

Ecological outcomes of rainforest restoration projects: dreams and realities

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Restoration of rainforest to formerly-cleared land, for a range of environmental outcomes, is receiving increasing support. Interest in formal offset arrangements for carbon or habitat is also increasing. Reforestation can take place through a variety of different pathways, including intensive ecological restoration ("biodiversity plantings"), lower-diversity timber plantations, and autogenic regrowth. We investigated the outcomes of these different pathways in the Australian Wet Tropics, where governments have financially supported a number of tree-planting schemes since 1989. Restoration trajectories, in terms of both biodiversity development and above-ground carbon accumulation, were assessed by means of quantitative surveys of flora, selected faunal groups and vegetation structure at replicate reforested and reference sites across the landscape. Results indicate that, when restoration plantings are well managed, they develop very rapidly within the first 5-10 years, and their performance is superior to timber plantations in terms of not only biodiversity outcomes, but also resilience to cyclone damage, and ability to sequester above-ground carbon. They also have potential timber values, even though they were not designed with harvest in mind. In successful rainforest restoration a closed canopy (a key indicator of rainforest structure and process) forms within five years or less. However, the planting techniques which produce these outcomes are relatively expensive, and in the absence of post-planting maintenance, sites can become sparsely-treed areas of tall grass or weeds in which planted seedlings have largely struggled or failed to survive, in the face of pressures such as grazing, flood or fire. Assessment of outcomes at a random sample of government-sponsored projects showed that around half were in poor condition due to lack of maintenance. If restoration projects are to have any real utility within environmental improvement or offset schemes, we need fewer assumptions, more monitoring, and an evidence-based approach.