

# Five years of experimental eco-restoration at Wairio wetland: or, How to establish a kahikatea swamp-forest

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The Wairio wetland block, on the Eastern shore of Lake Wairarapa, is 100ha of rough-grazing that is undergoing renewed management interest from the Department of Conservation, Greater Wellington Regional Council and Ducks Unlimited to restore a diverse system of ephemeral wetlands. The aim is to increase local biodiversity (e.g. kahikatea swamp forest habitat and a range of waterfowl populations) as well as enhancing the provision of multiple ecosystem services, such as water purification for Lake Wairarapa, carbon sequestration and flood control. For the past five years staff and students from Victoria University's Centre for Biodiversity and Restoration Ecology have undertaken a number of collaborative research projects on aspects of the hydrology, nutrient budget, soils and managed vegetation dynamics of the area. We will focus on one project in particular: monitoring the growth and survival of over 2000 planted trees (eight species), investigating the influence of nurse trees, planting into scraped vs intact topsoil, different spacings, all played out across a natural hydrological gradient. Kahikatea (*Dacrycarpus dacrydioides*) had the highest overall survival and slowest growth rates. Local hydrological conditions were of prime importance for six species, especially totara. Scraping of topsoil temporarily reduced the cover of competitive grasses, but resulted in shorter trees. Manuka put on the greatest growth and appeared to be the most sensitive to over-crowding.

Wetlands are among the most degraded and lost ecosystems across New Zealand. Determining efficient methods to restore their biodiversity and ecosystem functions has never been more important for the sustainable and resilient stewardship of land and water.