

Predicting the amount, quality and location of dead wood in the forest landscape - A modelling approach to predict saproxylic insect abundance

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The area of planted forest is increasing worldwide, bringing higher demand on modern forestry to conciliate timber production with progress towards sustainable forest management such as the conservation of biological diversity. Saproxylic species, which are mainly fungi and insects, are considered particularly valuable forest biodiversity indicators. They represent the wide spectrum of different habitat requirements and species' ability to utilise decaying wood. Earlier studies have demonstrated a significant positive correlation between the amount and quality of dead wood and the richness of saproxylic species, so that the richness of species inhabiting dead wood is usually greater in natural than in managed forests or in less intensively managed forests than in intensively managed ones. Using New Zealand highly productive and sustainably managed *Pinus radiata* plantations as a model system, we explored how monitoring of decaying wood may be a useful tool in the management of saproxylic insects. By merging existing forest industry data with an existing Scion model that predicts woody debris production we modelled the amount, quality and location of dead wood in the forest landscape. It shows that different forestry practices not only change the amount of decaying wood, but also influence the size, the quality, and the spatial distribution of available saproxylic habitats. In well characterised forests such as NZ intensively managed plantations, such a modelling approach using the amount of source habitat as a surrogate for saproxylic insect abundance could prove a useful alternative to regular forest inventories. This may be a tool for conservation purposes, as it could support recommendations to improve the continuity of dead wood and availability of recently produced dead wood. Another application is to use the model to quantify the distribution and abundance of some targeted market access species.

