

Topic: EFN and fisheries

Title:

Effects of forestry on late summer low flows and fish habitat in headwater catchments of the Pacific Northwest.

Description:

The streamflow regime of snow-dominated catchments in the Pacific Northwest is sensitive to changes in climate and forest cover.

Reductions in forest cover associated with harvesting and natural disturbance often result in an advanced snowmelt freshet and earlier peak flow. Most studies have focused on changes in annual water yield and peak flow, and have not focused on late-summer low flows.

In small, headwater catchments the late-summer low flow period is often a critical time for resident fish because of the corresponding reduction in habitat.

Some studies that have examined streamflow changes monthly, but these studies are often too temporally coarse to make meaningful inferences about impacts to certain biological processes (e.g. spawning) that can occur in streams over shorter periods.

This study considered the impacts of forestry on low flow and fish habitat in three small headwater catchments located in the southern interior of B.C.

The effects of forest harvesting on low flows were assessed at fine (daily) temporal scale using a paired-catchment approach. These results were coupled with the results of an eco-hydraulic fish habitat model (physical habitat simulation [PHABSIM] style) that quantified how available fish habitat changes with streamflow.

In two of the three watersheds, late-summer streamflow was consistently less than the predictions for the most recent post-harvest periods; these findings were supported by extended periods with p-values at and below a significance level of 0.1.

The results from the corresponding fish habitat modelling indicate a reduction of up to 40% of available habitat for the resident rainbow trout in the study streams.

These results begin to fill an important gap in our knowledge about longer-term impacts of logging on summer low-flows and fish habitat in small snowmelt dominated hydrological systems of the Pacific Northwest.

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