

Reduced-impact logging and biodiversity conservation: A case study from Borneo

Abstract

A key driver of rain forest degradation is rampant commercial logging. Reduced-impact logging (RIL) techniques dramatically reduce residual damage to vegetation and soils, and they enhance the long-term economic viability of timber operations when compared to conventionally managed logging enterprises. Consequently, the application of RIL is increasing across the tropics, yet our knowledge of the potential for RIL also to reduce the negative impacts of logging on biodiversity is minimal. We compare the impacts of RIL on birds, leaf-litter ants, and dung beetles during a second logging rotation in Sabah, Borneo, with the impacts of conventional logging (CL) as well as with primary (unlogged) forest. Our study took place 1-8 years after the cessation of logging. The species richness and composition of RIL vs. CL forests were very similar for each taxonomic group. Both RIL and CL differed significantly from unlogged forests in terms of bird and ant species composition (although both retained a large number of the species found in unlogged forests), whereas the composition of dung beetle communities did not differ significantly among forest types. Our results show little difference in biodiversity between RIL and CL over the short term. However, biodiversity benefits from RIL may accrue over longer time periods after the cessation of logging. We highlight a severe lack of studies investigating this possibility. Moreover, if RIL increases the economic value of selectively logged forests (e.g., via REDD, a United Nations program: Reducing Emissions from Deforestation and Forest Degradation in Developing Countries), it could help prevent them from being converted to agricultural plantations, which results in a tremendous loss of biodiversity.