

Summary of the Current Condition Report for GIS-Based Watershed Hazard in the Omineca Region

The Omineca Region is over 170,000 km² in size and it hosts numerous large lakes including Takla and Stuart Lakes, as well as the Williston Reservoir while large rivers include the Upper Fraser, Nechako, McGregor, Parsnip, and Stuart. The region is home to several aquatic species of interest and concern including salmon, bull trout, Arctic grayling, and the Nechako white sturgeon. The Omineca Region has 3,234 watershed assessment units (WAU), which are areas between 2,000 and 10,000 ha meant to emulate third order watersheds.

The purpose of this summary is to share highlights from the Current Condition Report for GIS-Based Watershed Hazard in the Omineca Region and inform collaborative discussions among government, natural resource industries, First Nations, and other community stakeholders to support healthy aquatic systems. The report details methodology and findings while this summary highlights findings from streamflow, sediment, and riparian hazard assessments.

Streamflow hazard reflects the relative likelihood of increased peak flow within a WAU by considering snow conditions, forest cover and disturbance, slope and drainage density, as well as size and location of wetlands and lakes. Regional streamflow hazard as shown in the figure to the right indicates that most moderate and higher hazard scores are observed in areas of pine beetle infestation and salvage, forest harvesting, fires, and agricultural or residential development in the Prince George and Stuart-Nechako Districts. In Mackenzie these elevated hazards are associated with disturbance as well as watershed conditions such as high snow load and steep slopes that elevate inherent streamflow hazard.

Sediment hazard reflects the relative likelihood of increased sediment generation and delivery of sediment to streams within the WAU. Sediment generation and transport potential was determined by considering sensitive soils and slopes next to streams as well as roads near streams and on steep slopes, stream crossings, forest development next to steep slopes as well as drainage density, watershed slope, and area and location of wetlands and lakes.

Sediment hazard for the region shown on the left panel below indicate a variable response with moderate and high scores associated with areas that have either seen disturbance from past development activities such as pine beetle and salvage or that have sensitive soils, slopes connected to streams, and little buffering capacity for increase to sediment levels as seen in the Robson Valley and Mackenzie District.

Riparian hazard reflects the likelihood that disturbance within the riparian zone will alter the freshwater and terrestrial attributes. This hazard identifies intrusion of forestry, private land, or range tenures within 20m of the stream bank. Regional hazards are identified in the figure below on the right and show moderate and higher riparian disturbance in areas with past harvesting history such as pine beetle affected areas as well as private and agricultural lands as well as wildfire areas.

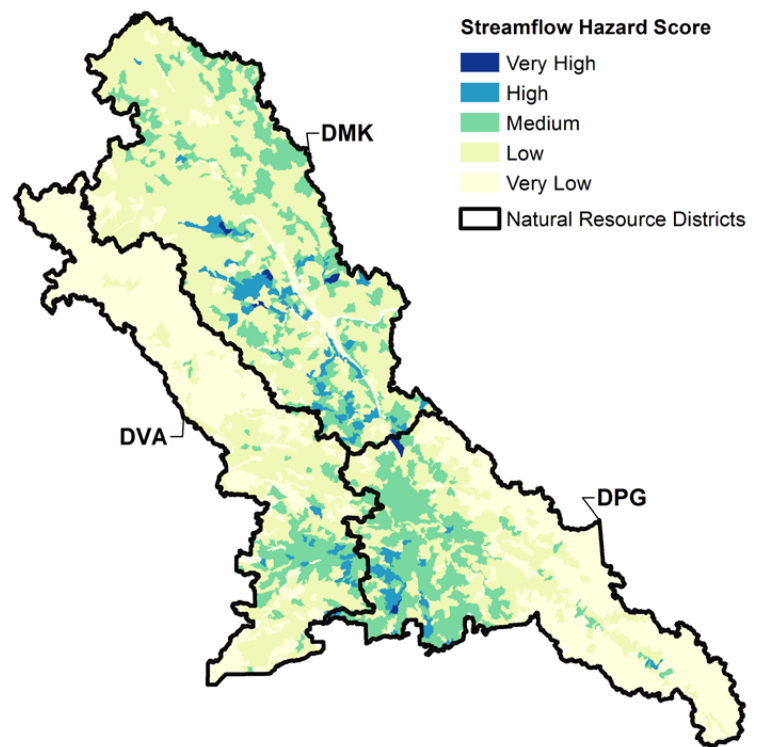


Figure 1 – Streamflow Hazard Score for the Omineca Region.

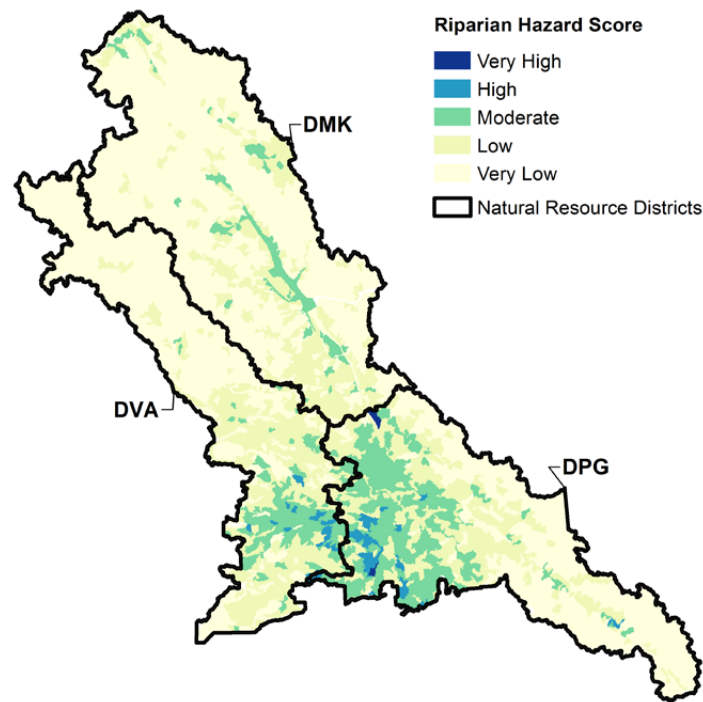
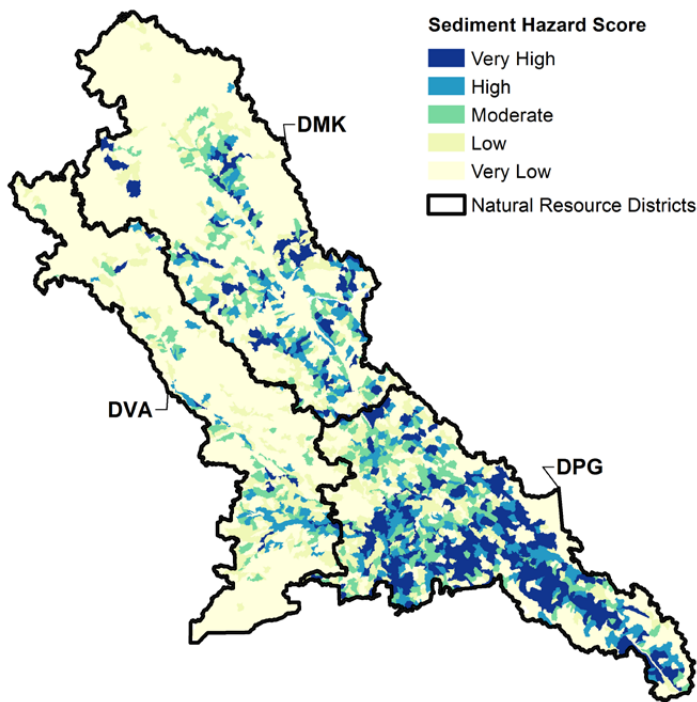


Figure 2 – Sediment Hazard Score for the Omineca Region.

Figure 3 – Riparian Hazard Score for the Omineca Region.

Findings

- All districts have more than 20% of their WAU with a moderate or higher streamflow hazard.
- Mackenzie and Prince George have close to 20% or more WAU with a moderate or higher sediment hazard.
- Prince George has more than 20% of WAU with a riparian hazard of moderate and higher.
- Hazard estimates reflect disturbance and watershed characteristics. Disturbance indicators such as ECA or stream crossing density can show a high or lower disturbance footprint relative to inherent watershed hazard because watershed characteristics such as steep slopes, sensitive soils, and drainage density can buffer or exaggerate disturbance response.

District	Hazard	Very Low	Low	Moderate	High	Very High
Mackenzie	Streamflow	7	67.4	19.6	5.6	0.4
	Sediment	70.6	9.8	7.3	5.5	6.7
	Riparian	76.4	20	3.6		
Prince George	Streamflow	5.1	44.8	29.8	20.1	0.2
	Sediment	35.7	15.8	11.8	12.9	23.8
	Riparian	44.1	27.8	24.6	3.1	0.4
Stuart-Nechako	Streamflow	10.8	57.4	16.6	15.2	
	Sediment	78.7	12.1	5.6	3	0.6
	Riparian	55.4	30.4	12.5	1.7	

Table 1 – Summary table of the three hazard types across resource districts in the Omineca Region.

Summary

The assessment provided clearly shows that the mountain pine beetle (MPB) epidemic and subsequent pine beetle salvage operations had a significant influence on WAU of the Prince George and Stuart-Nechako resource districts as they have the highest proportions of WAU in moderate and higher hazard categories (see table above). Mackenzie has some inherent streamflow and sediment hazard associated with watershed conditions and elevated hazard in disturbed areas.