

Does gorse make a difference?

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Summary The dominant native woody species forming early successional vegetation in lowland New Zealand on formerly forested sites were Myrtaceae, *Leptospermum scoparium* J.R. & G.Forst. (manuka) and *Kunzea ericoides* (A.Rich.) J.Thomps. (kanuka). These have been replaced extensively by gorse (*Ulex europaeus* L.), a naturalised species in New Zealand. Because gorse gives way to native broadleaved vegetation in about 30 years on these sites, it is often considered a desirable species for facilitating succession to native forest. We determined whether plant biodiversity values of gorse successions are similar to successions through native kanuka. From the New Zealand literature on gorse and kanuka scrub, we derived testable hypotheses:

1. kanuka stands have a different species composition and greater species richness than gorse stands at comparable successional stages;
2. kanuka and gorse scrub do not exhibit convergent successional trajectories, i.e. differences between kanuka and gorse stands are maintained over time; and
3. several groups of plants are absent from or less common in gorse than in kanuka stands.

Forty-eight scrub or low forest sites in the Wellington and Nelson regions were sampled and classified by canopy height and composition, as viewed from within the stands, into one of four pre-defined successional stages:

1. *young gorse* dominating the canopy with broadleaved woody species emergent;

2. *young kanuka* dominating the canopy, with an understorey of broadleaved saplings of comparable height to young gorse;
3. predominately broadleaved woody species with scattered live or dead *old gorse* stems indicating the stand had probably developed through gorse; or
4. *old kanuka* occupying the canopy over a sub-canopy of predominantly broadleaved species of comparable height to old gorse.

We determined that most site geographical aspects, including those of the surrounding landscape, did not differ significantly between our gorse and kanuka sites. We found the floras of kanuka scrub and gorse scrub and their immediate successors are different, and species richness is often lower in gorse. Differences between young gorse and kanuka, and old gorse and kanuka, are driven primarily by native woody species. Because old gorse and kanuka stands are not less different than young stands the successional trajectories of gorse and kanuka have yet to converge. Gorse leads to different forest from that developed through kanuka. For example, there are fewer small-leaved shrubs and orchids in gorse. Gorse succession is therefore not a direct substitute for native successions. Efforts may be needed to assist the preservation of native secondary vegetation on landscapes where it is pre-empted by gorse or other naturalised shrubs.

Keywords Secondary succession, *Kunzea ericoides*, *Ulex europaeus*, weeds, New Zealand.