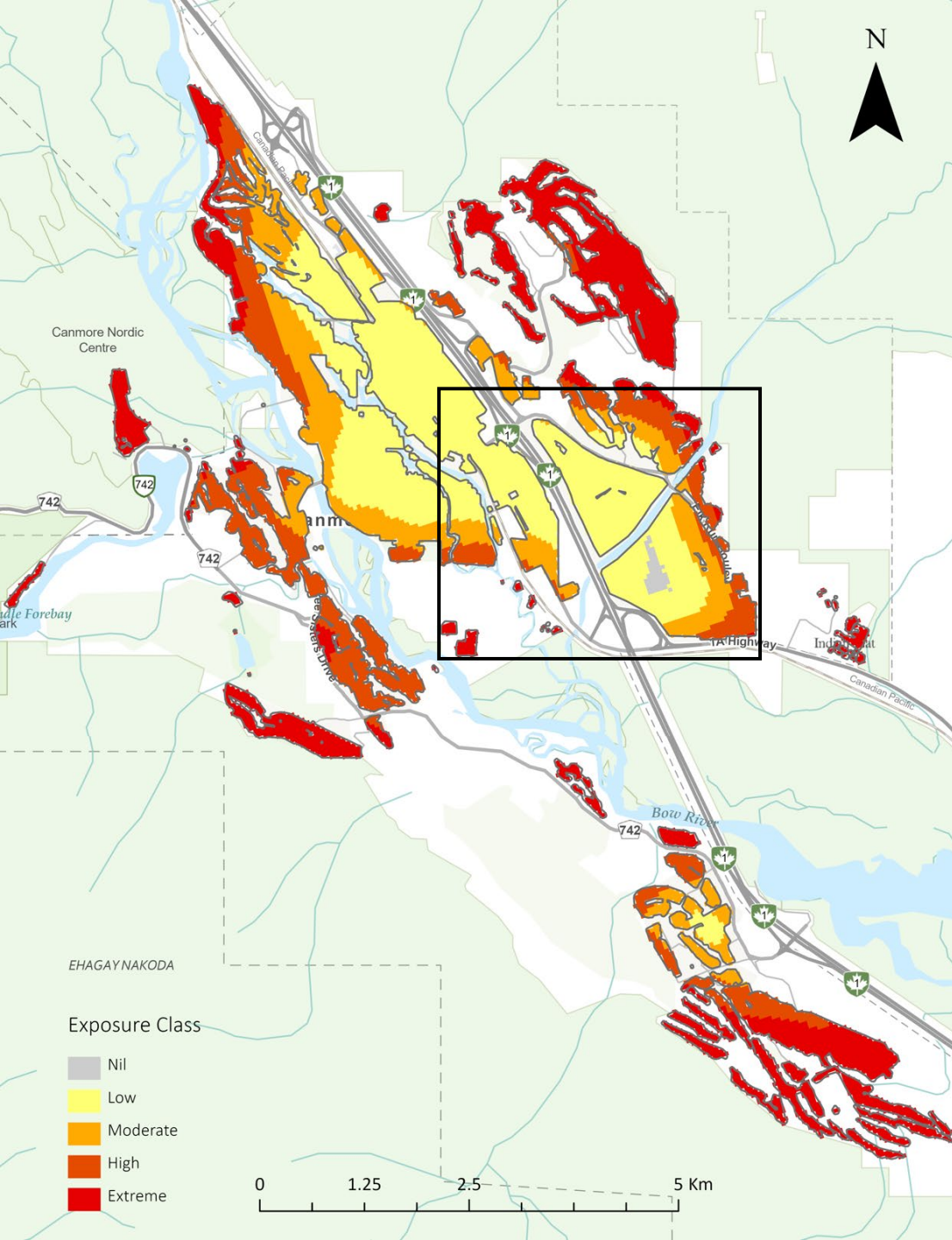
# Where can longer-range embers transmit to?



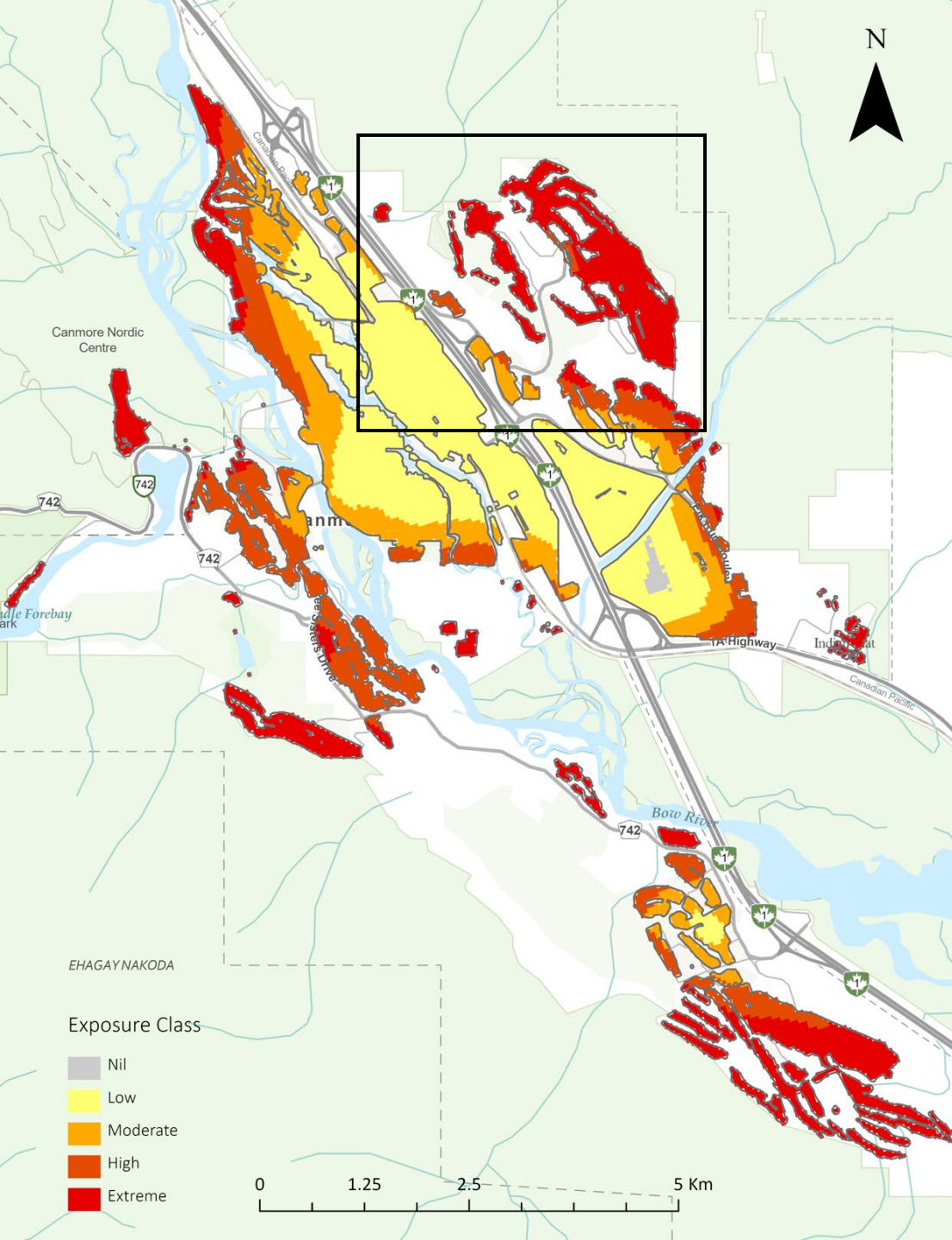
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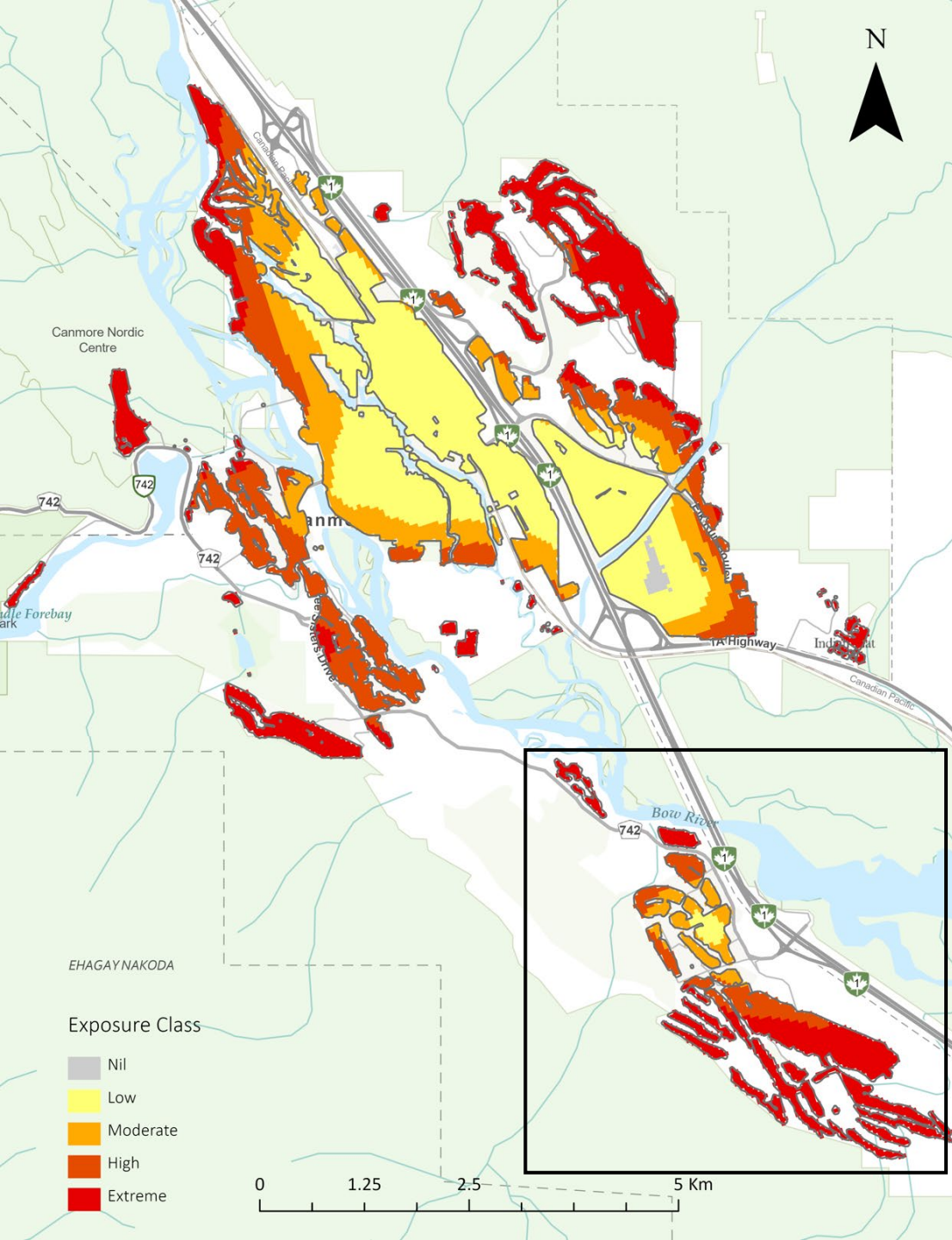
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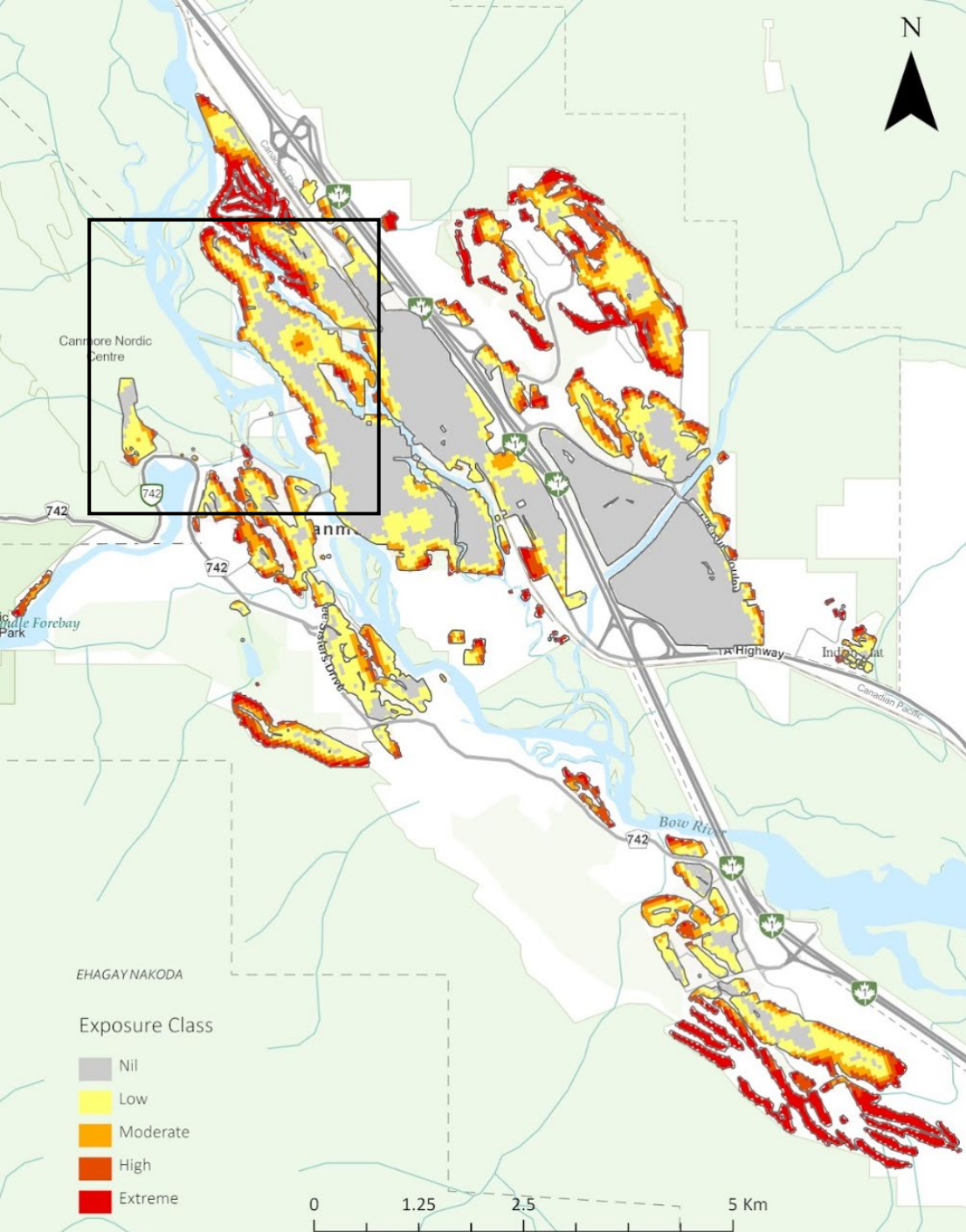


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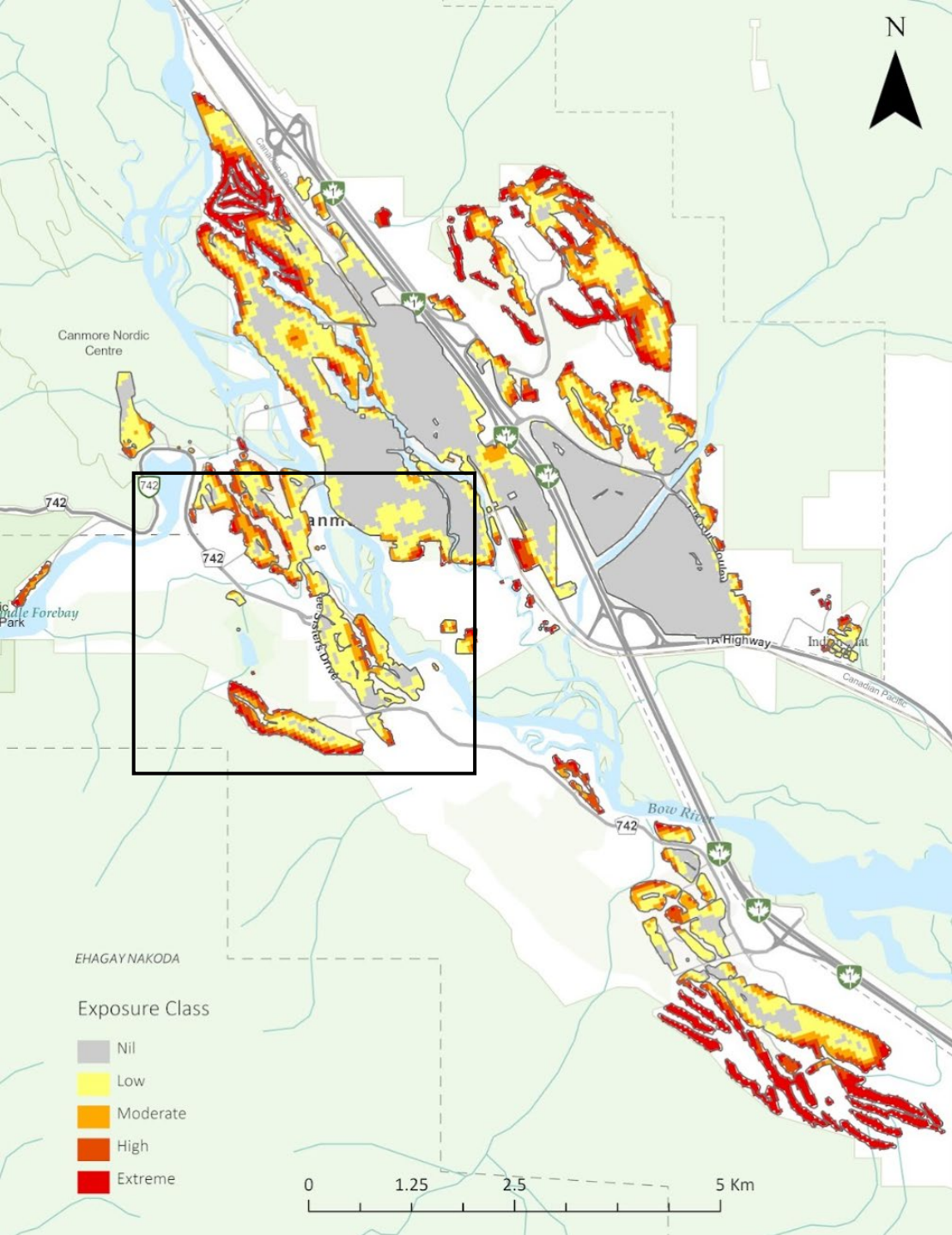
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Where can short-range embers transmit to?

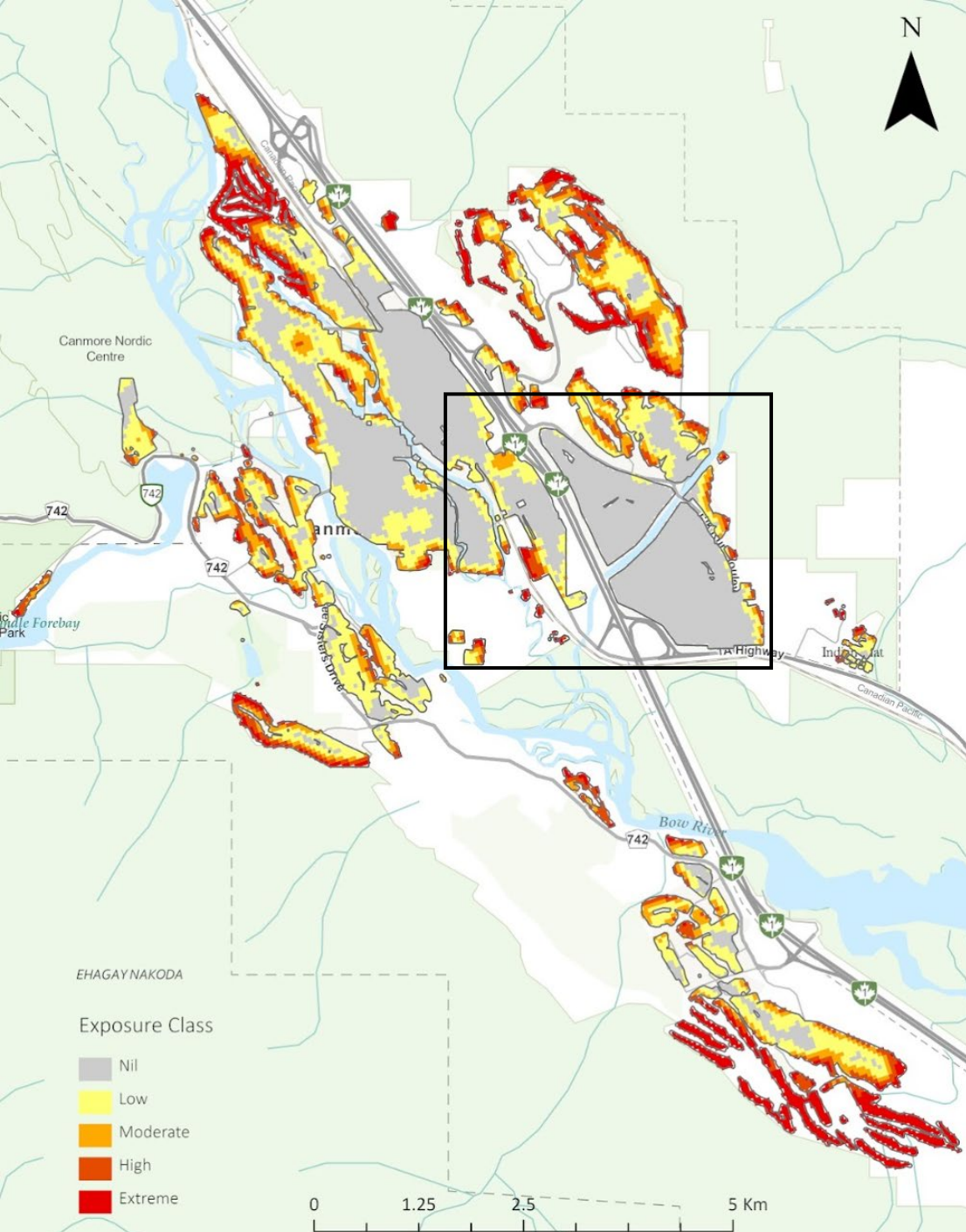




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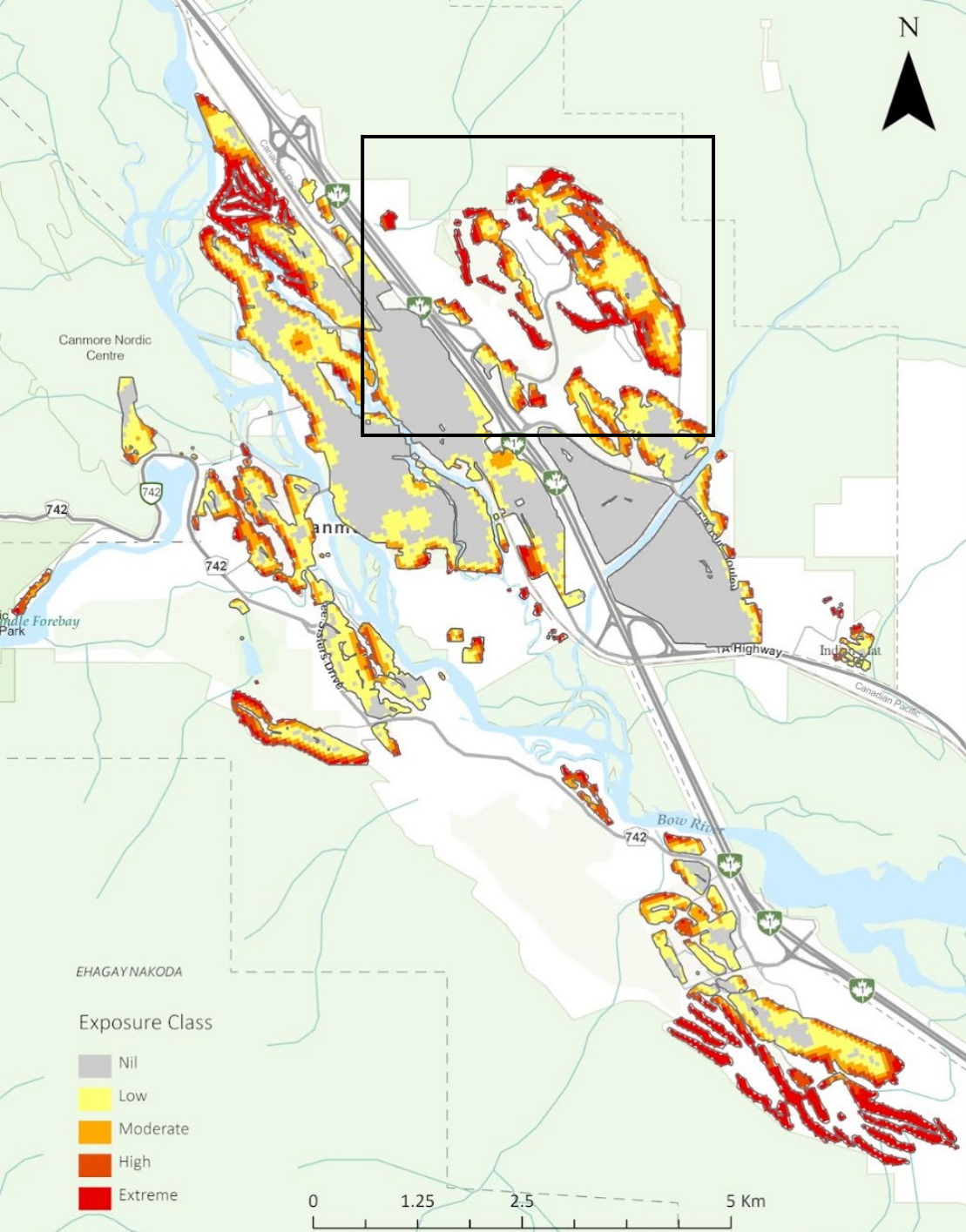






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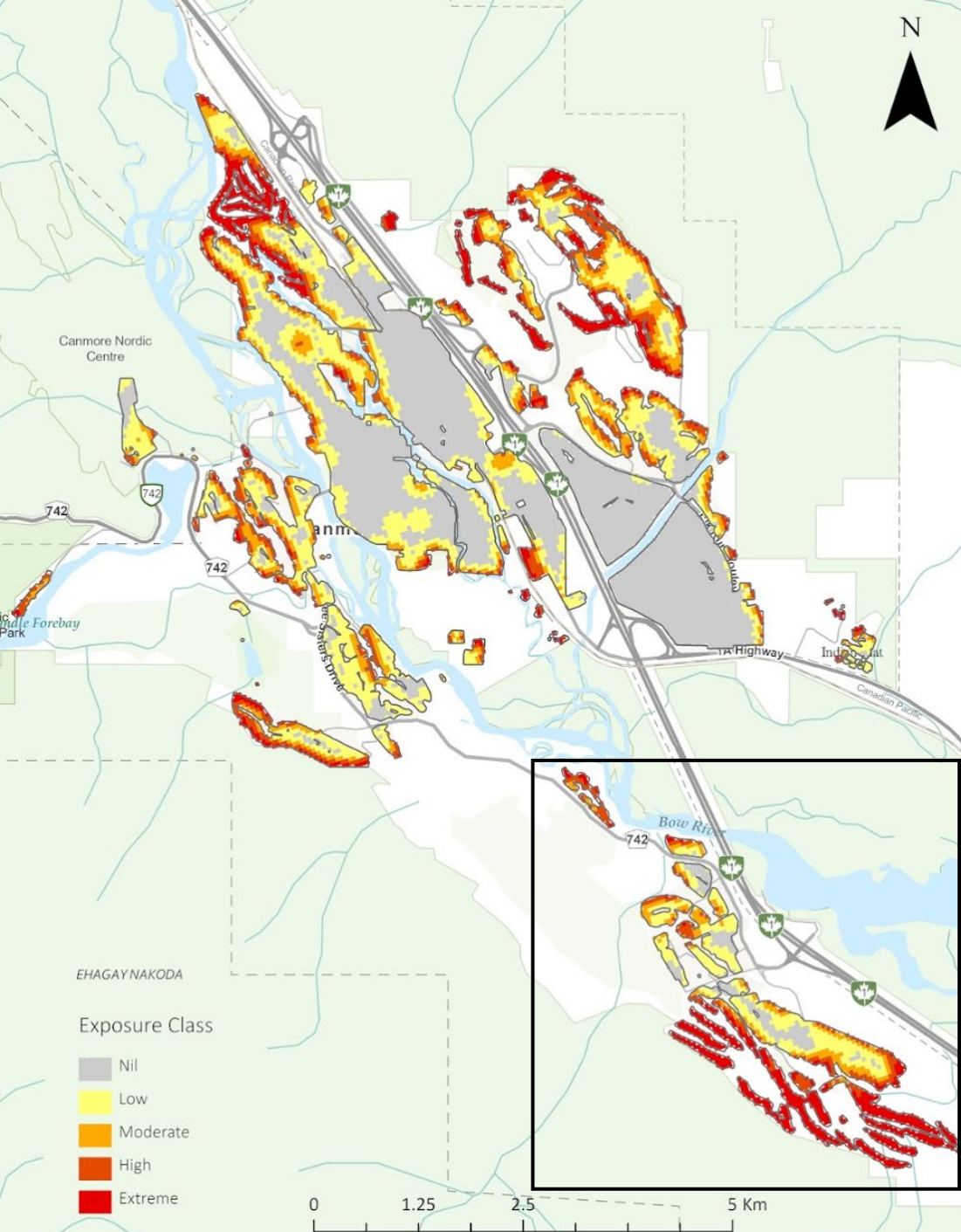




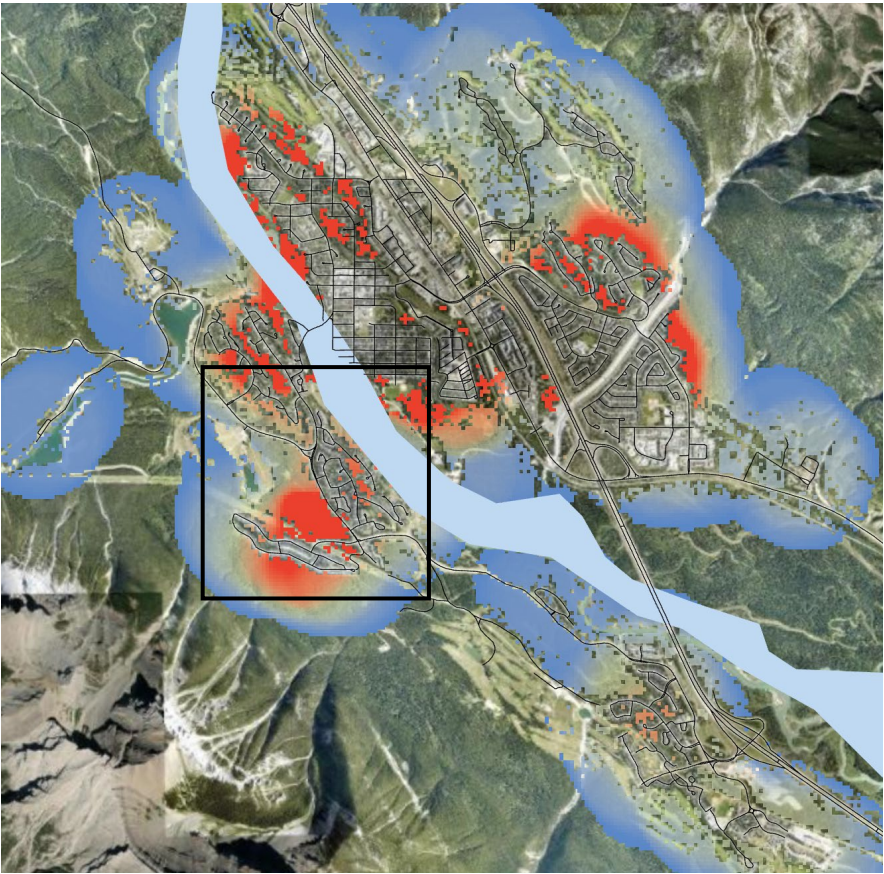
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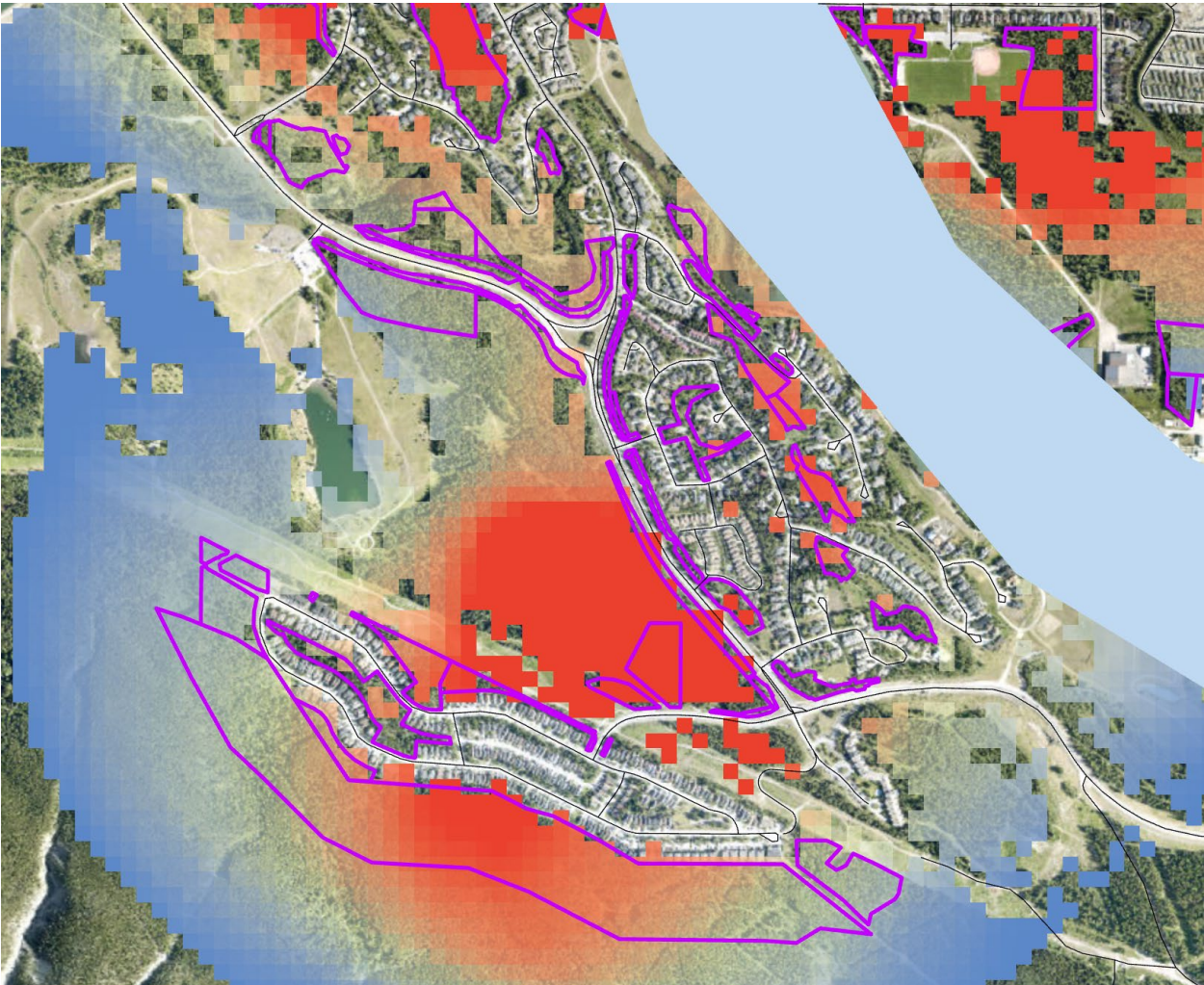
# Where can short-range embers transmit to?



# Which fuels are exposing the most buildings?

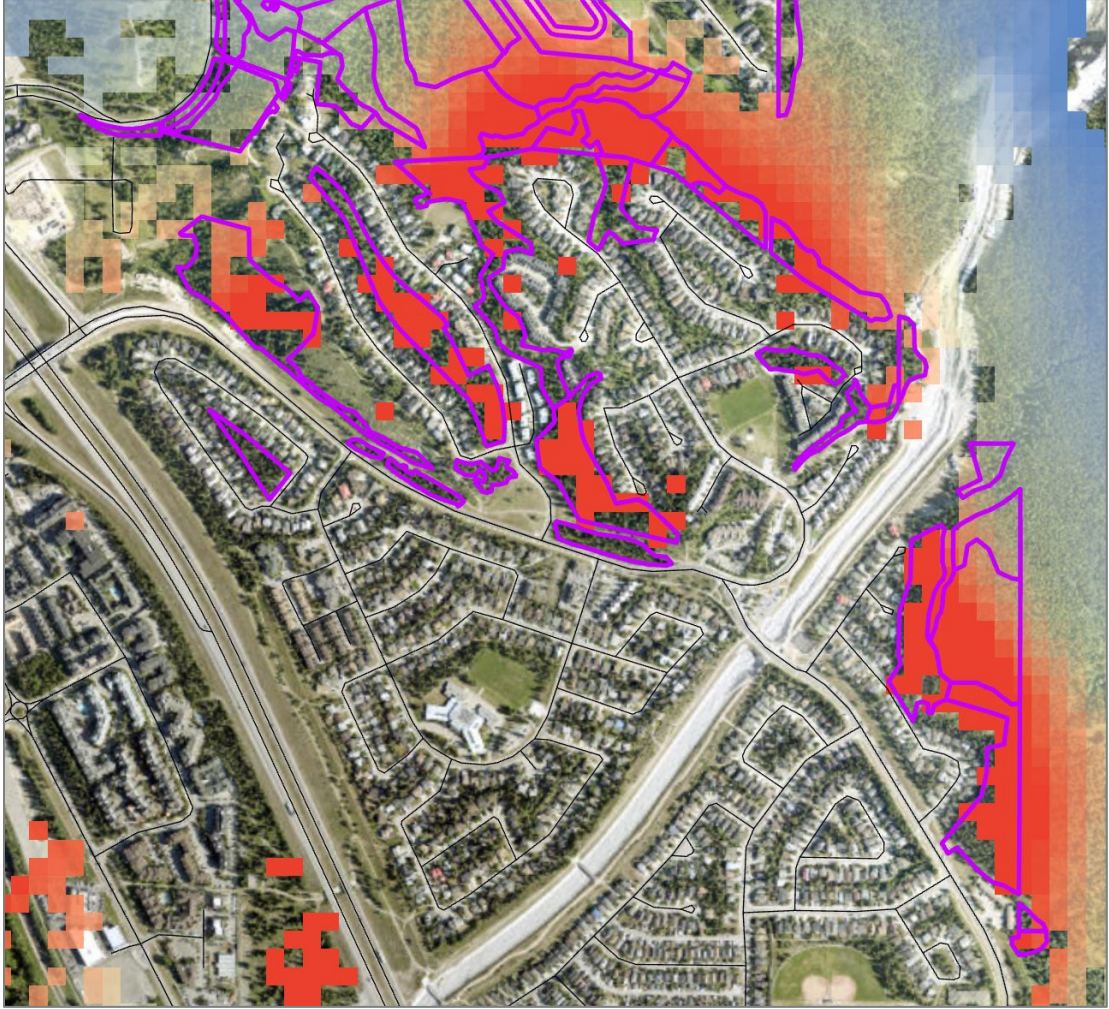
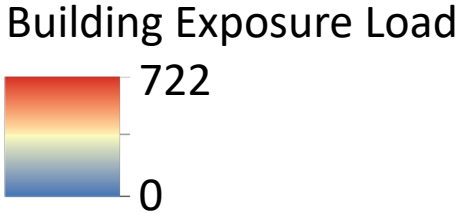
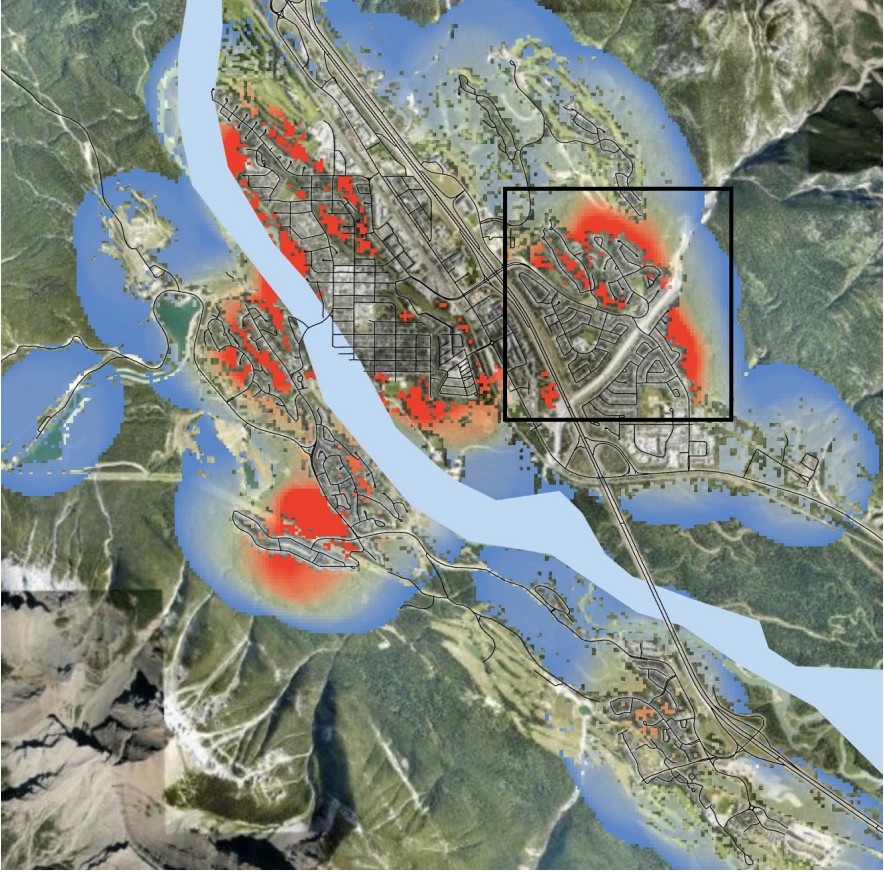



Building Exposure Load  
722  
0



Existing fuel treatments

# Which fuels are exposing the most buildings?



 Existing fuel treatments

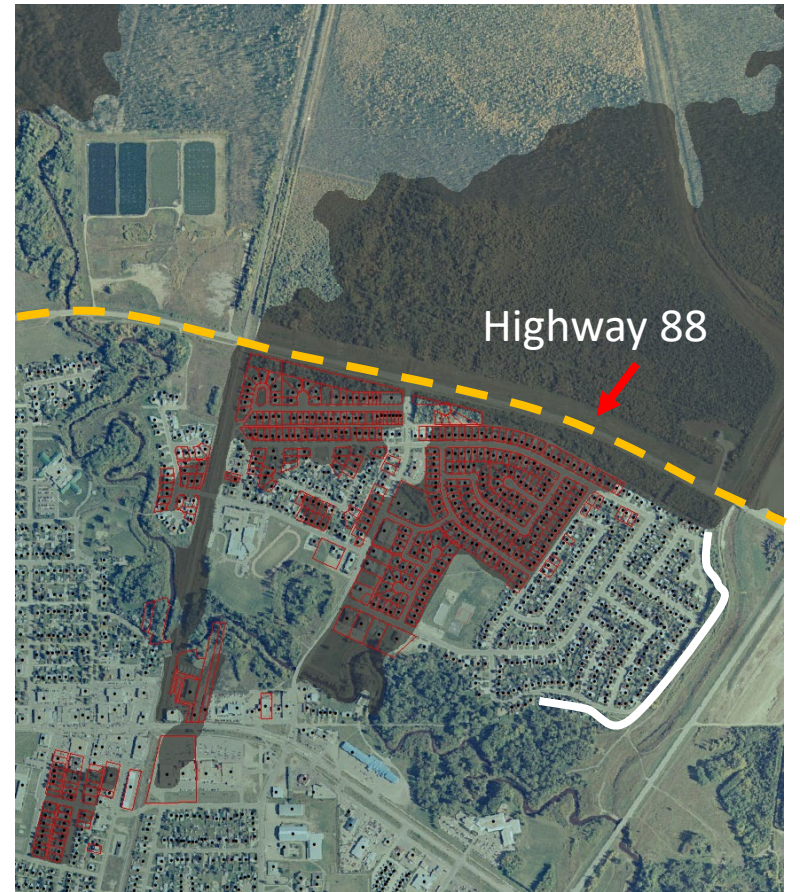
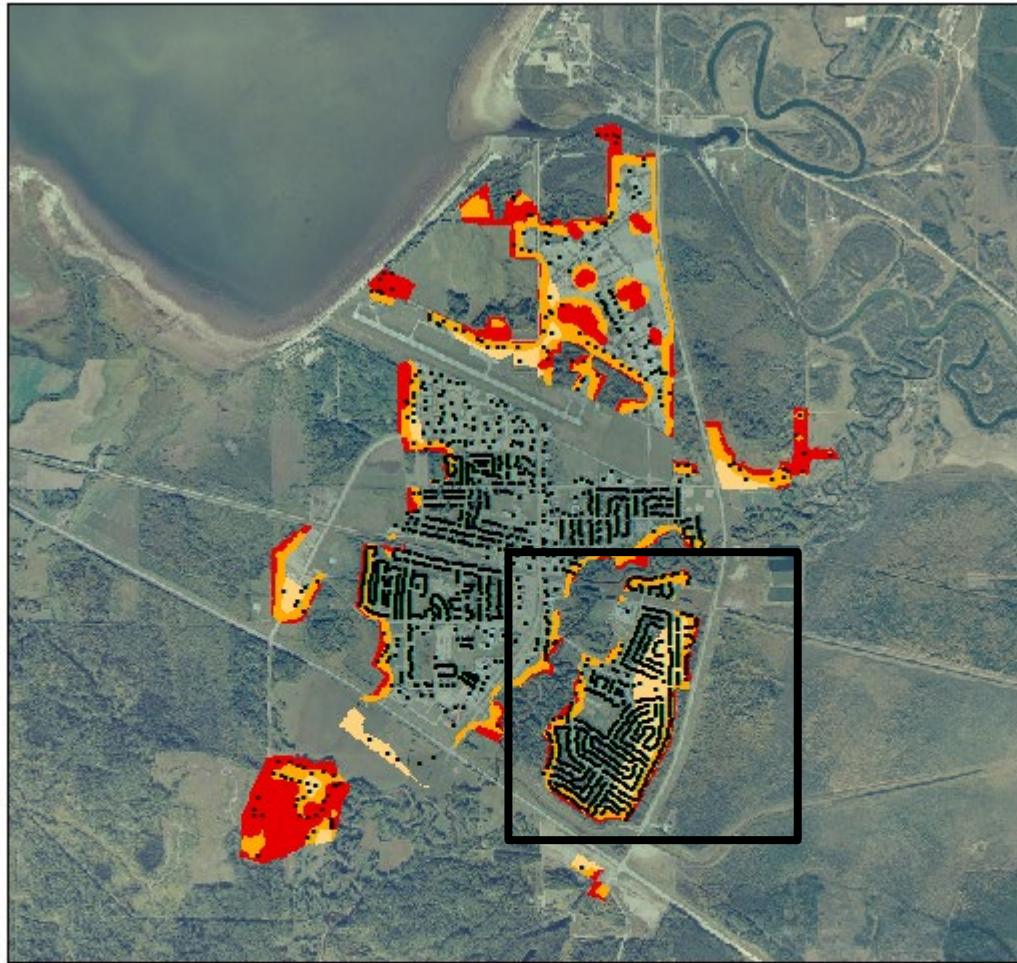
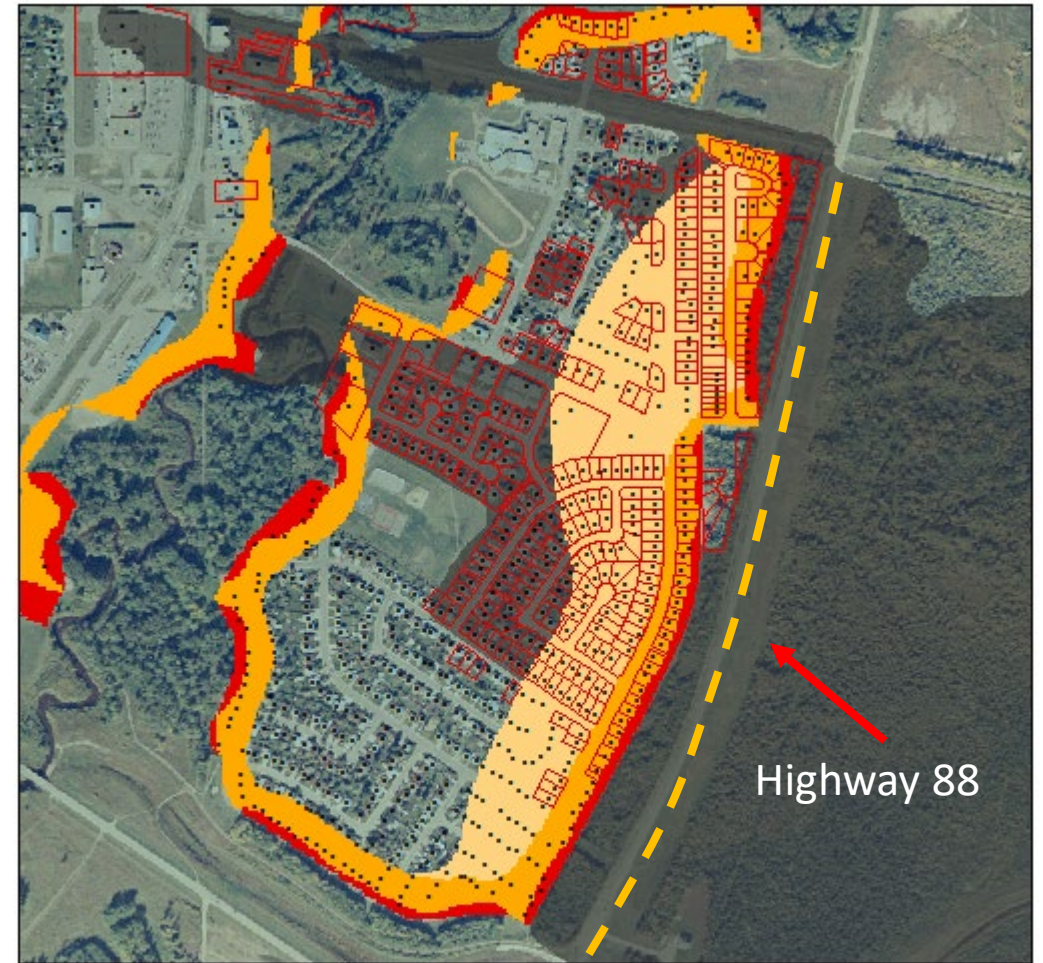
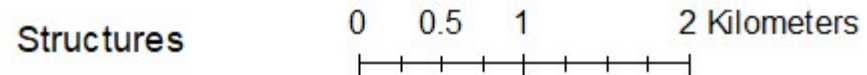


Figure 9 – SWF-065 approached Highway 88 and extreme short-range spotting ignited multiple structures in the Town of Slave Lake.



- Exposure to Radiant Heat Embers (30 m)  $\geq 10\%$
- Exposure to Shorter Range Embers (100 m)  $\geq 10\%$
- Exposure to Longer Range Embers (500 m)  $\geq 10\%$



# Thank you for listening...

## Funding



Forest Resource Improvement Association of Alberta (FRIAA)



National Research Council



Institute for Catastrophic Loss Reduction



Alberta Wildfire Management Branch

## People



Neal McLoughlin  
Liz Chapman



Laura Stewart



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Nima Karimi, Air Forbes,  
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## Connect



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# Preparing for a Changing Climate: Implementing Emergency Response Plans for Extreme Heat & Wildfire Smoke in Canmore

June 16, 2024

# Presentation Overview

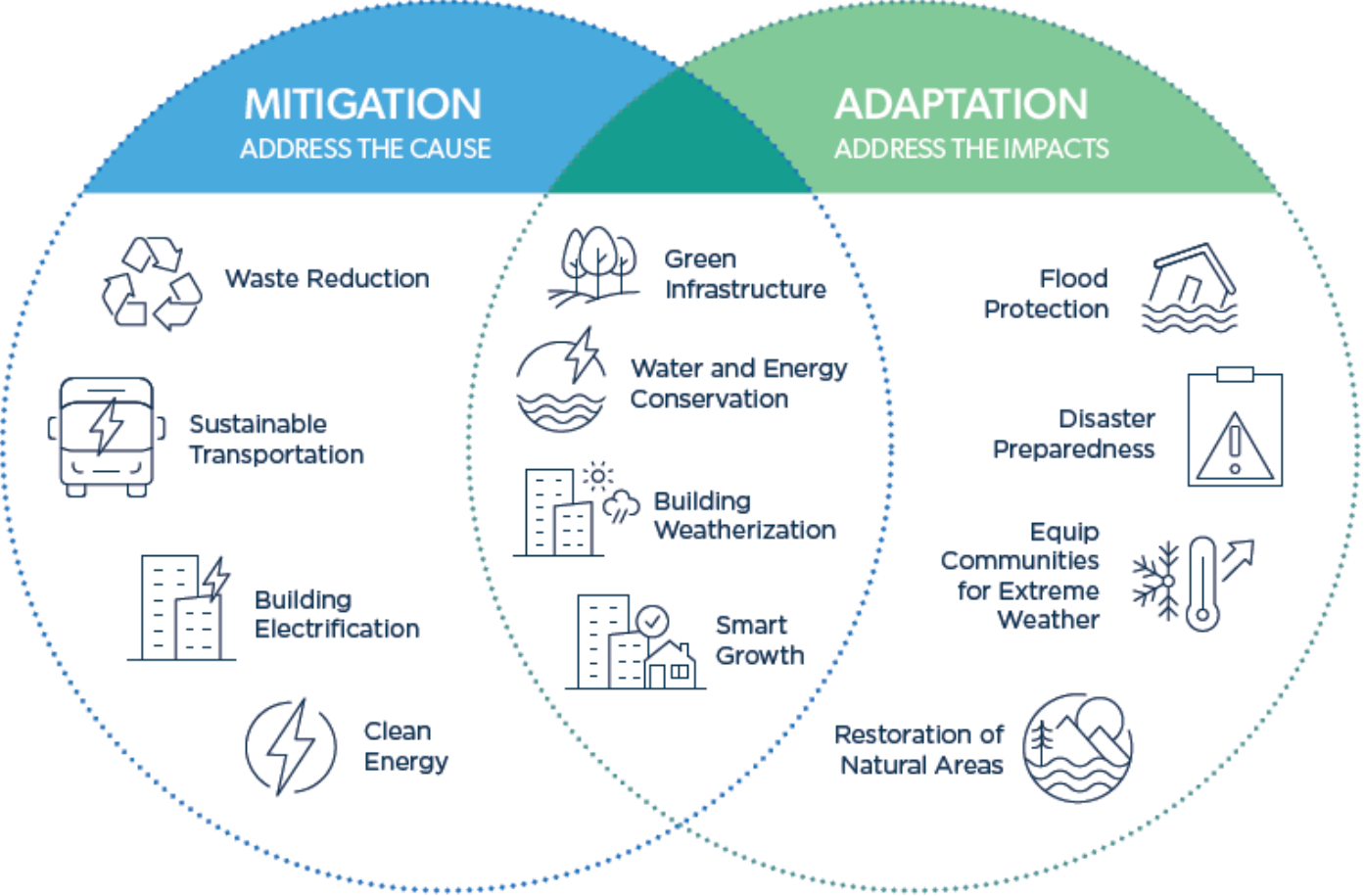
- ▶ What is climate change in Canmore
  - ▶ Canmore's Climate Hazards
  - ▶ Canmore's Climate Risks
- ▶ Extreme Heat and Wildfire Smoke Project
  - ▶ How are heat and smoke event changing?
  - ▶ Impacts and Vulnerable Populations
  - ▶ Emergency Response Plans
  - ▶ Air Quality Monitoring
- ▶ What can you do?

# Climate Change in Canmore

- ▶ **Climate:** The long-term weather patterns of a given location averaged over a period of time, typically 30 years.
- ▶ **Climate Change:** Changes in long-term weather patterns caused by natural phenomena and exacerbated by human activities that alter the chemical composition of the atmosphere by the build-up of greenhouse gases, which trap heat and reflect it back to Earth's surface.
- ▶ **Climate Change Adaptation:** The process by which built, natural, social, and human systems adjust to actual or expected climate change. Adaptation seeks to manage unavoidable harm and leverage beneficial opportunities that result from the changing climate.

# Climate Change Mitigation – Avoid the Unmanageable

## Climate Change Adaptation – Manage the Unavoidable



# Climate Impacts and Canmore



## Wetter

- River flooding
- Urban flooding
- Infrastructure damage
- Economic disruption
- Damage to natural environment
- Pollution
- Pest and diseases



## Wilder

- Damage to infrastructure
- Damage to natural environment
- Emergencies
- Economic disruptions



## Warmer

- Heat exposure
- Drought
- Urban heat island
- Increased energy use
- Fire
- Pests and diseases
- Food security

# Understanding Climate Risk

- To what **extent** is an event a threat?
- How **frequently** does it occur
- How will climate change impact the threat?

- What are the **direct** impacts? (injury, environmental costs)
- What are the **indirect** impacts? (disruptions, stress)

**Risk = Hazard Likelihood x Vulnerability x Consequence**

- Is there a **history** of significant exposure?
- What is our current **capability** to address the threat?
- How **sensitive** are we to future impacts being the same or beyond historical events?

Rank	Hazard	Hazard Threat	Vulnerability	Consequence	Risk
1	Ecoregion Changes	2.2	0.7	2.5	1.67
2	Wildfire	2.1	0.9	4.5	3.90
3	Steep Creeks	1.5	0.7	4.0	2.93
4	Extreme Heat	1.3	0.4	2.0	0.80
5	Riverine Flooding	1.1	0.7	4.0	2.67
6	High Winds	1.0	0.3	1.5	0.50
7	Freezing Rain/Ice Accumulation	0.9	0.2	1.5	0.30
8	Dry Weather Conditions/Drought	0.8	0.4	1.5	0.60
9	Extreme Cold/ Cold Snaps	0.8	0.3	1.0	0.27
10	Snow Accumulation	0.8	0.2	1.0	0.20

# Hazard Identification & Risk Assessment (HIRA)



- **Wildfire**
- Flood
- Human Health Emergency

- Extreme Cold
- **Extreme Heat**
- **Wildfire Smoke & Air Quality**

- Blizzards
- Major road accidents
- Wildlife Interactions

- Derailment
- Hazardous Material Release
- Ice Storm

- Power Outage
- Water Main Break
- Wind



# Emergency Response Plans for Extreme Heat and Wildfire Smoke Project



# Heat and Smoke Trends and Projections

## Observed daily highs (1985-2014)

95<sup>th</sup> percentile = 30.0°C

- ➔ 4.5% chance the daily high in J-A was > 30.0°C
- ➔ 3 times per summer (J-A) this happened
- ➔ 14 times per decade this happened in summer

97.5<sup>th</sup> percentile = 30.9°C

- ➔ 3.0% chance the daily high in J-A was > 30.9°C
- ➔ 2 times per summer (J-A) this happened
- ➔ 9 times per decade this happened in summer

99<sup>th</sup> percentile = 32.1°C

- ➔ 1.0% chance the daily high in J-A was > 32.1°C
- ➔ < 1 time per summer (J-A) this happened
- ➔ 3 times per decade this happened in summer

## Modelled daily highs (2041-2070)

Now

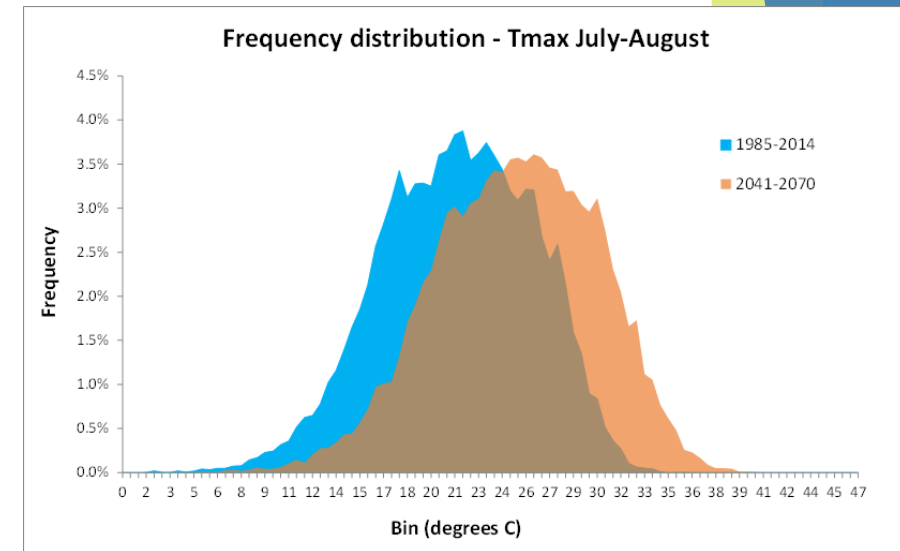
- ➔ 15.5% chance the daily high in J-A is > 30.0°C
- ➔ 10 times per summer (J-A) this will happen
- ➔ 48 times per decade this will happen

Now

- ➔ 13.0% chance the daily high in J-A is > 30.9°C
- ➔ 8 times per summer (J-A) this will happen
- ➔ 39 times per decade this will happen

Now

- ➔ 6-7% chance the daily high in J-A is > 32.1°C
- ➔ 4 times per summer (J-A) this will happen
- ➔ 20 times per decade this will happen



# Heat and Smoke Impacts

Heat	Smoke
<p><b>Health Concerns:</b></p> <ul style="list-style-type: none"><li>- Dehydration</li><li>- Heat Stroke</li><li>- Accelerated impacts from respiratory and cardiovascular disease</li></ul>	<p><b>Health Concerns:</b></p> <ul style="list-style-type: none"><li>- Lung irritation</li><li>- Inflammation</li><li>- Alter immune function</li></ul>
<p><b>Other Impacts:</b></p> <ul style="list-style-type: none"><li>- Increased water temperatures</li><li>- Increased deterioration of concrete in roads, sidewalks and buildings</li><li>- Stress on energy transmission and distribution systems</li><li>- Overloading of building mechanical systems</li><li>- Increase stress to wildlife leading to more human-wildlife interactions</li></ul>	<p><b>Other Impacts:</b></p> <ul style="list-style-type: none"><li>- Overloading of building mechanical and ventilation systems</li><li>- Poor indoor air quality</li><li>- Increase stress to wildlife and poor visibility leading to more human-wildlife interactions</li></ul>

# Who is most vulnerable?

## Who's most at risk?



Older adults



Infants and young children



Women who are pregnant



People who work and exercise outdoors



People with reduced mobility



People experiencing homelessness



People who live alone or are socially isolated



People with pre-existing medical conditions and illnesses



People with substance use disorders



People living in high density housing with no indoor cooling

**GUIDELINES FOR EMERGENCY CENTERS**  
Cool and Clean Air Centers for  
Extreme Heat and Wildfire Smoke



Canmore Recreation Centre  
Elevation Place  
Civic Centre  
Scout Hall  
Union Hall  
Seniors Centre  
Opera House

**BUILDING SYSTEMS AND FEATURES - Extreme Heat and Wildfire Smoke**

	Canmore Recreation Centre	Elevation Place	Civic Centre	Scout Hall	Union Hall	Seniors Centre	Opera House
<b>HVAC Systems</b>							
Facility can handle increased cooling loads due to high occupancy, with a target temperature of 24°C or lower. Natural or mechanical cooling systems are acceptable as long as they can handle increased occupant loads. <i>(Section 4.2 - Health Canada's Guidance for Cleaner Air Spaces during Wildfire Smoke Events)</i>	Yes	Yes	Yes	No	Yes	Yes	Yes
Facilities have humidity control systems which can achieve a target humidity of 35 to 50%. <i>(Section 4.2 - Health Canada's Guidance for Cleaner Air Spaces during Wildfire Smoke Events)</i>	No	No	No	No	No	No	No
Detailed SOP are available for building operators outlining processes during emergency events. Building systems are regularly balanced and inspected.	?	?	?	?	?	?	?
<b>Power Systems</b>							
Building has backup power generation systems meeting CSA C282 backup power generation standards and Section 3.2.7 of the National Building Code for emergency lighting and power generation.	No	No	Yes	No	No	No	No
Electrical capacity of the building is appropriate for increased cooling loads and higher building occupancies. Must be able to meet the load for all life safety and critical building systems (emergency lighting, sprinklers and fire extinguishing systems, fire alarm systems).	Yes	Yes	Yes	No	Yes	Yes	Yes
System can be isolated by building zones if necessary to maintain critical building systems.	Yes	No	No	No	No	Yes	No
Detailed SOP are available for building operators outlining processes to operate backup power systems. Backup power systems are regularly tested and inspected.	No	No	Yes	No	No	No	No

**BUILDING SYSTEMS AND FEATURES - Wildfire Smoke Only**

	Canmore Recreation Centre	Elevation Place	Civic Centre	Scout Hall	Union Hall	Seniors Centre	Opera House
<b>HVAC Systems, Options</b>							
Filters with MERV rating of 13 or more. Replacement filters are available. Optional: Odour-removing filters can be provided for additional comfort of occupants. Optional: A low-efficiency pre-filter is installed upstream to prevent rapid overloading of the filters.	Yes	Yes	No	No	No	No	No
AC systems that have recirculation capabilities to prevent outside air from infiltrating.	No	Yes	No	No	No	No	No
If applicable, Building Automation Systems need to be programmed for a 'Smoke Event' mode that will place systems in minimum outside air mode during occupied hours and close outside air intakes during unoccupied hours.	No	Yes	No	No	No	No	No
Ductless mini split-type air-conditioner, fully enclosed air-handling unit. Applicable use in a single room or smaller area.	No	No	No	No	No	No	No
Emergency support areas/amenities should be capable of being isolated from the HVAC system.	No	No	No	No	No	No	No
<b>Building Air Monitoring</b>							
Monitoring sensors for indoor/outdoor air quality (consider AQHI, PM2.5 and ozone).	No	No	No	No	No	No	No
Building systems should have sensors to monitor indoor CO and CO <sub>2</sub> levels, preferably those featuring a low-level digital display showing real-time readings. Indoor CO <sub>2</sub> levels should remain below 2,000 ppm. CO levels should remain below 9 ppm averaged over 8 hours, and 20 ppm averaged over 1 hour.	No	No	No	No	No	No	No
Ventilation rates can be achieved with a desired rate of 15 cfm per person and minimum rate of 5 cfm per person.	?	?	?	?	?	?	?

**BUILDING AND SITE ACCESSIBILITY - Extreme Heat and Wildfire Smoke**

	Canmore Recreation Centre	Elevation Place	Civic Centre	Scout Hall	Union Hall	Seniors Centre	Opera House
<b>Building Accessibility</b>							
Building is accessible by emergency medical personnel.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Building is in compliance with the Accessibility guidance in Section 3.8 of the National Building Code - 2019 Alberta Edition.	Yes	Yes	Yes	No	No	Yes	No
<b>Site Accessibility and Features</b>							
Site is accessible by emergency vehicles.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Site is accessible by walking or by transit.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Site has adequate parking available to meet increased demand during activations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Building exterior is shaded (structure, trees) to cool the buildings and to sit under.	No	No	No	No	No	No	No
Shuttles to and from centres are provided.	No	No	No	No	No	No	No

# Guidelines for Emergency Centers

**GUIDELINES FOR EMERGENCY CENTERS**  
Cool and Clean Air Centers for  
Extreme Heat and Wildfire Smoke



Canmore Recreation Centre  
Elevation Place  
Civic Centre  
Scout Hall  
Union Hall  
Seniors Centre  
Opera House

**SERVICES - Extreme Heat and Wildfire Smoke**

	Canmore Recreation Centre	Elevation Place	Civic Centre	Scout Hall	Union Hall	Seniors Centre	Opera House
<b>Drinking Water and Food</b>							
Cool drinking water available.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Emergency food or snacks available.	No	No	No	No	No	No	No
Emergency food or snacks available for pets or service animals.	No	No	No	No	No	No	No
<b>Medical Supplies and Care Spaces</b>							
Medical supplies/first aid kits for heat stroke/overheating on hand.	No	No	No	No	No	No	No
Fridges/coolers to keep medicine or breast milk cool.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quiet rooms for people who are sick or in need of medical attention.	Yes	Yes	Yes	No	No	Yes	No
An established plan to arrange transport from centers to hospitals/medical centres.	No	No	No	No	No	No	No
<b>Communication</b>							
Contains a radio and landline phone.	Yes	Yes	No	No	No	No	No
Public wi-fi or password readily available.	Yes	Yes	Yes	No	No	No	No
Access to interpreters for multiple languages.	No	No	No	No	No	No	No
Staff or volunteers that speak multiple languages.	Yes	Yes	Yes	No	No	No	No
<b>Activities and Amenities</b>							
Activities to keep people occupied (games, gym, books, television).	Yes	Yes	No	Yes	No	Yes	No
Quiet spaces for sitting, working, and sleeping.	Yes	Yes	Yes	No	No	Yes	No
Spaces available for pets and service animals.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plug-ins available to charge cell phones/electronics.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Child care services or supports.	No	Yes	No	No	No	Yes	No
<b>Hygiene Facilities</b>							
Has accessible washrooms, including child changing stations.	Yes	Yes	Yes	No	No	Yes	No
Site has the ability to accommodate portable toilets, if needed.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Has showers or provides access/shuttles to showers for longer activations.	Yes	Yes	No	No	No	No	No
For longer activations, access to laundry facilities to wash bedding, etc.	No	No	No	No	No	No	No
<b>Beds/Cots and Seating</b>							
Seating available.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tables and chairs available, preferably near electrical source.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beds or cots available, even for daytime activation.	No	No	No	No	No	No	No
Quiet areas for beds or cots and some more private locations ideally.	Yes	Yes	Yes	No	No	Yes	No
<b>Hours of Operation, Staffing and Other</b>							
Extended hours of operation. In an emergency it should be open 24 hours but less severe events should at least include evenings.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Site is secured afterhours (locked site, or on-site security staff).	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Building maintenance staff are available to implement building systems emergency SOPs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Staff or volunteers to support amenities and services, including child, language and pet services.	No	No	No	No	No	No	No
Staff with first aid training.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Staff with specialized medical training.	No	No	No	No	No	No	No
If other parties have emergency evacuation agreements with the site, the site must have capacity to accommodate everyone under all agreements.	N/A	N/A	N/A	N/A	N/A	N/A	N/A



Canmore Recreation Centre  
Elevation Place  
Civic Centre  
Scout Hall  
Union Hall  
Seniors Centre  
Opera House

# Guidelines for Emergency Centers

## BUILDING SYSTEMS AND FEATURES - Extreme Heat and Wildfire Smoke

**BUILDING SYSTEMS AND FEATURES - Extreme Heat and Wildfire Smoke**

HVAC Systems							
Facility can handle increased cooling loads due to high occupancy, with a target temperature of 24°C or lower. Facility has the capacity to handle increased cooling loads (Section 4.2 - Part 5).							
Detailed SOP are available for building operators outlining processes during emergency events. Building systems are regularly balanced and inspected.	?	?	?	?	?	?	?
Power Systems							
Building has backup power generation systems meeting CSA C282 backup power generation standards and Section 3.2.7 of the National Building Code for emergency lighting and power generation.	No	No	Yes	No	No	No	No
Electrical capacity of the building is appropriate for increased cooling loads and higher building occupancies. Must be able to meet the load for all life safety and critical building systems (emergency lighting, sprinklers and fire extinguishing systems, fire alarm systems).	Yes	Yes	Yes	No	Yes	Yes	Yes
System can be isolated by building zones if necessary to maintain critical building systems.	Yes	No	No	No	No	Yes	No
Detailed SOP are available for building operators outlining processes to operate backup power systems. Backup power systems are regularly tested and inspected.	No	No	Yes	No	No	No	No

## BUILDING SYSTEMS AND FEATURES - Wildfire Smoke Only

HVAC Systems, Options							
Filters with MERV rating of 13 or more. Replacement filters are available. Optional: Odour-removing filters can be provided for additional comfort of occupants. Optional: A low-efficiency pre-filter is installed upstream to prevent rapid overloading of the filters.	Yes	Yes	No	No	No	No	No
AC systems that have recirculation capabilities to prevent outside air from infiltrating.	No	Yes	No	No	No	No	No
If applicable, Building Automation Systems need to be programmed for a 'Smoke Event' mode that will place systems in minimum outside air mode during occupied hours and close outside air intakes during unoccupied hours.	No	Yes	No	No	No	No	No
Ductless mini split-type air-conditioner, fully enclosed air-handling unit. Applicable use in a single room or smaller area.	No	No	No	No	No	No	No
Emergency support areas/amenities should be capable of being isolated from the HVAC system.	No	No	No	No	No	No	No

**BUILDING AND SITE ACCESSIBILITY - Extreme Heat and Wildfire Smoke**

Building Air Monitoring							
Monitoring sensors are installed in the building. Building systems are designed to maintain indoor air quality, including CO <sub>2</sub> levels, featuring a low-level CO <sub>2</sub> alarm. CO <sub>2</sub> levels remain below 2,000 ppm. CO <sub>2</sub> levels remain below 2,000 ppm averaged over 1 hour.							
Ventilation rates can be achieved with a desired rate of 15 cfm per person and a minimum rate of 5 cfm per person.	?	?	?	?	?	?	?

## BUILDING AND SITE ACCESSIBILITY - Extreme Heat and Wildfire Smoke

Building Accessibility							
Building is accessible by emergency medical personnel.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Building is in compliance with the Accessibility guidance in Section 3.8 of the National Building Code - 2019 Alberta Edition.	Yes	Yes	Yes	No	No	Yes	No
Site Accessibility and Features							
Site is accessible by emergency vehicles.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Site is accessible by walking or by transit.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Site has adequate parking available to meet increased demand during activations.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Building exterior is shaded (structure, trees to cool the buildings and to sit under).	No	No	No	No	No	No	No
Shuttles to and from centres are provided.	No	No	No	No	No	No	No

## EMERGENCY CENTERS - Extreme Heat and Wildfire Smoke



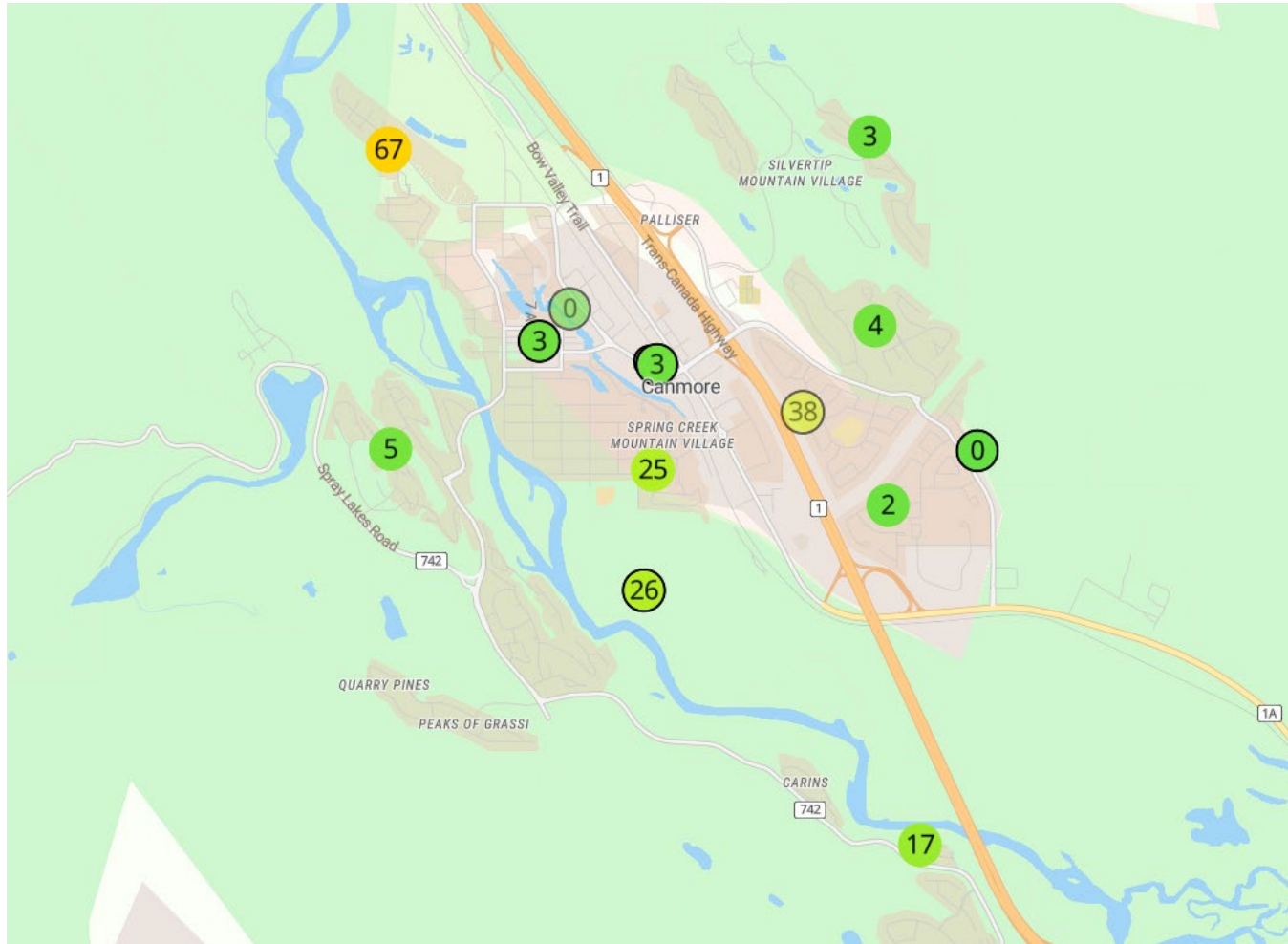
Canmore Recreation Centre  
Elevation Place  
Civic Centre  
Scout Hall  
Union Hall  
Seniors Centre  
Opera House

## SERVICES - Extreme Heat and Wildfire Smoke

**SERVICES - Extreme Heat and Wildfire Smoke**

Drinking Water and Food							
Cool drinking water available.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Emergency food or snacks available.	No	No	No	No	No	No	No
Medical Services							
Medical supplies available.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fridges/coolers available.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quiet rooms available.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
An established communication system.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Communication							
Contains a radio and landline phone.	Yes	Yes	No	No	No	No	No
Public wi-fi or password readily available.	Yes	Yes	Yes	No	No	No	No
Access to interpreters for multiple languages.	No	No	No	No	No	No	No
Staff or volunteers that speak multiple languages.	Yes	Yes	Yes	No	No	No	No
Activities and Amenities							
Activities to keep people occupied (games, gym, books, television).	Yes	Yes	No	Yes	No	Yes	No
Quiet spaces for sitting, working, and sleeping.	Yes	Yes	Yes	No	No	Yes	No
Spaces available for pets and service animals.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plug-ins available to charge cell phones/electronics.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Child care services or supports.	No	Yes	No	No	No	Yes	No
Hygiene Facilities							
Has accessible washrooms, including child changing stations.	Yes	Yes	Yes	No	No	Yes	No
Site has the ability to accommodate portable toilets, if needed.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Shuttles to showers for longer activations.	Yes	Yes	No	No	No	No	No
Laundry facilities to wash bedding, etc.	No	No	No	No	No	No	No
Other Services							
Emergency services are available nearby.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Emergency services are available nearby electrical source.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beds or cots available, even for daytime activation.	No	No	No	No	No	No	No
Quiet areas for beds or cots and some more private locations ideally.	Yes	Yes	Yes	No	No	Yes	No
Hours of Operation, Staffing and Other							
Extended hours of operation. In an emergency it should be open 24 hours but less severe events should at least include evenings.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Site is secured afterhours (locked site, or on-site security staff).	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Building maintenance staff are available to implement building systems emergency SOPs.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Staff or volunteers to support amenities and services, including child, language and pet services.	No	No	No	No	No	No	No
Staff with first aid training.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Staff with specialized medical training.	No	No	No	No	No	No	No
If other parties have emergency evacuation agreements with the site, the site must have capacity to accommodate everyone under all agreements.	N/A	N/A	N/A	N/A	N/A	N/A	N/A

# Air Quality Monitoring – purpleair.ca





### Response Strategies and Tactics

Factor	Pre-Event Phase	Warning Phase	Emergency Phase – Activation of EOC	Post-Event Phase
Activation Criteria	Pre-season communication in June or July. Highest risk is in August.	<b>Forecast: AQHI 7-10 (High) during 2 day forecast period</b> Data Source: Environment Canada (ECCC), Calgary Station Additional Monitoring Sources: FireWork, FireSmoke, Town of Banff	<b>Forecast: AQHI 10+ (Very High) during 2 day forecast period and it is determined that there is an immediate public safety and health concern</b> Data Sources: Environment Canada (ECCC), Calgary Station Additional Monitoring Sources: FireWork, FireSmoke, Town of Banff	<b>Forecast: Observed AQHI of previous day does not achieve threshold trigger AND forecast AQHI does not achieve threshold trigger.</b> Monitor resource use. If community resources are not being used consider demobilizing before the forecast trigger.
<b>Actions</b>				
Communications  <i>*Messaging should be provided in multiple languages and using different methods (digital and physical signage).</i>	<b>Attachment B Key Messages</b> <ul style="list-style-type: none"> <li><b>Town Staff:</b> Reminders of the phases, general Town actions, roles/responsibilities, and notification of public messaging.</li> <li><b>Stakeholders:</b> Organizations supporting vulnerable populations to confirm contacts, protocols and what individuals/organizations can do.</li> <li><b>General Public:</b> What individuals can do to prepare and what the Town will do and when.</li> </ul>	<b>Attachment C Key Messages</b> <ul style="list-style-type: none"> <li><b>Town Staff:</b> Notification of actions to implement, role of staff and any adjustment to working conditions of staff (especially outdoor workers).</li> <li><b>Stakeholders:</b> Notification of enhanced services and actions by the Town that are targeted to vulnerable populations. Communication protocol for feedback on needs from stakeholders.</li> <li><b>General Public &amp; Tourists:</b> What individuals can do during smoke event and what enhanced services or actions that Town is providing. <b>Encourage individuals to check on their neighbours.</b></li> </ul>	<b>Attachment D Key Messages</b> <ul style="list-style-type: none"> <li><b>Town Staff:</b> Notification of ECC activation, <b>redirection of staff resources or rescheduling of programs at Town facilities to support emergency actions</b>, and adjustment to working conditions of staff (esp. outdoor workers).</li> <li><b>Stakeholders:</b> Notification of ECC activation &amp; communication protocols, emergency clean air centre locations and services, enhanced actions by the Town targeted to vulnerable populations.</li> <li><b>General Public &amp; Tourists:</b> Notification of emergency clean air centre locations and services, enhanced services and actions by the Town and what individuals can do. <b>Encourage individuals to check on their neighbours.</b></li> </ul>	<b>Attachment E Key Messages</b> <ul style="list-style-type: none"> <li><b>Town Staff:</b> Notification of ECC de-activation, removal of temporary measures (water), deactivate clean air centre, re-establish regular programming at Town facilities, re-establish working conditions for staff.</li> <li><b>Stakeholders:</b> Notification of ECC de-activation and removal of temporary measures. Solicit input of needs of vulnerable populations to recover from event. Post-event feedback on impacts and improved supports.</li> <li><b>General Public &amp; Tourists:</b> Notification of ECC de-activation and removal of temporary measures. Post-event feedback on impacts and improved supports. <b>Encourage individuals to check on their neighbours.</b></li> </ul>
Water Stations <i>(see map)</i>	<ul style="list-style-type: none"> <li>Confirm condition, number &amp; sites for water stations.</li> </ul>	<ul style="list-style-type: none"> <li>Communicate locations of public drinking water fountains (Rec Centre, Elevation Place, Civic Centre).</li> <li><b>Consider:</b> Setup temporary water stations including at off leash dog parks, monitor and <b>refill</b> regularly.</li> </ul>	<ul style="list-style-type: none"> <li>Implement actions in warning phase rather than consider.</li> <li>Monitor and <b>refill temporary water stations more frequently.</b></li> <li><b>Consider:</b> Additional locations if needed.</li> </ul>	<ul style="list-style-type: none"> <li>Removal of temporary water sources.</li> </ul>
Clean Air Centres <i>(see map and Attachment F)</i>	<ul style="list-style-type: none"> <li>Inspect and maintain HVAC systems, confirm backup smoke filters for HVAC, review emergency clean air SOP with maintenance staff.</li> <li>Confirm supplies and setup for activities/services.</li> </ul>	<ul style="list-style-type: none"> <li>Communicate locations of clean air spaces activities (Rec Centre, Elevation Place and Library).</li> <li><b>Consider:</b> Extending hours for public clean air spaces.</li> </ul>	<ul style="list-style-type: none"> <li>Activate emergency clean air centres. Reschedule regular programming if needed, redirect Town staff to centres, solicit volunteers if needed, setup activities, quiet spaces, cots, emergency supplies and food.</li> <li>Direct facility maintenance staff to activate Smoke Emergency SOPs and monitor HVAC systems.</li> </ul>	<ul style="list-style-type: none"> <li>De-activate clean air centre and re-establish programming at Town facilities.</li> </ul>
Transportation <i>(see map)</i>	<ul style="list-style-type: none"> <li>Review and confirm shuttle and transit plans to clean air centres focusing on vulnerable populations.</li> </ul>	<ul style="list-style-type: none"> <li>Enhance messaging on the use of transit and available parking to access clean air spaces.</li> <li><b>Consider:</b> Warning signs and communication of increased risk of highway collisions with wildlife due to limited visibility and more unpredictable behaviour from wildlife.</li> </ul>	<ul style="list-style-type: none"> <li>Implement actions in warning phase rather than consider.</li> <li>Add <b>additional</b> transit routes or shuttles targeting vulnerable populations and clean air centres.</li> </ul>	<ul style="list-style-type: none"> <li>Re-establish regular transit services.</li> <li>Remove wildlife risk signs.</li> </ul>
Other		<ul style="list-style-type: none"> <li>Follow Working in Smoke protocols.</li> <li><b>Consider:</b> Notification and adjustment to permitted events and outdoor recreation groups.</li> </ul>	<ul style="list-style-type: none"> <li>Implement actions in warning phase rather than consider.</li> <li>Notification and adjustment to permitted events and outdoor recreation groups.</li> </ul>	<ul style="list-style-type: none"> <li>Re-establish or consider alterations to permitted events and outdoor recreation groups.</li> </ul>



# Response Plan Highlights

## Pre-Season

- Prepare communication, confirm condition of structures, confirm plans

## Warning Phase

- Communication / education, direct to public cool spaces

## Emergency Phase

- Potential to activate cooling centres, reschedule events, reschedule programming, additional services and resources

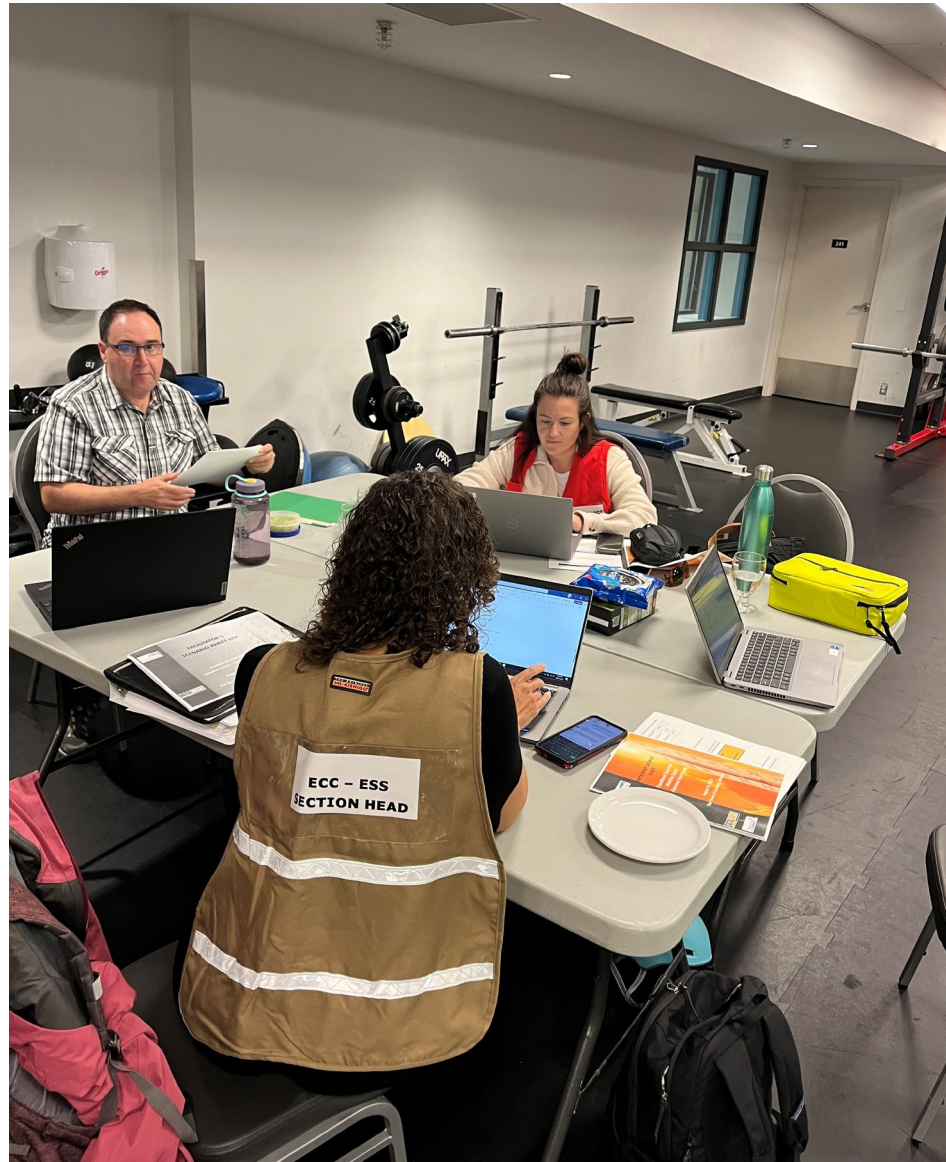
## Post-Event

- Evaluate response, make recommendations for improvement, implement recommendations

# ERP Exercises

Tabletop

Emergency Social Services



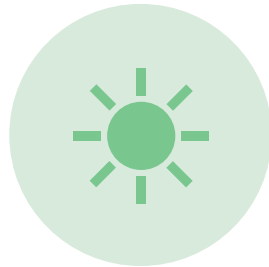
**What Can You Do?**



# Key Actions During Heat and Smoke Events:



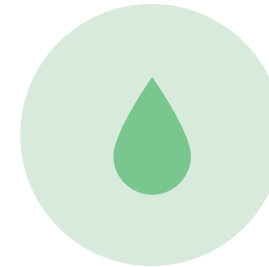
**COOL, CLEAN  
AIR SPACES**



**LIMIT TIME  
OUTDOORS**



**NO STRENUOUS  
EXERCISE**



**STAY HYDRATED**

# Monitor Conditions:

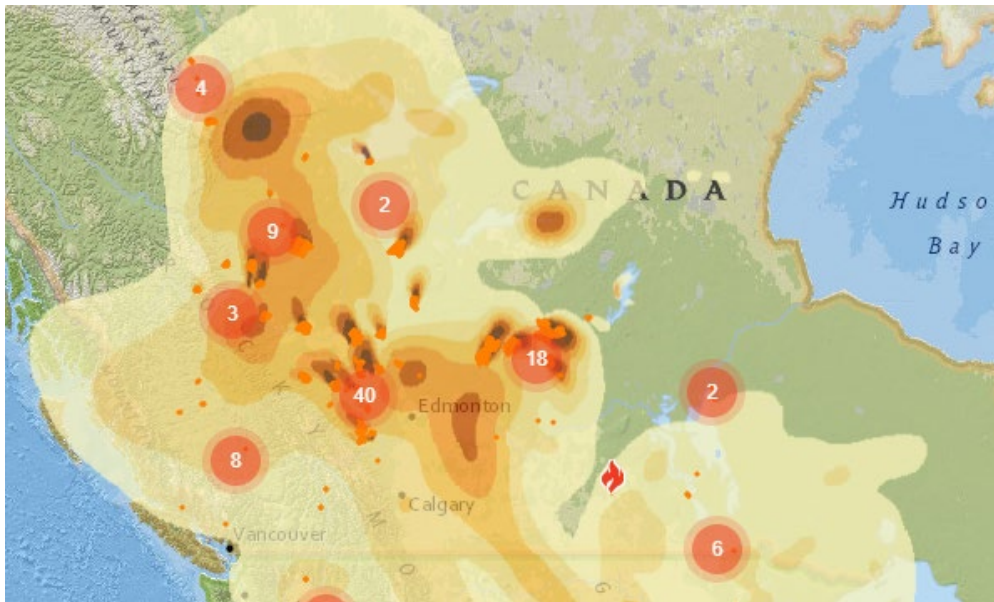
Weather – current and forecasted

Air Quality (purpleair.ca)

Fire Smoke Map (firesmoke.ca)

Town Alerts (Voyent Alert)

Provincial/Federal Communication



10:19 5G 100

**VOYENT ALERT!**  
BY ICESOFT TECHNOLOGIES

100

11:48 5G 98

PurpleAir

US EPA PM2.5 AQI 10-minute

A screenshot of the PurpleAir mobile app showing a map of the Canmore area. The map displays AQI data points for various locations: Harvie Heights (7), Canmore (3, 10, 9, 3, 10, 5), Silvertip Mountain Village (9), Quarry Pines (13), Carins (12), and Three S Mountain (10). A legend at the bottom indicates AQI values from 0 to 300. The app interface includes a search bar, a settings icon, and a search icon. The bottom of the screen shows a mobile browser address bar with the URL map.purpleair.com.

# Municipal Climate Change Action Centre

- ▶ Thank you to MCCAC and the Climate Resilience Capacity Building Program



In partnership with:



# Questions?

## **Caitlin Van Gaal**

Supervisor of Environment and Sustainability

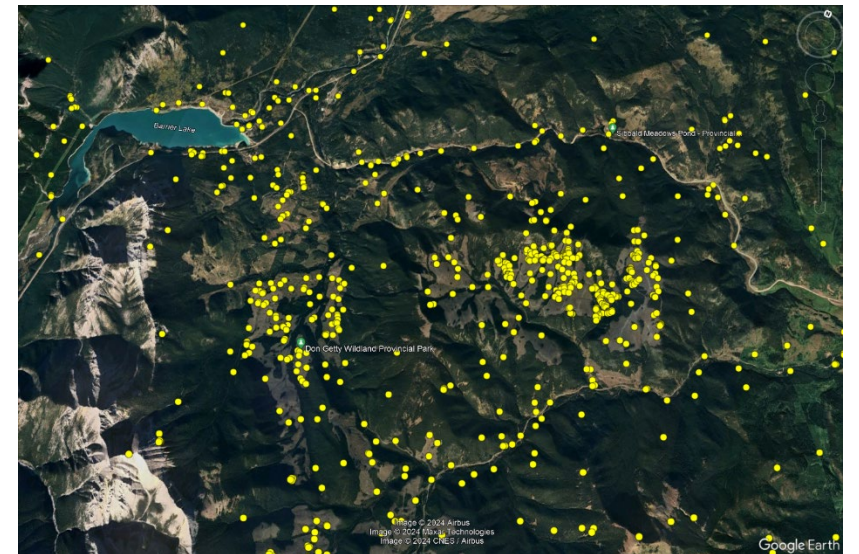
Town of Canmore

[caitlin.vangaal@canmore.ca](mailto:caitlin.vangaal@canmore.ca)

# Ecological Implications of Fireguards and FireSmart



John Paczkowski  
Alberta Forestry and Parks  
Kananaskis Region  
John.Paczkowski@gov.ab.ca









# Georgetown B

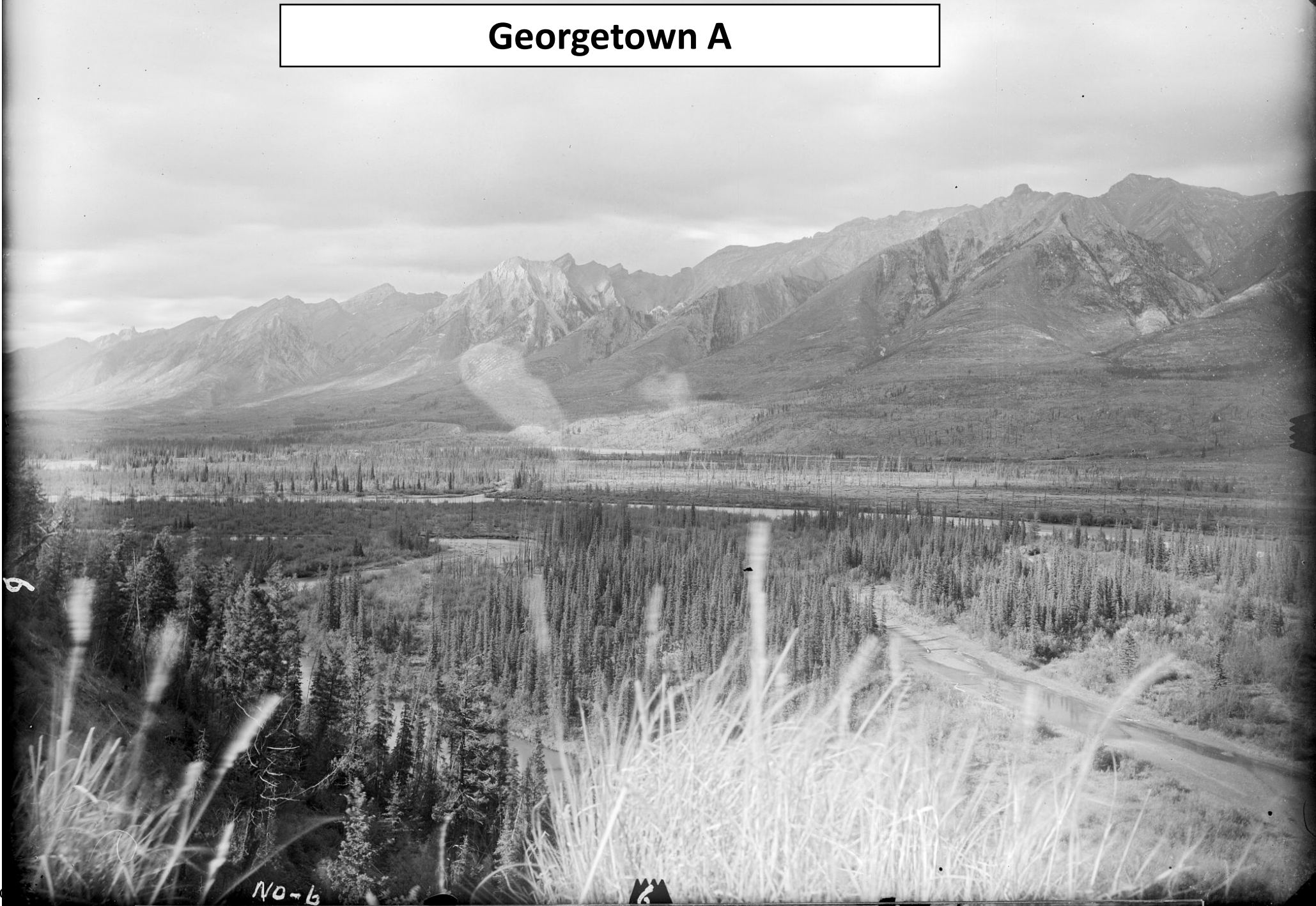


1001

# Georgetown B



Georgetown A



NO-6



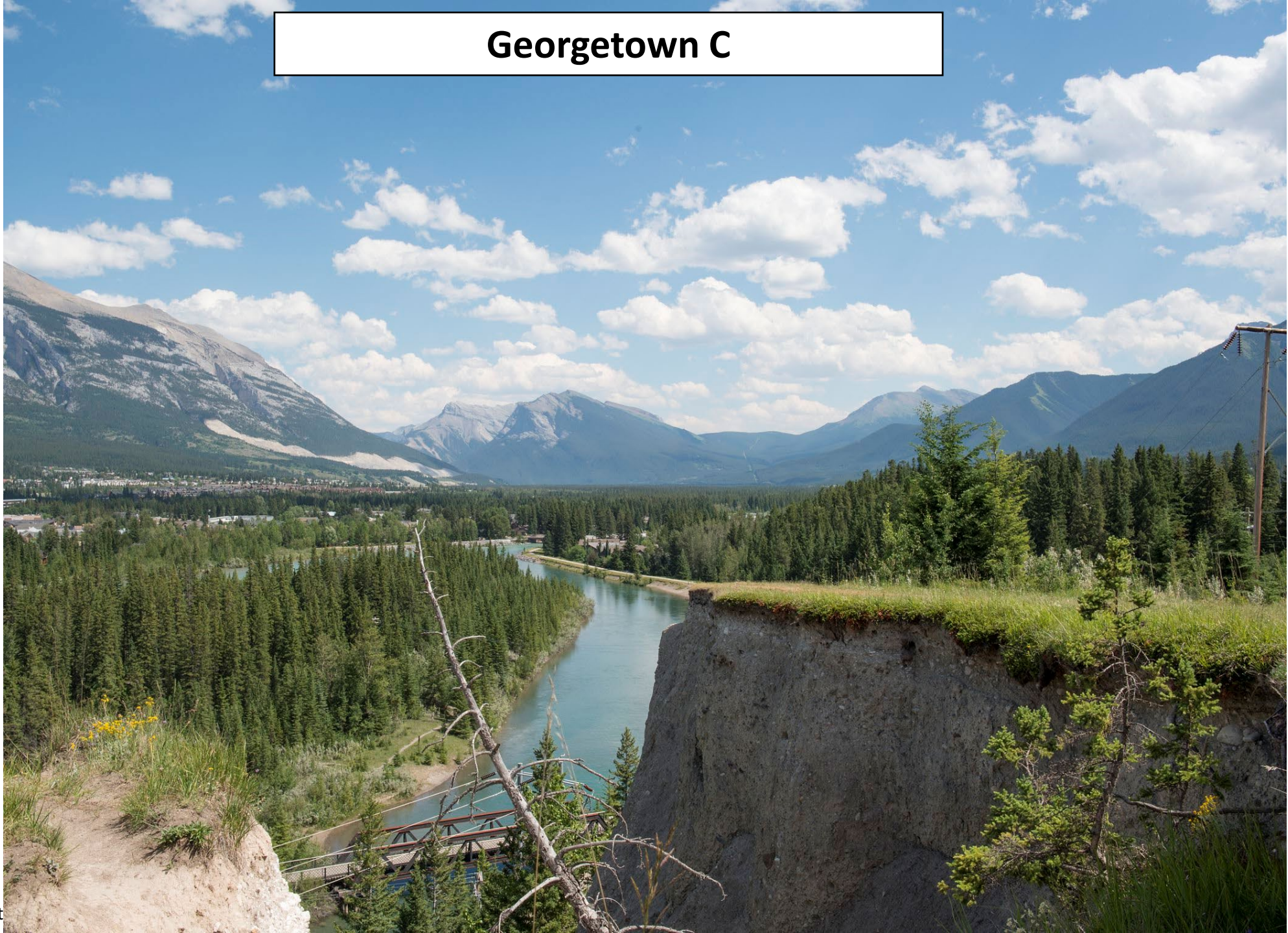
# Georgetown A



# Georgetown C

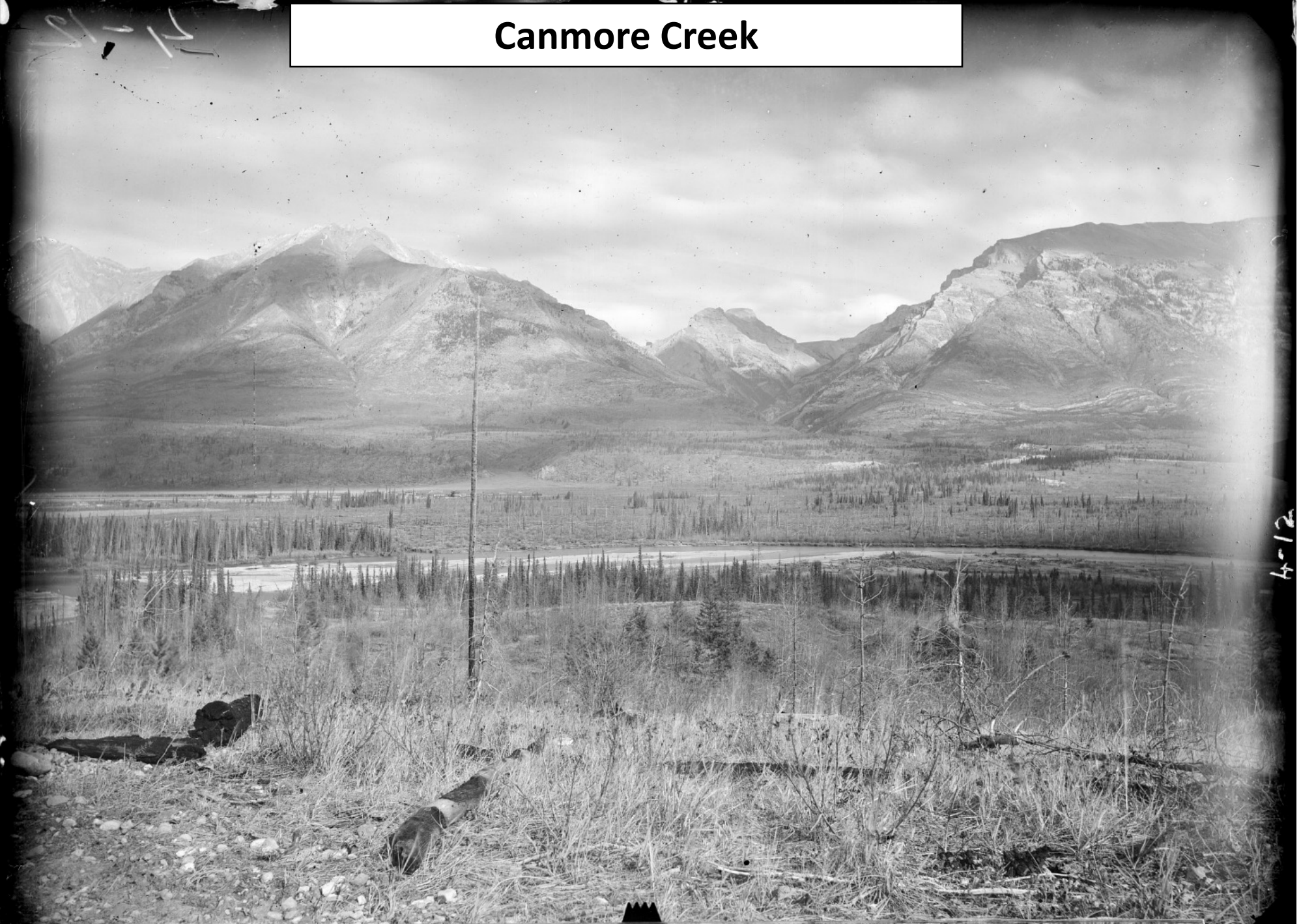


# Georgetown C





Canmore Creek



4-12

# Canmore Creek C



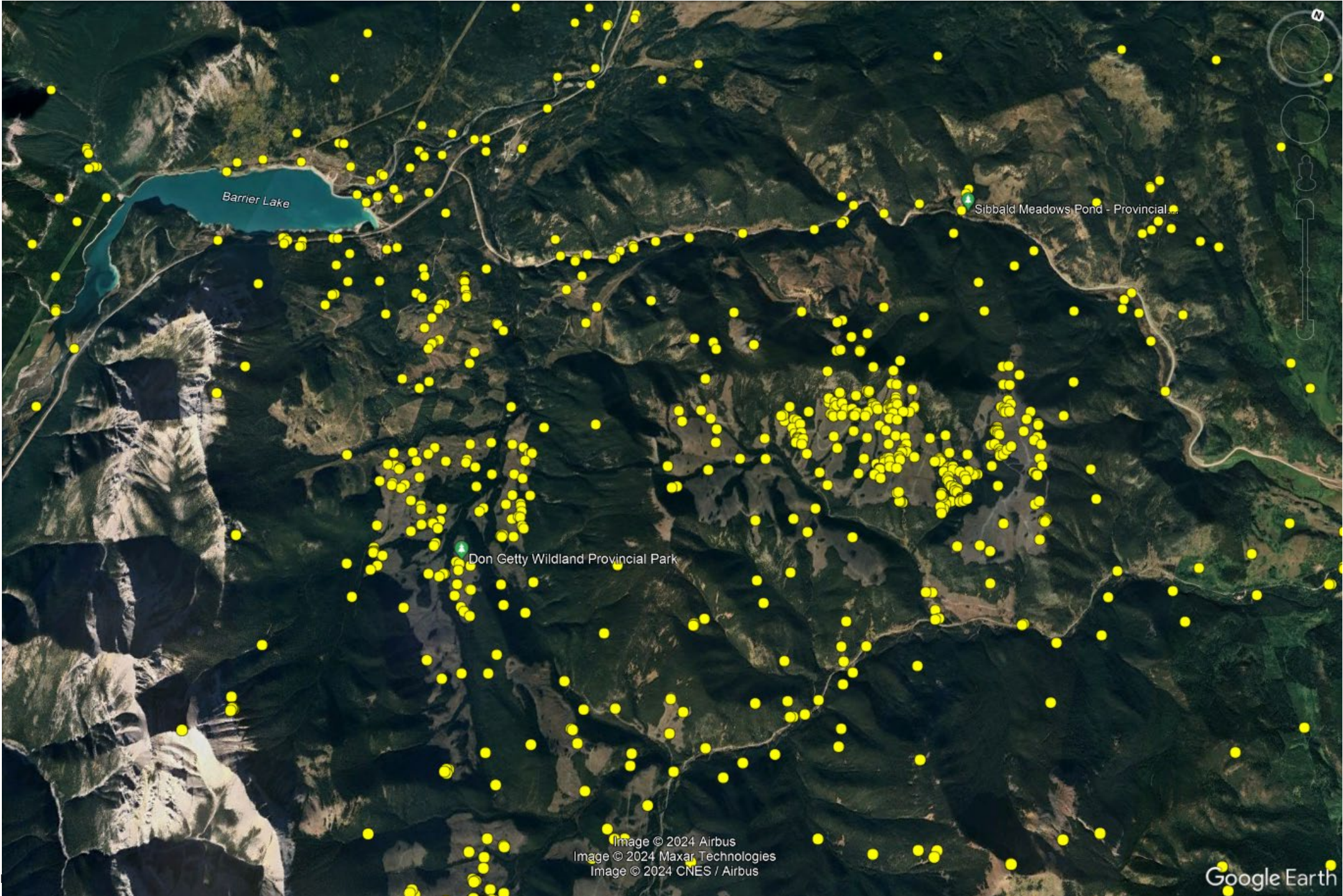




Image © 2024 Airbus  
Image © 2024 Maxar Technologies  
Image © 2024 CNES / Airbus

Google Earth

Classification: P



Barrier Lake

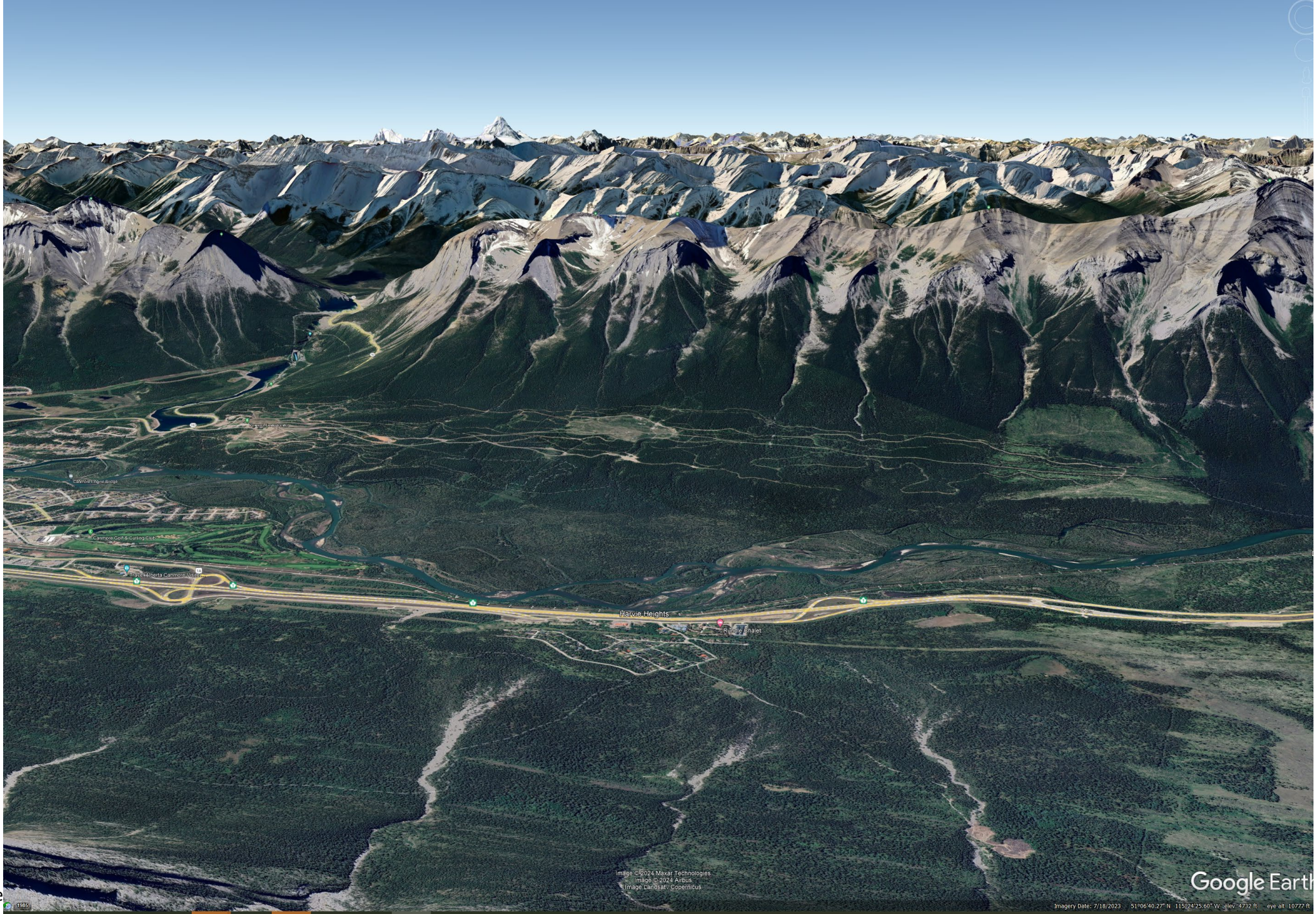
Sibbald Meadows Pond - Provincial...

Don Getty Wildland Provincial Park

Image © 2024 Airbus  
Image © 2024 Maxar Technologies  
Image © 2024 CNES / Airbus

Google Earth

Classification: P

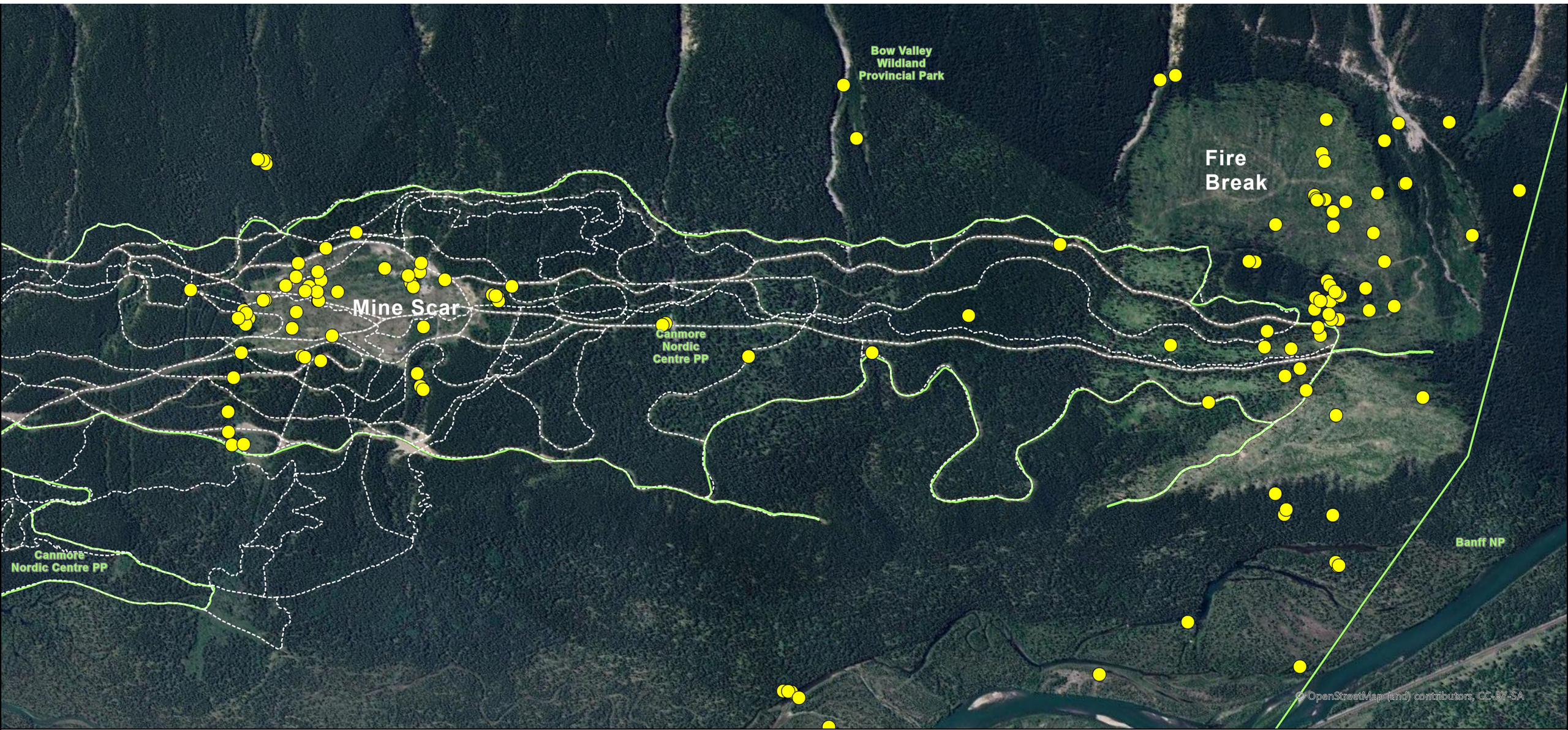


Classification: Prote

Image © 2024 Maxar Technologies  
Image © 2024 Airbus  
Image Landsat / Copernicus

Google Earth

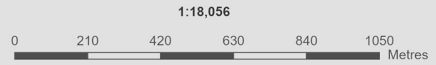
Imagery Date: 7/18/2023 51°06'40.27" N 115°24'25.60" W elev: 4732 ft eye alt: 10777 ft



© OpenStreetMap (and) contributors, CC-BY-SA

- Legend
- Bear GPS location
  - Park boundary
  - Designated trails

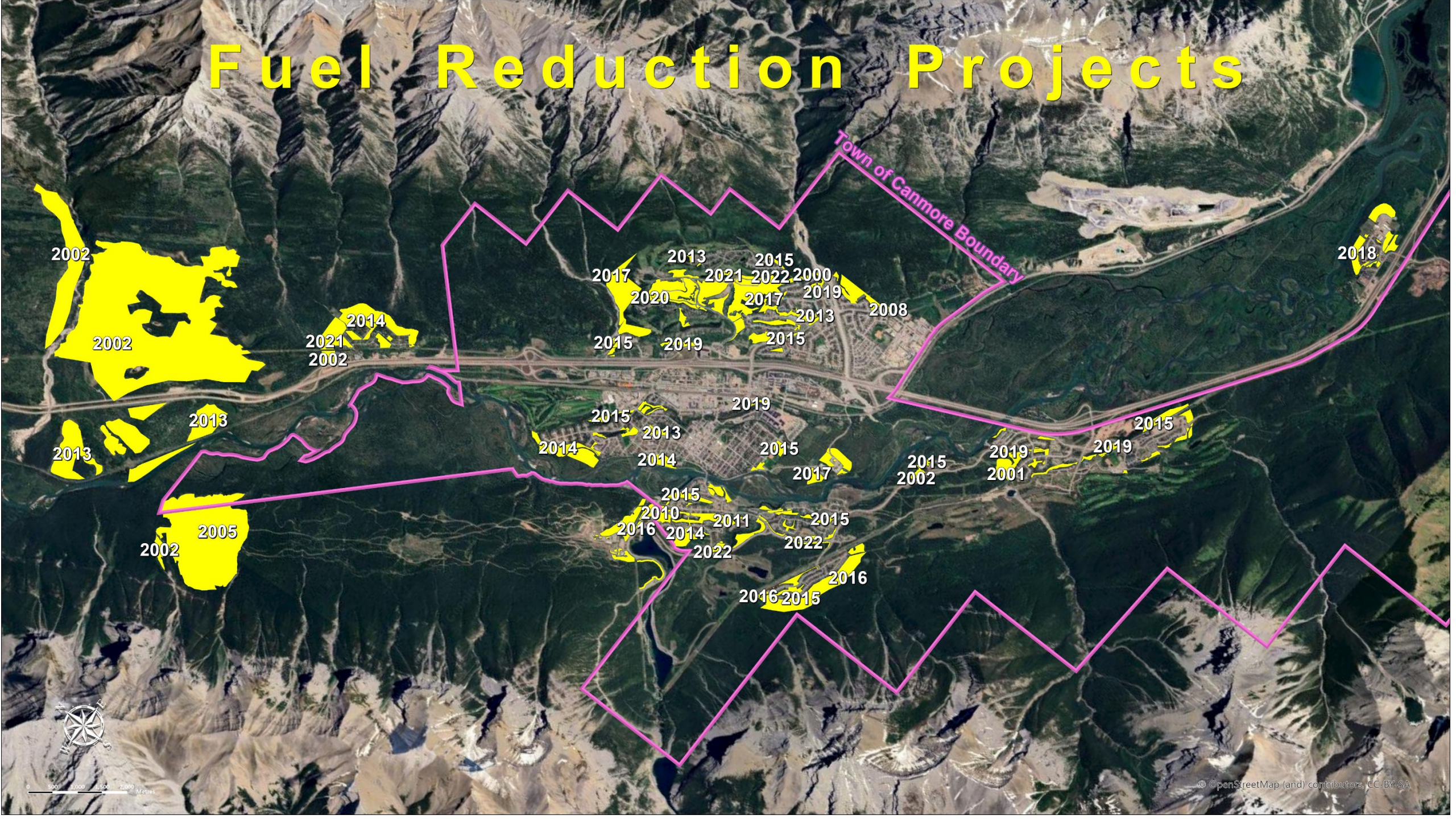
**Bear 148 circa 2016-2017**



Alberta Parks, Canmore. File ref: CNC\_Hab\_Restoration  
 Layout: Bear 148 circa 2016-2017. Date: June, 16, 2024.  
 Bear GPS data courtesy of Banff National Park.



# Fuel Reduction Projects



0 500 1000 2000 Metres























2022-09-27 07:22:57

M 4/5

10°C



Classification: Protected

BCM095A KC127 ABPARK



2022-08-24 13:06:41 M 2/5

0 20°C



Classification: Protected

BCM095A KC122 ABPARK



2022-10-15 15:12:26

M 1/5



15°C



Classification: Protected

BCM095A KC122 ABPARK













# Grotto C



# Grotto C

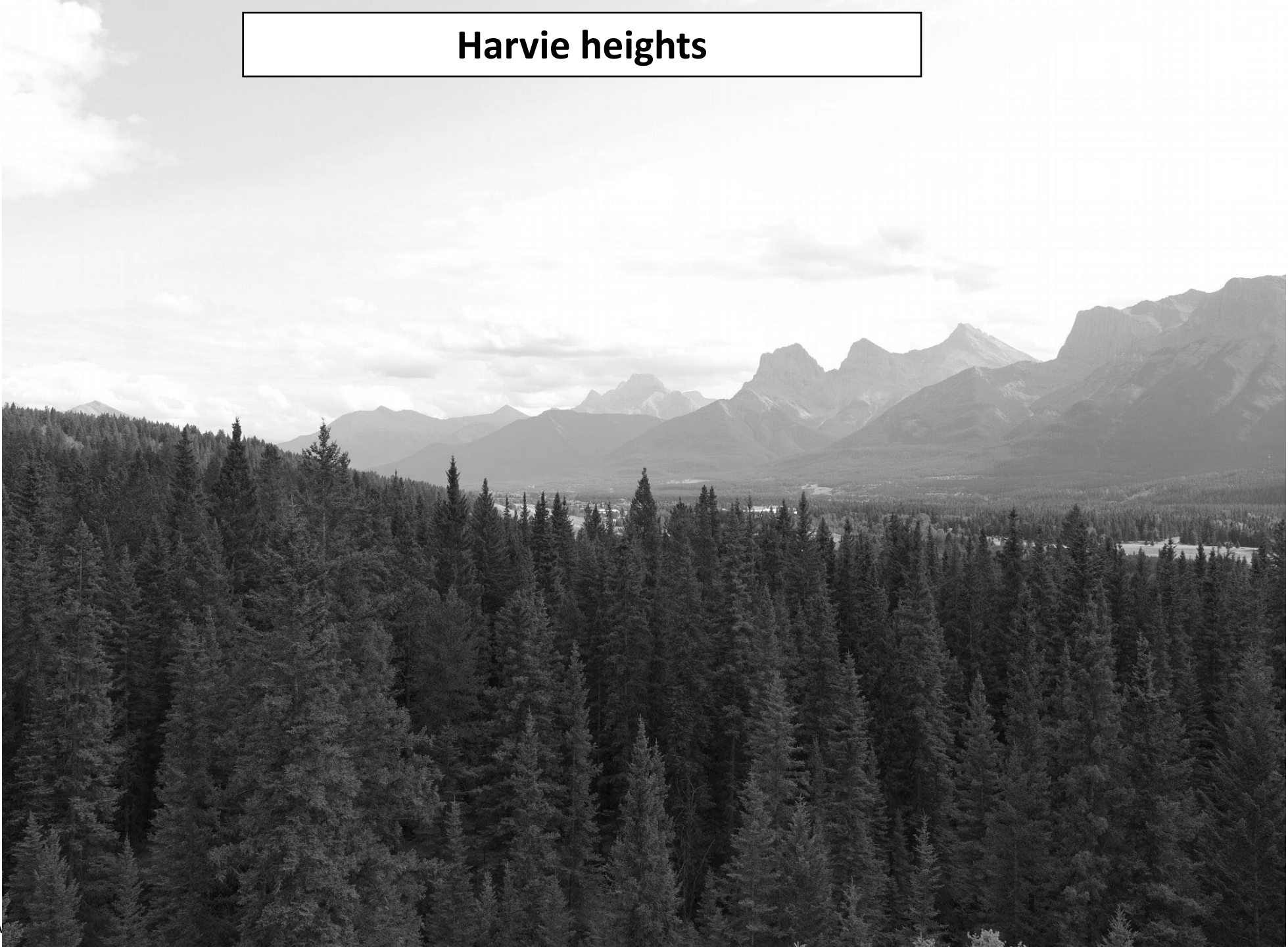


# Harvie heights



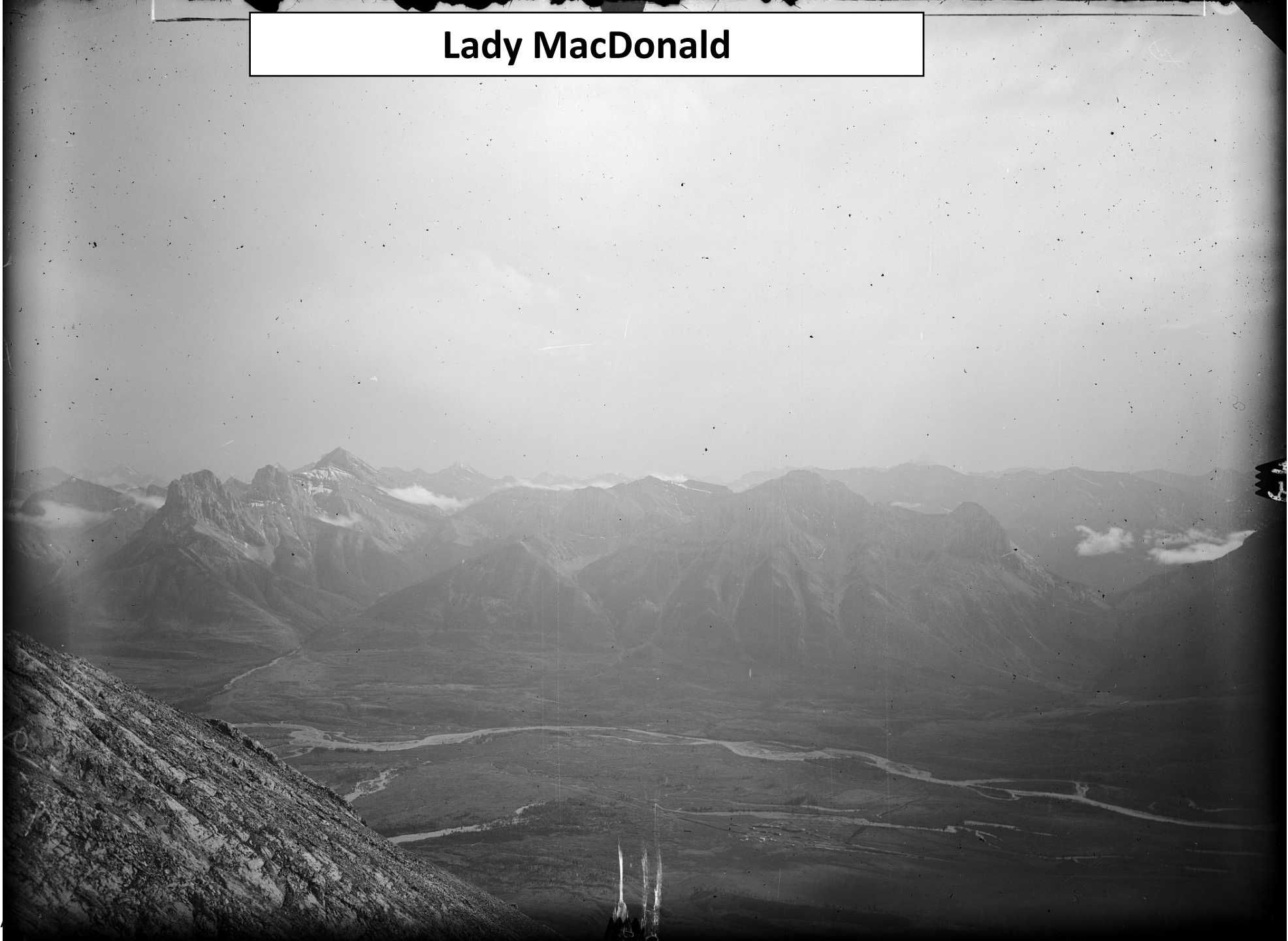
110-1

# Harvie heights





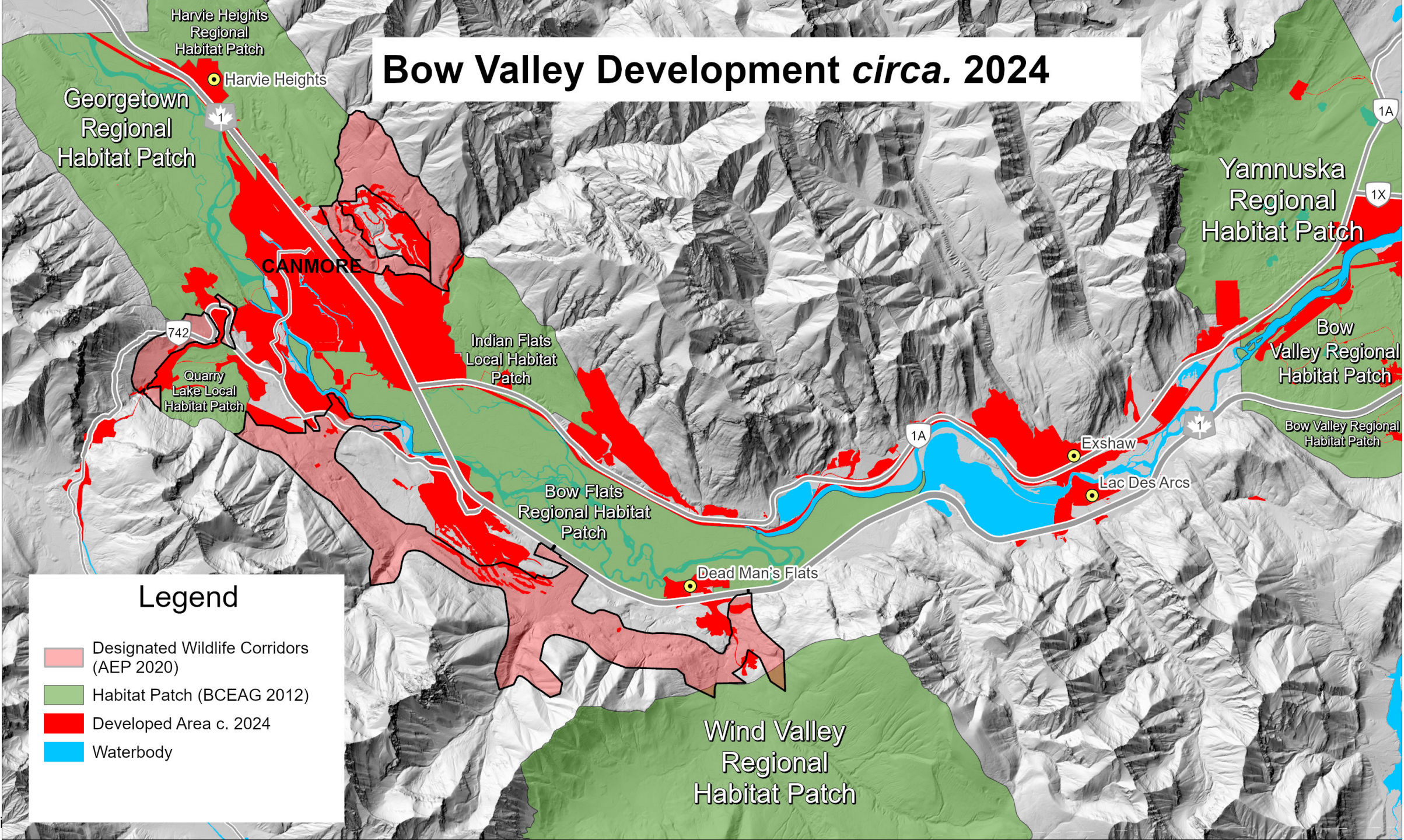
# Lady MacDonal



# Lady MacDonald



# Bow Valley Development circa. 2024







# Area Closed

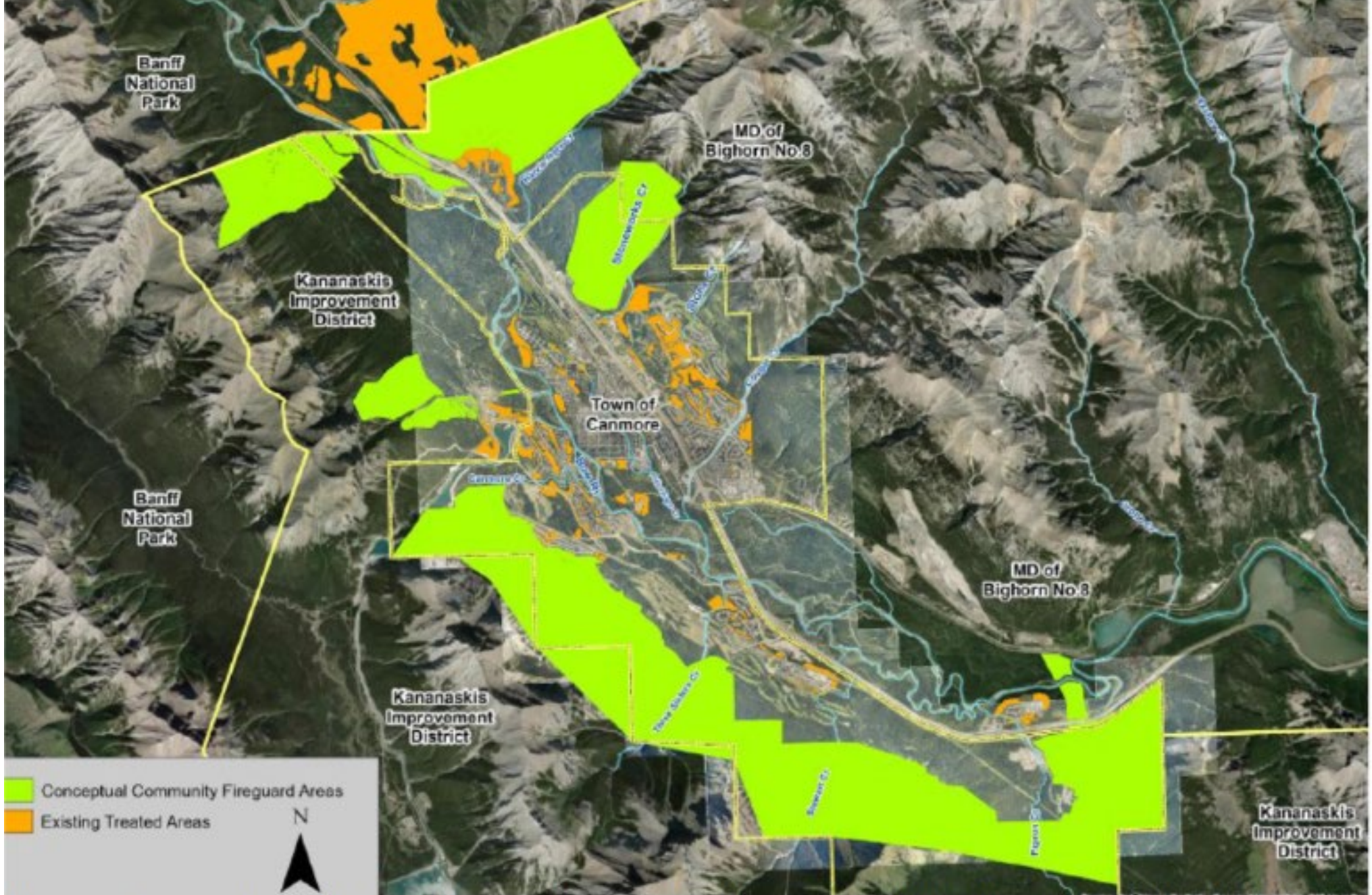
Wildlife Corridor

Kananaskis Country  
Information: 403-678-0760  
albertaparks.ca

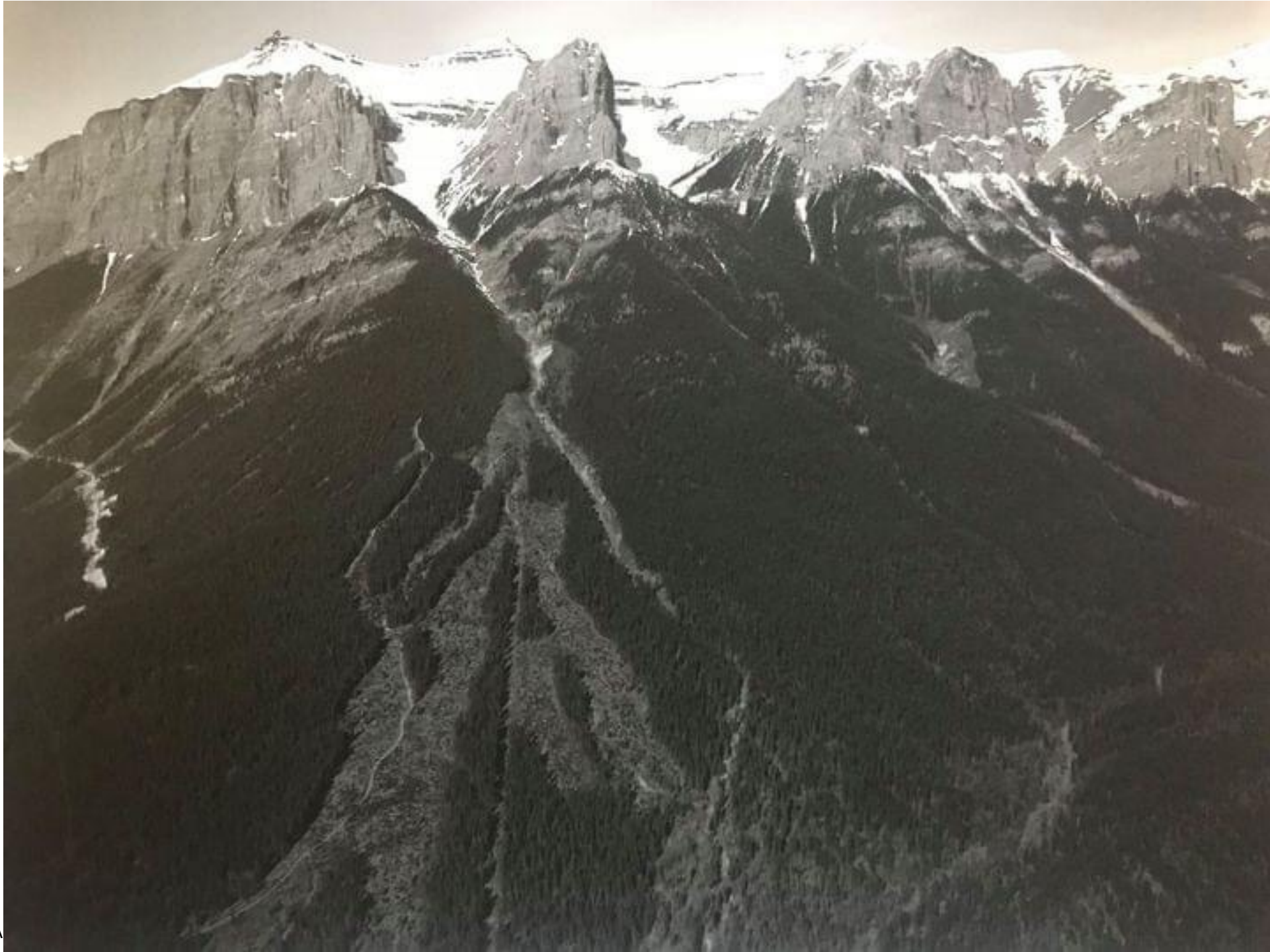


Alberta  
Alberta Parks



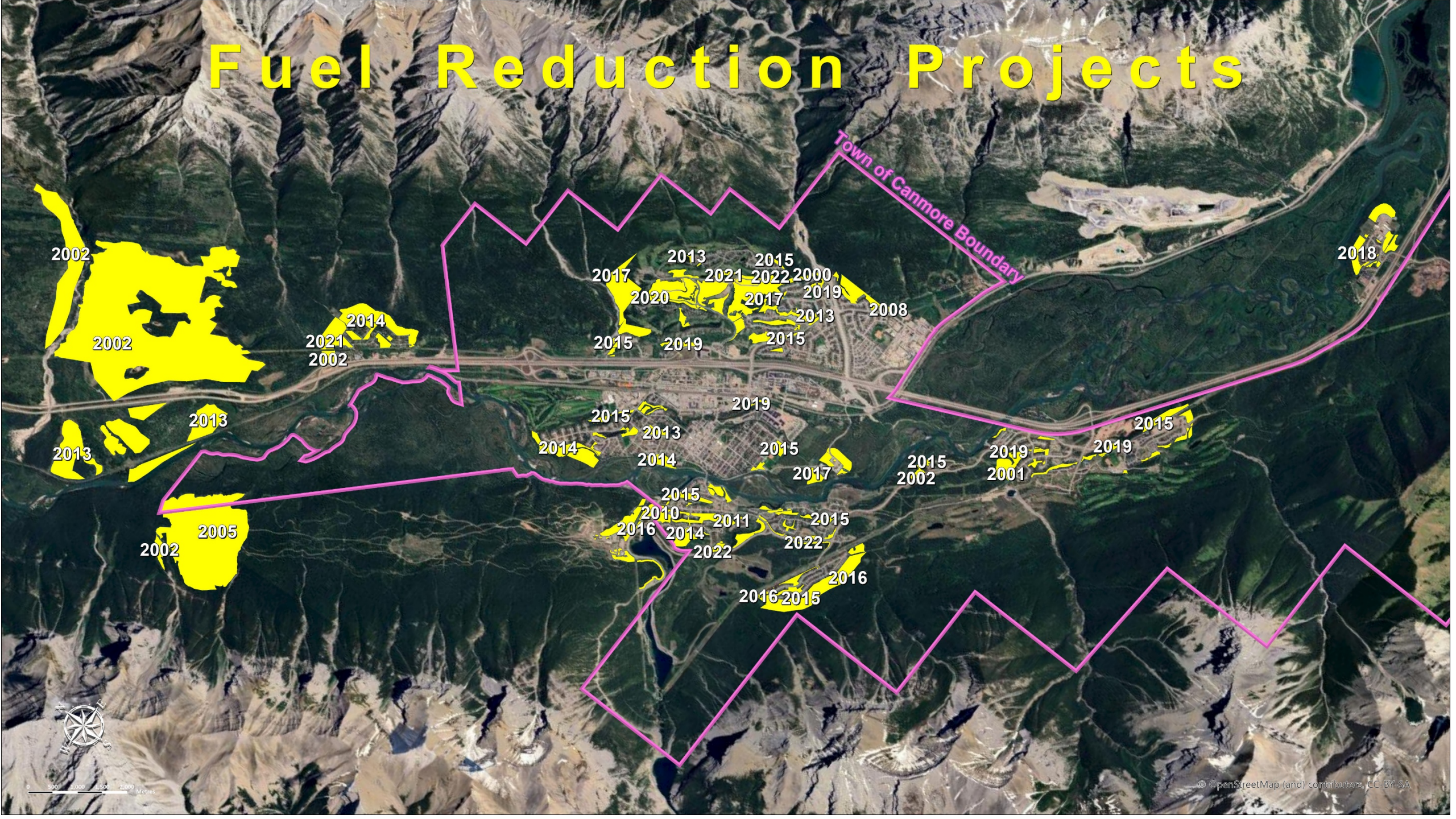


Planning is underway for large-scale fireguards to protect Canmore and neighbouring communities like Harvie Heights and Dead Man's Flats from a future wildfire. HANDOUT

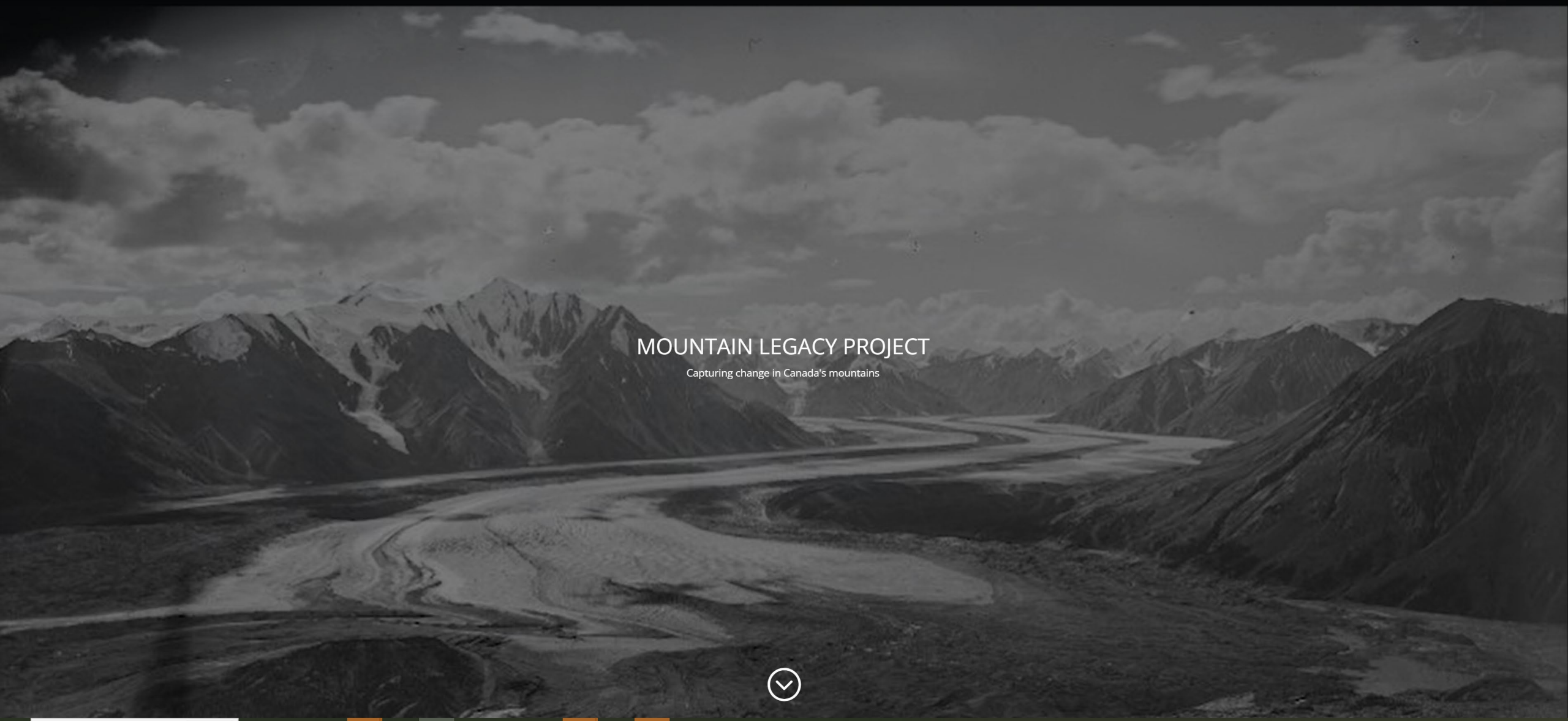




# Fuel Reduction Projects



0 500 1000 2000 2500 Metres



# MOUNTAIN LEGACY PROJECT

Capturing change in Canada's mountains



# John Paczkowski

Human Wildlife Co-Existence Team Lead

## Alberta Forestry and Parks

### Kananaskis Region

[John.Paczkowski@gov.ab.ca](mailto:John.Paczkowski@gov.ab.ca)

403-609-8837







# FireSmart – Introduction to Reducing Wildfire Risks

Laura Stewart, Provincial FireSmart Specialist

June 16, 2024

Canmore Wildfire Forum, Town of Canmore, AB

# FireSmart Actions in the Home Ignition Zone

## MITIGATED PROPERTY

*Immediate and Intermediate Zones*  
0 – 10 m

Clean  
gutter

Mowed  
grass

Leaf litter, branches, and other  
ground fuels removed



*Extended Zone*  
10 – 30 m

Trees separated  
and pruned

Fire cannot “ladder”  
up pruned trees

Shrubs further  
from house and  
not under trees

Fire quickly runs out  
of ground fuels



## EXTENDED ZONE

10m to 30m

## INTERMEDIATE ZONE

1.5m to 10m

## IMMEDIATE ZONE

0m to 1.5m



## EXTENDED ZONE

10m to 30m

## INTERMEDIATE ZONE

1.5m to 10m

## IMMEDIATE ZONE

0m to 1.5m

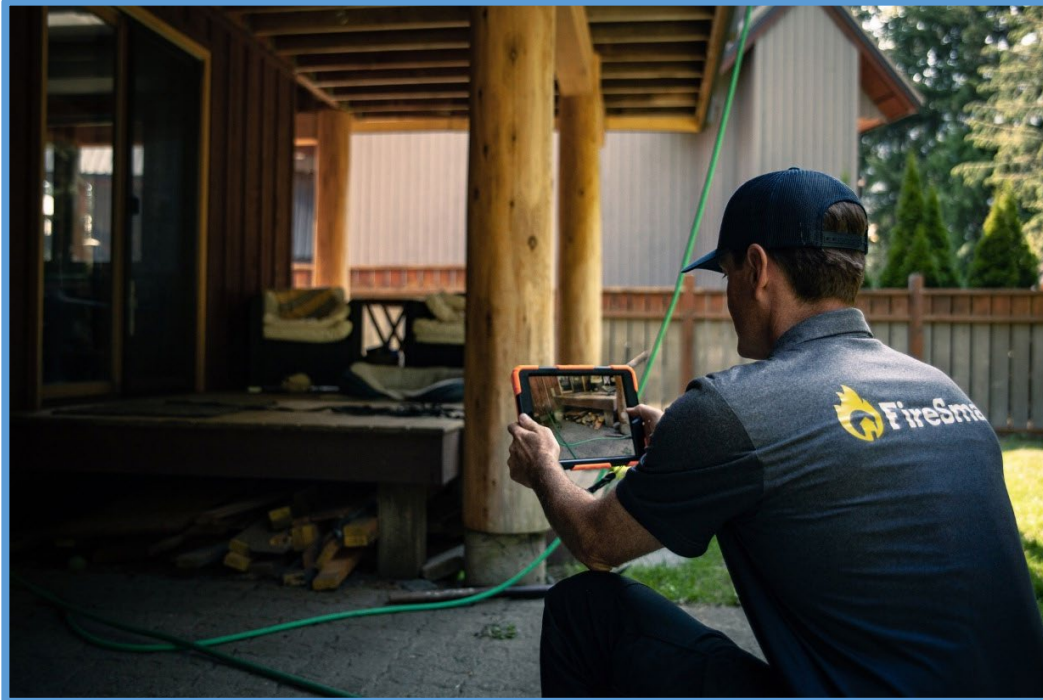


# UNMITIGATED PROPERTY



# The Advanced Home Assessment Program...

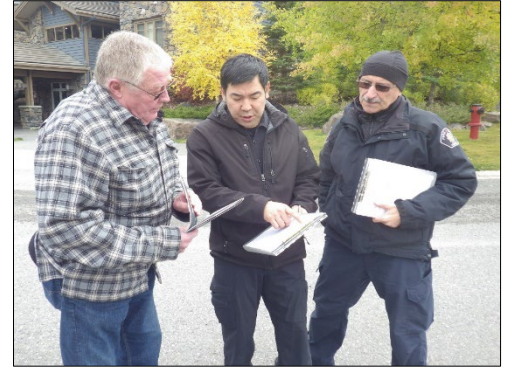
...is for residents looking to mitigate their property's risk to wildfire.



A **trained assessor** visits your property and reviews key areas within the home ignition zone.

# Advanced FireSmart Home Assessment Program

- There is not a single home, neighbourhood or community that is the same in Alberta.
- This means that every single home and property has unique wildfire risks and unique actions that can be taken to reduce risk.
- FireSmart can feel inherently complicated.
- The Advanced FireSmart Home Assessment is designed to take the complicated out of FireSmart.



# Trained Assessor will visit your property to complete assessment

- Offers an assessment of your property completed by a qualified and trained Assessor.
- Your Assessor will assess your property's unique risks and vulnerabilities, providing simple property-specific recommendations on how to reduce it.
- All recommendations are rooted in science and meet both National and International Wildfire Mitigation Best-Practices.







## Neighbourhood Recognition Program (NRP)

# HOME IGNITION ZONE



## OVERLAPPING ZONES

**EXTENDED ZONE**  
10 m to 30 m

**INTERMEDIATE ZONE**  
1.5 m to 10 m

**IMMEDIATE ZONE**  
0 m to 1.5 m



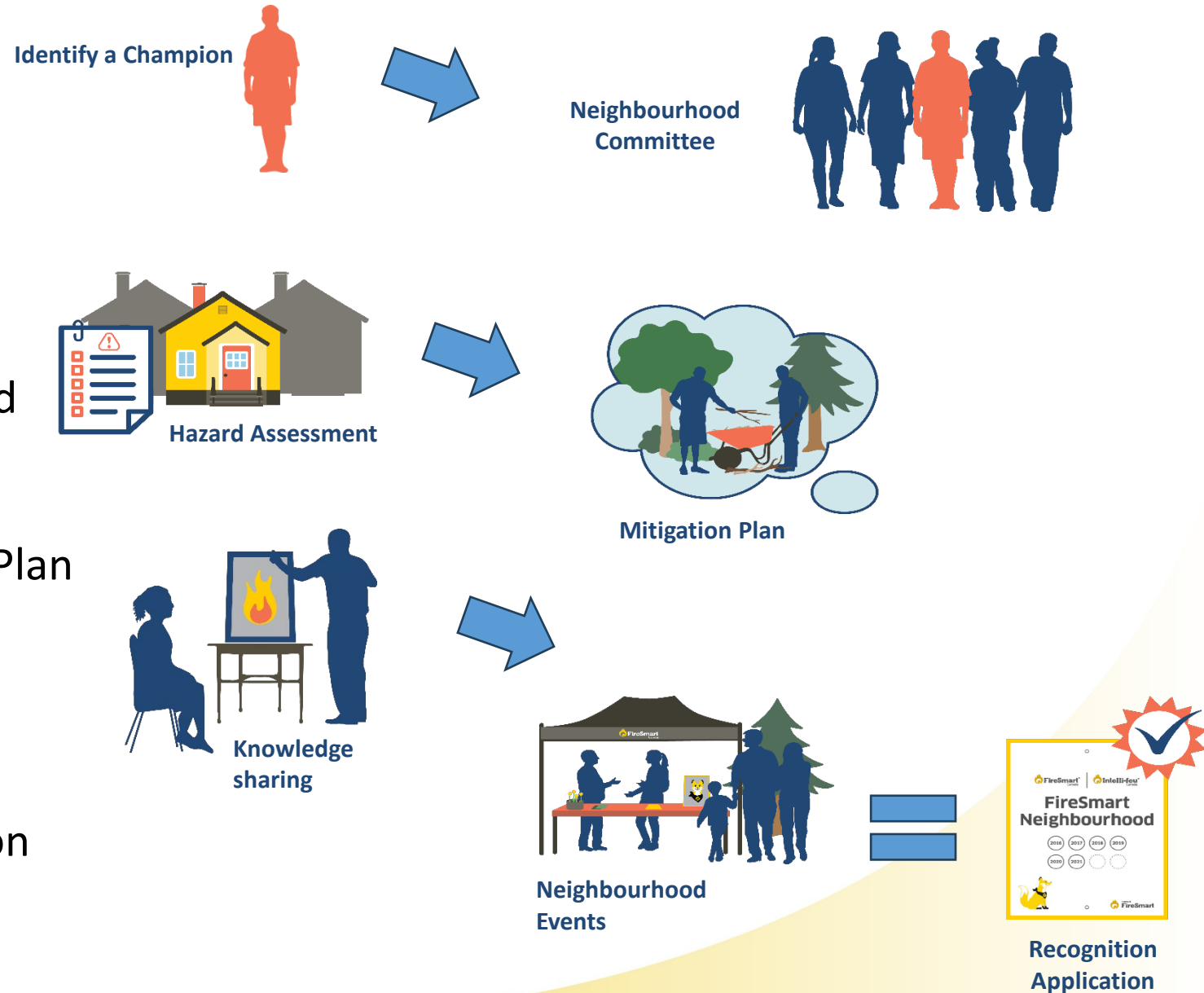
Get started on your FireSmart journey!  
**WWW.FIRESMARTCANADA.CA**

FireSmart, Intelli-Fire and other associated Marks are trademarks of the Canadian Interagency Forest Fire Centre (CIFFC).



# Key Neighbourhood Recognition Program Milestones

- Neighbourhood Champion contacts their local NRP Specialist
- Form a FireSmart Neighbourhood Committee
- Have a Neighbourhood Wildfire Hazard Assessment completed
- Develop a Neighbourhood Mitigation Plan
- Hold FireSmart events
- Celebrate success through the Neighbourhood Recognition application and renewal process



# Why should you become a Recognized FireSmart Neighbourhood?

- Working together to increase resilience to wildfire is a great way to get to know your neighbours.
- Allows firefighters to concentrate their efforts on fighting the wildfire
- Mitigation measures reduce the probability of homes igniting due to embers.
- Develops strong connections with the local fire department.
- Gives you peace of mind, knowing that your property and neighbourhood are more prepared in the event of a wildfire.

# FireSmart Canada Online Training



## FireSmart 101

More so than ever before, Canadians are feeling the direct and indirect impacts of wildfire. There is a growing need for FireSmart education.

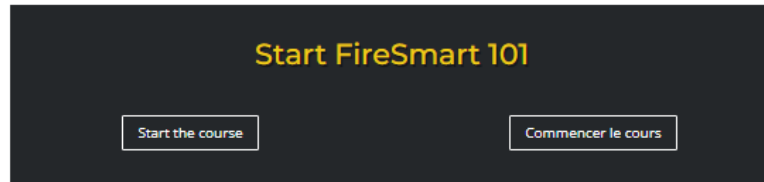
FireSmart Canada has developed a FREE one-hour course for those who are getting started with FireSmart and want to learn more.

### FireSmart 101

- provides an introduction to FireSmart and its principles
- helps participants understand the need to protect homes and properties from wildfire
- defines the wildland urban interface
- outlines the seven FireSmart disciplines
- explains the FireSmart the home ignition zone.

There's a short quiz at the end to ensure participants understand the material.

FireSmart 101 empowers residents to take action!



## Program Support





Our goal at FireSmart Canada is to see wildland fire-resilient communities from coast to coast to coast. And we know that to get there, every province and territory must have the right tools to implement their mitigation/FireSmart programs.

That is why we have developed a comprehensive role structure and accompanying training to grow and strengthen capacity within the provincial and territorial FireSmart teams.

The roles comprise of four levels:

- Level 1 – FireSmart Ambassador
- Level 2 – Neighbourhood Recognition Program Specialist
- Level 3 – Home Ignition Zone Specialist
- Level 4 – Program Coordinator



 <b>FireSmart Ambassador</b>	<b>Level 1</b> <p>FireSmart Ambassadors serve as frontline representatives, knowledgeable about FireSmart within the local community. As promoters of FireSmart guidelines, programming, and concepts, they play a foundational role in building awareness of and promoting wildland fire prevention and encouraging action within their community. Ambassadors do not conduct technical assessments.</p> <p>Find more information on the position and its requirements: <a href="#">FireSmart Ambassador Role Description</a>.</p>
 <b>Neighbourhood Recognition Program (NRP) Specialist</b>	
 <b>HIZ Specialist</b>	
 <b>Program Coordinator</b>	<b>Training</b> <p>The FireSmart Ambassador training is a four-module online course, open to anyone, regardless of background or role in the community. The course takes approximately 3 hours to complete and can be stopped and started at any point. The goal of the Level 1 training is to have as many FireSmart Ambassadors in communities as possible because the more educated community residents and leaders are on FireSmart, the more resilient to wildland fire they will become. Anyone wanting to advance to Level 2-4 roles will be required to have completed the Ambassador training.</p> <p>Access <a href="#">Level 1 FireSmart Ambassador</a> training here.</p>


# FireSmart 101

<https://firesmartcanada.ca/programs/firesmart-101/>


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- A different way of thinking...

11:43 / 34:33 Minutes



## FireSmart 101



REPLAY

PREV || NEXT

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# Level 1 – FireSmart Ambassador

A promotional banner for FireSmart Ambassador training. The top half has a yellow background with a flame icon containing a house silhouette. The text "FIRESMART" and "AMBASSADOR" is written in large, bold, blue letters. The bottom half has a white background with a hand pointing icon and the text "A FREE FOUR MODULE ONLINE TRAINING". The bottom section is a dark blue banner with the FireSmart Canada logo.

**FIRESMART  
AMBASSADOR**

**A FREE FOUR MODULE  
ONLINE TRAINING**

**FireSmart™**  
Canada

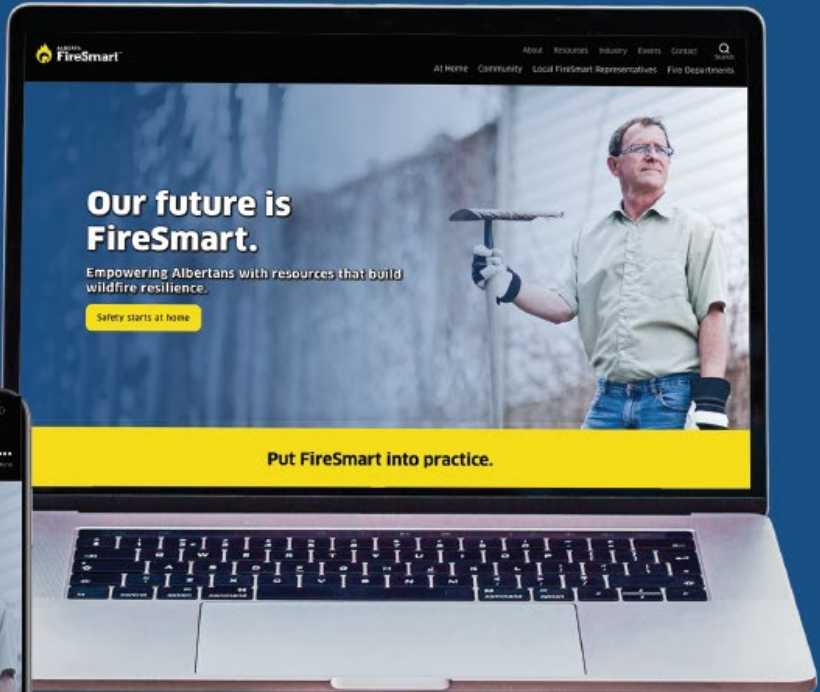


# FireSmart Alberta Website



We have a new website!

Visit [www.firesmartalberta.ca](http://www.firesmartalberta.ca) for access to resources and information to help build wildfire resilience in Alberta!



Remember...





**Thank You!**

## **Questions?**

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**Provincial FireSmart Specialist**

**587-985-2095**

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