

Conservation values and significance of kanuka forest at East Taieri, coastal Otago

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Published by
Department of Conservation
Head Office, PO Box 10-420
Wellington, New Zealand

This report was commissioned by Otago Conservancy

ISSN 1171-9834

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Reference to material in this report should be cited thus:

Allen, R.B., 1997.

Conservation values and significance of kanuka forest at East Taieri, coastal Otago. *Conservation Advisory Science Notes No. 157*, Department of Conservation, Wellington.

Keywords: Kanuka, secondary vegetation, grazing.

Summary

Kanuka forest at East Taieri comprises a dense 5-10 m canopy of kanuka, with occasional trees of kowhai, narrow-leaved lacebark, mahoe and other species. The understorey and ground vegetation are depleted by grazing. The stand is typical of grazed kanuka forest in this region. It occupies an area which formerly supported forest characterised by kahikatea, totara, matai, kowhai and narrow-leaved lacebark. This forest type is now very rare and underrepresented in eastern Otago, but could re-establish at this site in the absence of grazing.

1. Introduction

Landcare Research were requested to undertake a survey of kanuka-dominated forest at East Taieri in order to assess its value for biological conservation. This report describes the vegetation and flora, comments on its representativeness, condition and trend, and makes recommendations on its future management.

The area was visited on 15 February 1996 with Ms Helen Clarke of the QEII Trust and Mr Alan MacKay, a local landowner.

2. Site location and characteristics

Forest occupies most of a pair of small steep gullies some 500 m south of State Highway 1 at grid reference NZMS 260 144 107742, about 2 km south-west of the township of East Taieri. The southern of the two gullies was surveyed. It lies on a SW-NE axis, with slopes from 10 to $>30^\circ$. Spurs with schist outcrops and talus alternate with relatively rock-free slopes. Several small seeps and springs coalesce to form a small stream. The bush-clad gullies are a prominent landscape feature of the area.

3. Vegetation

The more or less continuous canopy of kanuka 5-10 m tall is broken by occasional trees of kowhai, mahoe, narrow-leaved lacebark and totara, particularly near the gully floor. A small group of pine trees and some blue gum trees

emerge from the kanuka canopy in the upper gully. A few hawthorn trees and elder bushes occur, mainly around the periphery, along with scattered small gorse bushes, many of which have been killed with herbicide.

The understorey is very open, and consists mainly of browsed shrubs of *Helichrysum aggregatum*, with occasional *Coprosma crassifolia*. Ground cover varies from almost continuous pasture grasses and weeds close to the forest edge, to continuous native herbaceous cover of *Hydrocotyle* and *Poa imbecilla* on sunny mid-slopes, and almost no plant cover at all on shady mid-slopes. The fern *Pellaea rotundifolia* is prominent on some sunny talus slopes, and other fern species were found in places along streamsides. Lower gully floors carry pasture species, rushes and sedges.

A list is appended of species recorded during the survey; this is not an exhaustive species list.

4. Condition and trend

The vegetation is entirely secondary, and probably established 60-80 years ago when farm management was insufficiently intensive to prevent reversion after clearance of former forest. It is typical of kanuka forest which has been open to grazing by domestic stock (including goats) and rabbits in this region, but the open understorey also results from the dense canopy of this successional stage of kanuka establishment. Areas of slumping, particularly near the gully floors, reflect the natural instability of this landscape as well as the damage caused by stock browsing the stabilising vegetation and changing the soil structure by trampling.

There is no weed problem at present. Gorse is scattered and under control, and no seedlings were seen of elder or hawthorn. The native vine *Muehlenbeckia australis* covers small areas of canopy around the edge of the kanuka stand and in the gully floors, but does not appear to be causing significant canopy collapse.

In the absence of grazing, kanuka forest is replaced by podocarp-broadleaved forest within a couple of centuries. Most broadleaved tree species which might be expected in this locality are present. The exceptions are palatable species such as three-finger and pate, but these are present in other forest remnants nearby. Although totara was the only podocarp seen, other forest remnants in the area contain Hall's totara, matai, miro, kahikatea and rimu. The abundance of fruit-eating birds (eg bellbird, waxeye, native pigeon) noted in the surveyed area suggests that establishment of the other podocarp and broadleaved species from seed would be likely in the absence of grazing. The understorey would also become more dense and diverse, and ground cover of ferns and herbaceous species would increase.

Continued grazing will prevent both the establishment of a more diverse native flora and succession to podocarp-broadleaved forest. Kanuka would oc-

copy the site for perhaps a couple of centuries but eventually be replaced by vegetation dominated by exotic species better adapted to the presence of browsing animals.

5. Discussion and conclusion

Forest with kahikatea, totara and matai emerging from a canopy characterised by kowhai and lacebark formerly occupied much of the low coastal hills and fertile alluvial soils of eastern Otago. Polynesian fires and, more significantly, European farm practices, have substantially reduced the area of this vegetation to a few remnants, representing less than 1% of its original extent. It is now the most under-represented of east Otago's pre-historic forest types. Examples, all modified by logging and grazing, are found only in part of the catchment of the Waikouaiti River, at Woodhaugh in the lower Leith valley, in two or three gullies on the western side of the Taieri Plain, and in the upper and lower Taieri River Gorges and their adjacent catchments (all 1976, 1977a, b, 1978, 1979, 1983a, b, 1985, 1986, 1987, Ward and Munro 1989).

Kanuka-dominated forest now occupies sites from which forest of this type was cleared but where subsequent management has not maintained a cover of exotic species. Where an appropriate seed source still survives within dispersal range, in the absence of grazing kanuka forest would be succeeded by forest resembling the original. Thus kanuka stands are the most important sites with potential for extending the present minimal area of this formerly widespread podocarp-broad leaved forest type.

The area surveyed for this report is such a site. Fencing to exclude domestic and feral stock, and control of rabbits, would enable resumption of succession to podocarp-broadleaved forest. Within five to ten years representative understorey and ground vegetation would establish, along with young plants of a wide range of broadleaved canopy trees. Within fifty years the onset of podocarp establishment should be evident.

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Appendix 1: Species list

* marks exotic species

species	common name
<i>Agrostis stolonifer</i> *	creeping bent
<i>Asplenium bulbiferum</i>	hen and chickens fern
<i>Asplenium flaccidum</i>	
<i>Asplenium hookerianum</i>	
<i>Asplenium terrestre</i>	
<i>Blechnum fluviatile</i>	
<i>Blechnum lancolatum</i>	
<i>Blechnum penna-marina</i>	
<i>Cardamine debilis</i>	
<i>Carex coriacea</i>	cutty grass
<i>Carex dissita</i>	
<i>Carpodetus serratus</i>	marbleleaf
<i>Cerastium fontanum</i> *	mouse-ear chickweed
<i>Cirsium arvense</i> *	Californian thistle
<i>Cirsium vulgare</i> *	Scotch thistle
<i>Clematis marata</i>	
<i>Coprosma crassifolia</i>	
<i>Coprosma linariifolia</i>	
<i>Coprosma propinqua</i>	
<i>Coprosma propinqua x robusta</i>	
<i>Coprosma rotundifolia</i>	
<i>Cordyline australis</i>	cabbage tree
<i>Crataegus monogyna</i> *	hawthorn
<i>Dactylis glomerata</i> *	cocksfoot
<i>Digitalis purpurea</i> *	foxglove
<i>Dryopteris filix-mas</i> *	male fern
<i>Eucalyptus globulus</i> *	blue gum
<i>Fuchsia excorticata</i>	tree fuchsia
<i>Griselinia littoralis</i>	broadleaf
<i>Helichrysum aggregatum</i>	
<i>Hoheria angustifolia</i>	narrow-leaved lacebark
<i>Holcus lanatus</i> *	Yorkshire fog
<i>Hordeum murinum</i> *	barley grass
<i>Hydrocotyle americana</i>	
<i>Hydrocotyle moschata</i>	
<i>Hypericum androsaemum</i> *	tutsan
<i>Hypolepis millefolium</i>	
<i>Juncus effusus</i>	
<i>Kunzea ericoides</i>	kanuka
<i>Lagenifera strangulata</i>	
<i>Marrubium vulgare</i> *	horehound
<i>Mimulus guttatus</i> *	monkey musk
<i>Melicytus ramiflorus</i>	mahoe
<i>Muehlenbeckia australis</i>	
<i>Myrsine australis</i>	mapou
<i>Oxalis exilis</i>	
<i>Parsonsia heterophylla</i>	NZ jasmine
<i>Pellaea rotundifolia</i>	
<i>Pinus radiata</i> *	radiata pine

<i>Pittosporum eugenoides</i>	lemonwood
<i>Pittosporum tenuifolium</i>	kohuhu
<i>Poa imbecilla</i>	
<i>Podocarpus totara</i>	totara
<i>Polystichum richarddi</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern
<i>Prunella vulgaris</i>	self-heal
<i>Pseudopanax crassifolius</i>	lancewood
<i>Pseudowintera colorata</i>	peppertree
<i>Ranunculus acris</i>	buttercup
<i>Rubus cissoides</i>	lawyer
<i>Rubus fruticosus</i>	blackberry
<i>Rubus schmedlioides</i>	lawyer
<i>Rytidosperma sp.</i>	danthonia
<i>Sambucus nigra</i>	elder
<i>Senecio minimus</i>	fireweed
<i>Solanum dulcamara</i>	bittersweet
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai
<i>Stellaria media</i> *	chickweed
<i>Stellaria parviflor</i>	
<i>Ulex europaeus</i>	gorse
<i>Urtica urens</i> *	nettle