

Replacement of woody weeds by native plant succession in New Zealand

Kate G. McAlpine

Department of Conservation, PO Box 10-420, Wellington 6143, New Zealand

Corresponding author: kmcalpine@doc.govt.nz

Summary It is widely known that gorse (*Ulex europaeus*) eventually disappears from many areas in New Zealand where native forest is regenerating, but what about the numerous other dominant woody weed species that are actively controlled by the Department of Conservation? Are any of them similarly susceptible to competition from native plants in the long-term? Very little successional information has been published to date for most of these other species, so the answer to this question remains largely unknown. The aim of this work in progress is to identify which of these species could potentially be left for native plant succession to 'control' on conservation land (where native plant propagules are present and disturbance is minimal), thereby enabling weed managers to achieve conservation goals at considerably reduced cost and effort. Additional benefits of this 'minimal intervention' approach include reduced herbicide use, reduced disturbance, and reduced risk of re-invasion by the same or different weed species.

There are likely to be critical weed species-specific and site-specific variables that determine successional outcomes where weeds and native plants co-occur in New Zealand. For the individual weed species, such variables are likely to include longevity, shade tolerance, maximum canopy height

(relative to the potential climax native vegetation), ability to regenerate beneath its own canopy, and ability to inhibit native plant regeneration. Site-specific influences on successional outcomes are likely to include abiotic variables, such as climate, weather, geology and geography, and a range of biotic variables pertaining to the local vegetation and ecosystem. These weed species-specific and site-specific variables will be used to analyse the *c.* 55 dominant woody weed species managed by the Department of Conservation to assess where and when these weeds are likely to be replaced by native plant succession in New Zealand.

This 'minimal intervention' approach could be a viable weed management option at sites where weed control is deemed prohibitively difficult or costly. However, it may not be feasible at sites where native biodiversity is at risk in the short- to medium-term, or when further spread of the weed in question needs to be contained. It may also be difficult to predict successional outcomes in some situations, for example where the weed is ecologically similar to the dominant native species, or where a suite of co-dominant weeds is present.

Keywords Invasive species, seedling establishment, regeneration, weed management.