

**Forest and scrub vegetation,
East Branch Tokomairiro River**

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Location: NZMS 260 H45 730585

SUMMARY

A small remnant of native forest and scrub located in the upper East Branch of the Tokomairiro River is described and assessed for ecological significance. Vegetation grades from pasture on rolling ridges through bracken, Himalayan honeysuckle, gorse and broom scrub on upper gully slopes, to a mosaic of forest types characterised by kanuka, common broadleaved species, or narrow-leaved lacebark, with a few remnant mature podocarps.

The vegetation is typical of the Tokomairiro Ecological District and much of the rest of the Otago Coast Ecological Region. Because of past heavy logging, clearing and fire, and concentrated use by stock and feral goats, it is almost entirely secondary vegetation, with few mature podocarp trees, a canopy dominated by broadleaved trees, little understorey, and almost no regeneration of native species. Recovery to a near-natural forest structure and composition would depend on complete exclusion of browsing animals. At present it has low conservation and scientific values, but these would increase with the protection and recovery of the much larger area of surrounding similar vegetation.

INTRODUCTION

The Department of Conservation, Dunedin, requested a description and an appraisal of the condition and ecological significance of vegetation in the upper East Branch of the Tokomairiro River, near Milton, east Otago. This report describes the plant communities, explains their significance in terms of the Tokomairiro Ecological District, rates their conservation and scientific values, and comments on their condition and protection.

The area was inspected on 20 August 1992 in the company of Conservation Officer D. Wilkins.

SITE DESCRIPTION

The area inspected (grid reference NZMS 260 H45 730585) is the central block of about 20 ha of a larger (c. 150 ha) forest and scrub remnant that occupies two steep-sided gullies in the hills about 9 km north of the town of Milton. Its altitude ranges from about 40 to 200 m, and aspect is predominantly south-east, with spurs running from rolling ridges in the north-west down towards the Tokomairiro River, the eastern boundary of the study area, in the south-east.

Geology is mapped as weakly foliated quartzo-feldspathic schist, chlorite subzone III (McKellar 1966). Soils are mapped as Tuapeka lowland yellow-brown earths in the gullies with Waitahuna yellow-grey to yellow-brown earths intergrade hill soils on the rolling ridges (N.Z. Soil Bureau 1964).

Normal annual rainfall at Waihola, about 10 km to the east, is 697 mm (N.Z. Meteorological Service 1985).

PLANT COMMUNITIES

a. Farmland

Cultivated farmland with pasture and fodder crops occupies the rolling ridges. Rough pasture with patches of rushes descends the lateral spurs to grade into scrub. It also occupies much of the terrace adjacent to the Tokomairiro River, where there are scattered trees of totara, narrow-leaved lacebark and lowland ribbonwood, and shrubs including gorse, *Coprosma* species, manuka and kanuka.

b. Scrub

A fringe of scrub separates farmland from forest on the upper slopes of steep gullies and spurs. It is dominated by bracken with Himalayan honeysuckle, by gorse, or by broom, and contains variable densities of lemonwood and kohuhu and scattered cabbage trees. Below a band of broom, the entire main central spur of the study area carries open scrub of 1-1.5 m tall kanuka, *Coprosma* species, and patches of elder, with a few kowhai trees.

c. Forest

Except on the main central spur, below the scrub of upper slopes spurs and the gullies between them carry a mosaic of five main types of predominantly low forest.

i. Dominated by kanuka 3-10 m tall, mainly on rocky spurs and sunny aspects. This sometimes has an understorey of relict bracken and Himalayan honeysuckle, or scattered shrubs of *Coprosma crassifolia*, *C. propinqua*, *C. rotundifolia* and, rarely, *Corokia cotoneaster*. Ground cover is sparse and comprises mainly the herbs hook sedge, *Cardamine debilis*, bidibidi and *Lagenifera strangulata*, with rare plants of the clubmoss *Lycopodium volubile* and the ferns *Asplenium hookerianum*, *A. flabellifolium* and *Pellaea rotundifolia*.

ii. Dominated by kohuhu and lemonwood 3-10 m tall, mostly on relatively recent burn scars on upper gully sides. Relict bracken and Himalayan honeysuckle contribute to the understorey, with hard fern and prickly shield fern, and occasional flax and *Astelia fragrans*.

iii. Dominated by broadleaved species up to 10 m tall, on mid slopes and in gullies. The main trees are kohuhu, lemonwood, marbleleaf and fuchsia, with frequent wineberry and lancewood, and in gullies, frequent totara and rare matai, kahikatea and rimu. Understorey shrubs and small trees include peppertree, kaikomako, *Coprosma propinqua*, *C. rotundifolia*, *Myrsine australis*, *M. divaricata*, and frequent totara saplings. The tree ferns *Cyathea smithii* and *Dicksonia fibrosa* are rare. Ground cover is predominantly crown fern, varying from 10 to 50% cover,

with occasional shield fern, prickly shield fern, *Leptopteris hymenophylloides*, *Blechnum fluviatile* and *B. chambersii*.

iv. Dominated by broadleaved species up to 15 m tall, on lower slopes. Similar to iii, with the addition of narrow-leaved lacebark.

v. Stand of narrow-leaved lacebark 15 m tall on river terrace and adjacent fan. A few young totara 2-10 m tall are the only other trees, and there is little understorey apart from a few shrubs of *Coprosma propinqua*, *C. rotundifolia*, and, mainly near the forest edge, *Helichrysum aggregatum*, *Corokia cotoneaster* and *Meliccytus angustifolius*. Ground cover is provided by a sparse turf of exotic grasses and pasture weeds.

VEGETATION CONDITION

All the plant communities described are in very poor condition. The entire area is subjected to heavy use by domestic stock and feral goats. Almost all accessible palatable plants have been removed or severely browsed. Regeneration of most plant species is rare or absent, the main exceptions being totara, which is abundant throughout, with matai and kahikatea showing more restricted distribution. The ground surface is highly disturbed by animal trampling, resulting in complete loss of topsoil in places. Logging has long removed all merchantable podocarps, and the decaying stumps of totara from 20 cm to more than 1 m in diameter are still evident throughout.

There are no woody weeds present that will persist under an intact forest canopy. Himalayan honeysuckle, gorse and broom are being replaced by native species on the upper slopes, and the few shrubs of gooseberry seen within native vegetation were not vigorous. A few introduced herbs, including wall lettuce, self-heal and cleavers, are likely to persist as a minor component of ground cover where the forest canopy remains relatively open, mainly on steep rocky upper slopes.

Vegetation recovery could be expected if stock and feral goats were removed and the area was securely fenced. However, goats are present in gullies throughout the district and would be a continuing threat.

SIGNIFICANCE IN THE TOROMAIRIRO ECOLOGICAL DISTRICT

Forest characterised by kahikatea, matai, totara, narrow-leaved lacebark, cabbage tree and kowhai probably covered most of the hills of east Otago prior to European settlement, and is now found as scattered remnants throughout the Otago Coast Ecological District from the Shag River to the Clutha River.

The majority of vegetation descriptions available for the Tokomairiro Ecological District include forest and scrub similar to that of the study area (e.g. Allen 1977a, b, c, 1978, 1979a,

b, 1983 a, b, 1985 a, b; Ward and Munro 1989). However, whereas several examples are protected on the eastern coastal hills (e.g Taieri River Scenic Reserve; covenants on the Popham and Morrison blocks, Otago Coast Forest; Flett covenant; Henley covenant) and north of the Taieri Plain (Outram Glen Scenic Reserve and adjacent covenants, Sullivan covenant), only one small area is protected west of the Tokomairiro Plain, near Waihola Hill (Marshall covenant).

Although the vegetation described in this report is in poor condition compared with that of areas protected elsewhere in the ecological district, it provides an opportunity to extend the distribution of protected examples to reflect more closely the former distribution of the forest type. It also includes a small area of forest on fertile alluvial floodplain, the most under-represented of east Otago's forest types under protected status.

CONSERVATION AND SCIENTIFIC VALUES

Because of its small size and highly modified condition, the area described is presently of low conservation value. This would increase if protection was conferred on the much larger surrounding area of similar vegetation, but the improvement would also depend on effective exclusion of domestic and feral stock to allow re-establishment of more representative vegetation.

The area's present scientific value is also low. Despite its highly modified vegetation and soils, it may have some use as a benchmark against which to measure changes resulting from agricultural practices in the surrounding landscape. It could also provide an opportunity to monitor recovery processes in the absence of stock, providing information that could be applied to the management of other similarly depleted forest remnants.

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SPECIES LIST

species	common name
Acaena juvenca	bidibidi
Acaena novae-zelandiae	bidibidi
Agrostis tenuis	browntop
Anthoxanthum odoratum	sweet vernal
Aristotelia serrata	wineberry
Asplenium hookerianum	
Asplenium flabellifolium	
Asplenium flaccidum	
Asplenium bulbiferum	hen and chickens fern
Astelia fragrans	
Blechnum "brown scale"	hard fern
Blechnum fluviatile	
Blechnum chambersii	
Blechnum discolor	crown fern
Cardamine debilis	
Carex coriacea	
Carex secta	niggerhead
Carpodetus serratus	marbleleaf
Cirsium arvense	Californian thistle
Coprosma crassifolia	
Coprosma linariifolia	
Coprosma rhamnoides	
Coprosma parviflora	
Coprosma propinqua	
Coprosma rotundifolia	
Cordyline australis	cabbage tree
Corokia cotoneaster	
Cyathea smithii	
Cytisus scoparius	broom
Dacrycarpus dacrydioides	kahikatea
Dacrydium cupressinum	rimu
Dicksonia fibrosa	
Digitalis purpurea	foxglove
Epilobium brunnescens	
Fuchsia excorticata	fuchsia
Galium aparine	cleavers
Grammitis heterophylla	
Griselinia littoralis	broadleaf
Hebe salicifolia	koromiko
Helichrysum aggregatum	
Hoheria angustifolia	narrow-leaved lacebark
Holcus lanatus	Yorkshire fog
Hydrocotyle montana	
Hypericum androsaemum	tutsan
Juncus sarophorus	
Juncus gregiflorus	
Kunzea ericoides	kanuka
Lagenifera strangulata	
Leptospermum scoparium	manuka
Leptoteris hymenophylloides	
Leycesteria formosa	Himalayan honeysuckle
Lycopodium volubile	clubmoss
Melicope simplex	
Melicytus ramiflorus	mahoe
Melicytus angustifolius	
Mimulus moschatus	musk
Mycelis muralis	wall lettuce
Myrsine australis	mapou
Myrsine divaricata	
Olearia avicenniaefolia	
Parsonsia heterophylla	
Pellaea rotundifolia	
Pennantia corymbosa	kaikomako

Phormium tenax	flax
Phymatosorus diversifolius	hound's tongue fern
Pittosporum eugenioides	lemonwood
Pittosporum tenuifolium	kohuhu
Plagianthus regius	lowland ribbonwood
Poa imbecilla	
Podocarpus hallii	mountain totara
Podocarpus totara	totara
Polystichum vestitum	prickly shield fern
Polytichum richardii	shield fern
Prumnopitys taxifolia	matai
Prumnopitys ferruginea	miro
Prunella vulgaris	self-heal
Pseudopanax crassifolius	lancewood
Pseudowintera colorata	peppertree
Pteridium esculentum	bracken
Ranunculus repens	buttercup
Ranunculus lappaceus	
Ribes uva-crispa	gooseberry
Rubus cissoides	lawyer
Rubus schmidelioides	lawyer
Sambucus nigra	elder
Sophora microphylla	kowhai
Trifolium repens	white clover
Ulex europaeus	gorse
Uncinia uncinata	hook sedge