MOUNT TARAWERA

Some General Observations on the Vegetation of the SE Slopes & Crater.

Mount Tarawera is a rhyolite volcano split during the 1886 eruption into a series of craters in a north-east to south west line. The same eruption overlaid the rhyolite with basalt scoria, whose low water-holding capacity is probably the greatest influence on the present vegetation pattern.

The present vegetation is still in the process of changes initiated by the 1886 eruption. Remnants of the pre-1886 forest may be seen among the present forest as emergent dead trunks of at least Hall's totara and broadleaf (Griselinia littoralis). A feature of the present vegetation is the relatively small amount of podocarp regeneration, the only species seen being Hall's totara, with seedlings not uncommon in valleys under kamahi forest, and toatoa (Phyllocladus glaucus). Forest is best established on the sides and broader tops of the ridges, and is dominated by kamahi, with occasional five-finger (Pseudopanax arboreum), heketara and broadleaf. Valley floors, dry much of the time, under heavy rain are being filled with scoria, producing very well drained sites. These, and the dry ridge-tops from about 2100 feet to 2700 feet are occupied by xerophytic scrub, varying in height from 6 to 15 feet. Dominant species here are kanuka, toru (Persoonia toru), Olearia arborescens, Gaultheria paniculata, and occasional smaller kamahi. Sites less densely poulated by tall scrub contain smaller shrubs (Gaultheria antipoda, Cyathodes spp.), mosses, lichens, and club-moss species, among the taller shrubs.

According to the type of site, this continuous scrub ceases between 2700 and 2900 feet. Its place is taken by dwarf shrubs, herbs, tussock, mosses, and lichens forming a continuous turf in damper sites, but usually with broad areas of rocks and scoria as well. This area includes the Plateau Dome (where the eastern access track ends), the whole crater area, and an extensive desert-like area on the western slopes. In appearance, this vegetation is superficially similar to the alpine tussock and herbfields of the higher North Island mountains, but a comparison of the species with such areas suggests that factors other than altitude are the main factors giving this area its "alpine" appearance. The small shrubs of this zone are dominated by species of the two heath families Ericaceae and Epacridaceae, indicative of an acid soil (pH since checked as 5 to 5.5). Nine native "heaths" are present: Gaultheria antipoda, G. paniculata and G. oppositifolia; and several hybrid swarms between these species; Cyathodes fasciculata, C. fraseri, C. juniperina, C. empetrifolia; Dracophyllum strictum and D. subulatum; and one exotic, the Spanish heath (Erica lusitanica). They have only three other common shrubs in competition with them, namely manuka, tutu (Coriaria arborea) and Pimelea prostrata. Quantitative analysis of ground cover in one site selected at random on the Plateau produced the following results :

Gravel, stones and boulders :	60%
Heaths	16%
Mosses and lichens :	24%

The most conspicuous moss, Rhacomitrium lanuginosum var. pruinosum, is abundant, especially in shallow depressions and water courses. Crustose and fructose lichens (mainly on rocks and gravel respectively) and the red alga Trentepohlia, complete the third group above.

The success of exotic conifers over indigenous species is obvious in some sites, being pioneers that could well cover any areas not already under indigenous forest, unless controlled!

T The writer has, in the course of a number of trips, listed as indigenous: 59 dicotyledons, 15 monocotyledons, 2 gymnosperms, 19 ferns, and 7 club-mosses for the parts covered above. The probable origins of these over the last 80 years could form a basis for specultion. NO exclusively alpine species are present, a reflection of Tarawera's isolation from other high mountains, though Celmisia gracilenta, three of the four Raoulia spp. present, Helichrysum bellidioides, and Muehlenbeckia axillaris are in common with many alpine areas. Several other species of special interest are Ophioglossum coriaceum (on the Plateau), korokio (Corokia buddleoides var. linearis), and raukawa (Pseudopanax edgerleyi), and Hymenophyllum pulcherrimum (all in forest).

To summarise, the whole vegetation pattern has probably developed according to available water, and the ability of plants to withstand desiccation. The extremely porous nature of the deep scoria layer allows water to penetrate rapidly beyond the reach of plant roots. Under these conditions, soil development is slow also, and only a limited selection of the species which must have reached Tarawera in the last 80 years could have survived in the skeletal soils and the extremes of drought, temperature and wind.

Belying the "alpine" appearance of the vegetation are the occasional finds of lowland species in rock crevices on the plateau. Some recorded are Asplenium flaccidum at 3110 feet, and Coprosma robusta at 3230 feet. These examples can be multiplied by a study of certain areas within the crater, between 3400 feet and 3600 feet. Here there is a return of forest species absent in at least the previous 600 feet in altitude, including kamahi, broadleaf, Hebe stricta, rangiora, Phymatodes diversifolium, and Pseudopanax colensoi.

Also, there occur in the crater some species not recorded elsewhere on the mountain, including Grammitis pumila, Blechnum vulcanicum, Lycopodium australianum, L. varium, and in the vicinity of steaming ground in the "Chasm", Gleichenia microphylla and Lycopodium cernuum.

Mount Tarawera is unique geologically, and presents some fascinating problems and rewards botanically. It is to be hoped that present negotiations to have it set aside as a scenic reserve or national park will be successful.

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CENTRAL RUAHINES

The Old Rangiwahia Ski - Grounds.

The way led up the side of a steep gorge, always climbing sharply, through a stand of open beech forest (Nothofagus fusca) with little underneath. Coprosma tenuifolia occurred sparingly, a tree of 8 or 9 feet with thin brownish-green leaves, to be found only from Te Aroha to the Ruahines. Gaultheria subcorymbosa grew in austere places, attractive bushes with dark green leaves and quite large panicles of flowers.

The dominant subalpine shrub was Senecio elaeagnifolius, Olearia nummularifolia with its yellow-green round leaves contrasted with the many darker-leaved divaricating shrubs, which all look superficially much the same with their small leaves. Pittosporum rigidum was a tiny shrub with a few little seeds, hard and flat; P. divaricatum with scarcely two leaves the same; juvenile plants of pokaka (Elaeocarpus hookerianus); Phyllocladus alpinus with stiff thick leaves.

We crossed a very wet rocky place, shaded most of the day, and down by a stream were several large plants of Ranunculus insignis, with clear golden flowers on 20 inch stalks, the rounded leaves fringed with brown hairs. There were plenty of seedlings amongst the crevices.