CONSERVATION PLAN FOR MAUAO HISTORIC RESERVE 2015 - VOLUME 2

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R3544a

CONSERVATION PLAN FOR
MAUAO HISTORIC RESERVE
2015 - VOLUME 2

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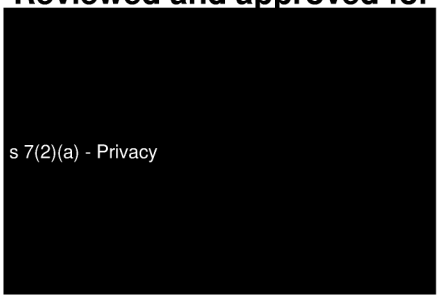

Wildland Consultants Ltd

VISION, GOALS, OBJECTIVES, AND POLICIES - FROM THE 1998 MANAGEMENT PLAN

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VISION

- All historic resources conserved and effectively managed and woven into the conservation of natural features.
- A place where people may visit to admire and enjoy some of the special gifts and cultural history, provided impacts are minimised.

GOALS

1. To meet the spiritual, cultural, and historical needs of tangata whenua.
2. To protect the landscape character, ecology and historic values of the reserve.
3. To continue to meet the appropriate recreational and amenity needs of the residents and visitors to the District.

OBJECTIVES AND POLICIES

1. GOAL 1

To meet the spiritual, cultural, and historical needs of tangata whenua.

1.1 Objective 1

Place of Cultural and Spiritual Significance

To recognise and provide for the special cultural and spiritual relationships that tangata whenua have with Mauao.

Policy

4.1.1a Determine what cultural, heritage and traditional rights or ceremonies are associated with Mauao, e.g. Waitangi Day.

4.1.1b Determine a mechanism for implementing the above (4.1.1a) consistent with the Reserves Act 1977.

4.1.1c Document a consensus as to the events that would initiate rāhui *self-imposed prohibition* and to make provision, e.g. for conservation purposes.

4.1.1d Determine a mechanism for implementing the above consistent with the Reserves Act 1977.

4.1.1e To limit the occupancy of Mauao to the public utilities, including the Trig Station, because they are necessary for the health, safety and amenities of the community.

4.1.1f To recognise and protect the sanctity of archaeological sites and, in particular to ensure that the tangata whenua determine whether information is released or sought by way of digs (archaeological excavations) on such sites or from silent files.

1.2 Objective 2

Heritage Protection

- **To manage the reserve with due recognition to the archaeological significance of Mauao.**

- **To manage the reserve and all sites of cultural significance located within the reserve so that they are protected for the long term.**

- **To carry out specific measures to ensure the long term conservation of the significant sites and areas of Mauao.**

- **To interpret parts of Mauao in consultation with tangata whenua.**

- **To carry out all conservation work in accordance with regard to the guidelines of the ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Value (ICOMOS New Zealand Charter).**

Policy

4.1.2a Carry out a detailed historical assessment of Mauao to provide information on the development and use of sites and area. This information will be available for Conservation Plans (see below) and interpretation of the history of Mauao, in consultation with tangata whenua.

4.1.2b Prepare a Conservation Plan for the archaeological features and historic areas located in the reserve, commissioned in consultation with the tangata whenua. Such a plan is to include:

- An inventory of all sites, accurately mapped, described and recorded on a plan. This would be limited to those sites that area already a matter of public record and would not include sites about which the tangata whenua does not wish to divulge information.

- The condition of each site and the presence of vegetation, together with options for its management.
- An historical assessment of the sites.
- A review of all documentation and records of existing sites.
- Detailed policies for the conservation of all sites.

4.1.2c A specialist in vegetation management of archaeological sites currently prone to erosion to be consulted during production of a Conservation Plan.

4.1.2d A survey of the area's exotic plants and vegetation detailing the types of plants should be carried out, along with documentation of the history. Any work carried out should make reference to recommendations for these planted areas.

4.1.2e Prepare a Conservation Plan for the Stone Steps[1]. This would document the history, record their current condition, determine the cultural significance of the steps and enable development of conservation policy and actions to ensure their long term retention.

4.1.2f Prepare a Conservation Plan for the Iron Wharf area[2]. This should document the site's history including construction of the wharf, water storage tanks and planting of exotic trees, record the site's condition and layout, establish the cultural significance and develop policy for the long term conservation. The New Zealand Archaeological Association recorded the site's layout in 1981. This information will be useful in the Conservation Plan's preparation.

4.1.2g Prepare a Conservation Plan for the Stone Jetty[3] documenting the history, including construction of the wharf and its use, recording the structure and developing policy for its long term conservation.

4.1.2h Assess the degree to which stock are damaging archaeological sites with special attention to be paid to the midden sites on the south western side. If it is found that erosion of the sites is intensified by stock, alternative management should be examined. This could include allowing areas to revert to native bush.

4.1.2i The Pilot Reserve area is a site of significance from the post contact period. An assessment of the whole area should be carried out to determine the extent of significant material still on the site from this period, both built structures and occupation of the site. If the terraced area where the cottage stood has not been modified to any great extent, i.e. the ground surface

1 Not part of the current project.
2 Not part of the current project.
3 Not part of the current project.

disturbed to the point that there is no longer any subsurface cultural deposit relating to the occupation of the cottage, the area should be managed as an archaeological site. If the area is shown to be of archaeological interest, it is recommended that no development which is likely to disturb the area is allowed to occur. An explanation of the historic significance of this site should be included in any other interpretative information located on Mauao, together with its relation to other sites.

4.1.2j No work should be carried out on Mauao which is likely to destroy, damage or modify any archaeological or historic features. No development (i.e. development of tracks, underground services, fencing, vegetation management such as replanting areas around archaeological features etc.) should be undertaken unless an impact assessment of the proposed activity on the archaeological and historic features is carried out by a qualified archaeologist and tangata whenua are consulted. Any activity will require an Authority to Modify Sites from the New Zealand Historic Places Trust, under Section 11 of the Historic Places Act 1993.

4.1.2k Prior to any planting works being carried out on the lower slopes of Mauao, consultation with tangata whenua and an archaeologist is to be undertaken. This consultation will allow for advice on areas of archaeological and cultural sensitivity which should not be planted. Planting should not take place on archaeological features. If sites are to be included in areas for planting it will be necessary to apply to the Historic Places Trust for Authority to Modify Sites, under Section 11 of the Historic Places Act 1993.

4.1.2l Further recording and historical research of the disused paths and tracks on the south western slopes of Mauao should be undertaken to reveal any heritage values these tracks may have. When this has been completed, policy should be developed with regard to the long term retention or otherwise of these features in consultation with tangata whenua.

2. GOAL 2

To protect the historical values, landscape character, and ecological values of the reserve.

2.1 Objective 1

Vegetation

To restore the "cloak[1] of Mauao" whilst sustaining the ecological integrity of Mauao.

[1] Korowai/vegetative cover.

Policy

4.2.1a Preserve and protect the existing continuous areas of indigenous vegetation forest and encourage its growth and predominance except where archaeological and other considerations may be paramount.

4.2.1b Develop new areas of indigenous vegetation where this will result in the improvement of water quality (springs) and otherwise enhance the habitat value of existing vegetation.

4.2.1c Carry out a controlled programme over a period of time to eradicate the radiata pine (*Pinus radiata*) and gorse (*Ulex europaeus*) with the main area of the indigenous forest, and replace this loss with indigenous species.

4.2.1d Selectively preserve exotic trees in appropriate locations.

4.2.1e Develop wāhi rongonui (groves of coastal vegetation).

4.2.1f Ensure that all new plantings of indigenous vegetation are of stock that has been propagated from plants that have evolved genetically in the Tauranga ecological district.

4.2.1g Allow sheep to graze parts of Mauao to ensure that grass growth is adequately controlled whilst the public's use of the area is not unduly impeded.

4.2.1h Review the need for stocking all grassed areas of the reserve and the options for retiring land from grazing. Planting and fencing of retired areas should be carried out only in consultation and tangata whenua and an archaeologist to ensure that the integrity of archaeological sites is not compromised. If planting is to occur on archaeological sites it will be necessary to apply to the Historic Places Trust for authority to modify sites under Section 11 of the Historic Places Act 1993.

4.2.1i To control weeds in accordance with the Bay of Plenty Regional Council's Plant Pest Strategy.

4.2.1j To eliminate all gorse within the existing grazed areas so as to reduce the fire hazard.

4.2.1k To restore and develop additional planting on Mauao.

(a) Restore and add to the coastal vegetation around the base of Mauao, particularly pōhutukawa (*Metrosideros excelsa*).
(b) Care should be taken to ensure good view corridors are maintained.

4.2.1l To continue to plant indigenous vegetation through gorse areas.

2.2 Objective 2

Fire Control

The Council will take all practical precautions to protect the natural and cultural features of Mauao from fire risk and damage.

Policy

4.2.2a The Fire Plan should be used as an action plan in the event of a fire.

2.3 Objective 3

Fauna

- **To take all necessary measure to protect and enhance the native fauna on Mauao, including the nesting areas of the grey faced petrel and little blue penguin. Consideration will also be given in due course to the release of threatened species on Mauao if consultation determines this is appropriate.**

- **To produce and implement an integrated pest control programme on Mauao for predators and browsers, including ongoing control of the rabbit population.**

Policy

4.2.3a To continue the annual monitoring programme for the grey faced petrel and implement appropriate protective measures.

4.2.3b To complete, as soon as possible, a comprehensive assessment of the density, diversity and distribution of the fauna.

4.2.3c To continue the existing opossum, rabbit and cat control programme, to modify it as required in accordance with the Bay of Plenty's Animal Pest Management Strategy, to carry out an annual review, and to monitor progress.

4.2.3d To annually monitor and, if necessary, to control the populations of other introduced fauna that may threatened the vegetation, wildlife or archaeological sites.

2.4 Objective 4

The Summit

- **To prohibit further development or the provision of utilities of any kind on the summit. Maintenance and improvement of existing facilities is acceptable but must be in accordance with Objective 5 of this Management Plan and approved by Council.**

- **To protect and preserve the summit's historic and archaeological features.**

- **To retain its character as a natural lookout.**

- **To retain its open space character and peaceful atmosphere.**

Policy

4.2.4a Redesign (if removal is not practical or appropriate) the existing man-made utilities to blend into the landscape as unobtrusively as possible.

2.5 Objective 5

Buildings, Structures and Facilities

- **The following existing buildings, structures and facilities on Mauao should be retained: the Hot Salt Water Pools, the Surf Lifesaving Clubhouse, the Farm Service Area, the Public Toilet, and the Camping Ground Facilities. Any changes to existing facilities or proposals for new facilities not included in this Plan must be approved by Council following public consultation, if deemed appropriate by Council.**

- **To limit the utilities on Mauao to the existing cairn, reservoir, communications repeaters and overhead wires[1]. Navigational structures including lights and beacons may be maintained, improved or relocated to meet navigational requirements. Except for those required to ensure public safety, no additional structures or facilities that provide for activities other than recreation or maintenance of the reserve shall be placed on the reserve.**

- **To continue to allow use of the Pilot Bay Wharf by commercial fishers at the present level.**

Policy

4.1.5a To actively seek the removal of the abandoned reservoir from the lower slopes provided that an assessment of environmental effects is undertaken to prove that the actions do not compromise the cultural, spiritual and ecological values of Mauao and it is deemed to be practicable.

4.1.5b Other facilities to improve public enjoyment of the reserve, such as seats, direction and information signs, and rubbish bins may be provided. These shall be appropriately designed and sited.

[1] And trig station.

APPENDIX 2

VISION FROM THE 2004 CONSERVATION PLAN

Reproduced from Wildland Consultants (2004)

Mauao is preserved as a taonga of exceptional cultural, spiritual, historic, and natural significance.

Mauao shall remain a taonga for all people to enjoy its unique features, while ensuring that impacts are minimised.

GEOLOGY, SOILS, AND LANDFORM UNITS

Reproduced from Wildland Consultants (2004)

GEOLOGY

This section is from Phillips (2003).

Mauao is the remnant of a large lava dome, formed by upwelling and outpouring of viscous rhyolite lava about 4.3 million years ago (Rutherford 1978). Its outline has since been considerably modified by erosion; however, its volcanic origins can still be evidenced by the lava flows that characterise the northern shoreline.

Deep pyroclastic tephra deposits formed the lower slopes of Mauao about 65,000 years ago (Hall 1994) which were subsequently mantled by many airfall volcanic ash deposits from the Ōkataina, Taupō, Maroa, and Tuhua volcanic centres.

The former island of Mauao later became connected to the mainland by a prograding sand spit (tombolo) that also connected the former island of nearby Hopukiore (Mt Drury) (Hall 1994). The tombolo comprises 50 closely spaced parallel dunes of Plio-Pleistocene sediments. The dunes increase in age from east to west and are thought to have begun forming about 6,000 years ago (Pullar & Cowie 1967; see also Dham 1983). A volcanic ash mantle from the Kaharoa eruption of AD 1314 provides evidence that the tombolo had formed completely when Polynesians first arrived at Mauao (Hogg *et al*. 2003). Conclusive archaeological evidence of Polynesian settlement has yet to be identified below Kaharoa Ash.

SOILS

Information was collated from various reports and geological and soils maps.

Most of the steep slopes are covered with Ōtānewainuku series soils, consisting of acidic orthic-allophanic soils derived from a thin rhyolitic tephra. There are also large areas of Katikati series soils on the lower north-eastern and south-western slopes, as well as in the crater, these are from very thin rhyolitic tephra on loess and weathered rhyolitic tephra (Rijkse and Cotching 1993). Soils in the Recreation Reserve have been modified, by man, from their original Ōhope sand; however, this constitutes a relatively small area.

The Katikati sandy loams and Katikati hill soils are present on the broad terrace formations on the lower south-western and north-eastern slopes and on the level summit. These soils are classified as Typic Orthic Allophanic soils derived from thin rhyolitic tephra (Taupō pumice and tuhua tephra). They are characterised by a black gritty sandy loam A Horizon and a yellow brown silt loam B horizon (Rijkse 1995).

The Katikati soils are generally well drained and are used extensively in other parts of Tauranga district for the cultivation of subtropical crops such as kiwifruit and citrus. They

would have been suitable for the cultivation of traditional Polynesian crops during the Maori occupation of Mauao.

LANDFORMS - GENERAL

Mauao is a low mountain (231.4 m asl) composed of Pleistocene minden rhyolites (Healy *et al*. 1974). The easy gradient of the lower slopes becomes progressively steeper further upslope, the undulating summit being generally surrounded by rocky precipitous cliffs. Mauao is bounded by sea on three sides; to the north and west it is exposed to the open sea, with Tauranga Harbour to the south. On its eastern side It is connected by a low sand isthmus to the flats and low hills east of Tauranga. The foreshore is generally rocky, with small shell beaches in the north east and sand beaches in the south west. It should also be noted that there are several springs, including one geothermal spring.

Information from Healy, Schofield and Thompson (1974) indicated that landforms could not be derived from differences in the underlying geology. A field survey was undertaken in 1999 and topographical differences were used as the basis for the differentiation of landforms. Landforms were mapped onto an enlarged colour photocopy of an aerial photograph (1:3595; 1999) and notes were collated on the features that characterise each landform unit.

LANDFORM UNITS

There are 10 landform units on Mauao and these are described and mapped in Wildland Consultants 1999 (see Figure 6).

1. Rocky shore

   A rocky shore is present around most of the coastal margin of Mauao. The substrate varies from boulders to basal rock headlands

2. Beaches
   (a) sand beach
   (b) shell beach

   Sand beaches are present on the southern, harbour facing shores, with shell beaches on the northern, open seaward shores. The beaches are relatively small in extent compared to the extent of rocky shore.

3. Coastal bank
   (a) rock
   (b) debris mantled

   A coastal bank is present below the track along the seaward margin, with a debris mantled variant more common than rock bank. A rock bank is present at the northern end of Mauao, exposed to the open sea.

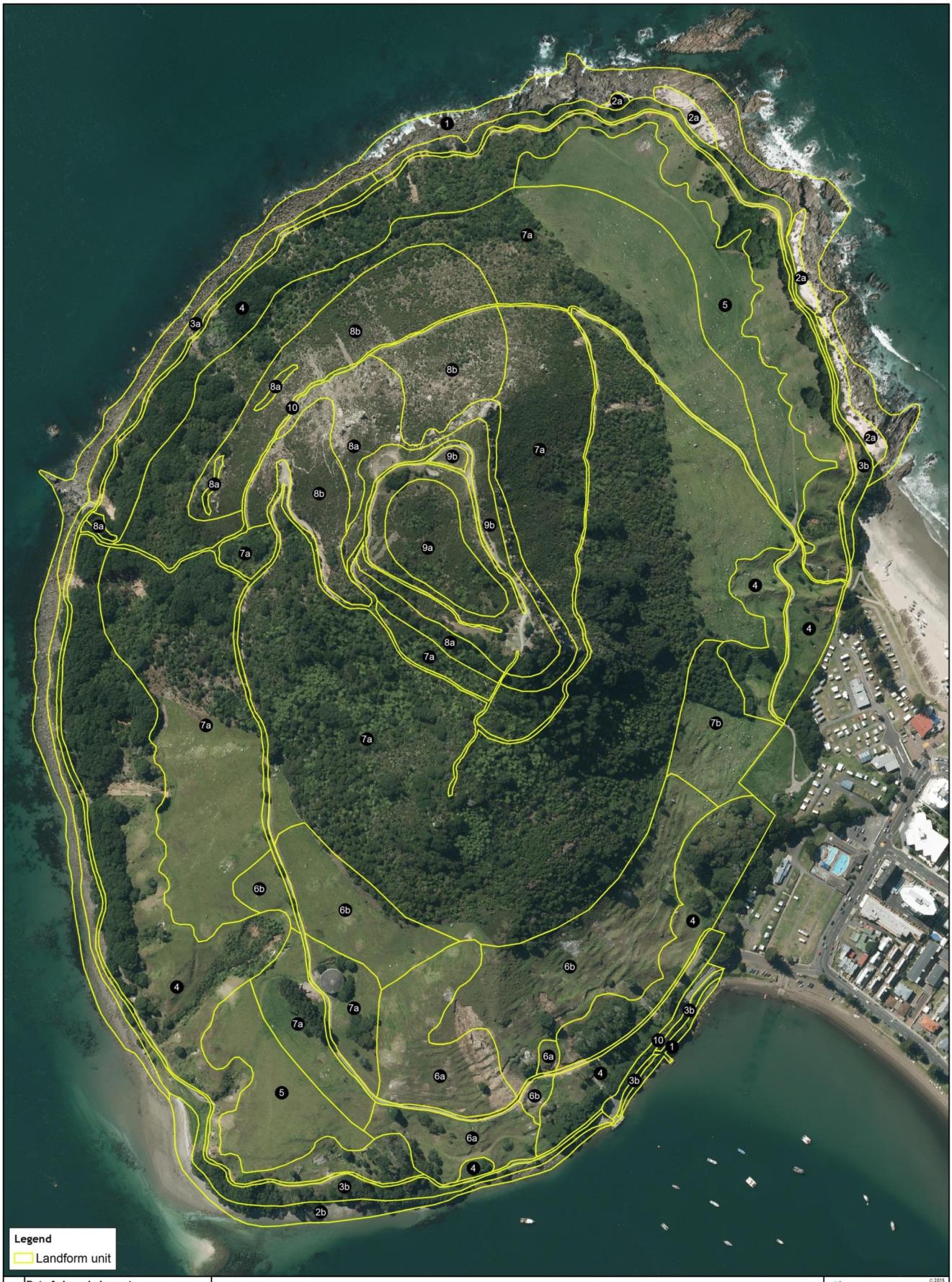

Figure 6. Landform units (derived from Wildland Consultants 2004)

4. Gully system

A gully system is present along the toeslope of Mauao, above the coastal track. It is generally steep (*c.*20^{o} on average) comprising of a series of small gullies and dividing 'ridges'.

5. Gentle slopes

Gently sloping areas (generally 5-10°) immediately above the gully system at the northern and southern ends of Mauao.

6. Terraced hillslope (cultural)
   (a) higher density terracing
   (b) lower density terracing

Relatively large areas of hillslope terraced by Polynesians for cultivation and settlement. The terracing present in some areas is more prominent and denser than others.

7. Moderately steep to steep slopes
   (a) with extensive slumping
   (b) hummocky surface

Moderately steep to steep slopes (approximately 10-35^{o}) are the predominant landform of Mauao. Boulders are common on the surface, particularly on the eastern slopes. An area in the east shows evidence of extensive slumping.

8. Very steep slopes
   (a) rock bluffs/outcrops
   (b) debris-mantled

Immediately below the summit there is a rim of rock bluffs and outcrops with a slope generally greater than 35^{o}. On the northern face, debris mantled steep slopes extend down to adjoin the gully system. The most extensive area of rock bluffs and outcrops is present in this area.

9. Summit
   (a) hollow
   (b) rim

The summit has been divided into an outer rim, which is relatively flat and undulating, with a hollow in the centre, which is generally of lower elevation than the rim and more sheltered.

10. Roads and tracks

VEGETATION AND HABITAT MAP, AND DESCRIPTIONS

Reproduced from Wildland Consultants (2015)

GENERAL

A detailed vegetation map was prepared in 2014 (Wildland Consultants 2015); this is presented in Volume 1 (Figure 3). The vegetation and habitats types on Mauao comprise a defined area of pasture on the lower slopes with secondary indigenous vegetation (or a mixture of indigenous and exotic species) extending from the pasture margin to the summit. Grazed pasture covers over a third (*c*.34%) of Mauao. On the western side indigenous vegetation extends from the sea to the summit, with well-developed pōhutukawa forest present in this area. There are areas of pōhutukawa treeland along the northern and southern shorelines, and some patches of exotic treeland and forest on the southern and eastern margins. Pōhutukawa forest, treeland and scrub covers approximately 27% of Mauao. Planted shrubland (with some exotic weeds in the canopy) on the northern and north-western slopes covers an area that was burnt by fire in December 1997 and again in January 2003.

Sixteen broad vegetation and habitat types were identified and mapped (see Figure 3 in Volume 1), and are described below.

Vegetation Type		Area (ha)
1	Pōhutukawa forest	8.0
2	Pōhutukawa/māhoe-mamaku-hangehange forest	12.7
3	Mānuka-(Spanish heath)-(whararikī) shrubland	6.3
4	Mixed exotic-indigenous scrub and shrubland	2.8
5	Māhoe forest and scrub	2.8
6	Pōhutukawa-mixed indigenous species forest, treeland, and scrub	3.8
7	Planted indigenous species forest/scrub/treeland/shrubland	4.8
8	Pōhutukawa treeland	2.7
9	Mixed indigenous species scrub	1.8
10	Mixed exotic and indigenous species forest and treeland	2.4
11	Rocky bluffs	1.0
12	Close-cropped grassland and paths	0.8
13	Rocky promontory	0.2
14	(Wīwī)/bracken-pōhuehue-cocksfoot shrub-grassland	0.1
15	Shallow gully	0.1
16	Pasture	26.1

1. **Pōhutukawa forest** (8.0 ha)

Pōhutukawa forms a canopy up to *c*.20 m tall (range 10-20 m) on the upper eastern slopes, lower western and north-eastern slopes of Mauao. Most of the pōhutukawa within this type are large, old trees, although a small patch of forest on the lower north-eastern slopes comprises younger trees with a lower, denser canopy. The understory and ground cover are variable within this type, with four sub-types reflecting these differences described below. All areas of this type are fenced to exclude domestic stock.

a. Large, old pōhutukawa form a canopy up to *c.*20 m tall over an understorey dominated by hangehange (*Geniostoma ligustrifolium* var. *ligustrifolium*) and māhoe (*Melicytus ramiflorus* subsp. *ramiflorus*), but with kawakawa (*Piper excelsum* subsp. *excelsum*) locally common, and local tūrepo (*Rhabdothamnus solandri*), and mamaku (*Cyathea medullaris*) scattered throughout. Groundcover species common within this type include pukupuku (*Doodia australis*) and *Adiantum cuninghammii*. Other species present include māpou, mingimingi (*Leucopogon fasciculatus*), heketara (*Olearia rani* var. *colorata*), akepiro (*Olearia furfuracea*), kānuka, and Japanese honeysuckle (*Lonicera japonica*).

b. Large, old pōhutukawa form a canopy *c.*18-20 m tall on the lower western and north-western slopes of Mauao. Māhoe and kawakawa are the dominant understorey species and pukupuku and *Adiantum cuninghammii* are the main groundcover species, but other species common within these tiers include hangehange, whauwhaupaku (*Pseudopanax arboreus*), mamaku, māpou, and mingimingi. Spanish heath (*Erica lusitanica*) is common on the margins of tracks that pass through this type. Gaps in the pōhutukawa canopy contain mixed indigenous and exotic species scrub with bracken (*Pteridium esculentum*), māhoe, hangehange, whauwhaupaku, akeake (*Dodonaea viscosa*), mamaku, karamū (*Coprosma robusta*), glossy karamu (*Coprosma lucida*), kawakawa, gorse (*Ulex europaeus*), Spanish heath, and pampas (*Cortaderia selloana*) common and local Japanese honeysuckle, woolly nightshade (*Solanum mauritianum*), and kikuyu (*Cenchrus clandestinus*).

Slips of varying sizes are present throughout this type and are in various stages of revegetation/regeneration. Recent slips have a sparse groundcover of occasional pōhutukawa seedlings and herbaceous species, with occasional pampas and locally common Spanish heath amongst bare clay and rocks. Some areas have been planted with indigenous species, including māhoe, ngaio, glossy karamu, whaririki (mountain flax; *Phormium cookianum* subsp. *hookeri*), tarata (*Pittosporum eugenioides*), whau, and mānuka. Exposed areas beside the base track support patches of wīwī (*Ficinia nodosa*) and *Machaerina juncea*.

Other species present at lower densities within this type include ponga (*Cyathea dealbata*), tūrepo, *Asplenium polyodon*, *A. oblongifolium*, *Oplismenus hirtellus* subsp. *imbecillis*, *Astelia solandri*, and boneseed (*Chrysanthemoides monilifera*).

c. A small area of pōhutukawa trees form a dense canopy up to *c.*10 m tall on the north-eastern, lower slopes of Mauao. This area contains a very sparse understorey of glossy karamu and does not support any groundcover species. A small slip on the north-eastern margin of this type supports pōhutukawa seedlings and saplings with patches of grass (predominantly kikuyu), pōhuehue, wīwī, a few pampas (*c.*6), and gorse.

2. Pōhutukawa/māhoe-mamaku-hangehange forest (12.7 ha)

Large pōhutukawa are locally emergent over a canopy dominated by māhoe, mamaku, and hangehange with a sparse to locally dense understorey of hangehange, ponga, māhoe, māpou, kawakawa, akepiro, and rangiora (*Brachyglottis repanda*). Groundcover species common within this type include pukupuku, rereti (*Blechnum chambersii*), *Asplenium oblongifolium*, *Microsorum pustulatum*, *Blechnum filiforme*, and *Astelia*

solandri. Houhere[1] (*Hoheria sexstylosa*) is locally common in the canopy in parts of this type, and occasional emergent rewarewa, rimu[1], and totara[1] (*Podocarpus totara*) are also present.

Track margins within this type support a range of species. Spanish heath is common; kiokio (*Blechnum novae-zelandiae*), Mexican daisy (*Erigeron karvinskianus*), and climbing asparagus (*Asparagus scandens*) are locally common; and hawthorn (*Crataegus monogyna*), cotoneaster (*Cotoneaster glaucophyllus*), Japanese honeysuckle, gorse, and blackberry (*Rubus fruticosus*) are occasional. Some areas include regenerating koromiko (*Hebe stricta*), pōhutukawa, and houhere in association with *Adiantum cunninghamii*, pukupuku, and gorse.

A small (*c.*7 × 3 m) patch of Chinese privet (*Ligustrum sinense*) and *c.*10 hawthorn trees are present near the eastern boundary of this type where it borders Vegetation Type 4 (māhoe forest and scrub) (see Figure 3, in Volume 1). Other species present in this area include climbing asparagus, *Calystegia sepium* × *C. soldanella*, and planted harakeke (*Phormium tenax*).

Other species present within these areas include totara[2], kōwhai[1] (*Sophora microphylla*), kānuka, ponga, whauwhaupaku, houpara, kāmahi, rimu, mingimingi, mānuka, Japanese spindleberry (*Euonymus japonicus*), smilax (*Asparagus asparagoides*), Italian evergreen buckthorn (*Rhamnus alaternus*), Chinese privet, pampas, swan plant (*Gomphocarpus fruticosus*), and loquat (*Eriobotrya japonica*).

3. Mānuka-(Spanish heath)-(whaririki) shrubland (6.3 ha)

Shrubland dominated by planted mānuka, with locally common whaririki (planted) and Spanish heath, and scattered pōhutukawa, māpou, and pampas, is present on the upper to mid-slopes on the northern face of Mauao. Bluffs at the top of the slope within this area support Spanish heath, whaririki, radiata pine (*Pinus radiata*) seedlings, and a few pōhutukawa. Other species present include *Pomaderris amoena*, karamū, gorse, tī kōuka (*Cordyline australis*), ngaio (planted), *Hebe parviflora* (planted), *Metrosideros excelsa* × *M. kermadecensis* (planted), broadleaf (*Griselinia littoralis*) (planted), and Montpellier broom (*Teline monspessulana*). *Morelotia affinis* is locally common on exposed track margins. This vegetation type is located within the area of affected by fires in 1997 and 2003.

4. Mixed exotic-indigenous scrub/shrubland (2.8 ha)

This vegetation type is located on the upper, eastern slopes of Mauao. Rocky bluffs are present at the top of the slope on the western side of this vegetation type. The bluffs are surrounded by Spanish heath shrubland with planted whaririki, and scattered gorse, *Pomaderris amoena*, mānuka (planted), and pōhutukawa (planted). Below the bluffs, scrub is present and is dominated by Spanish heath, pampas, and gorse in association with whaririki, pōhutukawa, and mānuka. This vegetation type is located within the area affected by fires in 1997 and 2003. Slips within this type have scattered plants of

[1] All these species are planted, and are not known to occur naturally on Mauao.
[2] All these species are planted, and are not known to occur naturally on Mauao.

pōhutukawa, pampas, Spanish heath, *Morelotia affinis*, mānuka, gorse, and tūrutu (*Dianella nigra*).

5. Māhoe forest and scrub (2.8 ha)

This type is present on the south-eastern mid-slopes of Mauao. Occasional emergent pōhutukawa are present above a *c.*6 m tall canopy dominated by māhoe in association with kawakawa and mingimingi. Patches of blackberry and bracken shrubland-fernland and pōhuehue vineland are present within this type, and parts of the lower, southern margins support planted indigenous shrubland. Planted species within these areas include māhoe, whau, rimu, totara, pōhutukawa, and koromiko. Locally, Japanese honeysuckle forms dense vineland, smothering the indigenous canopy. Pampas and blackberry have been controlled near the fenceline. In these areas, a variety of herbs are growing on the bare soil including *Acaena novae-zelandiae*, woolly mullein (*Verbascum thapsus*), Scotch thistle (*Cirsium vulgare*), Californian thistle (*Cirsium arvense*), broad-leaved fleabane (*Conyza sumatrensis*), and scarlet pimpernel (*Anagallis arvensis*). Other species present within this type include māpou, kānuka, English oak (*Quercus robur*), Spanish heath, Chinese windmill palm (*Trachycarpus fortunei*), cotoneaster, sycamore (*Acer pseudoplatanus*), woolly nightshade, sweet briar (*Rosa rubiginosa*), Chinese privet, and Mexican daisy. A single radiata pine tree is present at the northern boundary of this type with Vegetation Type 1a. Some indigenous vegetation (pōhutukawa and māhoe) has been affected by herbicide spray drift during control of pampas, gorse, and blackberry.

6. Pōhutukawa-mixed indigenous species forest, treeland, and scrub (3.8 ha)

Located on the mid- and lower northern slopes of Mauao, natural and planted pōhutukawa form a canopy to *c.*5 m tall in association with planted ngaio, glossy karamu, mānuka, *Hebe parviflora*, and whaririki. Planted kawakawa, tī kōuka, and nīkau are also present. Little ground cover is present within this area: the parts of this type with a more open canopy support patches of grass and the parts with a closed canopy contain patches of ring fern (*Paesia scaberula*).

7. Planted indigenous species forest/scrub/treeland/shrubland (4.8 ha)

Restoration plantings of mixed broadleaved indigenous species have been undertaken over a number of years in various locations around Mauao. These are often located on the margins of existing vegetation, but also include small gullies. The maturity of the plantings is reflected in the vegetation structure within these areas, as described below:

a. A small area of forest dominated by pōhutukawa, māhoe, and whau on the eastern mid-slopes of Mauao. Other species present within this area include karaka, rimu, and broadleaf.

b. Treeland and scrub with natural and planted pōhutukawa in association with planted ngaio, glossy karamu, mānuka, *Hebe parviflora*, and whaririki in a small gully on the eastern lower slopes of Mauao. Planted tī kōuka and nīkau are also present. Rank grassland dominated by Yorkshire fog (*Holcus lanatus*) and kikuyu is present in canopy gaps and some slumping of steep slopes has occurred within this area.

c. Mixed indigenous species scrub and treeland in a gully with a small stream on the south-western mid- to lower slopes of Mauao. Ngaio, pōhutukawa, harakeke, mānuka, whau, and *Hebe parviflora* represent the bulk of the planted species. Rank grassland is present between plantings.

d. Pōhutukawa saplings and small trees have been planted within rank grassland on steep lower slopes on the south-western and western sides of Mauao. Some large, old pōhutukawa up to *c.*16 m tall are also present within this area. Occasional, naturally-occurring patches of māhoe and Japanese honeysuckle are present where parts of this type meet old-growth pōhutukawa forest. Other species present in parts of this type include hawthorn, black wattle (*Acacia mearnsii*), and gorse.

e. Forest and treeland dominated by kānuka, māhoe, houhere, karamū, whau, pōhutukawa, and koromiko forms a patchy canopy to *c.*6 m tall over fern, grass, and herb species including milkweed (*Euphorbia peplus*), sow thistle (*Sonchus oleraceus*), woolly mullein, pukupuku, ring fern, *Acaena novae-zelandiae*, browntop (*Agrostis capillaris*), and toatoa (*Haloragis erecta*). Other planted species present include totara, mānuka, māhoe, ngaio, tarata, akeake, and whaririki. Other species present within this type include Japanese honeysuckle, hawthorn, Spanish heath, pampas, and cotoneaster.

f. Mixed indigenous species scrub and shrubland to *c.*3 m tall within a triangle formed by the two main tracks to the summit. Ngaio, *Hebe parviflora*, karamū, mānuka, pōhutukawa, and whaririki are the main species planted within this area. Other planted species present include broadleaf, koromiko, glossy karamu, tī kōuka, and kōhūhū (*Pittosporum tenuifolium*). Patches of Spanish heath are also present.

g. Recently planted seedlings within rank grassland. Planted species present within this area include glossy karamu, whaririki, totara, and mānuka. Other species are likely to have been planted within this area, but are not identifiable as they have died. Whaririki plants are in good condition, glossy karamu plants are in average condition, and totara and mānuka are in poor condition. Rank grass around the plantings has been sprayed.

8. Pōhutukawa treeland (2.7 ha)

Predominantly large, old pōhutukawa form a patchy canopy over a variable groundcover and understorey in various places around the lower slopes of Mauao. In some areas, pōhutukawa trees are present over walking tracks or rocks and there are rarely any understory or groundcover species. Other areas have local patches of woody species (seedlings and saplings) and pasture. Woody species present beneath pōhutukawa trees include pōhutukawa, kawakawa, pōhuehue, and glossy karamu. Grass species present include *Rytidosperma* species and Yorkshire fog. Other species present include *Cyperus ustulatus*, *Adiantum cuninghammii*, *Carex* aff. *raoulii* ("raotest"), wīwī, wall lettuce (*Mycelis muralis*), catsear (*Hypochaeris radicata*), hawkbit (*Leontodon taraxacoides*), creeping buttercup (*Ranunculus repens*), and *Isolepis cernua*. *Samolus repens* is present growing amongst wīwī and trampled kikuyu beneath pōhutukawa trees on the seaward side of the track in the northern section of this type.

9. Mixed indigenous species scrub (1.8 ha)

Small patches of remnant scrub are surrounded by planted scrub dominated by mānuka, koromiko, and whahariki on relatively flat land near the summit of Mauao. Remnant patches of scrub contain occasional emergent rewarewa over a *c.*4-5 m tall canopy dominated by māhoe, hangehange, and pōhutukawa with heketara, mamaku, and karamū common. The ground cover is generally sparse and mostly comprises leaf litter, with scattered kiokio, *Adiantum cuninghammii*, ring fern, and *Asplenium polyodon* also present. Other species present within this type include glossy karamu (planted), akepiro (planted), *Rubus schmidelioides*, mingimingi, miro (*Prumnopitys ferruginea*) (planted), kauri (*Agathis australis*) (planted), *Clematis paniculata*, *Pyrrosia eleagnifolia*, *Machaerina juncea*, *Gonocarpus incanus*, *Tetraria capillaris*, tūrutu, Spanish heath, cotoneaster, Japanese spindleberry, kahili ginger (*Hedychium gardnerianum*), yucca (*Yucca gloriosa*), wilding pine (*Pinus* spp.), and pampas. Some control of pampas and kahili ginger has been undertaken in this area.

Patches of grass are present within this type and informal tracks are common. A small area of *Drosera auriculata* is present within moss on the south-western margins of this type beside the track.

10. Mixed exotic and indigenous species forest/treeland (2.4 ha)

Large, mature indigenous and exotic tree species have been planted on the south-eastern, southern, and south-western lower slopes of Mauao.

a. Mixed exotic-indigenous treeland at the boundary with the motor camp has a canopy dominated by sycamore (up to *c.*18 m tall), with clusters of karaka, macrocarpa (*Cupressus macrocarpa*), English oak, radiata pine, Chinese windmill palm, and phoenix palm (*Phoenix canariensis*) over leaf litter and pasture grass with occasional Chinese windmill palm seedlings and saplings, strawberry dogwood (*Cornus capitata*), Chinese privet, and cotoneaster. Other species within this area include smilax, boxthorn (*Lycium ferocissimum*), and tree privet (*Ligustrum lucidum*). This area is not fenced to exclude stock.

b. Forest dominated by macrocarpa and karaka (up to *c.*20 m tall) in association with radiata pine, sycamore, and pōhutukawa on the south-eastern boundary of the Reserve. This area contains a variable groundcover and understorey dominated by kawakawa in the understory, but also contains karamū, ring fern, meadow rice grass (*Microlaena stipoides*), Yorkshire fog, cocksfoot (*Dactylis glomerata*), Japanese honeysuckle, cleavers (*Galium aparine*), and sow thistle. Other species present include karo, māhoe, māpou, totara, Indian strawberry, grey sedge (*Carex divulsa*), climbing asparagus, cotoneaster, and Chinese windmill palm.

c. Treeland within grazed pasture on the southern lower slopes of the Reserve. Tree species present within this area include planted and natural pōhutukawa, and planted totara, karaka, houhere, paulownia (*Paulownia tomentosa*), melia (*Melia azedarach*), sycamore, Lombardy poplar (*Populus nigra* 'Italica'), tree of heaven (*Ailanthus altissima*), English oak, radiata pine, silky oak (*Grevillea robusta*), sheoak (*Casuarina* species), eucalyptus (*Eucalyptus* species), and box alder (*Acer negundo*).

d. Treeland around a water tower on the southern mid-slopes of Mauao. Tree species present within this area include poplar (*Populus* species), silky oak, pōhutukawa, paulownia, melia, and pūriri.

11. Rocky bluffs (1.0 ha)

Rocky bluffs on the north-western side of Mauao have patches of vegetative cover, predominantly grass, pampas, gorse, *Astelia banksii*, and pōhutukawa. Other species present include boxthorn, swan plant, hawthorn, and *Psilotum nudum*.

12. Close-cropped grassland and paths (0.8 ha)

Vegetation and habitats within this area comprise close-cropped grass dominated by kikuyu with scattered pōhutukawa. Tables, chairs, a trig, and paths are present throughout this area. Spanish heath is present in exposed places. Other species present within this area include ratstail (*Sporobolus africanus*), catsear, gorse, and pampas.

13. Rocky promontory (0.2 ha)

A small rocky peninsula jutting into the ocean on the north-western side of Mauao supports scattered clumps of plants in cracks in the rocks. Plants present include wīwī, *Samolus repens, Senecio lautus* var. *lautus,* scarlet pimpernel, and glasswort (*Sarcocornia quinqueflora*). A small area of *Disphyma australe* is also present growing in association with glasswort.

14. (Wīwī)/bracken-pōhuehue-cocksfoot shrub-grassland (0.1 ha)

Occasional kawakawa and local patches of wīwī are emergent within bracken, pōhuehue, and cocksfoot shrub-grassland on the south-western midslopes of Mauao. Other species present include shore bindweed (*Calystegia soldanella*) and *Acaena novae-zelandiae*.

15. Shallow gully (<0.1 ha)

A narrow band of *Cyperus ustulatus* and ring fern tussockland is present at the top of a shallow gully around a seep in the hillslope. Below the tussockland, grazed pasture with horehound (*Marrubium vulgare*), woolly mullein, and prickly sow thistle (*Sonchus asper*) grades into scrub dominated by whau and māhoe with ponga, blackberry, pōhuehue, and kawakawa. Pampas and thistles have been controlled in this area.

16. Pasture (26.1 ha)

Grazed pasture of variable composition is present around the mid- and lower slopes on the north-eastern, eastern, southern, south-western, and western sides of Mauao. Some areas of the pasture are dominated by *Rytidosperma* species and meadow rice grass, whilst other parts are dominated by either Yorkshire fog or kikuyu. Patches of ring fern, woolly mullein, horehound, wīwī, and pōhuehue are common throughout this type. Scattered trees are also present, including totara, pōhutukawa, karaka, and paulownia. Other species present within the pasture include gorse, *Acaena novae-zelandiae*, and *Oxalis exilis*.

LIST OF VASCULAR SPECIES RECORDED ON MAUAO

Reproduced from Wildland Consultants (2015)

Note - All species were observed during 2014 and 2015 site inspections, unless otherwise annotated, e.g. Beadel 2004.

INDIGENOUS

Key

* = Occurs naturally at the site
P = Planted
N = Naturalised

Gymnosperms

Agathis australis (P)	kauri
Dacrycarpus dacrydioides (P)	kahikatea
Dacrydium cupressinum (P)	rimu
Phyllocladus trichomanoides (Beadel 2004)	tānekaha
Podocarpus totara var. *totara* (P)	totara
Prumnopitys ferruginea (P)	miro

Monocot. trees and shrubs

Cordyline australis (* P)	tī kōuka, cabbage tree
Rhopalostylis sapida (P)	nīkau

Dicot. trees and shrubs

*Brachyglottis repanda**	rangiora
*Carmichaelia australis**	maukoro, tainoka, taunoka
*Coprosma grandifolia**	kanono, raurēkau, raurākau, manono
Coprosma lucida (* P)	karamū, kāramuramu, glossy karamu
Coprosma repens (* P)	taupata
Coprosma robusta (* P)	karamū, kāramuramu
Coriaria arborea var. *arborea**	tutu
Corynocarpus laevigatus (* P)	karaka
Dodonaea viscosa (*? P)	akeake
Entelea arborescens (* P)	whau
*Gaultheria antipoda**	tāwiniwini, koropuka, takapo, taupuku
Geniostoma ligustrifolium var. *ligustrifolium**	hangehange
Griselinia littoralis (P)	kāpuka
Hebe parviflora (P)	koromiko tāranga, kōkōmuka tāranga
Hebe stricta var. *stricta* (* P)	koromiko, kōkōmuka

Hoheria sexstylosa (P, N)	houhere, lacebark
*Knightia excelsa**	rewarewa
Kunzea robusta (* P)	kānuka
Leptecophylla juniperina var. *juniperina**	prickly mingimingi
Leptospermum scoparium agg. (* P)	mānuka
*Leucopogon fasciculatus**	mingimingi
*Leucopogon fraseri**	pātōtara
Melicytus novae-zelandiae (P) (Beadel 2004)	coastal māhoe
Melicytus ramiflorus subsp. *ramiflorus* (* P)	māhoe
Metrosideros excelsa (* P)	pōhutukawa
Myoporum laetum (P)	ngaio
*Myrsine australis**	māpou, matipou, māpau
*Olearia furfuracea**	akepiro, tanguru
Olearia paniculata (P)	akiraho
Olearia rani var. *colorata**	heketara
Pimelea tomentosa (Beadel 2004)*	
Piper excelsum subsp. *excelsum**	kawakawa
Pittosporum crassifolium (* P)	karo
Pittosporum eugenioides (P)	tarata; lemonwood
Pittosporum tenuifolium (* P)	kōhūhū, rautāhiri, rautāwhiri
*Pomaderris amoena**	tauhinu
*Pseudopanax arboreus**	whauwhaupaku, puahou, five finger
Pseudopanax lessonii (* P)	houpara
*Rhabdothamnus solandri**	tūrepo
Sophora microphylla (P)	kōwhai
Vitex lucens (P)	pūriri
*Weinmannia racemosa**	kāmahi

Dicot. lianes

*Calystegia soldanella**	panahi, shore bindweed
Calystegia sepium subsp. *roseata**	pōhue
Calystegia sepium × *C. soldanella**	
*Clematis paniculata**	puawānanga
*Muehlenbeckia complexa**	pōhuehue
*Parsonsia capsularis**	akakiore
Rubus schmidelioides var. *schmidelioides**	tātarāmoa, bush lawyer

Lycopods and psilopsids

Huperzia varia (Beadel 2004)*	whiri-o-Raukatauri
Lycopodium deuterodensum (Beadel 2004)*	puakarimu
*Psilotum nudum**	
*Tmesipteris elongata**	
*Tmesipteris tannensis**	

Ferns

*Adiantum cunninghamii**	huruhuru tapairu, maidenhair fern
*Adiantum diaphanum**	huruhuru tapairu, maidenhair fern

*Asplenium flaccidum**	makawe, ngā makawe o Raukatauri
*Adiantum hispidulum**	huruhuru tapairu, maidenhair fern
*Asplenium oblongifolium**	huruhuru whenua
*Asplenium polyodon**	petako
*Blechnum chambersii**	rereti, nini
*Blechnum filiforme**	pānako
*Blechnum novae-zelandiae**	kiokio
Blechnum parrisiae *	pukupuku
Cardiomanes reniforme (Beadel 2004)	kidney fern, konehu raurenga, kopakopa
*Cyathea dealbata**	ponga, silver fern
*Cyathea medullaris**	mamaku
*Dicksonia fibrosa**	whekī-ponga, kurīpākā
*Dicksonia squarrosa**	whekī
*Histiopteris incisa**	mātātā, water fern
Hymenophyllum demissum (Beadel 2004)*	irirangi, piripiri, filmy fern
Hymenophyllum dilatatum (Beadel 2004)*	matua mauku, filmy fern
Hymenophyllum sanguinolentum (Beadel 2004)*	piripiri, filmy fern
*Lygodium articulatum**	mangemange
*Microsorum pustulatum**	kōwaowao, pāraharaha, hound's tongue fern
*Paesia scaberula**	mātātā
*Pneumatopteris pennigera**	pākau
Polystichum neozelandicum subsp. *neozelandicum**	pikopiko, shield fern
*Pteridium esculentum**	rārahu, bracken
*Pteris macilenta**	titipo, sweet fern
*Pteris tremula**	turawera, shaking brake
*Pyrrosia eleagnifolia**	leather-leaf fern

Orchids

Diplodium alobulum (Beadel 2004)*	
*Drymoanthus adversus**	
*Earina autumnalis**	raupeka
*Earina mucronata**	peka-a-waka
Microtis unifolia agg.*	
*Nematoceras macranthum**	
Nematoceras rivulare (Beadel 2004)	
*Pterostylis banksii**	tutukiwi
*Thelymitra longifolia**	
*Thelymitra pauciflora**	slender sun orchid
*Winika cunninghamii**	

Grasses

*Deyeuxia avenoides**	
*Dichelachne crinita**	plume grass
*Echinopogon ovatus**	
*Microlaena stipoides**	pātītī, meadow rice grass
Oplismenus hirtellus subsp. *imbecillis**	
Poa anceps agg.*	
Poa sp. *	

*Rytidosperma gracile**	
*Rytidosperma clavatum**	
*Zoysia pauciflora**	

Sedges

Carex aff. *raoulii* ("raotest")*	
*Carex breviculmis**	
*Carex dissita**	
*Carex secta**	pūrei, makura, pūreirei, pūrekireki, pūkio
*Carex testacea**	
Cyperus ustulatus f. *ustulatus**	toetoe upoko-tangata
*Ficinia nodosa**	wīwī
*Isolepis cernua**	
*Isolepis habra**	
Lepidosperma laterale (Beadel 2004)*	
*Machaerina juncea**	
*Machaerina sinclairii**	toetoe tūhara, pēpepe
*Morelotia affinis**	
Schoenus apogon (Beadel 2004)*	
Schoenus tendo (Beadel 2004)*	wīwī
*Tetraria capillaris**	
*Uncinia uncinata**	kamu matau a Maui, kamu

Rushes

*Apodasmia similis**	oioi
*Juncus edgariae**	wi, wīwī
Luzula picta var. *picta**	

Monocot. herbs (other than orchids, grasses, sedges, and rushes)

*Astelia banksii**	kakaha, pūwharawhara, wharawhara, kōwharawhara
*Astelia hastatum**	kahakaha
*Astelia solandri**	kōwharawhara
*Dianella haematica**	
*Dianella nigra**	tūrutu
Lemna disperma (Beadel 2004)*	karearea
Phormium cookianum subsp. *hookeri* (P)	whararikī, mountain flax
Phormium tenax (P)	harakeke, flax

Composite herbs

*Euchiton audax**	
*Euchiton japonicus**	
*Lagenifera pumila**	papataniwhaniwha
Pseudognaphalium luteoalbum agg. *	pukatea
*Senecio hispidulus**	
Senecio lautus var. *lautus**	

Dicot. herbs (other than composites)

*Acaena novae-zelandiae**	piripiri
Atriplex hollowayi (Beadel *et al.* 2009 - historic record)*	Holloway's crystalwort
*Centella uniflora**	
*Dichondra repens**	Mercury Bay weed
Disphyma australe subsp. *australe**	horokaka
*Drosera auriculata**	sundew, wahu
*Galium trilobum**	
Geranium sp.*	
*Gonocarpus incanus**	piripiri
Haloragis erecta subsp. *erecta**	toatoa
*Hydrocotyle heteromeria**	
*Lobelia anceps**	punakura
*Oxalis exilis**	
*Oxalis rubens**	sand oxalis
*Peperomia urvilleana**	wharanui
*Ranunculus reflexus**	maruru
Samolus repens var. *repens**	māakoako
*Sarcocornia quinqueflora**	ureure, glasswort
*Selliera radicans**	remuremu, rekoreko, raumangu
*Solanum americanum**	raupeti
*Tetragonia tetragonioides**	kōkihi, rengamutu, rengarenga, tūtae-rimuroa
*Wahlenbergia violacea**	

NATURALISED AND EXOTIC SPECIES

Gymnosperms

Cupressus macrocarpa	macrocarpa
Pinus pinaster	maritime pine
Pinus radiata	radiata pine
Pinus sp.	

Monocot. trees and shrubs

Phoenix canariensis	Phoenix palm
Trachycarpus fortunei	Chinese windmill palm
Yucca gloriosa	yucca

Dicot. trees and shrubs

Acacia dealbata (Beadel 2004)	silver wattle
Acacia longifolia (Beadel 2004)	Sydney golden wattle
Acacia mearnsii	black wattle
Acacia sophorae (Beadel 2004)	coastal wattle
Acer negundo	box alder
Acer pseudoplatanus	sycamore maple

Ailanthus altissima	tree of heaven
Alnus glutinosa	common alder
Berberis glaucocarpa	barberry
Brachychiton acerifolius	Illawara flame tree
Buddleja davidii	buddleia
Casuarina sp.	sheoak
Chamaecytisus palmensis	tree lucerne
Chrysanthemoides monilifera	boneseed
Cotoneaster glaucophyllus	cotoneaster
Cotoneaster simonsii (Beadel 2004; Wilcox and Ecroyd 1984)	Khasia berry
Crataegus monogyna	hawthorn
Dendrobenthamia capitata	strawberry dogwood
Erica lusitanica	Spanish heath
Eriobotrya japonica	loquat
Eucalyptus sp.	eucalyptus
Euonymus japonicus	Japanese spindleberry
Gomphocarpus fruticosus	swan plant
Grevillea robusta	silky oak
Hakea salicifolia (Beadel 2004)	willow-leaved hakea
Hakea sericea (Beadel 2004)	prickly hakea
Jasminum mesnyi	primrose jasmine
Ligustrum lucidum	tree privet
Ligustrum sinense	Chinese privet
Lupinus arboreus (Beadel 2004)	lupin
Lycium ferocissimum	boxthorn
Melia azedarach	melia
Metrosideros kermadecensis	
Nerium oleander	oleander
Paraserianthes lophantha	brush wattle
Paulownia tomentosa	paulownia
Populus alba 'Nivea'	silver poplar
Populus nigra 'Italica'	Lombardy poplar
Populus sp.	poplar
Quercus ilex[1]	holm oak
Quercus robur	English oak
Rhamnus alaternus	Italian evergreen buckthorn
Rhaphiolepis umbellata	Sexton's bridge
Roldana petasitis[1]	velvet groundsel
Rosa rubiginosa	sweet briar
Rubus sp. (*R. fruticosus* agg.)	blackberry
Senecio angulatus	Cape ivy
Solanum mauritianum	woolly nightshade
Teline monspessulana	Montpellier broom
Teucrium fruticans	
Ulex europaeus	gorse

[1] Present just outside the project area.

Monocot. lianes

Asparagus asparagoides	smilax
Asparagus scandens	climbing asparagus

Dicot. lianes

Delairea odorata[1]	German ivy
Dipogon lignosus (Beadel 2004)	mile-a-minute
Hedera helix[1]	ivy
Lonicera japonica	Japanese honeysuckle
Passiflora edulis (Beadel 2004; Wilcox and Ecroyd 1984)	black passionfruit
Rumex sagittatus	climbing dock
Senecio angulatus	cape ivy
Vitis sp. (Beadel 2004)	

Grasses

Agrostis capillaris	browntop
Agrostis stolonifera	creeping bent
Aira caryophyllea	silver hairy grass
Anthoxanthum odoratum	sweet vernal
Aristida ramosa (Wilcox and Ecroyd 1984)	
Briza minor (Beadel 2004)	shivery grass
Bromus diandrus	ripgut brome
Cenchrus clandestinus	kikuyu grass
Cortaderia jubata (Beadel 2004)	purple pampas
Cortaderia selloana	pampas
Cynodon dactylon	Indian doab
Dactylis glomerata	cocksfoot
Ehrharta erecta	veldt grass
Holcus lanatus	Yorkshire fog
Lolium perenne	rye grass
Miscanthus nepalensis	Himalaya fairy grass
Paratrophis sp.	
Paspalum conjugatum (Beadel 2004)	
Paspalum dilatatum	paspalum
Poa annua	annual poa
Poa pratensis	Kentucky bluegrass
Schedonorus arundinaceus	tall fescue
Sporobolus africanus	ratstail
Stenotaphrum secundatum	buffalo grass
Vulpia myuros	vulpia hair grass

[1] Present just outside the project area.

Sedges

Carex divulsa	grey sedge
Cyperus congestus (Beadel 2004)	purple umbrella sedge
Cyperus eragrostis (Beadel 2004)	umbrella sedge
Isolepis sepulcralis	

Rushes

Juncus bufonius var. *bufonius*	toad rush

Monocot. herbs (other than orchids, grasses, sedges, and rushes)

Arum italicum[1]	Italian arum
Colocasia esculenta (Beadel 2004)	taro
Crocosmia ×crocosmiiflora	montbretia
Hedychium gardnerianum	kahili ginger, wild ginger
Ixia maculata (Beadel 2004)	ixia
Narcissus pseudonarcissus (Beadel 2004)	daffodil
Tradescantia fluminensis	tradescantia

Composite herbs

Arctotheca calendula	cape weed
Bellis perennis	lawn daisy
Cirsium arvense	California thistle
Cirsium vulgare	Scotch thistle
Conyza sumatrensis	broad-leaved fleabane
Crepis capillaris	hawksbeard
Erigeron karvinskianus	Mexican daisy
Gamochaeta calviceps	silky cudweed
Gamochaeta coarctata	purple cudweed
Hypochaeris radicata	catsear
Jacobaea vulgaris (Beadel 2004)	ragwort
Lactuca serriola	prickly lettuce
Leontodon taraxacoides	hawkbit
Leucanthemum vulgare	oxeye daisy
Mycelis muralis	wall lettuce
Senecio bipinnatisectus (Beadel 2004)	Australian fireweed
Senecio sylvaticus	wood groundsel
Sigesbeckia orientalis (Beadel 2004)	Indian weed, punawaru
Soliva sessilis (Beadel 2004)	Onehunga weed
Sonchus asper	prickly puha
Sonchus oleraceus	puha, sow thistle
Taraxacum officinale	dandelion

[1] Present just outside the project area.

Dicot. herbs (other than composites)

Acaena agnipila (Beadel 2004; Wilcox and Ecroyd 1984)	Australian sheep's burr
Acanthus mollis[1]	bear's breeches
Anagallis arvensis	scarlet pimpernel
Aphanes arvensis	parsley piert
Cerastium fontanum subsp. *vulgare*	mouse-ear chickweed
Dianthus armeria (Beadel 2004)	Deptford pink
Digitalis purpurea	foxglove
Dipsacus fullonum	wild teasel
Duchesnea indica	Indian strawberry
Epilobium ciliatum (Beadel 2004)	tall willow herb
Euphorbia peplus	milkweed
Foeniculum vulgare	fennel
Fumaria muralis	scrambling fumitory
Galium aparine	cleavers
Galium divaricatum	slender bedstraw
Geranium molle	dovesfoot cranesbill
Geranium robertianum	herb Robert
Gomphocarpus fruticosus	swan plant
Hypericum perforatum (Beadel 2004)	St John's wort
Impatiens sodenii	shrub balsam
Linum bienne (Beadel 2004)	pale flax
Lotus pedunculatus	lotus
Lotus suaveolens	hairy birdsfoot trefoil
Marrubium vulgare	horehound
Medicago arabica	spotted medick
Medicago nigra	bur medick
Modiola caroliniana	creeping mallow
Myosotis sylvatica	garden forget-me-not
Nasturtium officinale	watercress
Oenothera stricta	evening primrose
Ornithopus perpusillus (Beadel 2004)	wild seradella
Oxalis sp.	
Physalis peruviana (Beadel 2004)	cape gooseberry
Phytolacca octandra	inkweed
Plantago australis	swamp plantain
Plantago lanceolata	narrow-leaved plantain
Plantago major	broad-leaved plantain
Polycarpon tetraphyllum	allseed
Prunella vulgaris	selfheal
Ranunculus parviflorus	small-flowered buttercup
Ranunculus repens	creeping buttercup
Ranunculus sceleratus (Beadel 2004)	celery-leaved buttercup
Rumex acetosella	sheep's sorrel
Rumex obtusifolius	broad-leaved dock
Sagina procumbens	pearlwort
Silene gallica (Beadel 2004)	catchfly
Solanum chenopodioides	velvety nightshade
Solanum linnaeanum (Beadel 2004)	Apple of Sodom

Solanum marginatum (Beadel 2004)	white-edged nightshade
Solanum nigrum	black nightshade
Solanum tuberosum (Beadel 2004)	potato
Stellaria media	chickweed
Trifolium pratense	red clover
Trifolium repens	white clover
Tropaeolum majus[1]	garden nasturtium
Urtica dioca	stinging nettle
Verbascum thapsus	woolly mullein
Verbascum virgatum	moth mullein
Verbena bonariensis	purple-top
Veronica arvensis	field speedwell
Veronica persica	scrambling speedwell

[1] Present just outside of survey area.

INDIGENOUS SPECIES POTENTIALLY SUITABLE FOR PLANTING ON MAUAO

Reproduced from Wildland Consultants (2004)

Key

1 = Sheltered sites
2 = Salt spray zone
3 = Rocky outcrops at base of Mauao
4 = Gullies on sheltered side of Mauao
5 = Sand dunes (limited habitat available)
6 = Exposed faces

Gymnosperms

Dacrycarpus dacrydioides (1)	kahikatea
Dacrydium cupressinum (1)	rimu
Podocarpus totara (1)	totara
Prumnopitys ferruginea (1)	miro
Prumnopitys taxifolia (1)	mataī

Monocot. trees and shrubs

Cordyline australis (1,4)	tī kōuka, cabbage tree
Cordyline banksii (1)	tī ngahere, forest cabbage tree
Rhopalostylis sapida (4)	nīkau

Dicot. trees and shrubs

Alectryon excelsus var. *excelsus* (1)	tītoki
Aristotelia serrata (1)	makomako, wineberry
Beilschmiedia tawa (1)	tawa
Brachyglottis repanda s.s. (1)	rangiora
Carmichaelia australis (1)	makaka, maukoro
Carmichaelia williamsii (6)	
Carpodetus serratus (1)	putaputawētā
Coprosma acerosa (5)	
Coprosma acerosa × *C. repens* (3)	
Coprosma grandifolia (1)	kanono
Coprosma lucida (1)	glossy karamu
Coprosma repens	taupata
Coprosma robusta (1, 4)	karamū
Coprosma rhamnoides (1)	
Coriaria arborea var. *arborea* (1)	tutu
Corynocarpus laevigatus	karaka

Dodonea viscosa (1)	akeake
Dysoxylum spectabile (1)	kohekohe
Entelea arborescens (1)	whau
Fuchsia excorticata (1)	kōtukutuku
Fuchsia perscandens (1)	
Gaultheria antipoda (1)	tāwiniwini
Geniostoma ligustrifolium var. *ligustrifolium* (1)	hangehange
Griselinia lucida (1)	puka
Hebe stricta var. stricta	koromiko
Hedycarya arborea (1)	porokaiwhiri; pigeonwood
Knightia excelsa (1)	rewarewa
Kunzea robusta (1)	kānuka
Leptecophylla juniperina subsp. *juniperina* (1)	prickly mingimingi
Leucopogon fasciculatus (1)	mingimingi
Litsea calicaris (1)	mangeao
Melicytus novae-zelandiae	coastal māhoe
Melicytus ramiflorus subsp. *ramiflorus* (1)	māhoe
Metrosideros excelsa (1, 2, 6)	pōhutukawa
Myoporum laetum (1, 2)	ngaio
Myrsine australis (1)	māpou
Nestegis apetala (1)	
Olearia furfuracea (1)	akepiro
Olearia pachyphylla	
Olearia rani (1)	heketara
Pimelea villosa (5)	
Piper excelsum var. *excelsum* (1)	kawakawa
Pisonia brunoniana (1)	
Pittosporum crassifolium (1)	karo
Pittosporum tenuifolium subsp. *tenuifolium* (1)	kōhūhū
Pomaderis kumerahou (1)	
Pomaderris amoena (1)	
Pseudopanax arboreus var. *arboreus* (1)	whauwhaupaku, five finger
Pseudopanax crassifolius (1)	horoeka, lancewood
Pseudopanax crassifolius × *P. lessonii* (1)	
Pseudopanax lessonii (1)	houpara
Rhabdothamnus solandri (1)	taurepo
Schefflera digitata (1)	pate
Solanum aviculare var. *aviculare* (1)	poroporo
Vitex lucens (1)	pūriri
Weinmannia racemosa (1)	kāmahi

Monocot. lianes

Freycinetia banksii (1)	kiekie
Ripogonum scandens (1)	kareao, supplejack

Dicot. lianes

Calystegia soldanella (5)	panahi
Clematis cunninghamii (1)	ngākau-kiore

Clematis paniculata (1)	puawānanga
Metrosideros diffusa (1)	rātā
Metrosideros fulgens (1)	rātā
Metrosideros perforata (1)	aka
Muehlenbeckia complexa (5)	pōhuehue
Parsonsia capsularis (1)	akakiore
Parsonia heterophylla (1)	
Rubus australis (1)	
Rubus cissoides (1)	tātarāmoa
Rubus schmidelioides (1)	akatataramoa

Ferns

Asplenium oblongifolium	
Blechnum novae-zelandiaei	kiokio
Cyathea dealbata (1)	ponga
Cyathea medullaris (1)	mamaku
Dicksonia squarrosa (1)	whekī
Marratia salicina var. *salicina* (1,4)	para, kingfern

Grasses

Microlaena stipoides (6)	pātītī, meadow rice grass

Sedges

Ficinia nodosa (5)	wīwī
Ficinia spiralis (5)	pīngao

Monocot. herbs (other than orchids, grasses, sedges and rushes)

Arthropodium cirratum (1)	rengarenga
Astelia banksii (1,6)	kakaha
Libertia grandifolia (1)	mikoikoi
Phormium cookianum (1,2,6)	whararikī

Dicot. herbs (other than composites)

Euphorbia glauca (5)	
Lepidium oleraceum (5)	
Tetragonia tetragonioides (5)	kokihi

Relative Flammability of Indigenous Plant Species

The following material was obtained from a pamphlet produced by Forest Research in conjunction with the National Rural Fire Authority and the New Zealand Fire Service Commission. Only species suitable for planting on Mauao are listed here.

Flammability Classes

These flammability classes are intended as a guide only. They were derived from expert opinion, and represent a state-of-knowledge summary that will need to be refined in the light of future observations. Species flammability also varies as a result of genetic and environmental factors, so that the flammability of a particular species will depend on age and situation. For example, flammability may increase as a result of drought or other critical fire weather conditions, or mature vegetation could carry greater amounts of dead material, adding to the potential severity of any fire.

- *Low*

  Suitable for green breaks or defensible space, but when in the immediate vicinity of structures, there should be at least a 3-4 m break between the crowns to reduce fuel continuity.

  Low Flammability Species

Fuchsia excorticata	kōtukutuku
Pseudopanax crassifolius	horoeka, lancewood
Pseudopanax arboreus	five finger, whauwhaupaku
Coprosma robusta	karamū
Coprosma grandifolia	kanono
Geniostoma ligustrifolium	hangehange
Coprosma repens	taupata
Carpodetus serratus	putaputawētā
Corynocarpus laevigatus	karaka
Griselinia lucida	puka
Piper excelsum	kawakawa, peppertree
Solanum aviculare	poroporo

- *Low/Moderate*

  Not recommended for planting in green breaks. If planted in defensible space, elevated dead material and litter should be removed regularly, greater than 4 m should be left between tree crowns, and trees or shrubs in this category should not be within 10 m of structures.

  Low/Moderate Flammability Species

Hebe stricta	koromiko
Melicytus ramiflorus	māhoe
Aristotelia serrata	makomako, wineberry
Coriaria arborea	tutu
Myoporum laetum	ngaio
Pittosporum crassifolium	karo
Knightia excelsa	rewarewa
Plagianthus regius	mānatu, ribbonwood
Weinmannia racemosa	kāmahi

- *Moderate*

  Most of these species produce heavy accumulations of flammable litter and elevated dead material, and/or have flammable green foliage. Not recommended for green breaks or for planting in defensible space.

  Moderate Flammability Species

Beilschmiedia tawa	tawa
Cordyline australis	tī kōuka, cabbage tree
Pittosporum tenuifolium	kōhūhū
Dacrydium cupressinum	rimu
Phormium spp.	flax
Dacrycarpus dacrydioides	kahikatea, white pine

- *Moderate/High*

  Species may have flammable green foliage and/or produce high levels of litter and elevated fuel. Not recommended for green breaks or defensible space.

  Moderate/High Flammability Species

Podocarpus totara	tōtara
Dodonaea viscosa	akeake
Cyathea and *Dicksonia* spp.	tree ferns
Leucopogon fasciculatus	mingimingi

- *High*

  Burn readily at Low/Moderate forest fire danger conditions.

  High Flammability Species

Kunzea robusta	kānuka
Leptospermum scoparium	mānuka

FAUNA SPECIES RECORDED ON MAUAO

Reproduced from Wildland Consultants (2015)

Key

1 = Recorded prior to 2014 field survey.
2 = Recorded during the 2014 field survey.
3 = Recorded in Wildland Consultants (2004).
4 = Recorded in Wildland Consultants (2008).

MAMMALS

Indigenous

Arctocephalus forsteri (1)	kekeno; New Zealand fur seal

Introduced

Erinaceus europaeus (1)	European hedgehog
Felis catus (1)	cat
Mustela erminea (1)	stoat
Mustela furo (1)	ferret
Mustela nivalis vulgaris (1)	weasel
Oryctolagus cuniculus (2)	European rabbit
Rattus norvegicus (1)	pouhawaiki; Norway rat
Rattus rattus (1)	ship rat
Trichosurus vulpecula (1)	brushtail possum

BIRDS

Indigenous

Anthus novaeseelandiae (3)	New Zealand pipit
Chrysococcyx lucidus lucidus (3)	pīpīwharauroa; shining cuckoo
Gerygone igata (2)	riroriro; grey warbler
Egretta sacra sacra (3)	matuku-moana; reef heron
Eudyptula minor iredalei (1)	kororā; northern little blue penguin
Falco novaeseelandiae (3)	kārearea; New Zealand falcon
Hirundo neoxena neoxena (2)	welcome swallow
Larus dominicanus dominicanus (2)	karoro; southern black-backed gull
Nestor meridionalis septentrionalis (3)	North Island kākā
Petroica macrocephala (2)	tomtit
Phalacrocorax varius varius (2)	kāruhiruhi; pied shag
Porphyrio melanotus melanotus (2)	pūkeko
Prosthemadera novaeseelandiae (2)	tūī

Pterodroma macroptera gouldi (1)	ōi, grey-faced petrel
Rhipidura fuliginosa (2)	pīwakawaka, fantail
Sterna striata striata (3)	tara; white-fronted tern
Tadorna variegata (2)	pūtangitangi; pari; paradise shelduck
Todiramphus sanctus vagans (2)	kōtare; sacred kingfisher; New Zealand kingfisher
Vanellus miles novaehollandiae (2)	spur-winged plover

Introduced

Acridotheres tristis (2)	common myna
Anas platyrhynchos platyrhynchos (2)	mallard
Callipepla californica bunnescens	California quail
Carduelis carduelis britannica (2)	European goldfinch
Columba livia (2)	rock pigeon
Fringilla coelebs (2)	chaffinch
Gymnorhina tibicen (2)	Australian magpie
Passer domesticus domesticus (2)	house sparrow
Phasianus colchicus (2)	common pheasant
Platycercus eximius (2)	eastern rosella
Sturnus vulgaris vulgaris (2)	common starling
Turdus merula merula (2)	Eurasian blackbird
Turdus philomelos (2)	song thrush

HERPETOFAUNA

Indigenous

Oligosoma smithii (4)	shore skink

TANGATA WHENUA ISSUES - FROM THE 1998 MANAGEMENT PLAN

Reproduced from Wildland Consultants (2004)

NGĀI TERANGI/NGĀTI PUKENGA, FISHER 1995

Tangata whenua issues report

Mana affected by vesting of maunga in the Crown.

Vision Statement

"Our vision therefore is one that sees the mana of the tangata whenua of Tauranga Moana restored by the return of Mauao to tangata whenua ownership. It is one that sees Mauao continuing to meet the spiritual and cultural needs of the tangata whenua, as well as the recreational and amenity needs of the wider Tauranga community, but without compromising the cultural values of the tangata whenua. Our vision is also one that sees the Tauranga community valuing Mauao as a taonga of exceptional significance to the region and working to actively promote and protect that status" (p4)

Issues

- Claims by tangata whenua to the ownership of Mauao.
- The future use of, and access to, Mauao - should continue to meet needs.
- The practical application of partnership in the management of Mauao - tangata whenua must be actively involved in all levels of decision-making.
- The need to understand and promote the unique and special relationship that tangata whenua have with Mauao - this special relationship must be encapsulated in the management plan, and in the actual management of Mauao.
- Respecting the cultural heritage value of Mauao to the tangata whenua of Tauranga Moana.
- Recognition of the amenity/commodity value of Mauao; the tensions that may exist between those values and cultural heritage values; and managing those tensions.
- The need to preserve and enhance the cultural heritage, amenity/commodity, and environmental/conservation values of Mauao.
- There must be a commitment to the management of Mauao.

- Management goals and objectives must be realistic and workable and must seek to give effect to the aspirations of tangata whenua.

Discussion

Management Plan should be "portable" across different administration and ownership regimes.

The principle of partnership extends to the practical application of the management functions, including decision-making, in respect of the maunga. The inclusion of the tangata whenua of Tauranga Moana as a legitimate and active partner in the management of Mauao is one simple but powerful acknowledgment of the special affinities of Ngāi Te Rangi, Ngāti Ranginui, and Ngāti Pūkenga with Mauao (p8).

"…Tangata whenua do not consider that they should be regarded as one of a number of different sections of the public with an interest in Mauao" (p8) - RMA provisions cited.

"For both tangata whenua it is essential that the wider Tauranga community understands and appreciates the deep attachment that the tangata whenua of Tauranga Moana have with Mauao. The maunga is steeped in legend; it occupies a very significant place in the tribal histories of the tangata whenua, and is one of the principal ways by which tribal identity and rohe is confirmed." (p9)

- Favour information pavilion at the base of Mauao as a way of conveying information to the general public. Not a tourist information centre.

- No signage drawing attention to archaeological features - fear of desecration.

- Protection of shell middens from damage.

- Any current or proposed amenity/commodity activities that put at risk the heritage and conservation values of Mauao must be discontinued (p11).

- Management and implementation goals and objectives must be realistic and workable, and must seek to give effect to the aspirations of the tangata whenua. Ngāi Te Rangi and Ngāti Pūkenga believe that, in general, these aspirations are in conflict with those of the wider Tauranga community if we accept that one of the underpinning principles to the management of Mauao is preservation and enhancement. (p11).

Recommendations on Issues

"… Ngai Te Rangi and Ngāti Pūkenga believe that restoration of the mana of the tangata whenua can be achieved in part by the TCC actively involving the tangata whenua of Tauranga Moana in the management of Mauao at all levels." (p11)

Desired structure - joint Mauao Management Committee - 6 tangata whenua /4 TCC.

- Role to oversee implementation of the Mauao Management Plan.

- Carry out specific management functions (including decision-making, control of activities).

- Make recommendations to TCC.

- Information pavilion at the base of Mauao - hand out information, self-guiding or guided walking tours.

- No signage on archaeological sites.

- Conservation of middens.

- Archaeological surveys of Mauao are not favoured. However, where work is to be undertaken to mitigate damage to existing sites, or where maintenance work of other than a routine or minor nature is to be undertaken (e.g. excavating for carriageway repairs), an archaeological assessment and report is to be carried out. For major programmes (e.g. flora/fauna reinstatement and vegetation removal) a cultural assessment of appropriate sections of Mauao must be undertaken in conjunction with the tangata whenua." (p15)

"It is accepted that the retention of the existing grassed (pasture) areas are appropriate in terms of management. Exotic vegetation in these areas should, however, be removed and replaced with native vegetation."

Restoration of puna required.

Vehicle access to the summit or around Mauao is to be prohibited except for approved maintenance and other approved purposes. The objective here is that Mauao is for pedestrian traffic only. Toilets and refreshment facilities, or any other structures, are to be prohibited on Mauao. The exception is any structure that informs and enhances the cultural and spiritual sanctity of the maunga.

Ngai Te Rangi and Ngāti Pūkenga would like to have a tourism management plan for Mauao developed by Council in partnership with the tangata whenua of Tauranga Moana. Properly maintained walking tracks, observation points, and information on areas of interest will act as an appropriate means of pedestrian management.

"Mauao is tired and has been neglected. As a taonga it needs to be cared for."

NGĀTI RANGINUI - PIAHANA 1995

Tangata whenua Issues Report

The following issues are representative of the concerns of Ranginui.

- Recognition of the status and position of Te Waka Takitimu and the associated heritage and cultural rights of Ngāti Ranginui as tangata whenua.

- Restoration of Mauao consistent with its mana.

- The extent and nature of management rules and functions transferred to tangata whenua.

- The protection of historical sites.

- The reinstatement of Mauao as a historical reserve.

- The restoration of cultural and heritage relationships and give practical effect to use rights.

"To state: "Ko Mauao te Maunga" is tantamount to "I am Mauao" - that the essential ancestral aspects of an individual's identity is inextricably tied to Mauao." (p2)

"… the amenity value of a calm, peaceful, place of retreat, reminisce and reflection should be promoted." (p3)

Reserves Act does not meet or facilitate tangata whenua aspirations to exercise greater authority and control over Mauao.

The environment is sufficiently volatile to act as an obstacle to joint participation and management of Mauao (relationship between tangata whenua due to competing Wai claims for Mauao).

Reinstate Maori nomenclature.

Ranginui, for example, might have the responsibility for restoring and enhancing the summit area, with the opportunity to negotiate agreements to develop concepts and complete work in that area. Tangata whenua seek to re-establish natural relationships with Mauao based on their culture.

Tangata whenua envisage the removal of all exotic vegetation on Mauao and the reinstatement of native vegetation with the aim of restoring the mountain to its pre-European state. This is with the exception of areas of pasture which tangata whenua accept are appropriate in terms of current management. (Ngāti Ranginui wants a programme of eradication of exotics where they threaten or inhibit re-colonisation of indigenous vegetation). A programme of restoration and beautification would include the creation of a native forest reserve as a conservation, recreational, and educational feature. This programme of restoration would focus on the existing forest area on the upper slopes extending to other areas where appropriate to soften the delineation between forest and pasture areas.

As part of the restoration programme, Ngāti Ranginui see the opportunity to establish new sites of cultural significance with specific protections and established work programmes. These sites would come to develop their own identity and act as mnemonics to hapū history, identity, and events. These sites may include the following:

- Wāhi Tiraha - places set aside including the dominant stands of pōhutukawa, ponga, rewarewa, and areas with specimens of rakau.

- Wāhi Rongonui - re-established coastal groves of trees and shrubs including pūriri, rata, tarata, tī kōuka, raukawa, kohurangi, koromiko, rangiora, akiraho tanguru, harakeke, and ngaio.
- Wāhi Ngawari – "living reserves" where families are able to be 'in the embrace of the mountain'. These areas may include the foreshore area from Stoney Point to Pilot bay or a re-developed camping ground.
- Wāhi Whakatau – the summit. Ngāti Ranginui would like this to remain as an open space with restoration of surfaces dissected by vehicle road way.
- Taumata – lookouts and vantage points.

Ngāti Ranginui would like to establish and enhance the flora of Mauao consistent with local coastal habitats as part of a restoration plan aimed at enhancing plant diversity and preferably incorporate plantings of the following species:

Koromiko, karo, kiekie, horoeka, tete a weka, kohekohe, kowharawhara, kaikōmako, harakeke, raukawa, tanguru, nikau, puka, tītoki, tōwai, maire, akiraho, neinei, rata, māpou, tūrepo, māhoe, pūriri, ngaio, kawakawa, rangiora, wharangi, tawapou, and puahou.

Other specific recommendations from Ngāti Ranginui are as follows:

- That the lower north and eastern face around the fenceline on the south face to a level between 40-50 m is planted with coastal shrubs and herbs.
- That pōhutukawa should predominate within the lower coastal fringes (to 20-30 m) with the long-term effect on an avenue of pōhutukawa.
- That the two gullies immediately above the camping ground to the seaward side of the fenceline aligned with Ocean Beach Road are forested to create 'fingers' of coastal forest extending to the existing tree line.
- That open spaces on the inner harbour side below Summit Road are maintained and that gully to the Pilot Bay side of Kinonui's pa is planted.
- That the karaka groves above the old stone jetty and Pilot wharf are extended.
- The progressive removal of exotic vegetation from the area of trees adjacent to Stoney Point and the extension of the stands of karaka with the inclusion of pūriri.
- The restoration of the gully immediately above Pilot Bay wharf to the summit with a view to planting a more diverse range of trees and shrubs.
- The screening of the reservoir and removal of a line of trees immediately below it.
- The establishment of wide fire breaks where gorse and scrub butts up to native stands.

It is anticipated that a programme of upgrading walkways would be developed where walkways would complement the natural features of Mauao and avoid 'scarring' and where existing 'scarring' is mitigated with plantings of low to medium height indigenous vegetation. Ngai Te Rangi and Ngāti Pūkenga oppose the development of new walkways with the exception of those that are considered necessary in terms of management. Ngāti Ranginui would like to see Summit Road downgraded to a pedestrian path with plantings along the roadside on the lower slopes to consolidate the edge. Ngāti Ranginui have also suggested that paths are closed during fires season to reduce fire hazards.

Tangata whenua also foresee the reinstatement of degraded waterways and springs in conjunction with vegetation reinstatement and Ngāti Ranginui envisage the creation of ponding areas to enable collection and use.

It is expected that the management plan would include actions to contain and then eliminate animal pests including possums, rabbits, and feral cats from Mauao. Tangata whenua would also like to see the elimination of pest plants from Mauao; however anticipate that the removal of gorse may need to be phased over a longer period in view of its usefulness as a nurse crop for native seedlings. Removal of pest plants from the upper slopes may also need to be phased over a longer period.

It is anticipated that the management plan will preserve and enhance the outstanding environmental and conservation values of Mauao with the long-term view of the re-instatement of the Historical Reserve status.

Historically, policy methodology has focussed on the perceived needs of tangata whenua (to have their history, settlement story told) rather than the expressed need (to regain authority, mana and an intrinsic relationship with their ancestral mountain) (p.13).

”The summit requires interpretative work, and restoration of surfaces dissected at the summit by vehicle roadway. This should be maintained as an open space, utilising the environment for natural shade and shelter from the wind.” (p14)

Also favour information pavilion idea.

- Pouwhenua and tuahu.
- No further archaeological excavations.
- Protect middens.
- Remove bath water troughs from near Kinonui Pa.
- Downgrade roadways.

MODIFICATION OF ARCHAEOLOGICAL SITES

Any modification of archaeological sites, regardless of scale, requires formal approval from Heritage New Zealand who are governed by the Heritage New Zealand Pouhere Taonga Act 2014. The following selected sections set out legal requirements and information about the process to be followed to obtain an appropriate consent.

HERITAGE NEW ZEALAND POUHERE TAONGA ACT 2014

Part 3

Protection of places and areas of historical and cultural value

Subpart 2 - Archaeological sites

Overarching protection for archaeological sites

42 - Archaeological sites not to be modified or destroyed

(1) Unless an authority is granted under section 48, 56(1)(b), or 62 in respect of an archaeological site, no person may modify or destroy, or cause to be modified or destroyed, the whole or any part of that site if that person knows, or ought reasonably to have suspected, that the site is an archaeological site.

(2) Subsection (1) applies whether or not an archaeological site is a recorded archaeological site or is entered on -

(a) the New Zealand Heritage List/Rārangi Kōrero under subpart 1 of Part 4; or
(b) the Landmarks list made under subpart 2 of Part 4.

(3) Despite subsection (1), an authority is not required to permit work on a building that is an archaeological site unless the work will result in the demolition of the whole of the building.

Applications

44 - Applications for authorities

The following applications may be made by any person to Heritage New Zealand Pouhere Taonga:

(a) an application for an authority to undertake an activity that will or may modify or destroy the whole or any part of any archaeological site or sites within a specified area of land, whether or not a site is a recorded archaeological site or is entered on the New Zealand Heritage List/Rārangi Kōrero or on the Landmarks list:

(b) an application for an authority to undertake an activity that will or may modify or destroy a recorded archaeological site or sites, if the effects of that activity on a site or sites will be no more than minor, as assessed in accordance with section 47(5):

(c) an application for an authority to conduct a scientific investigation of an archaeological site or sites within a specified area of land, whether or not a site is a recorded archaeological site or is entered on the New Zealand Heritage List/Rārangi Kōrero or on the Landmarks list.

45 - Application for approval of person to carry out activity

(1) At any time before an activity in relation to an archaeological site is carried out under an authority, the person applying for the authority (or the holder of an authority) must apply to Heritage New Zealand Pouhere Taonga for approval of any person nominated to undertake the activity under an authority.

(2) A person must not be approved to carry out an activity under subsection (1) unless Heritage New Zealand Pouhere Taonga is satisfied that the person -

(a) has sufficient skill and competency, is fully capable of ensuring that the proposed activity is carried out to the satisfaction of Heritage New Zealand Pouhere Taonga, and has access to appropriate institutional and professional support and resources; and
(b) in the case of a site of interest to Māori:
(i) has the requisite competencies for recognising and respecting Māori values; and
(ii) has access to appropriate cultural support.

(3) If it is necessary at any time, and for any reason, to replace the person approved to carry out an activity under an authority, the holder of the authority must, by written application to Heritage New Zealand Pouhere Taonga, seek approval for another nominated person to carry out that activity.

(4) Heritage New Zealand Pouhere Taonga must -

(a) determine an application under subsection (1) or (3) in accordance with this section not later than 10 working days after receiving it; and
(b) notify the applicant, and any other person directly affected, of the determination as soon as practicable.

(5) Despite subsection (4)(a), if an application for approval under this section is made concurrently with an application under Section 44, the determination and notification of both applications must be made within the relevant time period specified in Section 50.

GLOSSARY OF PLANT NAMES

akatataramoa	*Rubus schmidelioides*
akeake	*Dodonea viscosa*
akepiro	*Olearia furfuracea*
barberry	*Berberis glaucocarpa*
bead tree	*Melia azedarack*
bidibid	*Acaena novae-zealandiae*
black nightshade	*Solanum nigrum*
blackberry	*Rubus fruticosus* agg.
brush wattle	*Albizia lophantha*
catsear	*Hypochoeris radicata*
cleavers	*Galium aparine*
climbing asparagus	*Asparagus scandens*
cocksfoot	*Dactylis glomerata*
cotoneaster	*Cotoneaster glaucophyllus* f. *serotina*
eucalyptus	*Eucalyptus* sp.
fleabane	*Conyza sumatrensis*
gorse	*Ulex europeaus*
harakeke	*Phormium tenax*
hangehange	*Geniostoma rupestre* var. *ligustrifolium*
hawthorn	*Crataegus monogyna*
houhere	*Hoheria populnea*
houpara	*Pseudopanax lessonii*
huruhuruwhenua	*Asplenium oblongifolium*
inkweed	*Phytolacca octandra*
Japanese honeysuckle	*Lonicera japonica*
kahikatea	*Dacrycarpus dacrydioides*
kakaha	*Astelia banksii*
kānuka	*Kunzea robusta*
karaka	*Corynocarpus laevigatus*
karamu	*Coprosma robusta*
karo	*Pittosporum crassifolium*
kawakawa	*Piper excelsum* var. *excelsum*
kikuyu grass	*Cenchrus clandestinus*
kiokio	*Blechnum novae-zelandiae*
koromiko	*Hebe stricta*
kōwaowao	*Phymatosorus pustulatus*
Lombardy poplar	*Populus canadensis*
macrocarpa	*Cupressus macrocarpa*
māhoe	*Melicytus ramiflorus* subsp. *ramiflorus*
mamaku	*Cyathea medullaris*
mānuka	*Leptospermum scoparium*
māpou	*Myrsine australis*
mingimingi	*Leucopogon fasciculatus*
ngaio	*Myoporum laetum*

oioi	*Leptocarpus similis*
pampas	*Cortaderia selloana*
paspalum	*Paspalum distichum*
paulownia	*Paulownia tomentosa*
phoenix palm	*Phoenix canariensis*
pōhuehue	*Muehlenbeckia complexa*
pōhutukawa	*Metrosideros excelsa*
ponga	*Cyathea dealbata*
poplar	*Populus* sp.
pukupuku	*Blechnum parrisiae*
pūniu	*Polystichum neozelandicum* subsp. *neozelandicum*
purpletop	*Verbena bonariensis*
radiata pine	*Pinus radiata*
rangiora	*Brachyglottis repanda*
rārahu	bracken; *Pteridium esculentum*
ratstail	*Sporobolus africanus*
rewarewa	*Knightia excelsa*
Scotch thistle	*Cirsium vulgare*
silky oak	*Grevillea robusta*
similax	*Asparagus asparagoides*
Spanish heath	*Erica lusitanica*
Sycamore	*Acer pseudoplatanus*
tall fescue	*Schedonorus arundinaceus*
tarata	*Pittosporum eugenioides,*
taupata	*Coprosma repens*
tūrepo	*Rhabdothamnus solandri*
tōtara	*Podocarpus totara*
tree of heaven	*Ailanthus altissima*
turawera	*Pteris tremula*
tūrutu	*Dianella nigra*
whau	*Entelea arborescens*
whauwhaupaku	*Pseudopanax arboreus*
woolly mullein	*Verbascum thapsus*
woolly nightshade	*Solanum mauritianum*

APPENDIX 11

GLOSSARY OF MĀORI WORDS USED IN THIS PLAN

All translations have been derived from the Māori Dictionary Online (http://www.maoridictionary.co.nz/)

Māori	English
Hapū	Subtribe
Iwi	Tribe
Kaitiaki	Guardian
Kaumātua	Elder
Kororā	Blue penguin
Korowai	Cloak
Mana	Prestige
Marae atea	Courtyard, public forum - open area
Mauao	Mount Maunganui
Maunga	Mountain
Mauri	Special nature
Ngā Poutiriao o Mauao	Guardians of Mauao; Joint administration board including the four iwi of Tauranga Moana and Tauranga City Council
Ōi	Grey-faced petrel
Pā	Fortified village
Pouwhenua	Post marker of ownership
Puna	Water spring
Purakau	Story
Pūrākau	Legends
Rāhui	To put in place a temporary prohibition
Rakau	tree, stick
Rangatiratanga	Chieftainship, right to exercise authority
Rongonui	Well known
Tangata whenua	Local people, hosts, indigenous people
Taonga	Treasure, anything prized
Tapu	Scared
Tauparapara	Speeches
Te Taumata o Mauao	The summit of Mauao
Tikanga	Tradition
Tohunga	Skilled person, chosen expert
Tūāhu	Scared place
Tūāhu	Sacred place for ritual practices by a tohunga
Wāhi tapu	Sacred place, sacred site
Waiata	Song
Whakataukī	Proverb
Whānau	Family
Whāriki	To cover with a mat, floor covering, ground cover
Whenua	Land

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