

Impacts of selective logging on insectivorous birds in Borneo: The importance of trophic position, body size and foraging height

Abstract

Habitat destruction and degradation are major drivers of biodiversity loss and attention is increasingly focused on how different traits of species affect their vulnerability. Dietary traits are critical in this respect, and are typically examined by assigning species to different feeding and foraging guilds. However, such guilds may mask large variation in species' trophic interactions, limiting our understanding of species' responses. Here we use stable isotopes to quantify trophic positions within a Family of insectivorous understory birds, the Timaliidae (babblers), within Bornean rainforests. We then relate changes in species' abundances following intensive selective logging of forest to their trophic positions, body sizes and foraging heights. We found that trophic positions within this single feeding guild spanned more than an entire trophic level. Moreover, changes in abundance following logging were significantly and independently related to mean trophic position in primary forest, body size and foraging height: large ground-feeding species occupying high trophic positions were more adversely affected than small understory-feeders with lower trophic positions. These three variables together explained 81% of the variance in species' responses to logging. The single most important predictor, however, was a species' mean trophic position. Species recorded in both habitats also had significantly higher trophic positions in logged forest. These data provide critical new understanding of species' responses to disturbance. They also indicate previously unrecognised functional changes to species assemblages following logging, highlighting the importance of numerical assessments of trophic position within individual feeding guilds.