Invasion impacts and medium-term benefits of controlling invasive alien plants in one the most invaded island forests worldwide

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Abstract

High oceanic islands are often hotspots of endemic species subjected to strong and rapid anthropogenic impacts that lead to high extinction and endangerment rates of their biota. Mauritius, an oceanic island in the Indian Ocean champions the highest levels of extinction per land area in the world, and similarly, extreme levels of invasion by alien species. To better understand impacts of alien plants and lost of potential frugivores on native plants, we monitored temporal changes in woody native plants in permanent plots of 0.01 and 1 hectare located in one of the island's best preserved wet forest remnants. We sampled 28,000 woody plants reaching at least 1.3 m high in forests cleared of alien plants at least five years previously to compare with nearby control areas (non-weeded forests). Plants were permanently tagged, identified to species level and their stem diameter measured. In non-weeded plots, the number of individuals, biomass and species richness of native woody plants steadily decreased through time (5 to 15 years), with recruitment of new native individuals being virtually nil, whereas in weeded areas the opposite was observed. Recruitment in managed areas were mainly of lianas, understory and fleshy fruited species. Timely weeding also averted imminent plant species extinction. To halt and reverse the on-going degradation of protected forest remnants in Mauritius, control of alien plant species must be considered the utmost priority. Management actions like thinning of native species or planting within areas with a matrix of good quality remnants should be strongly discouraged as they bring no tangible results apart from slowing down restoration progress. At the scale of our study, extinction of the largest birds and reptiles apparently do not have much of a negative effect on the vast majority of native fleshy fruited species which appear to regenerate well shortly after alien plants are controlled. However, the recent mass-culling of the Endangered Mauritius flying fox, the last animal species able to handle large seeded species, might have profound negative effects as at least 53% of native woody plants of the wet forests have their fruits eaten by this native frugivore.

Keywords: conservation management, ecological restoration, forest, invasive alien plants, plant animal interaction

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