Wildfire

Unplanned fires occurring on forest or range lands, which burn forest vegetation, brush, etc. and can spread to developed areas.

EXTENTS	CONSEQUENCE
LOCAL-REGIONAL	HIGH

TYPE	DURATION	SEASONALITY	WARNING TIME	LIKELIHOOD
SHOCK	DAYS-WEEKS	SUMMER	HOURS-DAYS	LIKELY

About the Hazard

Wildfires can damage property and infrastructure, wildlife habitat and ecosystems, and human health. Wildfires are primarily driven by an ignition source (human activity or lightning) occurring in a receptive fuel bed conditioned by local hydroclimate factors (lack of precipitation, high air temperatures, low humidity). Large-scale climate patterns influence these conditioning periods. Fire behavior is modulated by land use and changes (fuel type, load, continuity – heavily altered by logging, insect infestations, or previous fires), watershed physical characteristics (topography, especially slope), and fire suppression efforts.

What We Assessed

Blackwell and Associates Ltd. conducted a detailed analysis based on historical climate and wildfire data, terrain, and fuel type. The latter was ground-truthed and filled an important knowledge gap. A 2-km buffer around the LSA was mapped to understand how conditions outside of the boundary could affect wildfires inside the LSA. Head fire intensity, rate of spread, and ignition potential were modelled and combined to understand suppression difficulty. These two were then combined to map wildfire hazard. Several simulations were conducted to understand wildfire spread based on scenarios that considered different ignition source locations and wind patterns.

Challenges

- The Provincial fuel type classification applied is based on a forest resource inventory database algorithm. The data reliability is based on the age and quality of the inventory, changes related to human disturbance, and the time since last update. While the inventory provides the best available data on fuel type there are inherent errors that cannot be adjusted for in this type of project.
- The map shows fewer or no hazards in many urban areas, but this is a limitation of modelling related to transportation of embers. These areas are still susceptible to embers generated as far away as two kilometers from the interface.
- Fire growth simulation is critical to emergency management and fire preparedness.

Mapping Results

Approximately 50% of the land base in the study area is classified as either high (23 km^2) or moderate (67 km^2) wildfire hazard. Winds during the fire season are predominantly northwestern or southeastern.

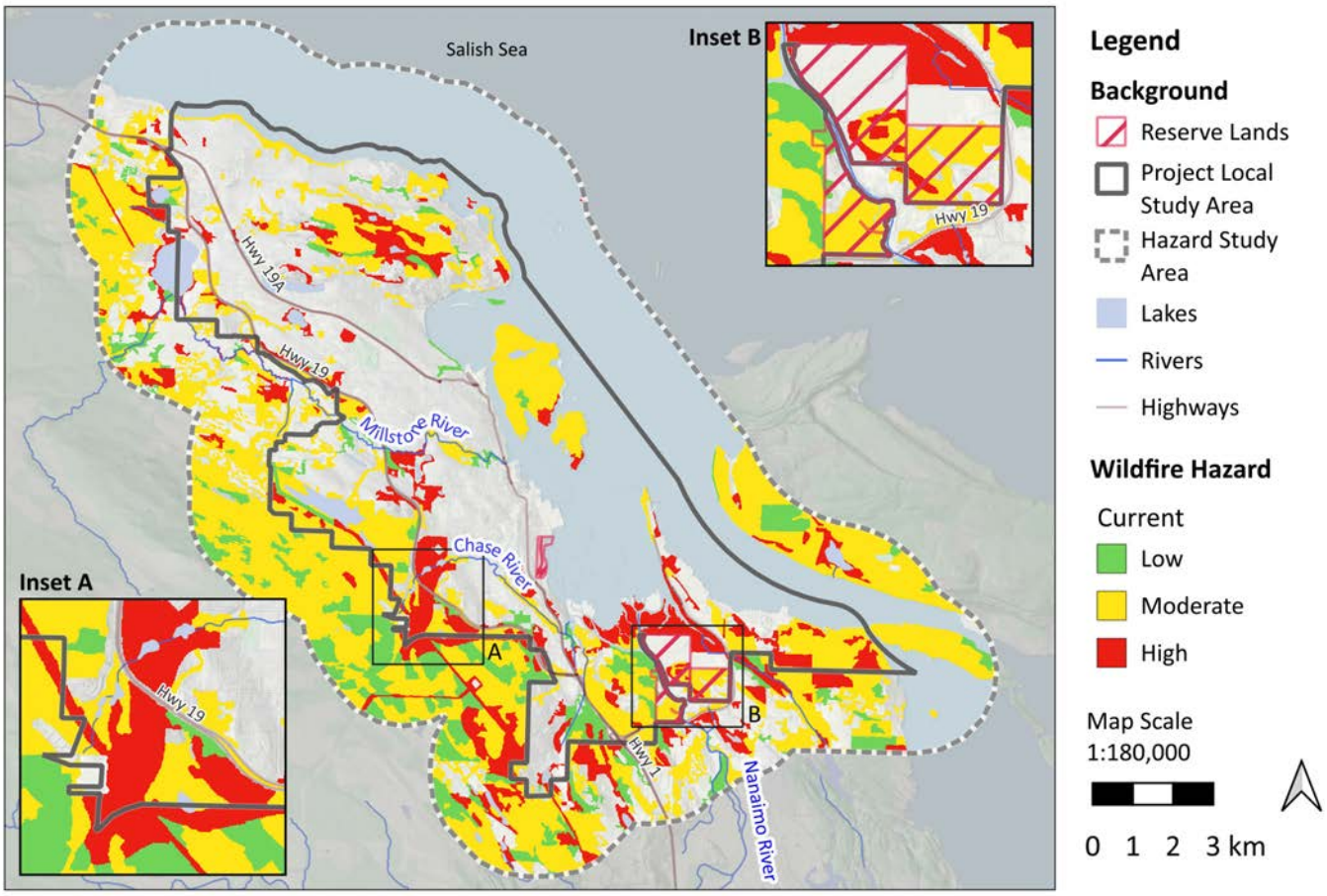
There is a continuous extent of forested land, classified as moderate hazard, along the western boundary of the City. Ignition and spread simulations from this area produced the most significant fire behavior observed in the modelling. If left unsuppressed, a wildfire ignited along the western boundary could spread along the community's edge within a 24-hour burn period (see the yellow areas on the left hand side of the map).

Climate Change Trends

Wildfire hazard is projected to increase along with extreme heat and, potentially, drought in the project area. Other trends include:

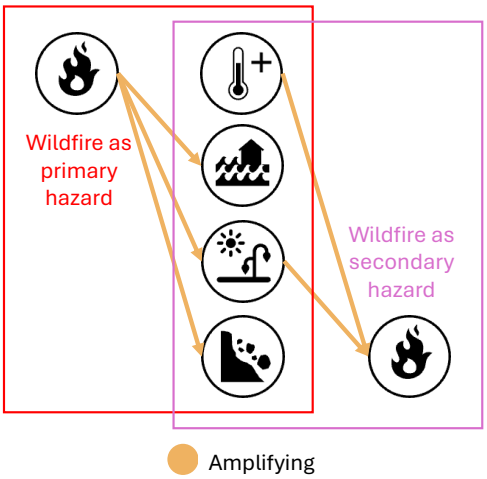
- The conditions causing wildfires will increase in frequency due to extended periods of high and extreme danger class days.
- The total area burned on an annual and decadal basis is expected to increase.

In the next 5-10 years, this hazard is trending toward getting worse.



Interactions with Other Hazards

Wildfires interact with five other priority hazards. They intrinsically coincide with extreme heat and drought conditions, which create fuel flammability. They also can coincide with windstorms, which drive their spread. Post-wildfire conditions significantly amplify the risk of subsequent riverine flooding, stormwater flooding, and mass movement geohazards. It is noted that extreme precipitation works against wildfires by partially or fully extinguishing them.



Emergency Management Considerations

- Due to its linkages with temperature and dryness, wildfire hazard could potentially increase during El Niño events, whose forecasting can be used to track upcoming hazard potential (see Provincial resource discussed in Section 9 Recommendations)[30].
- During a severe drought, lack of water supply can complicate firefighting efforts.
- Education and prevention should be emphasized, where wildfire preparedness should be properly planned and organized.
- A tactical suppression plan can contain and limit wildfires within the project area under difficult wildfire conditions.

30 The ENSO index is based on long-term average conditions, and it does not mean that an extreme heat event, and dry conditions, cannot occur during a La Niña phase.