

FIELD TRIP TO TE NGAE TAWA FOREST REMNANT AND KAHIKATEA STAND

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We had a good turnout of members for our AGM field trip 2000, including one from Wellington and two from Te Teko. Our first stop was the tawa remnant at Te Ngae, behind the Central North Island Forest Partnership radiata pine nursery. We then moved to the kahikatea stand between the main highway and Lake Rotorua. Brief accounts are provided below of our visits to these two sites.

Te Ngae Tawa Forest Remnant

We were met at the remnant by the chairman of the Ngati Rangiteaorere Trust, which owns the land. The tawa forest covers 7.3 hectares and has been fenced and protected by the owners. The owners have also appointed a 'caretaker' to look after the remnant. Members set off in every direction through the remnant, searching for interesting species and features.

I was particularly interested to visit this patch of forest as I had previously described the site, on behalf of the owners, in 1993. It was striking then, how depauperate the understorey was due to a long history of grazing - probably in the order of 100-120 years. I compiled the following notes in 1993:

The forest remnant covers approximately 7 hectares, with a compact shape but a somewhat uneven boundary. It is in Rotorua Lakes Ecological District, on the relatively flat plain that slopes down to Lake Rotorua on a northern extension of the area affected by Rotomahana mud ejected during the 1886 Tarawera eruption.

“The remnant is comprised entirely of tawa (*Beilschmiedia tawa*) dominant forest, with a canopy 15-20 metres high. There are also pukatea (*Laurelia novae-zelandiae*), mangeao

(*Litsea calicaris*), and titoki (*Alectryon excelsus*) in the canopy. Some of the mangeao are particularly large, being up to 1.6 metres in diameter. There are a few kahikatea (*Dacrycarpus dacrydioides*) and hinau (*Elaeocarpus dentatus*) present in the canopy and one matai (*Prumnopitys taxiplia*) was seen. The stature of the tawa varies throughout the remnant, with many small diameter trees on the eastern side of the block. A few epiphytes are present; *Earina mucronata*, *Asplenium flaccidum* subsp. *flaccidum*, *A. polyodon*, *Pyrrosia serpens* and *Collospermum hastatum*. The understorey is almost non-existent, with a few ponga (*Cyathea dealbata*) and wheki (*Dicksonia squarrosa*) (rare). There is no shrub tier and the groundcover is almost entirely litter. There are few tawa saplings and seedlings, undoubtedly the result of a long history of grazing. The depauperate understorey is the result of many decades of heavy grazing.

The forest is of very significant conservation value, being one of the few forest remnants and the only tawa forest remaining on the plain sloping down to Lake Rotorua. As such it is a very high priority for protection, especially exclusion of stock. If stock are excluded recovery of the understorey will occur relatively rapidly. The block is complementary to a nearby stand of kahikatea situated at the northern end of Rotorua airport runway.

List of Indigenous Plants¹

Alectryon excelsus

Asplenium flaccidum subsp. *flaccidum*

Asplenium polyodon

Beilschmiedia tawa

Collospermum hastatum

Cyathea dealbata

Dacrycarpus dacrydioides

¹ Recorded in 1993.

Dicksonia squarrosa
Earina mucronata
Elaeocarpus dentatus
Griselinia lucida
Laurelia novae-zelandiae
Litsea calicaris
Melicytus ramiflorus subsp. *ramiflorus*
Metrosideros diffusa
Metrosideros perforata
Microlaena stipoides
Parsonsia sp.
Phymatosorus diversifolius
Prumnopitys taxifolia
Pyrrosia serpens
Ripogonum scandens

Historic Value

This property is the only significant land holding owned by Ngati Rangiteaorere. It immediately adjoins the marae and has played an integral part in the social, economic, cultural and spiritual development of the tribe over several centuries.

In 1839 the property was made available to the Church Mission Society for the establishment of a mission station which was established in the 1840s.

The property's strategic location at the junction of SH33 and SH30 and its attractive landscape features and visual appeal has resulted in a relatively high level of public use over many decades. For example:

- it was the site of Kingsford Smith's historic landing in Rotorua;

- it has been Rotorua’s main equestrian show jumping and cross-country venue for many years;
- it is the historic site of Rotorua’s first Anglican mission station and flour mill.”

Notes from 2000 visit to tawa forest

It was striking to see the degree of understorey regeneration that has established in the 6-7 years since the remnant was fenced.

Mangeao seedlings were locally common and pukatea seedlings were locally abundant and/or dominant. Mahoe was abundant in a canopy gap and mamaku and makomako were also establishing in gaps.

With the removal of domestic stock, weeds previously controlled by domestic stock were also becoming evident, including Chinese privet (*Ligustrum sinense*), kiwifruit (*Actinidia chinensis*), and strawberry dogwood (*Dendrobenthamia capitata*). Weed control will be an ongoing requirement to keep the stand in good condition. Possum sign was evident (one was seen, being tormented by a younger member of the party), and the owners intend to undertake possum control.

It was somewhat disappointing to see that some indigenous species have been planted in the stand which would not have occurred here naturally, including nikau (*Rhopalostylis sapida*), karaka (*Corynocarpus laevigatus*), and karo (*Pittosporum crassifolium*). Various ferns have also been planted, including *Blechnum chambersii*, *Pneumatopteris pennigera*, *Asplenium polyodon*, and *Asplenium flaccidum*. We saw one massive puka (*Griselinia lucida*) on a large pukatea.

This remnant is of strategic importance for indigenous birds, having a key position, in ecological terms, between the larger tract of tawa-dominant forest to the east and the

Te Ngae kahikatea forest at the northern end of the airport runway. Kereru, korimako (bellbird), tui, piwakawaka (fantail) and riroriro (grey warbler) were seen during our visit.

This remnant is an important example of an ecological unit (tawa forest on relatively flat terrain), with less than 1% of this type remaining in the Rotorua Lakes Ecological District (Shaw and Beadel 1998, Beadel *et al.* 1998).

Te Ngae Kahikatea Forest

We entered this stand from the vehicle access track that traverses the centre of the stand and there was an immediate illustration of the relationship between the presence of invasive weeds and human disturbance, with montbretia (*Crocasmia × crocosmiiflora*), tradescantia (*Tradescantia fluminensis*), and elaeagnus (*Elaeagnus × reflexa*) on the road margins.

Within the context of the Rotorua Lakes Ecological District this is an outstanding example of kahikatea swamp forest. It is the largest example of its type, with only three stands remaining (one near Ngongotaha and one at Rotoma). It is notable, however, that this stand is the only one with a wet swampy forest floor that qualifies it as true swamp forest. The canopy is *c.* 16 m high and is mainly kahikatea, with occasional pukatea and rimu also in the canopy. Mahoe, wheki and ponga (*Cyathea dealbata*) are present in the understorey, with *Diplazium australe* and *Pneumatopteris pennigera* above a groundcover tier of *Uncinia uncinata* and litter. There were patches of shallow water with hukihuki or swamp coprosma (*Coprosma tenuicaulis*) and *Carex virgata* and *C. geminata*. There were occasional ti kouka (*Cordyline australis*) - mainly on margins. We observed a mite on a small mahoe that was causing galling.

The northern margin of the stand, adjacent to the 'maze', was very weedy with ivy (*Hedera helix*), Japanese honeysuckle (*Lonicera japonica*), Chinese privet, and Italian arum (*Arum italicum*) present in the understorey.

The southern end of the stand is narrow in places but this part of the remnant is nevertheless still an excellent example of kahikatea swamp forest. There was evidence that some trees had been felled and removed from this area.

ACKNOWLEDGMENTS

The Ngati Rangiteaorere Trust provided access to the two sites visited and Mr Hiwinui Heke and Mrs Piri Fenwick assisted with access details and liaison. The property caretaker, Tom Maunder, also assisted with the visit to the tawa forest.

REFERENCES

- Beadel S.M., Shaw W.B. and Nicholls J.L. 1998: Rotorua Lakes Ecological District natural area inventory and evaluation. *Wildland Consultants Ltd Contract Report No. 175*. Prepared for Rotorua District Council and Environment BOP.
- Shaw W.B. and Beadel S.M. 1998: Natural heritage of the Rotorua District. *Wildland Consultants Ltd Contract Report No. 176*. Prepared for Rotorua District Council and Environment BOP. 657 pp.

**CHECKLIST OF VASCULAR PLANTS RECORDED IN
THE KAHIKATEA STAND* AT TE NGAE**

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* Grid reference NZMS 260 U15 017407

Key: * possibly adventive

Indigenous Species

Gymnosperms

<i>Dacrycarpus dacrydioides</i>	kahikatea
<i>Dacrydium cupressinum</i>	rimu

Monocot. trees and shrubs

<i>Cordyline australis</i>	ti kouka
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Dicot. trees and shrubs

<i>Alectryon excelsus</i> var. <i>excelsus</i>	titoki
<i>Aristotelia serrata</i>	makomako, wineberry
<i>Beilschmiedia tawa</i>	tawa
<i>Brachyglottis repanda</i> s.s.	rangiora
<i>Carpodetus serratus</i>	putaputaweta
<i>Coprosma grandifolia</i>	kanono
<i>Coprosma robusta</i>	karamu
<i>Coprosma tenuicaulis</i>	hukihuki
<i>Fuchsia excorticata</i>	kotukutuku
<i>Geniostoma rupestre</i> var. <i>ligustrifolium</i>	hangehange
<i>Hedycarya arborea</i>	porokaiwhiri
<i>Laurelia novae-zelandiae</i>	pukatea

<i>Litsea calicaris</i>	mangeao
<i>Lophomyrtus bullata</i>	ramarama
<i>Macropiper excelsum</i> var. <i>excelsum</i>	kawakawa
<i>Melicytus ramiflorus</i> subsp. <i>ramiflorus</i>	mahoe
<i>Pittosporum tenuifolium</i> subsp. <i>tenuifolium</i>	kohuhu
<i>Pseudopanax arboreus</i> var. <i>arboreus</i>	whauwhaupaku, five finger

Monocot. lianes

<i>Ripogonum scandens</i>	karea, supplejack
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Dicot. lianes

<i>Metrosideros diffusa</i>	rata
<i>Muehlenbeckia australis</i>	puka
<i>Parsonsia capsularis</i>	akakiore
<i>Parsonsia heterophylla</i>	akakaikiore

Lycopods and psilopsids

<i>Tmesipteris</i> sp.	
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Ferns

<i>Asplenium bulbiferum</i> s.s.	mouku
<i>Asplenium flaccidum</i> s.s.	makawe
<i>Asplenium gracillimum</i>	petako-paraharaha
<i>Asplenium oblongifolium</i>	huruhuruwhenua
<i>Asplenium polyodon</i>	petako
<i>Blechnum chambersii</i>	rereti
<i>Blechnum discolor</i>	petipeti, crown fern
<i>Blechnum filiforme</i>	panako
<i>Blechnum novae-zelandiae</i> s.s.	kiokio

<i>Blechnum novae-zelandiae</i> (wetland form; <i>B. minus</i> of NZ authors)	swamp
<i>Crepidomanes venosum</i>	
<i>Cyathea dealbata</i>	ponga
<i>Cyathea medullaris</i>	mamaku
<i>Dicksonia fibrosa</i>	wheki-ponga
<i>Dicksonia squarrosa</i>	wheki
* <i>Diplazium australe</i>	
<i>Doodia australis</i>	pukupuku
<i>Histiopteris incisa</i>	matata
<i>Hymenophyllum demissum</i>	irirangi
<i>Hymenophyllum flabellatum</i>	mauku
<i>Lastreopsis microsora</i> subsp. <i>petangularis</i>	
<i>Leptopteris hymenophylloides</i>	heruheru
<i>Microsorium pustulatum</i>	kowaowao (hounds tongue fern)
<i>Microsorium scandens</i>	mokimoki
<i>Pellaea rotundifolia</i>	tarawera (button fern)
<i>Pneumatopteris pennigera</i>	pakau
<i>Polystichum vestitum</i>	puniu (shield fern)
<i>Pteridium esculentum</i>	rarahu (bracken)
<i>Pteris macilenta</i> (of NZ authors)	
<i>Pyrrhosia eleagnifolia</i>	leather-leaf fern

Orchids

<i>Earina mucronata</i> s.s.	peka-a-waka
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Grasses

<i>Cortaderia fulvida</i>	toetoe
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Microlaena avenacea bush rice grass
Microlaena stipoides patiti

Sedges

Baumea rubiginosa
Baumea tenax
Carex dipsacea
Carex secta purei
Carex solandri
Carex sp. (*C. geminata* agg.) rautahi
Cyperus ustulatus toetoe upokotangata
Schoenus maschalinus
Uncinia scabra matau
Uncinia uncinata kamu, matau a Maui

Rushes

Juncus gregiflorus wi
Juncus planifolius

Monocot. herbs (other than orchids, grasses, sedges and rushes)

Collospermum hastatum kahakaha
Collospermum microspermum
Typha orientalis raupo

Dicot. herbs (other than composites)

**Callitriche stagnalis*
Cardamine sp. (*C. debilis* agg.) panapana
Geranium solanderi
Haloragis erecta subsp. *erecta* toatoa
Hydrocotyle sp.

<i>Hydrocotyle heteromeria</i>	
<i>Pelargonium inodorum</i>	kopata
<i>Persicaria decipiens</i>	
<i>Pratia angulata</i>	panakenake
<i>Ranunculus amphitrichus</i>	kawariki
<i>Solanum americanum</i>	

Adventive Species

Dicot. trees and shrubs

<i>Buddleja davidii</i>	buddleia
<i>Clerodendron trichotomum</i>	
<i>Crataegus monogyna</i>	hawthorn
<i>Elaeagnus × reflexa</i>	elaeagnus
<i>Ligustrum sinense</i>	Chinese privet
<i>Lupinus arboreus</i>	lupin
<i>Rosa rubiginosa</i>	sweet brier
<i>Rubus</i> sp. (<i>R. fruticosus</i> agg.)	blackberry
<i>Salix cinerea</i>	grey willow
<i>Ulex europaeus</i>	gorse

Dicot. lianes

<i>Hedera helix</i>	ivy
<i>Lonicera japonica</i>	Japanese honeysuckle

Grasses

<i>Agrostis capillaris</i>	browntop
<i>Dactylis glomerata</i>	cocksfoot
<i>Holcus lanatus</i>	Yorkshire fog

Sedges

Cyperus eragrotis

Isolepis sepulcralis

Rushes

Juncus acuminatus

Juncus bufonius

Juncus effusus rush

Juncus tenuis track rush

Monocot. herbs (other than orchids, grasses, sedges and rushes)

Arum italicum Italian arum

Crocodymia × *crocodymiflora* montbretia

Tradescantia fluminensis tradescantia

Composite herbs

Cirsium arvense California thistle

Cirsium vulgare Scotch thistle

Gamochaeta (Euchiton) spicata cudweed

Senecio bipinnatisectus Australian fireweed

Senecio jacobaea ragwort

Dicot. herbs (other than composites)

Epilobium ciliatum willow herb

Foeniculum vulgare fennel

Geranium robertianum herb Robert

Phytolacca octandra inkweed

Ranunculus repens creeping buttercup

Rumex acetosella sheep's sorrel

Rumex crispus curled dock

<i>Scrophularia auriculata</i>	
<i>Solanum nigrum</i>	black nightshade
<i>Solanum tuberosum</i>	potato
<i>Spergula arvensis</i>	spurrey
<i>Trifolium pratense</i>	red clover
<i>Verbascum thapsus</i>	woolly mullein
<i>Verbena bonariensis</i>	purple-top