

## Impact of Invasive Weeds on Forest Ecosystems

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There are relatively few lowland forest remnants in New Zealand. More often than not they are small fragments that have been modified by selective logging, grazing and edge effects. As a result of these modifications they are prone to invasion by exotic weeds. Over large areas the indigenous early successional systems have been entirely replaced by adventive species. Knowledge of the resulting impacts on ecosystem function and biodiversity would enable predictions of the long-term health of these fragments and the development of appropriate management actions.

We have begun a project to quantify impacts of three different invasive weeds - wild kahili ginger (*Hedychium gardnerianum*) and wandering Jew (*Tradescantia fluminensis*) in forest remnants, and gorse (*Ulex europaeus*) as a replacement to early successional communities of kanuka (*Kunzea ericoides*).

For each system we aim to determine the impact of the weed on community structure, ecosystem function and biodiversity by replicate sampling in invaded and non-invaded plots.

The broad approach is to consider in each system; vegetation and invertebrate community structure, primary productivity, regeneration dynamics, and nutrient pools and fluxes. Standard methods will be used to describe the vegetation as well as novel methods to measure primary production and the standing crop of invaded and uninvaded systems. Seed fall and seedling dynamics are being studied to determine whether weeds influence regeneration patterns. Soil nutrients, litter fall, litter decomposition, and nutrient fluxes in these components are being recorded. Invertebrates are being sampled using Malaise traps, pitfall traps, and soil cores, to compare biodiversity, guild structure, and the native vs exotic component of selected taxa.

The impacts of the three weeds on community composition and ecosystem function will be synthesised to predict the long term fate of the community in the presence of each weed and to identify common themes.