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### Abstract

#### Effects of bark beetle outbreaks on avian biodiversity in the British Columbia interior: Implications for critical habitat management

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The health of coniferous and mixed forests in western Canada is a critical forest management issue with implications for the forest industry, biodiversity conservation, and regional land use planning. The mixed forests of interior British Columbia have high biodiversity and species abundance, and support rich communities of over 185 wildlife vertebrate species, about 24% of which are cavity-nesters. These cavity-nesting birds and mammals live in complex, strongly structured wildlife communities (Nest Webs) that consist of an array of excavators and consumers of tree holes, many of which have strong preferences for large, old and decayed trees, especially deciduous trees, for nesting.

Mountain pine beetle (MPB; *Dendroctonus ponderosae* Hopkins) and fire are the two major natural disturbance types structuring mature conifer stands in the interior of the province. The temporal changes in value and availability of dead and dying trees and their associated insect fauna are expected to result in stand-level variation in wildlife populations. Our research in the Cariboo-Chilcotin region showed that insect outbreaks can initially result in improved conditions for cavity-users and many other birds that feed on insects in dead and dying trees, but as the epidemic proceeds, these enhanced conditions deteriorate for many species as the supply of forest insects and old trees decline. The cumulative effects of habitat and environmental changes on the working landscape have the potential to negatively affect the stability of wildlife populations. This paper summarizes field observations regarding changes in forest stand conditions and avian biodiversity and evaluates the patterns of habitat change, beetle salvage, and wildlife responses as the mpb epidemic runs its course. It also discusses some of the issues that forest managers face when considering the maintenance of critical habitat for cavity-nesting species.

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