

M.J. Milne & Associates Ltd.

November 18, 2024

BC Ministry of Water, Land and Resource Stewardship
441 Columbia Street
Kamloops, BC
V2C 2T3

Attention: Ms. Tracy Thomas, P.Ag.

Dear Madame:

Re: Nicola River Post 2021 Fire and Flood Review – Overflight Summary – November 2024

The Coldwater River, Spius Creek and Lower Nicola River portion of the Nicola River watershed were flown in advance of a literature review to be delivered to the Ministry of Water, Land and Resource Stewardship (WLRS) in the winter of 2024-25. The literature review will cover reports and summaries produced by various bodies/entities following the occurrence of the July Mountain and Lytton wildfires, and Atmospheric River (AR) flood event in 2021. The intent of the literature review will be to answer the question, “what’s changed in the Nicola post 2021 fire and post 2021 flood?” The opportunity to conduct an overflight in advance of the literature review was made possible by funding from the Stuwix Resources Joint Venture (Stuwix), who accompanied myself and a member of the WLRS team on the flight.

The overflight was completed almost three years from the date of occurrence of the 2021 AR flood event, and the system is recovering, generally. However, there remains an extensive amount of exposed river bank through crown, private and Indian Reserve (IR) lands that will need to stabilize, or continue to stabilize over time, naturally or through some form of restorative intervention. There should be messaging to private landowners and IR land managers to allow and/or promote natural revegetation of disturbed river banks, bars, and floodplain areas, as denudation of these areas pre-flood clearly exacerbated the extent of flood related erosion and deposition that occurred.

The 2021 wildfires, in particular where burned areas drain to private land, have increased hazard and risk relative to pre-fire conditions. In the Maka Creek fire which occurred in 2020, wide spread open slope landslides and gully failures occurred during the 2021 AR event resulting in numerous debris flows down onto alluvial fans and valley flats. This demonstrates what is possible in burned areas that experience floods of the magnitude seen in 2021. Fish were the key

element at risk in and downstream of the Maka Creek fire, and some damage to spawning and rearing habitat likely occurred.

In the case of the July Mountain and Lytton fires, there is private land and both transportation and pipeline infrastructure in downstream areas, so risk levels there may have increased to moderate or higher. Gordon Creek in the Lytton fire washed out Highway 8 during the AR event, and subsequently experienced a major debris flood in August 2022 that washed out the highway again, and deposited up to 2 m of sediment and debris on private land below. Portions of what was thought to be a relic alluvial fan on lower Gordon Creek were activated during the 2022 event resulting in multiple gullies carrying sediment and debris through the highway and down onto private land. Based on the limited amount of snow that accumulates within the Lytton fire in particular, which is required to recondition hydrophobic soil conditions, there is no reason to think that soils have reconditioned post fire so elements at risk within and downstream of the fire(s) will remain at risk for an undetermined period of time.

A pattern that appears to have not changed post fire and post flood in the Nicola River is the location(s) being selected to rebuild fire or flood damaged structures and/or infrastructure. That is, in the same location that the structures and infrastructure were located pre fire and flood. Ideally, flood prone areas in the Nicola River drainage would be reverted to Crown land through forms of purchase and/or swapping, and put into Old Growth Management Areas (OGMA) or equivalent. The City of Merritt for example is located largely on the Coldwater River terminal fan at the confluence with the Upper Nicola River, which is also prone to flooding. Alluvial fans are depositional features by nature, and deposition in channels results in changes in channel course (avulsion) like the one that directed water into the City during the AR event. Given the depositional nature of the Coldwater River fan and likelihood of avulsion in future, it may not be possible to protect the City of Merritt with engineered structures, indefinitely.

Finally, there are extensive areas of mature forest that was burned in the July Mountain and Lytton fires that could be salvage harvested to recover some economic value with little or no incremental effect on current hazard and risk levels. Hydrologically the effects on snow accumulation, snow melt and runoff have been realized by the fire. Removal of burned timber would facilitate prompt reforestation, as per government regulations, and initiate hydrologic recovery that could otherwise be delayed between 10 and 25 years if the areas are allowed to regenerate naturally. Natural recovery of burned stands will prolong elevated hazard and risk conditions where elements are at risk in downstream areas.

This concludes the summary of findings from the overview of 2021 fire and flood damaged portions of the Nicola River watershed. Please call or email us with any questions.

Yours truly,
M.J. Milne & Associates Ltd.



11/18/24

Michael Milne, MES, AFP
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Project Hydrologist

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