

VEGETATION OF THE MANGAOTANE ROAD AREA

M. Heginbotham
April, 1978.

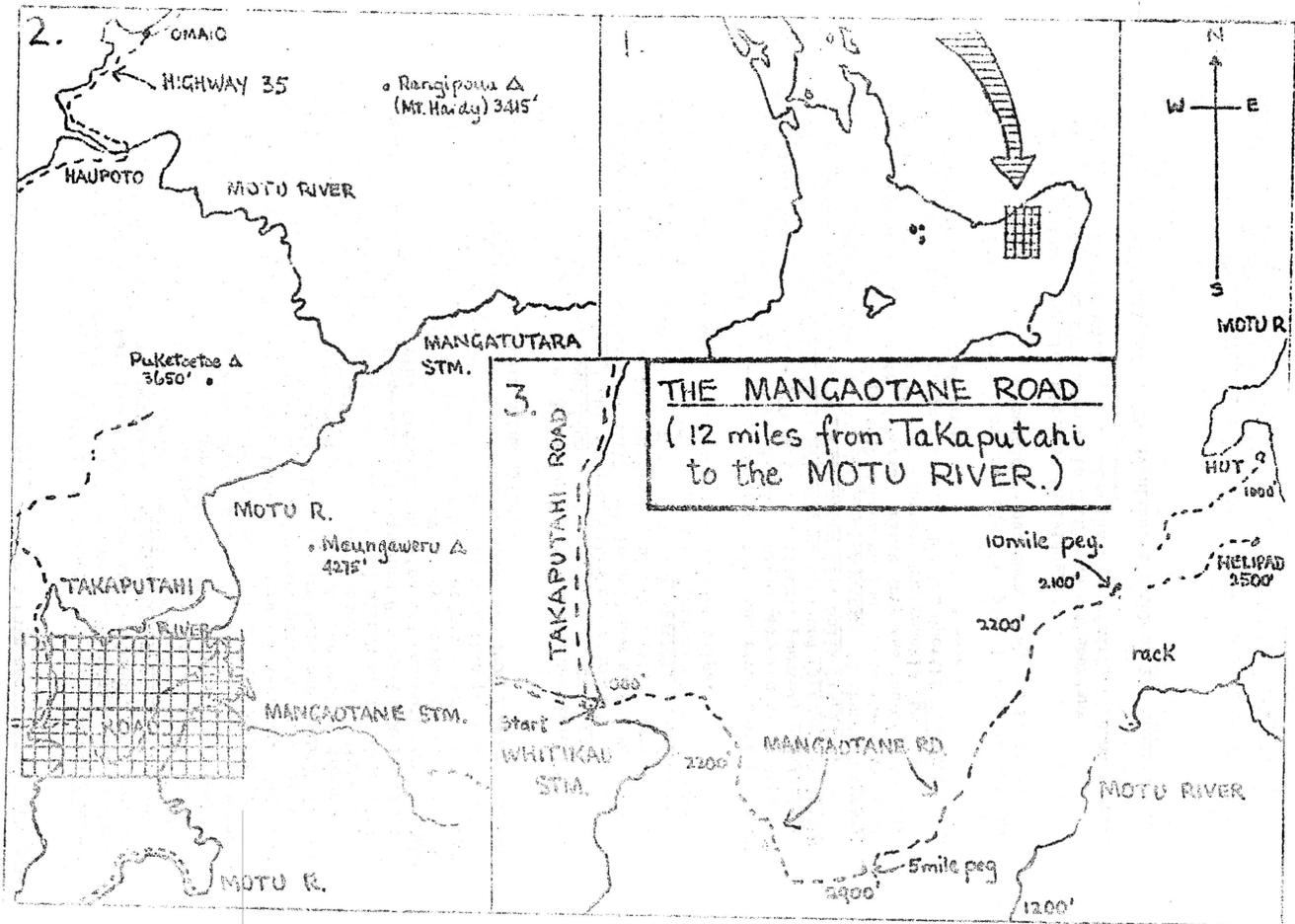
The Mangaotane Road is situated about 18 miles due South of the Motu River mouth in the eastern Bay of Plenty and can be reached by road from Opotiki by travelling some 28 miles via the old Motu-Gisborne road to Toatoa, there turning East on to the Takaputahi Road. The road is sometimes called Monk's Road after the contractor who formed it some twelve years ago for the Hydro-electric Investigation Group, when access to the mighty Motu River was required at one of the possible dam sites near the Mangaotane Stream junction. With latitude averaging $38^{\circ}06' S$ and longitude $177^{\circ}39' E$, the area is within the Raukumara Range and is of extremely rugged nature, thickly forested with indigenous species and virtually unexplored. Though the N.Z. Forest Service periodically checks the zone together with the various tracks and huts, it is left almost entirely to the many opossum trappers and hunters existing along the Motu River and adjacent streams, and to other hardy folk who jet up some 20 miles or float down much of the river on inflatable rafts from the Motu township region.

Today it seems probable that soon the 60 odd mile long Motu River will be harnessed for power supply and that several dams will be built, situated most likely at Haupoto near the coast and near the Mangatutara and Mangaotane Stream junction inland and perhaps elsewhere. The catchment area is extensive and the many narrow, high rock gorges of the river lend themselves admirably for dam sites. On the subject of rocks it is of interest to note, generally speaking, that formations here are of the Taitai Series (Lower Cretaceous Period) and are of hard sandstone with some argillite and mudstone present. Soil largely comprises of yellow-brown earths.

The Mangaotane Road rises steeply, winding its way up a ridge until the Summit is reached; then more or less straddling the ridge until the 10 mile peg, and from then on winding down the side of a ridge until the river flat is reached. Mile pegs cover the entire route, which is now being upgraded so that vehicles will be able to traverse the road to the river as before: At present washouts and falling trees prevent vehicles travelling beyond the 10 mile point and even so only machines with reasonable clearance can make it anyway. Incidentally a track also leads out to a helipad, and a walking track nearby descends to another point of the Motu River. You will see these marked on the location maps.

The start of the Mangaotane Road lies just across the Whitkau Stream where it first borders the Takaputahi Road near a bridge. Here in Summer the stream is little more than ankle deep. From around 1000 ft altitude above sealevel the track climbs steeply to the 2 mile peg at 2300 ft, and is surrounded by forest, often growing on precipitous slopes and in deep gullies. The dominant trees to this point are tawa, kamahi, rimu, Nothofagus truncata, Phyllocladus glauca, northern rata, together with Carpodetus serratus, Ixerba brexioides, wineberry, rewarewa, mahoe, hinau and fuchsia. Coprosmas, rangiora, Astelia, Gahnia, assorted ferns and Goniostoma ligustrifolium dominate the undergrowth. On banks and slips are toetoe, koromiko, tutu, mingimingi, Gaultheria antipoda and Quintinia acutifolia. Many of these species grow throughout the area.

Beyond the 2 mile peg to about 2600 feet, the more interesting species seen were Pseudopanax edgerleyi, Cordyline indivisa, Aroheria racemosa, Coprosma banksii and silver beech, Nothofagus menziesii. Different ferns presented themselves from time to time, along with



indigenous grasses, sedges and herbs and also a fair assortment of adventive plants.

At the 4 mile peg (2700 feet) I could see White Island sending up a plume of steam from its Pacific Ocean setting beyond Rawea to the north while around me were plentiful silver and red beech, the glorious mountain cabbage trees and occasionally Pseudowintera colorata. Just short of the 5 mile peg is the road summit of about 2900 feet, with a small clearing overlooking some precipitous gullies that lead down to the Motu River close by. The panoramic view from this spot was truly magnificent. Densely forested ridges rolled away in endless succession for miles and one could envisage rocky ravines, bush clad gorges and gullies that were associated with them in this rugged terrain. However to the South and slightly West beside the river, about $4\frac{1}{2}$ miles away was a grassed patch called "Kirk's Clearing" and here one could discern the numerous logging tracks that reached into the surrounding forest like gigantic tentacles. Further to the West, some 13 miles distant, was rocky, flat-topped Mt Arowhana (4724 feet) silhouetted, dramatically on the skyline and with neighbouring Maungawaru Plateau (4600 feet) a little further to the North. Quite often slips and washouts were visible on the intervening slopes, these often caused by cloudbursts, heavy rain or browsing animals such as deer (goats have not yet crossed to the East of the Motu River). To the North and Northwest of this point were the two high peaks, probably beech covered, Puketoeoe (3650') and Rangipoua (3415'), both with trig points installed.

It was here at the Summit and in the immediate vicinity that I found Raoulia glabra, Gnaphalium audax ssp. ruahinicum, Coprosma colensoi (incl. C. banksii) and numerous hybrids, often with C. foetidissima. Beeches were still much in evidence along the ridge that the road followed together with other higher altitude species, kamahi, and so on. Here too is the adventive Miscanthus nepalensis (Himalaya fairygrass) with its small, golden, "toetoe-like" plumes - abundant in most open areas, on banks, and distant slips.

Beyond the 10 mile peg the descent to the river commenced and with it came a few changes in vegetation. Nikau appeared at c. 1050 ft while near the river (850 - 900 feet) were titoki, pukatea, Jovellana sinclairii, Coprosma rhamnoides, Helichrysum agg. and Cyperus ustulatus. Here in adventive plants, grew Buddleia davidii, Salix fragilis, Actinidia chinensis (Kiwi fruit), Mimulus moschatus and abundant Cyperus congestus. A few patches of gorse had been noticed along the track but these had been sprayed by the N.Z.F.S. Blackberry was confined to only a few plants at the road start - no Japanese honeysuckle (Lonicera japonica) were apparent anywhere; it pervades the Opotiki District countryside including forest areas.

The following indigenous and adventive plants were encountered in this Mangaotane Road area; abundance has been shown as follows:

- o = occasional; species with few individuals
- m = many; species too numerous to count but not abundant
- p = plentiful; species seen in many places in fairly high numbers.

Numbers are - 184 indigenous, 87 adventive, a total of 271 species.

INDIGENOUSGymnosperm Trees

Dacrydium cupressinum	p	<i>P. hallii</i>	o
Phyllocladus glaucus	p	<i>P. spicatus</i>	o
Podocarpus dacrydioides	o	<i>P. totara</i>	o

Monocot Trees & Shrubs

<i>Cordylina banksii</i>	p	<i>Rhopalostylis sapida</i>	m
<i>C. indivisa</i>	m		

Dicot Trees

<i>Alectryon excelsus</i>	o	<i>Laurelia novae-zelandiae</i>	o
<i>Aristotelia serrata</i>	p	<i>Melicytus lanceolatus</i>	o
<i>Beilschmiedia tawa</i>	p	<i>M. ramiflorus</i>	p
<i>Carpodetus serratus</i>	p	<i>Metrosideros robusta</i>	p
<i>Dracophyllum latifolium</i>	p	<i>Myrsine australis</i>	o
<i>Elaeocarpus dentatus</i>	m	<i>M. salicina</i>	o
<i>E. hookerianus</i>	o	<i>Nestegis cunninghamii</i>	o
<i>Fuchsia excorticata</i>	m	<i>N. lanceolata</i>	o
<i>Griselinia littoralis</i>	p	<i>Nothofagus fusca</i>	m
<i>Hedycarya arborea</i>	o	<i>N. menziesii</i>	p
<i>Hoheria sexstylosa</i>	o	<i>N. truncata</i>	p
<i>Ixerba brexioides</i>	p	<i>Olearia rani</i>	o
<i>Knightia excelsa</i>	p	<i>Pittosporum tenuifolium</i>	o
		<i>Pseudopanax arboreus</i>	o
		<i>P. crassifolius</i>	m
		<i>P. edgerleyi</i>	o
		<i>Quintinia acutifolia</i>	p
		<i>Schefflera digitata</i>	m
		<i>Weinmannia racemosa</i>	p

Dicot Shrubs

<i>Alseuosmia pusilla</i>	o	<i>Gaultheria antipoda</i>	p
<i>Archeria racemosa</i>	m	<i>Geniostoma ligustrifolium</i>	p
<i>Brachyglottis repanda</i>	m	<i>Hebe stricta</i> var. <i>stricta</i>	p
<i>Cassinia leptophylla</i>	o	<i>Hebe</i> sp. (unnamed yellow-green midrib)	o
<i>Coprosma australis</i>	p	<i>Helichrysum</i> agg.	o
<i>Coprosma colensoi</i> (incl. <i>C. banksii</i>)	m	<i>Leptospermum ericoides</i>	o
<i>C. foetidissima</i>	p	var. <i>ericoides</i>	o
<i>C. lucida</i>	p	<i>L. scoparium</i>	m
<i>C. rhamnoides</i>	o	<i>Neomyrtus pedunculata</i>	o
<i>C. robusta</i>	p	<i>Pseudopanax anomalus</i>	o
<i>Coriaria arborea</i>	p	<i>P. colensoi</i>	o
<i>Cyathodes fasciculata</i>	m	<i>Pseudowintera colorata</i>	o

Monocot Lianes

<i>Freycinetia baueriana</i>		<i>Ripogonum scandens</i>	o
ssp. <i>banksii</i>	o		

Dicot Lianes

<i>Clematis foetida</i>	o	<i>M. perforata</i>	o
<i>C. paniculata</i>	o	<i>Muehlenbeckia australis</i>	o
<i>Metrosideros diffusa</i>	p	<i>Parsonsia heterophylla</i>	o
<i>M. fulgens</i>	p	<i>Rubus cissoides</i>	p

Psilopsids & Lycopods

<i>Lycopodium scariosum</i>	m	<i>L. volubile</i>	m
-----------------------------	---	--------------------	---

Ferns

<i>Asplenium bulbiferum</i>		<i>Gleichenia cunninghamii</i>	p
ssp. <i>bulbiferum</i>	o	<i>Grammitis heterophylla</i>	o
<i>A. flaccidum</i> ssp. <i>flaccidum</i>	m	<i>Histiopteris incisa</i>	p
<i>A. polyodon</i>	o	<i>Hymenophyllum dilatatum</i>	o
<i>Blechnum</i> sp.	p	<i>H. flexuosum</i>	o
(<i>B. capense</i> agg. - common species)			
<i>B. chambersii</i>	o	<i>H. ferrugineum</i>	o
<i>B. discolor</i>	p	<i>H. peltatum</i>	o
<i>B. fluviatile</i>	m	<i>H. revolutum</i>	o
<i>B. procerum</i>	o	<i>Hypolepis rufobarbata</i>	o
<i>Cyathea cunninghamii</i>	o	<i>Paesia scaberula</i>	p
<i>C. dealbata</i>	m	<i>Phymatodes diversifolium</i>	m
<i>C. medullaris</i>	p	<i>P. scandens</i>	o
<i>C. smithii</i>	o	<i>Polystichum richardii</i>	o
<i>Dicksonia fibrosa</i>	p	<i>P. sylvaticum</i>	o
<i>D. squarrosa</i>	p	<i>Pteridium aquilinum</i>	
<i>Doodia media</i>		var. <i>esculentum</i>	m
ssp. <i>australis</i>	o	<i>Pyrrhosia serpens</i>	m
		<i>Thelypteris pennigera</i>	o
		<i>Todea hymenophylloides</i>	o

Orchids

<i>Dendrobium cunninghamii</i>	o	<i>E. mucronata</i>	o
<i>Earina autumnalis</i>	o	<i>Thelymitra longifolia</i>	o

Grasses

<i>Cortaderia fulvida</i>	p	<i>Microlaena avenacea</i>	p
<i>C. toetoe</i>	m	<i>Notodanthonia gracilis</i>	p
<i>Dichelachne crinita</i>	m	<i>N. penicillata</i>	o
<i>Echinopogon ovatus</i>	m	<i>N. unarede</i>	o
<i>Lachnagrostis</i> sp.	o	<i>Poa anceps</i> var. <i>anceps</i>	o

Sedges

<i>Carex dipsacea</i>	o	<i>Schoenus maschalinus</i>	o
<i>C. forsteri</i>	o	<i>Scirpus chlorostachyus</i>	o
<i>C. solandri</i>	o	<i>S. inundatus</i>	o
<i>Cyperus ustulatus</i>	o	<i>S. pottsii</i>	o
<i>Sahnia pauciflora</i>	o	<i>Uncinia banksii</i>	o
<i>S. setifolia</i>	p	<i>U. clavata</i>	p
<i>Morelotia affinis</i>	p	<i>U. uncinata</i>	p

Rushes

<i>Juncus australis</i>	o	<i>J. gregiflorus</i>	m
<i>J. distegus</i>	p	<i>J. planifolius</i>	m

Monocot Herbs (other than orchids, grasses, sedges & rushes)

<i>Artelia solandri</i>	m	<i>Dianella nigra</i>	p
<i>Collospermum hastatum</i>	o	<i>Lemna minor</i>	o
<i>C. microspermum</i>	p	<i>Phormium cookianum</i>	m

Composite Herbs

<i>Gnaphalium audax</i>		<i>Helichrysum filicaule</i>	o
ssp. <i>ruahanicum</i>	m	<i>Lagenifera pumila</i>	m
<i>G. gymnocephalum</i>	m	<i>Racoulia glabra</i>	o
<i>G. limosum</i>	o	<i>R. tenuicaulis</i>	m
<i>G. luteo-album</i>	o	<i>Senecio minimus</i>	m
<i>G. sphaericum</i>	o		

Dicot Herbs (other than composites)

Acaena anserinifolia	m	H. microphylla	o
A. novae-zelandiae	o	H. novae-zelandiae	o
Cardamine debilis	o	H. n-z var. involucreta	o
Epilobium brunnescens		Hypericum gramineum	o
ssp. brunnescens	m	Jovellana sinclairii	o
E. hirtigerum	o	Nertera depressa	p
E. nerterioides	o	Oxalis exilis	o
E. nummularifolium	m	Pratia angulata	m
E. pedunculare	o	Ranunculus hirtus	m
E. pubens	o	Scandia roseifolia	o
Gunnera monoica	o	Solanum nodiflorum	m
Haloragis erecta	m	Stellaria parviflora	o
Hydrocotyle americana	o	Urtica incisa	o
H. elongata	o	Viola filicaulis	o

ADVENTIVEDicot Trees & Shrubs

Actinidia chinensis	o	Rubus fruticosus agg.	o
Berberis glaucocarpa	o	Salix caprea ssp. caprea	o
Buddleia davidii	o	S. decipiens	o
Hypericum androsaemum	o	S. fragilis	o
Phytolacca octandra	o	Ulex europaeus	o

Grasses

Agrostis stolonifera	o	Lolium multiflorum	o
A. tenuis	p	Miscanthus nepalensis	p
Aira caryophyllea	m	Paspalum dilatatum	m
Anthoxanthum odoratum	p	P. paspalodes	m
Bromus unioloides	p	Poa annua	m
Digitaria sanguinalis	o	Sporobolus africanus	o
Festuca arundinacea	m	Vulpia bromoides	m
Holcus lanatus	m	V. myuros	o

Sedges

Cyperus congestus	p	C. eragrostis	o
-------------------	---	---------------	---

Rushes

Juncus articulatus	m	J. microcephalus	o
J. bufonius	p	J. tenuis	m
J. effusus	m		

Composite Herbs

Achillea millefolium	o	Hypochoeris radicata	m
Anthemis cotula	o	Mycelis muralis	o
Chrysanthemum leucanthemum	o	Senecio bipinnatisectus	m
Cirsium arvense	o	S. jacoaea	p
C. palustre	p	S. vulgaris	o
C. vulgare	m	Sonchus asper	o
Conyza floribunda	o	S. oleraceus	o
Crepis capillaris	m	Taraxacum officinale	o
Gnaphalium spicatum	m		

Dicot Herbs (other than composites)

Anagallis arvensis	o	P. major	m
Callitriche stagnalis	m	Polygonum hydropiper	m
Cardamine hirsuta	o	Prunella vulgaris	o
Centaurium erythraea	o	Ranunculus repens	p
Cerastium glomeratum	o	Rumex acetosella	m

<i>Digitalis purpurea</i>	m	<i>R. conglomeratus</i>	o
<i>Galium aparine</i>	o	<i>R. obtusifolius</i>	o
<i>G. parisiense ssp. anglicum</i>	o	<i>R. pulcher</i>	o
<i>Geranium robertianum</i>	o	<i>Sagina apetala</i>	o
<i>Lotus angustissimus</i>	m	<i>S. procumbens</i>	o
<i>L. pedunculatus</i>	p	<i>Sherardia arvensis</i>	o
<i>Mentha pulegium</i>	p	<i>Stellaria alsine</i>	o
<i>M. suaveolens</i>	o	<i>S. media</i>	o
<i>Mimulus moschatus</i>	o	<i>Trifolium pratense</i>	o
<i>Myosotis caespitosa</i>	o	<i>T. repens</i>	m
<i>Nasturtium officinale</i>	m	<i>Verbascum thapsus</i>	o
<i>Parentucellia viscosa</i>	m	<i>Verbena bonariensis</i>	p
<i>Plantago hirtella</i>	o	<i>V. officinalis</i>	o
<i>P. lanceolata</i>	m		

DIOECY IN GENIOSTOMA LIGUSTRIFOLIUM

J.A. Rattenbury

In their descriptions of *Geniostoma ligustrifolium* (pigwood, hangehange) Allan, Cheeseman and other New Zealand botanists make no mention of sexual differentiation of the flowers although Cheeseman reports that members of the family (*Loganiaceae*) to which this species belongs, sometimes bear flowers which are unisexual by abortion. Species of *Geniostoma* from Java are reported as being gynodioecious (perfect-flowered plants and female-flowered plants).

Examination of several populations in the Auckland province has indicated that individual plants bear flowers that are either female or (apparently) hermaphrodite, (Figs. 1 and 2). In the former, sterile (empty) pollen sacs are present. The pistils are undistinguishable in the two types of flower. Because of the small size, the floral differentiation appears to have been missed.

Studies of these populations and detailed examination of the flowers at high magnification have revealed the following facts:

1. Only female flowers set seed (extremely rare exceptions may occur).
2. Female-flowered plants are fewer than males (about three females to five males or 37½% female).
3. Pollen from the apparently hermaphrodite flower is shed from the pollen sacs before the flower opens and is deposited virtually in its entirety on its own stigmatic surface, almost completely smothering the surface of the latter (Figs. 3 and 4).
4. Insects are powerfully attracted by the strongly fragrant flowers to the nectaries which are situated at the base of the style immediately under the capitate stigma.
5. Some good sized plants exist which appear to be non flower bearing, although this could be a question of age, season or environmental conditions.