

# Balls Clearing and Hutchinson Bush

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The two reserves at Puketitiri (25 miles N.W. of Napier), Ball's Clearing and the Hutchinson Bush, are the last remains of the 10,000 acre Puketitiri Bush. This was about the largest of a number of islands of rimu-matai-maire forest that lay along the slopes of the ranges between the Forty-Mile Bush and the forests of the Urewera.

By 1924 most of this had been milled and Ball's Clearing was reduced to an area of 400 acres, of which the clearing proper covered 100 acres; some difficulty about ownership had apparently kept it out of the market. Attempts were made to have it declared a reserve, not only on account of the particularly fine example of podocarp-dominant forest, but also because of the interesting features of the clearing. This, though frequently grazed by stray cattle, was largely unaltered as recently as 1924, an oval of *Festuca novae-zealandiae* and *Poa caespitosa* tussock, completely surrounded by tall timber, with a sluggish stream running through it between pumice banks, and a sphagnum bog at the northern end—in default of a better explanation, an old lake bed.

About 1930 the Forest Service decided to hand it over for milling, with the exception of a block of 50 acres of timber on the N.W. side which was offered as a reserve. Milling was completed some years ago.

Recently I had the opportunity of paying two visits to Puketitiri, twelve years since my last visit and twenty-five years since I first saw Ball's Clearing. I took the opportunity of traversing both reserves and making a detailed examination of certain localities. Most of the Hutchinson reserve was swept by fire in 1946 and the dead trees have been milled, but the forested portion of the Ball's Clearing reserve is still in good shape and does not appear to have suffered much from the depredations of cattle. An attempt has been made to leave the immediate forest margin intact during milling and this and the cut-over area on the north-western side are regenerating vigorously, though it will be some years before the second-growth gives effective protection to the podocarp forest on its exposed side. The induced forest margin along the road face, which is at least thirty years old, does not yet give complete protection to the taller trees though it is forming well. On the south-east side the milled area has been burnt and grassed, leaving the forest margin completely open, but this does not appear to suffer much wind.

On the inner margin the scrub belt itself is intact, but the trees immediately adjacent show much defoliation of several species, some of this, perhaps all of it, due to opossums.

In the clearing a good deal of alteration has taken place in varying degrees. At the lower end manuka is continuing its advance from

both sides and is on the way to becoming dominant, and is in effect a continuation of the scrub belt, although, as yet, the forest-margin scrub species have not entered it to any degree. It should be noted that the advance of the manuka has not been aided by fire and is probably a natural succession in the advance of forest into the clearing.

An area east of the stream is still in rather open low tussock (mainly *Festuca*), with a rich accompanying flora, but on the western side ox-eye daisy which has been prominent for at least 15 years remains aggressive, and introduced weeds and grasses now appear dominant.

The sphagnum bog at the upper end of the clearing has lost the shelter of the former forest margin and is reduced to vestiges much trampled by cattle. Practically all the previously recorded species, for this and for all the other habitats, both in the forest and in the clearing, were found however, though in several cases only by dint of a good deal of searching.

**Forest.** The main forest is podocarp-dominated, and viewed from the outside has a remarkably close and level canopy through which the conical crowns of kahikatea project slightly. The heights of two of these by triangulation agree fairly well, giving 110 and 115 feet, so that the main canopy may be taken as 100 feet. Straight unbranched boles and small heads are characteristic of the interior. A quadrat of one chain square, run out alongside the main track about a furlong in from the road boundary, contained eleven of these canopy trees, of which one was matai, one miro, two rimu and seven kahikatea. This would be a higher concentration of canopy trees than the average though by no means the highest observed; on the other hand in spite of the unbroken canopy it appeared possible to have picked similar areas which would not contain a single large tree—in fact the quadrat chosen although the largest practicable one, was really too small for the scale of forest. It appeared that it would be a fair approximation to reckon the average density at half that observed, i.e. 55 canopy trees to the acre, of which 45 would be rimu and kahikatea in about equal proportion.

To return to the quadrat actually observed, it is characteristic in having the second tier (i.e. trees of 30 to 50 feet) poorly developed, in this case represented only by miro—maire which is elsewhere frequent being absent except for one seedling. The third tier again is fairly open with *Dicksonia fibrosa*, mahoe, and *Pseudowintera colorata* the main components. *Pseudowintera axillaris*, *Coprosma rotundifolia* and *Myrtus pendunculata* are common, and *Nothopanax arboreum*, *N. anomalum*, *N. edgerleyi*, *Suttonia salicina*, *Melicytus micranthus*, *M. lanceolatus*, *Paratrophis microphylla* and *Dicksonia squarrosa* are also present in lesser quantity.

A luxuriant growth of *Leptopteris hymenophylloides* with a strongly developed caudex is a feature of the forest floor. *Hymeno-*

*phyllum* species are present in fair variety but in no great quantity, and *Alseuosmia pusilla* is fairly common.

**Forest Margin.** The inner margin shows a strongly marked succession. The canopy of the main forest ends abruptly with a belt of matai (which is infrequent in the interior) and from the clearing the line of its pale grey trunks is conspicuous above the narrow belt of *Nothofagus fusca*, which together with a few trees of *N. cliffortioides* and *N. cliffortioides*  $\times$  *fusca* forms the next stage. The *Nothofagus* belt also extends along the line of the main stream for some distance into the forest.

On the forest floor the change is also abrupt. With an increase in the amount of light, *Pittosporum tenuifolium* var. "Ball's Clearing," *P. ralphii*, *P. divaricatum*, *Leucopogon fasciculatus*, *Suttonia divaricata*, *Astelia nervosa*, and seedling or juvenile matai and kahikatea come in sharply. *Microlaena avenacea*, *Hypolepis tenuifolia* and *Gleichenia cunninghamii* may be locally dominant but should perhaps be considered rather as components of the adjacent scrub belt.

**Scrub Margin.** This consists of *Corokia cotoneaster*, *Aristolelia fruticosa microphylla* and several species of *Coprosma* of which a large shrub (possibly related to *C. propinqua*), *C. parviflora*, *C. liniarifolia* and a hybrid group (cf. *C. cunninghamii*) come in about that order of frequency. One possible parent of the hybrid group is *C. tenuifolia*, which was observed in the forest; *C. robusta* appeared to be entirely absent, *C. lucida* being the only other large-leaved species recorded. Under the scrub in addition to *Microlaena*, *Hypolepis* and *Gleichenia* already mentioned, *Blechnum penna-marina*, *Oxalis lactea* and *Lagenophora pinnatifida* are abundant, and *Clematis quadribracteolata* though by no means common appears to be surviving, having been almost eliminated from its former more exposed habitat, apparently by rabbits.

As has been already mentioned the spread of manuka into the clearing has now reached the stage where it is, in effect, an extension of the scrub belt, though so far other scrub species are not conspicuous in it. One minor community of round-headed trees of *Olearia virgata*, forming an open grove where a tributary creek runs out of the bush, is worthy of mention. Nearby traces of *Poa caespitosa* and *Festuca* tussock with *Clematis quadribracteolata* growing through it and scattered bushes of *Dracophyllum subulatum* suggest that the original community was similar to and perhaps identical with that of the Routu flats at the head of the Mohaka River.

**Clearing.** The clearing may be considered in two subdivisions, the dry area of the lower three-quarters of the clearing and the bog at the upper end.

The dry area is not much altered east of the stream but traces of rabbits are much in evidence. The first impression on the west side is that manuka and ox-eye daisy are dominant. *Dracophyllum subulatum* is also plentiful and this appears to be the limit of its range.



#### BALLS CLEARING

*Top:* Looking north across the clearing from near the entrance of the track. The wall of forest stands 100 to 120 feet above the clearing, dwarfing the small trees of *Olearia virgata* seen in the open on the left.

*Bottom:* Forest margin, western side of clearing, showing sequence from low tussock with scattered manuka to scrub belt, discontinuous line of beech, then palisade of matai trunks bordering the main forest.

(Photographs by the author, 1928)

*Pernettya macrostigma* is still abundant but appears to be much nibbled by rabbits. *Herpolirion* and *Stackhousia* are still present but apparently in reduced quantity; *Celmisia gracilentia* is plentiful. *Leucopogon fraseri*, *Epilobium tenuipes*, *Mentha cunninghamii*, *Clematis quadribracteolata* and *Poa caespitosa* have become comparatively rare, and no trace was found of *Olearia nummularifolia*, *Wahlenbergia albomarginata*, *Thelymitra decora* or *Aporostylis bifolia* (the last named not having been observed since 1928).

**Bog.** Only a few cushions remain of the formerly continuous area of sphagnum bog and only one small colony of *Mazus radicans* could be found among these. Most of the bog is now covered by species of *Carex* with one small area in *Typha*, and a rush-like sedge, *Vauthiera australis*, with 4-angled stems is abundant. In the muddy channels *Gratiola*, *Ranunculus rivularis* and *Hydrocotyle tripartita* are well established. A large form of *Lagenophora cuneata* is common. *Drosera binata* is no longer common but a few plants were seen. *Gleichenia alpina* was not seen though formerly recorded.

**Rimu nursery.** At the N.E. extremity of the clearing, where at some earlier date a fire had almost broken into it, leaving a gap in the forest wall, an area of perhaps half an acre has a dense growth of young rimu. This was revisited and the lower portion of it examined in more detail than on previous occasions. There is evidence



View across the head of Balls Clearing to Kaweka Range and Black Birch Range. The "rimu nursery" is just to the left of the gap through which the clearing is seen.

of an earlier growth of manuka, now drawn up to about 20 feet and mostly dying or dead. There is now an open canopy formed mainly by *Pittosporum tenuifolium* var. "Ball's Clearing" and *Nothopanax arboreum*. Where rimu is absent a good deal of light reaches the floor and there is quite a lot of bare ground with bushes of *Olearia furfuracea*, *Suttonia australis* and *Gaultheria antipoda* making their appearance. *Botrychium* in unusual quantity is a feature. A small gully is full of *Blechnum procerum*. Rimu trees from 3 to 15 feet in height grow so closely as to form almost a thicket. Further uphill where the nursery backs on to a fringe of adult rimu at the side of the gap there appears to be an older section of the nursery with the rimu dominant and approaching 30 feet but time did not permit of visiting it.

To give a clearer picture of the composition of the nursery a chain was measured across the middle and a rough count made of the species within a yard of it on either side (i.e. an area 22 yards by 2 yards). The fairly open roof at 20 to 25 feet was formed by five trees of *Carpodetus*, four of *Pittosporum tenuifolium*, three of *Nothopanax arboreum* and three very narrow-headed survivors of *Leptospermum*. There were 29 rimu from about 4 feet to 12 feet saplings, with 3 or 4 smaller dead ones, over 67 kahikatea ranging from a few inches to about 3 feet, 12 matai and two miro all ranging to about 2 feet.

Thus it appears that there are actually four successions present: (1) manuka, (2) carpodetus-pittosporum, (3) rimu, (4) kahikatea-matai-miro. The sequence here appears to depend on increasing shade, but it should be compared with the abrupt appearance of kahikatea and matai seedlings on the opposite side of the clearing where their presence is apparently the result of the reverse process—an increase in the light reaching the forest floor.

**Hutchinson Bush.** The Hutchinson Domain, originally rather a long narrow strip of forest of some 300 acres, lying about a mile to the north of Ball's Clearing, was of much the same general composition with a similar scrub belt along part of one side on to a former natural clearing now in induced pasture.

The length and narrowness of this reserve has always made its protection a problem especially as the scrub belt was on the wrong side to protect the forest from the prevailing westerlies. Fires had encroached on the reserve prior to 1924 and, at any rate from that date onwards, cattle breaking through the long fence-line were doing a great deal of damage. *Dactylanthus taylori* was an early casualty, and by 1928 a good deal of the undergrowth had been eaten and trampled in the most compact block of the forest near the site of Rob's Whare.

In the drought summer of 1946 a fire ran through most of the reserve, missing this block, but killing all but a dozen or two of the grown podocarps over the rest of it. The dead trees were milled and

most of the surviving scrub margin was smashed by the tractors used in logging operations. Three-quarters of the area is at first sight a depressing litter of charred logs and tall grass, but when seen from an elevation it is apparent that this conceals a certain quantity of second-growth, and there are even some living 20-foot rickers of kahikatea. In two or three years' time a detailed examination should prove interesting. The compact block of forest that has been missed by fire comprises perhaps 40 acres, and if this is kept effectively fenced should maintain itself. It appears to be in a better state than in 1928 and is of particular interest as it contains a vigorous colony of an undescribed species of *Olearia*, which was at first reported to have been wiped out by the fire. (Seed and some cuttings have been sent to Mr. Brockie to establish it at Otari).

**Summary.** Most of the Hutchinson Reserve has been swept by fire and the future of the burnt area is problematical, though a compact area of tall timber at the far end is intact.

At Ball's Clearing the 50-acre block remaining in forest is in a good state of preservation and remains an impressive relic of the former heavy podocarp forest of the Hawke's Bay foothills. The remnants of forest surrounding the clearing show vigorous growth, the regeneration of podocarps being noteworthy. Milled-over areas adjacent to the main block are coming away in second-growth and should in time form an induced margin to it.

The clearing itself, which was unique in this part of New Zealand as an area of virgin bog and grassland, still retains its main characteristics, though considerable changes are taking place. The invasion by manuka is probably a natural stage of succession from grassland, for ecologically speaking the clearing is only a temporary phenomenon.

Trampling of the bogs by cattle and close nibbling of the drier areas by rabbits are doing the greatest damage to the clearing, and opossums are doing a certain amount of damage along the forest margin, but the over-riding risk is the spread of fire from the scrub and logs of the adjacent farm land. The real danger is the attitude of mind that looks on a reserve as waste of good timber and a loss of potential grazing land. The survival of these reserves depends in the last resort upon an alert public opinion.

## REQUESTS FOR PLANTS

*Wahlenbergia*: Miss J. A. Hay (7 Elm St., Upper Hutt) would be glad to have live plants for cultivation, or freshly dried specimens (from which seeds may be obtained), from different parts of the country. The kinds particularly desired are those of the *W. gracilis*, *W. albomarginata* and *W. flexilis* groups. Any plants found growing on mountain scree will be welcome.