FOREST FRAGMENTATION EFFECTS ON AVIAN FRUGIVORES AND IMPLICATIONS ON SEED DISPERSAL AND REGENERATION IN KAKAMEGA FOREST, WESTERN KENYA.

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Abstract

The last decades have seen a biodiversity in many tropical rainforests decline leading to a species-extinction crisis. Loss of biodiversity might, for example, alter the composition of frugivore assemblages in fruiting trees and lead to a breakdown in seed dispersal. Disrupted seed dispersal could have long-term consequences for forest regeneration and might be a serious threat to tropical plant diversity (da Silva and Tabarelli, 2000).

The main objective of this study was to establish the effect of forest fragmentation and the type of management on avian frugivores and consequences for seed dispersal and plant regeneration processes. The study focused on the influence of forest fragmentation and disturbance on avian frugivores feeding on *Ficus thonningii* fruits and seedling establishment of animal dispersed trees below the crowns of *F. thonningii* in Kakamega Forest, Western Kenya. Individual *F. thonningii* trees with ripe fruits were selected in continuous forest, fragments and sites under Forestry Department (FD) and Kenya Wildlife Service (KWS). Seed traps under the same trees provided data on seed deposition by avian visitors and systematic seedling mapping provided data on recruitment under *F. thonningii* trees. Standardised tree observations were carried out and all avian frugivore visitors were quantified. During 400 observation-hours 29 frugivorous bird species visiting *F. thonningii* were recorded. Forest specialist frugivore species declined significantly both in the fragments and FD managed sites as compared to continuous forest and KWS managed sites. Frugivores made significantly shorter visits in trees located in low disturbance sites. Furthermore, the number of frugivores visiting a tree had a significant effect on the number of seeds collected below the crowns of *F. thonningii* trees. This study shows that fragmentation and disturbance leads to a decrease in the number of frugivores and especially the forest specialist species. However, this loss does not seem to have any impact on seedling establishment on the short-term since more seedlings were found establishing in the fragments (1.3 seedlings/m^2) than in the continuous forest (0.45 seedlings/m^2) (t-tests $p < 0.05$). Whether this has implications on the long-term regeneration of our forests require more detailed and long-term studies. In the short term, however, management needs to be improved especially in the FD managed sites.