

Managing Risks to Watershed Values

A description of the issue and best practices for professionals and lay people

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The Board has addressed numerous complaints and concerns about the effects of harvesting on water resources – in fact, 22 percent of complaints investigated since 2013 involve this topic. Examples include our complaint investigation reports on McClure Creek, Bonneau Creek and Yates Creek. These investigations highlight the need for licensees and their forest professionals to understand the risks of harvesting to downstream infrastructure and private property, assess risks and plan accordingly.

The July 2019 Preliminary Strategic Climate Risk Assessment for BC¹ identifies the top threats to BC. Among the risks are seasonal flooding and extreme precipitation and landslides. These significant storm events, and especially rain on snow events, are expected to occur more frequently in the future. There have been some recent cases where significant storm events in watersheds with recent harvest activity caused stream flooding that damaged resource roads, public access roads and private property. The licensees and government were responsible for the cost to repair the damage and apply mitigation measures to avoid future impacts, raising the question, “Could the damage have been prevented?”

Licensees not only plan road and stream crossing structures, but also make forest management decisions that can affect hydrology. For example, timing of harvest, area harvested, and silviculture system selected. With this knowledge, they should also be assessing the risk to downstream values.

The Board has found that licensees usually carry out their legal obligations for harvesting and road maintenance, but have not always considered increased hydrologic (i.e., water) risks to downstream values from planned harvesting. In light of climate change effects, these assessments become more important.

A hydrologic assessment is an added expense, so licensees do not always conduct one, unless required in a community watershed. The Board has also seen cases where the licensee did not even calculate an equivalent clearcut area (ECA)² to see if there is an indication that the planned harvest could increase the risk of flooding. An ECA is a basic consideration that should be done

¹ <https://www2.gov.bc.ca/gov/content/environment/climate-change/adaptation/risk-assessment>

² Equivalent clearcut area describes how much of a watershed is functioning as a clearcut, taking into consideration the growth of trees over the cutblock since harvesting. As second growth develops, the hydrological impact of tree removal from a site is reduced.

to identify whether there is a potential risk that warrants further assessment work. More information regarding ECA is available in Ministry of Forests, Lands, Natural Resource Operation and Regional Development Extension Note 118³ with a more technical definition given here.

Once alerted to the risk, a licensee can consider appropriate measures to reduce the risk. For example, prescribing a larger culvert for a site that is close to its capacity, or implementing a robust drainage stabilization plan to reduce the risk of environmental damage and associated mitigation costs before equipment leaves an area.

While a hydrological assessment may recommend more costly road improvements to reduce risk, the appraisal system may compensate a licensee for necessary improvements. However, the costs of repairs and improvements done after the fact are borne by the licensee.

If the risk is elevated, licensees could inform others whose infrastructure or private property is at risk so that they can take measures to protect it.

To help address these risks, and in response to a Board recommendation in its Community Watersheds Special Investigation Report⁴, a Task Force of the Joint Practices Board of the Association of BC Forest Professionals and Engineers and Geoscientists BC recently developed guidelines: *Professional Practice Guidelines: Watershed Assessment and Management of Hydrologic and Geomorphic Risk in the Forest Sector*. Section 2 of the guidelines provides a framework for the management of hydrologic and geomorphic⁵ risk. The guidelines also address climate change and risk management. Licensees' forest professionals should make themselves familiar with the Guidelines.

The Board, and the public, expect licensees to be aware of the downstream values potentially at risk; to routinely consider the risk during planning and design of forest operations; and to carry out risk assessments where appropriate, regardless of what the *Forest and Range Practices Act* requires. Stakeholders and the public rely on licensees to identify and manage for risks to watershed values when planning and conducting forestry operations.

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What Is ECA?

The potential effects of forest disturbance on streamflow are often evaluated by examining the total area disturbed and the location(s) in a watershed where forest cover has been (or will be) altered. The assumption is that the greater the disturbed area, the greater the potential for hydrologic change. It is also assumed that these changes will diminish over time as the forest regrows (i.e., recovers). The extent of disturbance, accounting for regrowth, is referred to as the equivalent clearcut area (ECA).

³ <https://www.for.gov.bc.ca/hfd/pubs/Docs/En/En118.htm>

⁴ <https://www.bcfpb.ca/reports-publications/reports/community-watersheds-from-objectives-to-results-on-the-ground/>

⁵ Geomorphic refers to the earth's surface – rock and soil.