

Refaunation and the reinstatement of the seed-dispersal function in Gorongosa National Park

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Abstract

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Large animals are important seed dispersers; however, they tend to be under a high extinction risk worldwide. There is compelling evidence that the global biodiversity crisis is leading to the deterioration of several ecosystem functions, but there is virtually no information on how large-scale refaunation efforts can reinstate seed dispersal. We evaluated the effectiveness of a 62-km² wildlife sanctuary, which was established to recover populations of large mammals in Gorongosa National Park (Mozambique), in restoring seed dispersal. We collected animal scats during the dry season of 2014 (June–August) along 5 transects inside and 5 transects outside the sanctuary fence (50 km total) with the same type of plant community, identified animal and plant species in the transects, and quantified the number of seeds in each scat. Based on these data, we built bipartite networks and calculated network and species-level descriptor values, and we compared data collected inside and outside the sanctuary. There were more scats (268 vs. 207) and more scats containing seeds (132 vs. 94) inside than outside the sanctuary. The number of mammal dispersers was also higher inside (17) than outside the sanctuary (11). Similarly, more seeds (2413 vs. 2124) and plant species

(33 vs. 26) were dispersed inside than outside the sanctuary. Overall, the seed-dispersal network was less specialized (0.38 vs. 0.44) and there was a greater overlap (0.16 vs. 0.07) inside than outside the sanctuary. Both networks were significantly modular and antinested. The high number and richness of seeds dispersed inside the sanctuary was explained mostly by a higher abundance of dispersers rather than by disperser identity. Our results suggest conservation efforts aimed at recovering populations of large mammals are helping to reestablish not only target mammal species but also their functional roles as seed dispersers in the ecosystem.