

NOTES ON THE KAURI-BEECH (*Nothofagus truncata*) ASSOCIATION IN OMAHUTA STATE FOREST.

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Introduction.—In 1935, during the course of reconnaissances in Omahuta Forest, an isolated area of *Nothofagus truncata* was discovered. As the occurrence of this genus in the north is occasional only, another visit was paid to the area in 1939 for the purpose of making fuller notes of the composition of the association.

Locality.—The forest is situated in approximately south latitude 35 degrees and east longitude 175 degrees, and the kauri-beech association occurs in the southern portion of the forest on two small areas, on adjoining spurs immediately to the east of the junction of the two main tributaries of the Pukekohe Stream. The total area of the two clumps would not exceed two acres. Another larger and more mature clump is situated outside the forest boundaries on the Hutu Ridge, a spur dividing the Waikaheru and Kauriwhati Streams in Block IV Mangamuka S.D.

Site.—A steep-sided ridge facing to the west with an average depression of about 8 degrees. The ridge is flattened on top for about one chain in width, the sides then dropping steeply into deep gullies. The sides of the ridge slope down at an angle exceeding 20 degrees. The soil is a heavy yellow clay of not more than three feet in depth and overlying sandstones and mudstones. The average rainfall is 60 inches on 160 days, but local drainage is good and the soil is very dry for this type of forest. An open canopy allows almost full light to fall on the forest floor. Elevation is 800-900 feet above sea-level.

Distribution in the Association.—Starting at an elevation of about 600 feet, is a normal kauri ricker stand, the dominants being trees from 20-30 inches D.B.H., old timber workings in this area have tended to make the spacing of the remaining trees rather wide and in fact throughout the area the kauri is never dense enough to interfere seriously with light conditions. Working up the ridge, the first beech (locally known as hutu) appear at about 800 feet as occasional suppressed saplings up to six feet in height; an increase in elevation shows a lessening number of kauri and an increase in the beech. At about 900 feet beech reaches its optimum in an almost pure stand of saplings in which are growing a few small kauri, together with the more xerophytic species of the neighbouring broadleaf (*Griselinia littoralis*) forest. This belt of optimum distribution is not more than two chains in width, with broadleaf forest rapidly becoming dominant

in the final chain. Generally the larger trees are to be found on the northern side of the ridge, the lower branches of the crowns being about on a level with the top of the spur. The other size classes are on the top of the ridge and a little to the south of the highest point

A fairly recent land-slip on the northern border of the area is being rapidly colonized by manuka, taraire, kauri, rata and lycopodium spp., but there is no sign of any seedlings of beech.

Growth-Form of Beech.—*N. truncata* in this locality ranges from a small tree 20 inches d.b.h. with a clean barrel of 20-30 feet and a total height of 40-50 feet, down through all the intermediate stages to suppressed saplings 5 inches in diameter and two to three feet in height. No seedlings were noted. As a small tree, the beech stands out from the other members of the association by reason of its clean, almost cylindrical bole and its broad rather squat crown. The crown formation is due to the few but stout branches growing at right-angles to the trunk and occupies the upper fourth of the tree's total height. In many cases the uppermost branches are dead and broken.

On a few of the largest trees the bark is rough and scaly, but no the majority the smooth typical beech sapling bark has been retained. The foliage of the larger trees is tinged with red as is the upper foliage of the larger saplings. The leaves of the smaller and more suppressed saplings are almost wholly tinged with red. Trees with a diameter greater than six inches are few; there are probably not more than a dozen in the whole area. Pole-type trees ranging from two to six inches in diameter are more numerous, but their annual diameter increment is slow; one sapling 2.6 inches in diameter showed at least 46 growth rings. Suppressed saplings from three to six feet in height and up to one inch in diameter, are numerous and their inter-lacing branches form thickets in some parts of the stand.

Description of the various storeys.

1. DOMINANTS. *Agathis australis*, average 30 inches d.b.h., with clean boles of over 60 feet in height; the crowns are very small and offer little hindrance to light. Occasional *Metrosideros robusta* also rise to the canopy; these are not the massive trees common in surrounding forest but are tall and slender with noticeably small heads.

2. SUB-DOMINANTS. Trees up to 40 feet in height. These include the following species:—

Agathis australis, *Nothofagus truncata*, *Podocarpus hallii*, *Dacrydium cupressinum*, *Phyllocladus trichomanoides*, *Persoonia toru*, *Elaeocarpus dentatus*. These species are all growing with small crowns and tall slender trunks so that little light is screened from

the forest floor. *P. hallii* is numerically dominant, as a small tree not exceeding 14 inches d.b.h. The kauri is robust and is showing good annual growth.

LARGE SHRUBS AND SAPLINGS. Up to 12 feet in height. The following are the main species :—

Agathis australis, *Podocarpus hallii*, *P. ferrugineus*, *Dacrydium cupressinum*, *Leucopogon fascicularis*, *Cyathodes acerosa*, *Nothofagus truncata*, *Coprosma lucida*, *Pseudopanax crassifolium*, *Dracophyllum latifolium*, *Quintinia serrata*, *Suttonia australis*, *Beilschmiedia tarairi*, *Geniostoma ligustrifolium*, *Alseuosmia macrophylla*, *A. banksii*, *Senecio kirkii*.

4. SMALL SHRUBS AND SAPLINGS AND LARGE HERBS.—From 1-3 feet in height :—

Agathis australis, *Nothofagus truncata*, *Podocarpus hallii*, *P. ferrugineus*, *Geniostoma ligustrifolium*, *Quintinia serrata*, *Cyathodes acerosa*, *Senecio kirkii*, *Beilschmiedia tarairi*, *Olea lanceolata*, *Nothopanax arboreum*, *Griselinia lucida*, *Olearia rani*, *Leptospermum ericoides*, *Pittosporum tenuifolium*, *Dacrydium cupressinum*, *Alseuosmia macrophylla*, *A. banksii*, *Gahnia xanthocarpa*, *Astelia trinervia*, *Suttonia australis*, *Freycinetia banksii*, *Dianella intermedia*.

5. FERNS. *Trichomanes reniform*, *Hymenophyllum demissum*, *Cyathea dealbata*, *Blechnum capense*, *Polypodium grammitidis*.

6. LIANES. *Metrosideros albiflora*, *M. hypericifolia*, *Rubus schmidelioides*, *Rhipogonum scandens*.

Metrosideros albiflora forms dense mats on the ground.

7. EPIPHYTES. *Earina autumnalis*, *E. mucronata*, *Tmesipteris tannensis*.

THE HUTU RIDGE AREA. According to reliable reports the trees here are very much bigger, often attaining a girth of about ten feet, while the stand is said to be almost pure. Viewed from a distance the stand does not appear to have any other dominants. Putawa *(*Polyporus eucalyptorum*) is also found in this locality, though no specimens were seen in the Omahuta stand.

***Editor's Note.**

This is recorded because the fructifications of this fungus are said to have had an economic significance for the Maoris in pre-pakeha times, as they provided the tinder with which fire was carried from place to place. In this district, therefore, beech localities were accorded much more native attention than in other parts of N.Z. where beech is more common. The local vernacular name Hutu for beech is not known in other districts.