

Review of Maungawhau Planting Plan Batger Rd to Owens Rd Area

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By Janeen Collings Senior Regional Advisor Flora - Biodiversity

Overview

This revision takes an ecosystem approach to the planting whereby the planting of Maungawhau represents an opportunity to restore the vegetative cover towards the appropriate ecosystem. The ecosystem is classified as the regionally Critically Endangered Puriri Forest variant 7.2, or more commonly known as Rock Forest.

The Tipuna Munga are largely devoid of forest and due to many layers of interest they are not likely to see any significant forest restorative activity. Planting on Mungawhau represents a significant opportunity to steer the vegetation in the right direction which will, in future, provide the required habitat for iconic fauna such as kaka, which are becoming more common on the Isthmus.

The current vegetation cover is a result of sustained ongoing disturbance including planting. Some native species present on the maunga represent flora from ecosystems that would not naturally have occurred on the Maunga itself or in some cases on the Auckland Isthmus. There are however elements of vegetation present that are components of Rock Forest, for example the naturally regenerating Tariare.

It is important to integrate planting across this maunga. At the moment it is a patchwork of vegetation each with separate characteristics according to disturbance and planting history. What is required is an overarching vision and planting plan that is designed to develop the best possible example of the endangered rock forest ecosystem.

Maungawhau Potential and Past Ecosystem Type – (Rock Forest)

Puriri Forest variant Warm Forest 7.2 On basalt volcanoes – younger volcanoes have skeletal soils on lava, although fertile granular soils develop in depressions, on ash and tuff, and with time.

WF7.2: Mixed broadleaved forest typically dominated by pūriri, karaka, kohekohe and, locally, taraire and kohekohe. Also present are occasional tōtara, mataī, pukatea, rewarewa, tawa, tītoki and northern rātā, and locally, abundant nīkau. Composition is strongly related to landform and soil development. On more exposed lava with skeletal soils, mangeao, tītoki, karaka, māhoe, houpara and occasional pūriri occur, colloquially referred to as 'rock forest' (Smale & Gardner 1999 in Singers

et al 2016). Secondary successional examples are often dominated by māhoe, puka, akeake and rangiora; having an abundance of puka and akeake they still maintain some character of 'rock forest' (Singers *et al*, 2016).

The Planting Plan

The Withiel Thomas Reserve is the best reference point to guide the planting plan and the section describing vegetation of similar sites locally has a number of species that occur in Withiel Thomas. It is not clear whether Withiel Thomas was used as reference to important canopy species is missing.

Interpretation of the Withiel Thomas Rock Forest, as a reference site, needs to account for vegetation that is not considered natural and the proportions of some species. For example, the abundance of puka represents a major disturbance event as this species requires high light to establish, therefore, puka is not necessarily a species to plant in great numbers for Maungawhau. Although present in the canopy, the natural distribution of Karo (*Pittosporum crassifolium*) in the Auckland region is strictly coastal. It is likely the karo has spread into the forest from nearby cultivated plants (Cameron, 1999).

The planting plan is missing canopy species and although the presence of naturally regenerating taraire indicates the forest is quietly going about the business of regeneration within shelter, it needs some help with other structurally important species to provide diversity for food and shelter of fauna and to represent the ecosystem type.

View Shafts and Canopy Species

Maintenance of view shafts is a management requirement for Maungawhau and this is one reason given for the lack of canopy trees in the planting plan.

Taraire is naturally regenerating and an accepted event. Taraire is a large sized forest tree which can reach heights of 22metres.

Given the steepness of the site and the position of the proposed planting below Puhī Huia road the recommended canopy species will not impede views from or to the Tihī. Contour lines clearly show that planting tall forest trees within existing vegetation can be easily accommodated. The height increases approximately 70 meters from the lower edge of the existing vegetation to the lower edge of the road and above the road rises steeply for another 20metres to the existing carpark. If the desired view would be most of the land above Puhī Huia road then, as a generous buffer, specify taller trees are planted no closer than 10 metres to the road edge.

Species and Proportions

The following recommendations follow the drafted species list. Recommended canopy species are added at the end of the list.

Ferns generally colonise reasonably quickly and are not usually planted; resources are often directed at getting more coverage from species that will take longer to naturally occur. Inclusion of ferns in the planting will however, increase groundcover and improve structural diversity so if they are available use them.

The high diversity of the planting list impacts on the proportionality of the key ecosystem species. Some ground covers and epiphytic species have been dropped to 0.5% and the key ecosystem species increased.

Species	proportion (%)	Notes
<i>Astelia banksii</i>	1	Epiphytic or terrestrial on rock and poorly developed soil. Assume planted terrestrially.
<i>Asplenium oblongifolium</i>	1	Ground cover
<i>Brachyglottis repanda</i>	5	Small tree understorey
<i>Coprosma crassifolia</i>	1	Shrub understorey
<i>Coprosma rhamnoides</i>	1	Shrub understorey
<i>Coprosma macrocarpa</i> subsp. minor	5	Small tree understorey
<i>Gahnia lacera</i>	1	Ground cover
<i>Geniostoma ligustrifolium</i> var, <i>ligustrifolium</i>	1	Shrub understorey
<i>Griselinia lucida</i>	5	Usually establishes as an epiphyte in mature phase forests but is terrestrial in rock forest and has the potential to become a canopy tree. Needs high light to establish.
<i>Melicytus ramiflorus</i>	15	Small tree understorey or canopy. Common in rock forest
<i>Metrosideros perforata</i>	1	Epiphyte or can develop into understorey shrub if planted terrestrially
<i>Microsorium pustulatum</i>	1	Ground cover and rupestral. Ferns will establish well on their own but if desired for planting proportions are given
<i>Oplismenus hirtellus</i> subsp. <i>hirtellus</i>	1	Groundcover grass. Note change in subsp. name to original list. If seed is collected locally then the species name is not important ie it doesn't mean another species needs to be sourced.
<i>Pellaea falcata</i>	1	Ground cover fern terrestrial and rupestral. According to current taxonomic research we don't have this species in New Zealand. Do NOT collect from other Maunga as the footnote in the plan suggests. If there is a desire to grow and plant this species it should be sourced only from those plants that already occur on Maungawhau and are identified as <i>Pellaea falcata</i> . Avoid collecting from hybrids which are present on other maunga. This is a threatened species so ensure no harm is done

		to the donor populations when collecting spores for propagation.
<i>Piper excelsum</i> subsp. <i>exselsum</i>	5	Small understorey tree. Ensure seed is not collected from planted species on Maungawhau as there is a range of kawakawa from eastern offshore islands.
<i>Pittosporum crassifolium</i>	0	Delete. Strictly a coastal species
<i>Pseudopanax lessonii</i>	5	Small tree understorey
<i>Pteris tremula</i>	1	Ground cover. Fern
<i>Pyrrosia eleagnifolia</i>	1	Rupestrial or epiphytic fern.
<i>Solanum aviculare</i> var. <i>aviculare</i>	1	Small understorey shrub of disturbed sites. Requires high light.
Additional species		
<i>Entelea arborescens</i>	5	Small understorey tree. <i>Whau</i> is <i>The namesake of the maunga</i> and should be planted in light wells and on the margins.
<i>Vitex lucens</i> (puriri)	20	Ecosystem canopy tree
<i>Dysoxylum spectabile</i> (kohekohe)	10	Ecosystem canopy tree
<i>Litsea calicaris</i> (mangeo)	5	Ecosystem canopy tree
<i>Podocarpus totara</i> (totara)	2	Ecosystem canopy tree
<i>Corynocarpus laevigatus</i> (karaka)	5	Ecosystem canopy tree
<i>Alectryon excelsus</i> (titoki)	2	Ecosystem canopy tree
Total	100	Ecosystem canopy tree

References

Cameron, E.K. 1999. *Mt Eden Rock Forests*. Auckland Botanical Society Journal. 54:46-53

Singers, N., Osborne, B., Lovegrove, T., Jamieson, A., Boow, J., Sawyer, J., Hill, K., Andrews, J., Hill, S., Webb, C. 2016. *Indigenous terrestrial and wetland ecosystems of Auckland*. Auckland Council.