Effects of stand age, logging roads, and elevation on pollinator communities in southern Appalachian forests

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Abstract

Many temperate deciduous forests are recovering from past logging, but the effects of logging legacies on forest insect pollinators are largely unknown. We asked how pollinator abundance and composition varied with time since logging, distance from logging roads, and elevation in southern Appalachian forests. At 15 sites that differed in time since logging (either > 100 or 20-40 yrs ago) and elevation, insect pollinators were sampled at 5 distances to logging roads per site during summer 2010 and spring 2011 using pan traps. In summer, six insect families were more abundant in young stands and near logging roads. Total bee abundance was also greater near logging roads but only in younger forests, suggesting diminishing effect of roads as forests mature. In spring, four of nine focal insect families were more abundant in younger stands. Abundance of many families was reduced at middle distances (2-10 m) from roads in spring, but effects diminished or were absent at 100 m. Two important bee families were strongly associated with high elevations in spring. Logging legacies may enhance resources such as food and nesting sites for insect pollinators especially during the summer months, although these effects appear to diminish as succession proceeds.