Enrichment planting to improve habitat quality and conservation value of tropical rainforest fragments

Abstract

Many areas of tropical rainforest have been fragmented and the habitat quality of fragments is often poor. For example, on Borneo, many forest fragments are highly degraded by repeated logging of Dipterocarpaceae trees prior to fragmentation, and we examined the viability of enrichment planting as a potential management tool to enhance the conservation value of these forest fragments. We planted seedlings of three dipterocarp species with contrasting light demands and tolerances (*Parashorea malaanonan* (light demander), *Dryobalanops lanceolata* (intermediate), *Hopea nervosa* (shade tolerant)) in eight forest fragment sites (3–3529 ha), and compared seedling performance with four sites in continuous forest. Eighteen months after planting, survival rates of seedlings were equally high in fragment sites (mean survival = 63 %), and in continuous forest sites (mean survival = 68 %). By contrast, seedling growth and herbivory rates were considerably higher in fragments (by 60 % for growth and 45 % for herbivory) associated with higher light environments in degraded forest fragments compared with continuous forest sites. Among the three study species, *H. nervosa* seedlings had the highest survival rates overall, and *P. malaanonan* seedlings generally grew fastest and suffered highest herbivory rates. There were no interactions between species performance and the effects of fragment site area, forest structure or soil characteristics of sites suggesting that the three species responded similarly to fragmentation effects. High survival of planted seedlings implies that enrichment planting would be a successful forest management strategy to improve forest quality, and hence conservation value, of fragments.