

Key Native Ecosystem Operational Plan for Porirua Western Forest

2022-2027



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1. Purpose

The purpose of the five-year Key Native Ecosystem (KNE) Operational Plan for Porirua Western Forest KNE site is to:

- Identify the parties involved
- Summarise the ecological values and identify the threats to those values
- Outline the vision and objectives to guide management decision-making
- Describe operational activities to improve ecological condition (eg, ecological weed control) that will be undertaken, who will undertake the activities and the allocated budget

KNE Operational Plans are reviewed every five years to ensure the activities undertaken to protect and restore the KNE site are informed by experience and improved knowledge about the site.

This KNE Operational Plan is aligned to key policy documents that are outlined below (in Section 2).

2. Policy Context

Under the Resource Management Act 1991 (RMA)¹ Regional Councils have responsibility for maintaining indigenous biodiversity, as well as protecting significant vegetation and habitats of threatened species.

The KNE programme funding is allocated for under The Greater Wellington Long Term Plan (2021-2031)² and is managed in accordance with The Greater Wellington Biodiversity Strategy³ that sets a framework for how Greater Wellington protects and manages biodiversity in the Wellington region. Goal One of the Biodiversity Strategy - *Areas of high biodiversity value are protected or restored* - drives the delivery of the KNE Programme.

Other important drivers for the KNE programme include the Proposed Natural Resources Plan⁴ and the Regional Pest Management Plan 2019-2039⁵.

3. The Key Native Ecosystem Programme

The KNE Programme is a non-regulatory programme. The programme seeks to protect some of the best examples of original (pre-human) ecosystem types in the Wellington region. Sites with the highest biodiversity values have been identified and prioritised for management.

KNE sites are managed in accordance with five-year KNE plans prepared by Greater Wellington’s Biodiversity department. Greater Wellington works with the landowners, mana whenua and other operational delivery providers to achieve mutually beneficial goals.

KNE sites can be located on private or publicly owned land. Any work undertaken on private land as part of this programme, it is at the discretion of landowners, and their involvement in the programme is entirely voluntary. Involvement may just mean allowing work to be undertaken on that land. Land managed by the Department of Conservation (DOC) is generally excluded from this programme.

Sites are identified as of high biodiversity value for the purposes of the KNE Programme by applying the four ecological significance criteria described below.

Representativeness	Rarity/ distinctiveness	Diversity	Ecological context
The extent to which ecosystems and habitats represent those that were once typical in the region but are no longer common place	Whether ecosystems contain Threatened/At Risk species, or species at their geographic limit, or whether rare or uncommon ecosystems are present	The levels of natural ecosystem diversity present, ie, two or more original ecosystem types present	Whether the site provides important core habitat, has high species diversity, or includes an ecosystem identified as a national priority for protection

A site must be identified as ecologically significant using the above criteria and be considered “sustainable” for management in order to be considered for inclusion in the KNE Programme. “Sustainable” for the purposes of the KNE Programme is defined as: a site where the key ecological processes remain intact or continue to influence the site and resilience of the ecosystem is likely under some realistic level of management.

4. Porirua Western Forest Key Native Ecosystem site

The Porirua Western Forest KNE site (315 ha) is located immediately west of the Porirua City centre and approximately 1 km inland from the coastline (see Appendix 1, Map 1).

The KNE site contains the largest remnant of indigenous forest in the Porirua City area⁶, comprising coastal and lowland broadleaved-podocarp forest with advanced regenerating scrub across series of ridges and valleys.

The KNE site supports a high diversity of indigenous flora and fauna species, including more than 180 native vegetation species^{7,8} and several species of conservation concern. The KNE site is surrounded by urban and industrial areas to the east and farmland to the west but is located in close proximity to several other important forest, wetland and coastal sites making it an important ecological site within the wider landscape context for indigenous wildlife.

5. Parties involved

There are many organisations, groups and individuals that play important roles in the care of the KNE site.

5.1. Landowners/Land Manager

The Porirua Western Forest KNE site has both private and public landowners:

- Porirua City Council (PCC) owns and manages the majority of the KNE site (~261 ha). This land is gazetted as a Scenic 'A' Reserve under the Reserves Act 1977 and it is managed in accordance with PCC's Porirua City Reserves Management Plan⁹ which provides for and ensures the maintenance, protection, preservation and enjoyment of heritage, natural and recreation values
- Pikarere Farm, a privately run sheep station, own the south-western arm of the KNE site (~49 ha)
- The Department of Conservation (DOC) owns the Raiha Street Conservation Area (~3ha) in the south-eastern most corner of the KNE
- The Crown, owns a very small area (~0.5 ha) toward the northern end of the KNE site

Land ownership boundaries are shown in Appendix 1, Map 2.

5.2. Operational delivery

Within Greater Wellington, three departments are responsible for delivering the Porirua Western Forest KNE operational plan.

- The Biodiversity department is the overarching lead department for Greater Wellington on the longer term planning and coordination of biodiversity management activities and advice within the KNE site. The Biodiversity department's KNE programme budget funds the Biosecurity and Environmental Science departments to coordinate and carry out pest control and monitoring activities.
- The Biosecurity department coordinates and implements ecological weed and pest animal control measures at the KNE site.
- The Environmental Science department coordinates small mammal monitoring.

PCC delivers and provides funding towards biodiversity management activities within the KNE site on PCC owned land in accordance with the Porirua City Reserves Management Plan¹⁰ and the Proposed Porirua District Plan¹¹.

5.3. Mana whenua partners

The Porirua Western Forest KNE site area is significant to Ngāti Toa Rangātira, who are mana whenua partners with Greater Wellington.

The area has been identified under the Proposed Natural Resources Plan (PNRP)¹² as important culturally with particular reference to freshwater (wai Māori) recognising that

these are areas where mana whenua lived and practiced wāhi tapu, urupā, wāhi maumahara, wai ora, kai awa and kāinga (see table 1).

Greater Wellington is committed to identifying ways in which kaitiakitanga can be strengthened by exploring opportunities on how mana whenua partners wish to be involved in the KNE plan development or operational delivery of the KNE site.

Table 1: Mana whenua sites of significance in Porirua Western Forest KNE site¹³

Sites of significance	Mana whenua values
Schedule C3: Takapūwāhia Stream	wāhi tapu, urupā, wāhi tūpuna, wāhi maumahara, kāinga, marae, wai ora, wai māori, marae, kai awa, nohoanga, taunga waka, rongoā, puna raranga, tohu whenua

6. Ecological values

This section describes the various ecological components and attributes that make the KNE site important. These factors determine the site's value at a regional scale and how managing it contributes to the maintenance of regional biodiversity.

6.1. Ecological designations

Table 2, below, lists ecological designations at all or part of the Porirua Western Forest KNE site.

Table 2: Designations at the Porirua Western Forest KNE site

Designation level	Type of designation
National	<p>Parts of the Porirua Western Forest KNE site are designated as a Scenic 'A' Reserve under the Scenic Reserve New Zealand Gazette 1994:</p> <ul style="list-style-type: none"> • 146099: Porirua Scenic Reserve <p>Part of the Porirua Western Forest KNE site has been identified by DOC as a Designated Ecological Site (See Appendix 1, Map 3):</p> <ul style="list-style-type: none"> • 367: Elsdon Bush (301.03 ha) <p>Part of the Porirua Western Forest KNE site is legally protected by a DOC Stewardship Area under the Conservation Act 1987 (See Appendix 1, Map 3):</p> <ul style="list-style-type: none"> • R27005: Raiha Street Conservation Area (5.53 ha)
Regional	<p>Parts of the Porirua Western Forest KNE site are scheduled under Greater Wellington's proposed Natural Resources Plan (PNRP)¹⁴ as:</p> <ul style="list-style-type: none"> • River with significant indigenous ecosystems - Habitat for indigenous fish species of conservation interest: Makara Stream and all tributaries (Schedule F1)
District	<p>Part of the Porirua Western Forest KNE has been identified by PCC as a Significant Natural Area. It is listed in the Proposed Porirua District Plan¹⁵ as:</p> <ul style="list-style-type: none"> • SNA130: Porirua Scenic Reserve (329.23 ha)

6.2. Ecological significance

The Porirua Western Forest KNE site is considered to be of regional importance because:

- It contains highly **representative** ecosystems that were once typical or commonplace in the region
- It contains ecological features that are **rare or distinctive** in the region
- It contains high levels of ecosystem **diversity**, with several ecosystem types represented within the KNE site boundary, including several naturally uncommon ecosystems
- Its **ecological context** is valuable at the landscape scale as it contains a variety of inter-connected habitats and, provides core/seasonal habitat for threatened indigenous plant and animal species within the KNE site

Representativeness

The Singers and Rogers¹⁶ classification of pre-human forest vegetation indicates the KNE site would likely have comprised of two ecosystem types. These dominant ecosystem types would have included tawa, kāmahī, and podocarp forest (MF7) covering the majority of the KNE site (195.8 ha) and kohekohe, tawa forest (MF6) comprising the eastern-most edge (81.4 ha).

The majority of the KNE site is still representative of these original ecosystem types (see Appendix 1, Map 4), with some parts in a modified and regenerating condition having experienced selective logging, hunting and clearances. The MF6 and MF7 forest ecosystem types present are considered regionally threatened ecosystems with only 16% and 22% respectively of their original extent remaining in the Wellington region¹⁷.

The Threatened Environment Classification system¹⁸ indicates that the majority of the KNE site is classified as At Risk as there is only 20-30% native vegetation remaining of these types of land environments in New Zealand. Some very small fringe areas of the KNE site are classified as Acutely Threatened (2.8 ha) and Chronically Threatened (9.4 ha), and a small portion is classified as Less Reduced and Better Protected (2.6 ha).

Rarity/distinctiveness

The Porirua Western Forest KNE site contains the largest remnant of indigenous forest in Porirua City¹⁹. New Zealand's national threat classification system²⁰ lists many nationally 'Threatened' or 'At Risk' plant, bird, fish and lizard species within the KNE site. Several species have also been listed as regionally threatened. Appendix 2 and 3 contain lists of nationally and regionally threatened species found within the KNE site.

Diversity

The KNE site contains a variety of habitat types incorporating areas of coastal, semi-coastal and lowland broadleaved-podocarp forest and native regenerating scrub at a range of successional stages. Together these varied habitat types and the transitional ecotones that exist between them form the best representative example of an altitudinal vegetation sequence in the Wellington Ecological District²¹. The site supports a high diversity of flora with more than 180 native vegetation species, including podocarp species of local interest, more than 60 species of fern, and 14 species of orchid^{22,23}.

Ecological context

The KNE site is located within 5 km of several important ecological sites such as Te Awarua-o-Porirua Harbour, Mana Island Scenic Reserve, Whitireia Coast KNE site and Taupō Swamp Complex KNE site. Together these sites form an important network of habitat linkages within the wider ecological landscape, enabling native birds to forage, breed and disperse throughout the local area. The site also provides suitable refuges for several invertebrate and lizard species that require mature forest habitat.

6.3. Ecological features

The Porirua Western Forest KNE site is located within the Wellington Ecological District²⁴ which is characterised by steep, strongly faulted hills and ranges with typically warm summers and mild winters. The climate is often windy with westerly to north-westerly

winds prevailing with frequent gales and an annual rainfall ranging between 900-1400 mm²⁵.

Vegetation communities and plants

The Porirua Western Forest KNE site comprises a mosaic of old-growth coastal and lowland broadleaved-podocarp forest, regenerating forest and scrub as well as shrubland which all support a high diversity of flora and fauna. The dominant vegetation types occurring across the site comprise largely of kohekohe (*Dysoxylum spectabile*), tawa (*Beilschmiedia tawa*) and māhoe (*Melicytus ramiflorus*) with altitude causing some composition variances. Scattered podocarps are also present throughout the site at a range of successional stages including some notable groves of mid-aged mataī (*Prumnopitys taxifolia*) as well as miro (*Prumnopitys ferruginea*), tōtara (*Podocarpus totara*), kahikatea (*Dacrycarpus dacrydioides*) and the occasional rimu (*Dacrydium cupressinum*).

The three most dominant vegetation types occurring across the KNE site are further described below.

Upper slopes and ridges – tawa-mahoe-(podocarp) forest

The upper slopes and ridges of the KNE site are comprised of regenerating secondary māhoe and tawa scrub with emergent rewarewa (*Knightia excelsa*). Ngaio (*Myoporum laetum*) is locally common in the mid canopy with scattered pigeonwood (*Hedycarya arborea*) also present. Mataī, miro and tōtara can also be found on several of the drier ridges. The understorey is largely dominated by species such as rangiora (*Brachyglottis repanda*), red matipo (*Myrsine australis*), five finger (*Pseudopanax arboreus*), wineberry (*Aristotelia serrata*) and various *Coprosma* species.

Mid slopes – tawa-mahoe forest

Regenerating tawa and mahoe both dominate the canopy on the mid slopes of the KNE site. Established podocarps are largely absent however, podocarp seedlings are present in some areas. Other canopy and mid-canopy species include pigeonwood, five-finger, rangiora, kaikomako (*Pennantia corymbosa*), lacebark (*Hoheria populnea*), ramarama (*Lophomyrtus bullata*), lancewood (*Pseudopanax crassifolius*), kāpuka (*Griselinia littoralis*) with occasional kōhūhū (*Pittosporum tenuifolium*) and mamaku (*Cyathea medullaris*) also present. Ferns are generally the thicker-leaved species such as shining spleenwort (*Asplenium oblongifolium*), sickle spleenwort (*Asplenium polyodon*) and *Blechnum* species.

Lower slopes and gullies – tawa-kohekohe-(podocarp) forest

The prominent vegetation through the lower slopes and gullies comprises of established tawa and kohekohe with emergent rewarewa and scattered matai and totara present in the sub-canopy. Nīkau (*Rhopalpstylis sapida*), mamaku and rewarewa are common in the understorey²⁶ whilst large pukatea (*Laurelia novae-zelandiae*) are present throughout the gully floor.

The understorey vegetation comprises a diverse assemblage of vegetation with at least 60 species of fern and 14 species of orchid present. Notable fern species include silver fern (*Cyathea dealbata*), kātote (*Cyathea smithii*), whekī (*Dicksonia squarrosa*), two locally occurring maidenhair ferns (*Adiantum diaphanum*/ *A.fulvum*) as well as a

diversity of *Asplenium* and *Blechnum* fern species. Notable orchid species such as fleshy tree orchid (*Drymoanthus adversus*), black orchid (*Gastrodia cunninghamii*) and winika orchid (*Dendrobium cunninghamii*) are also present²⁷.

Several nationally threatened species are also present including poroporo (*Solanum aviculare* var. *aviculare*; Threatened – Nationally Vulnerable); akatea (*Metrosideros perforata*; Threatened – Nationally Vulnerable), speargrass (*Aciphylla squarrosa* var. *squarrosa*; At Risk – Declining); willow-leaf maire (*Mida salicifolia*; At Risk – Declining); numerous rātā species (*Metrosideros diffusa*/ *M. fulgens*/ *M. robusta*; Threatened – Nationally Vulnerable) and the nationally and regionally threatened shrimp-flowered greenhood orchid (*Pterostylis porrecta*; At Risk – Naturally Uncommon).

Species

Birds

The KNE site is known to provide habitat for a range of native bird species, including the Nationally Threatened red-crowned kākārīki (*Cyanoramphus novaezealandiae*; At Risk – Relict), yellow-crowned kākārīki (*Cyanoramphus auriceps*; At Risk – Declining), New Zealand falcon (*Falco novaeseelandiae*; Threatened – Nationally Vulnerable) and North Island kākā (*Nestor meridionalis septentrionalis*; At Risk – Recovering)^{28,29,30}. It is likely these species are dispersing from a combination of source populations from Zealandia, several nearby islands (Mana, Matiu/Somes and Kapiti Islands) and from other mainland reserves³¹.

The Regionally threatened kererū (*Hemiphaga novaeseelandiae*; Regionally Recovering) is known to occur in good numbers within the site. Whitehead (*Mohoua albicilla*) have also been observed several times, however, are likely to require a larger forest area for breeding³².

Other more common bird species known to be present include^{33,34};

- Australasian harrier (*Circus approximans*),
- shining cuckoo (*Chrysococcyx lucidus*),
- morepork / ruru (*Ninox novaeseelandiae*),
- New Zealand kingfisher (*Todiramphus sanctus*),
- grey warbler (*Gerygone igata*),
- bellbird (*Anthornis melanura*),
- tūī (*Prosthemadera novaeseelandiae*),
- fantail (*Rhipidura fuliginosa*) and
- silvereye (*Zosterops lateralis*)

A comprehensive list of nationally and regionally threatened native bird species recorded within the KNE site are listed in Appendix 2 and Appendix 3.

Bats

An unidentified bat was recorded near Rakihau Place on the northern-most boundary of the KNE site in 2020³⁵. Long-tailed bats (*Chalinolobus tuberculatus*; Threatened – Nationally Critical) have also been recorded within a 12 km radius of the KNE site near Makara³⁶. Long-tailed bats have a large home range (approx. 100 km²) and it is possible

this species forage throughout the mature lowland forest present within the KNE site and utilise large podocarp trees with trunk hollows for roosting habitat.

Reptiles

The Nationally Threatened barking gecko (*Naultinus punctatus*; At Risk Declining) and ngahere gecko (*Mokopirirakau* “Southern North Island”; At Risk – Declining), have previously been recorded in the KNE site³⁷. An unidentified skink was also recorded in 2010³⁸.

It is possible that the raukawa gecko (*Woodworthia maculata*), spotted skink (*Oligosoma kokowai*; At Risk – Relict) and northern grass skink (*Oligosoma polychroma*) are also present within the KNE site as the site provides plenty of suitable habitat for these species to exist³⁹.

Fish

Several watercourses traverse through the KNE site and flow into the Porirua Harbour. These watercourses are known to contain a few native freshwater species including longfin eel (*Anguilla dieffenbachii*; At Risk – Declining), redfin bully (*Gobiomorphus huttoni*; At Risk – Declining) and banded kōkopu (*Galaxias fasciatus*)⁴⁰.

Invertebrates

The carnivorous snail, *Wainuia urnula* has previously been recorded within the KNE site near Raiha Street ⁴¹.

7. Threats to ecological values at the KNE site

Ecological values can be threatened by human activities, and by introduced animals and plants that change ecosystem dynamics. The key to protecting and restoring biodiversity as part of the KNE Programme is to manage key threats to the ecological values at each KNE site. Appendix 4 presents a summary of all known threats to the Porirua Western Forest KNE site.

7.1. Key threats

The primary threats to the ecological values of the Porirua Western Forest KNE site are ecological weed species, pest animals and adverse impacts from human activities such as green waste and rubbish dumping and unauthorised track creation.

Ecological weeds are widespread throughout the KNE site. Climbing and woody weeds have the highest ecological impact at the site with the most damaging species including; climbing asparagus (*Asparagus scandens*), old man's beard (*Clematis vitalba*), banana passionfruit (*Passiflora* spp.), Japanese honeysuckle (*Lonicera japonica*) boneseed (*Chrysanthemoides monilifera*) and evergreen buckthorn (*Rhamnus alaternus*). These weed species can smother native vegetation and inhibit native regeneration, resulting in altered vegetation structure and composition and reduced species diversity.

Mustelids, such as stoats (*Mustela erminea*), weasels (*Mustela nivalis*) and ferrets (*Mustela furo*), as well as possums (*Trichosurus vulpecula*) and rats (*Rattus* spp.) pose the greatest threats to the identified ecological values of the KNE site. These pest species impact forest habitat by over-browsing native vegetation, reduce food resource availability and through direct predation on lizards and birds. Reinvasion of pest animals from the surrounding landscape is also common and is likely to be an enduring threat to the biodiversity values within the KNE site.

Illegal rubbish dumping has been known to occur around the urban edges of the KNE site and has the potential to contaminate watercourses that flow through the site. Green waste dumping and unauthorised track creation (and the ongoing use of those tracks) make the KNE site vulnerable to inundation of ecological weeds. Such track creation may also cause loss of habitat and increase the amount of human disturbance on wildlife, such as to nesting birds.

8. Vision and objectives

8.1. Vision

The Porirua Western Forest KNE site comprises a resilient and self-sustaining forest ecosystem, dominated by native vegetation communities resembling those that originally existed there. The site provides core habitat for native bird, lizard and invertebrate populations and continues to provide an important wildlife corridor between the Wellington south coast and Porirua Harbour.

8.2. Objectives

Objectives help to ensure that operational activities carried out are actually contributing to improvements in the ecological condition of the site.

The following objectives will guide the operational activities at the Porirua Western Forest KNE site.

- 1. Protect the integrity of mature indigenous forest cover and increase forest regeneration**
- 2. Maintain and protect existing populations of threatened plant species**
- 3. Protect native bird, lizard and invertebrate populations and improve their habitat**
- 4. Increase community awareness of the ecological values of the KNE site**

9. Operational activities

Operational activities are targeted to work towards the objectives above (Section 8). The broad approach to operational activities is described briefly below, and specific actions, with budget figures attached, are set out in the operational delivery schedule (Table 3).

The primary management activities undertaken in the KNE site are ecological weed control and pest animal control.

For practicality, some areas of the KNE site have been defined as distinct operational areas based on the management activities undertaken in those locations (See Appendix 1, Map 5). These are:

A: Raiha–Colonial Knob walkway

B: Aparangi-Waiho

C: Waiho-Ngahue

D: Rangituhi

E: Pikarere

9.1. Ecological weed control

The aim of weed control at the Porirua Western Forest KNE site is to reduce the distribution and density of high impact weed species and prevent the incursion of new weed species into mature forest areas. This will increase native plant dominance and facilitate natural regeneration of native plant species in line with objectives 1, 2 and 3 of this operational plan.

The highest known density of weeds occurs in areas adjacent to the urban boundary of the KNE site where many gardens cultivate weed species, and/or green waste dumping is known to occur. In recent years, good progress has been made in reducing the density and impact of priority ecological weeds around this urban boundary. However, ongoing management is required to further reduce weed infestations and ensure ecological weeds do not regenerate and spread. Greater Wellington’s Biosecurity department will undertake weed control throughout the KNE site on an annual basis targeting species that are prioritised as having a ‘very high’ or ‘high’ ecological impact as indicated in Appendix 5.

Targeted control of priority woody and climbing weed species will be undertaken on an annual basis around the urban KNE boundary through Operational Areas A, B, C and D. Priority weed species include but are not limited to; climbing asparagus, Japanese honeysuckle, Cape ivy, jasmine, German ivy, old man’s beard, banana passionfruit, cherry and boneseed.

A weed survey will be undertaken through Operational Area E within the term of this plan to determine the severity of weed incursion in this area. This survey will be undertaken by the Biodiversity Advisor for the site and weed control will subsequently be planned if required. Any control undertaken in this area will prioritise woody and climbing weed species with the intention of maintaining native species dominance and supporting natural regeneration of natives.

9.2. Pest animal control

The aim of pest animal control is to protect areas of mature native forest, increase native plant regeneration and increase the abundance of threatened plants through the control of mammalian browsers; and increase populations of native birds and lizards through the control of mammalian predators, in line with objectives 1, 2 and 3 of this plan.

A possum control network was established by Greater Wellington in 1996, however more intensive management commenced in 2001 to include rats and mustelids⁴². At present, a network of 31 DOC 200 kill traps and 216 toxin bait stations are positioned throughout the KNE site (see Appendix 1, Map 6). Greater Wellington service and maintain the pest animal trapping network on a quarterly basis

A network of traps is also located outside the KNE site boundary on Pikarere Farm to target possums and mustelids (see Appendix 1, Map 6) and provide a pest animal control buffer zone area. This network is serviced by Greater Wellington on a monthly basis (except in pasture areas during lambing season between August and October) with the aim to reduce the higher known density of possums and mustelids in the local area and thereby decrease the risk of reinvasion into the KNE site.

Rabbit and Canadian geese control may be undertaken by the private landowner on their own property on an ad hoc basis. Rabbits are controlled by shooting, poisoning or burrow fumigation; and Canadian geese control is undertaken by shooting or egg pricking. All these activities will help to reduce the impact of these animals across the KNE site.

Greater Wellington's Regional Possum Predator Control Programme (RPPCP) also target possums with a toxin bait-station network located between Makara and Porirua. This programme aims to control possums to low densities across the wider landscape and is expected to benefit the KNE site by further reducing the occurrence of possum reinvasions. This bait station network is not included in Appendix 1, Map 6.

9.3. Community engagement

Awareness and prevention of unauthorised activities

The purpose of community engagement is to raise awareness of the KNE site's ecological values and involve the community in management activities to protect those values.

Unauthorised activities such as rubbish and garden waste dumping and track creation are ongoing problem within the Porirua Western Forest KNE site. These activities can lead to the establishment and spread of ecological weeds throughout the site, cause disturbance to native wildlife and have the potential to contaminate watercourses.

To discourage such activities, Greater Wellington and PCC will work with private landowners, businesses and the public and may seek to employ various intervention strategies and measures. Such measures could include:

- Surveillance for unauthorised activities around urban adjacent areas and known areas of interest within the KNE site

- A letterbox drop to surrounding residents and the wider community to raise awareness of the biodiversity values present within the KNE site and the threat illegal rubbish and garden waste dumping has on these values
- Erecting signage to reinforce that illegal dumping and unauthorised track creation is unacceptable

9.4. Monitoring

Small Mammal Monitoring

Greater Wellington undertake small mammal monitoring on a six-monthly basis for rodents in the KNE site. The Tracking Tunnel Index (TTI) method is used to monitor the presence of small mammal species. The Porirua Western Forest KNE site is also being used to trial different pest animal control techniques. The results of this monitoring provide an indication of the effectiveness of the pest animal control network and different control techniques and are reported in the KNE programme Small Mammal Monitoring report.

Forest Monitoring

The Porirua Western Forest KNE site is part of Greater Wellington's Natural Forest Monitoring programme. The monitoring programme is undertaken by the Environmental Science department on a five-yearly cycle to establish the effectiveness of management of indigenous forests in the Wellington region. The Porirua Western Forest KNE site was first surveyed in the summer of 2020/2021 and will be re-surveyed in the summer of 2025/26. As part of this survey the vegetation composition and structure are recorded within a 20x20m plot. Birds are also recorded, and pest animal levels are measured using chew cards and pellet counts. The follow-up survey in 2025/2026 will be used to determine changes and trends in plant and animal species overtime and may be used to guide management activities within the KNE site.

10. Future opportunities

Below is a list of some further management activities that have been identified as having the potential to improve the biodiversity values of the KNE site or would provide information to further our understanding of the present ecological values and how to protect them:

- Revegetation in open areas to increase native plant cover and reduce reinvasion of weed species following weed control
- Undertake a baseline lizard and invertebrate survey within the KNE site to better understand what species exist and what management and protection measures may be necessary
- Undertake a long-tailed bat survey within the KNE site to determine if bats are present and identify necessary management and protection measure
- Greater reporting of wildlife sightings through citizen science platforms such as iNaturalist and eBird.

11. Operational delivery schedule

The operational delivery schedule shows the actions planned to achieve the stated objectives for the Porirua Western Forest KNE site, and their timing and cost over the five-year period from 1 July 2022 to 30 June 2027. The budget for years 2023/24 to 2026/27 are indicative only and subject to change. A map of operational areas can be found in Appendix 1 (see Map 5).

Table 3: Five-year operational plan for the Porirua Western Forest KNE site

Objective	Management activity	Operational area	The Actions: Description/detail	Intended 5 year outcome	Implementing party	Timetable and resourcing where allocated				
						2022/23	2023/24	2024/25	2025/26	2026/27
1, 2, 3	Ecological weed control	A, B, C, D	Targeted control of priority climbing and woody weed species around the KNE boundary	There are no incursions of priority weed species from the KNE boundary in to the forest core	Greater Wellington Biosecurity department	✓ \$9,690	✓ \$9,884	✓ \$10,082	✓ \$10,284	✓ \$10,490
1, 2, 3	Ecological weed control	E	Weed survey for priority weed species through the northern forest extent and control as required	The integrity of the forest core is maintained	Greater Wellington Biodiversity department			✓ ⁺ (staff time only)		
1, 2, 3	Ecological weed control	E	Control of priority weed species through the northern forest extent if required	The integrity of the forest core is maintained and priority weed species are suppressed to a level which prevents any new infestations	Greater Wellington Biosecurity department				✓ [^]	✓ [^]

Objective	Management activity	Operational area	The Actions: Description/detail	Intended 5 year outcome	Implementing party	Timetable and resourcing where allocated				
						2022/23	2023/24	2024/25	2025/26	2026/27
1, 2, 3	Pest animal control	Entire KNE site	Traps and bait stations serviced on a quarterly basis and annual audit	Browsing pest animal populations are maintained to: possums <5% RTC*; rats <10% TTI**; mustelids <2% TTI** to facilitate native vegetation growth and protect native bird, lizard and invertebrate species	Greater Wellington Biosecurity department	✓ \$39,270	✓ \$40,055	✓ \$40,857	✓ \$41,674	✓ \$42,507
1, 2, 3, 4	Community engagement	Urban adjacent areas and throughout KNE site	Work with the public and implement intervention measures to discourage unauthorised activities as required	Reduced the incidence of unauthorised activities within the KNE site	Greater Wellington Biodiversity department, PCC	✓	✓	✓	✓	✓
1, 3	Monitoring	Entire KNE site	Small mammal monitoring	The effectiveness of small mammal control and control techniques used are identified and may be used to adjust control methods as required	Greater Wellington Environmental Science department	✓ \$3,600	✓ \$3,600	✓ \$3,600	✓ \$3,600	✓ \$3,600

Objective	Management activity	Operational area	The Actions: Description/detail	Intended 5 year outcome	Implementing party	Timetable and resourcing where allocated				
						2022/23	2023/24	2024/25	2025/26	2026/27
1, 3	Monitoring	Entire KNE site	Natural forest monitoring of vegetation, birds and pest animal levels	Changes and trends in plant and animal species over time are identified and may be used to inform management activities	Greater Wellington Environmental Science department				✓	

*RTC = Residual Trap Catch. The control regime has been designed to control possums to this level but monitoring will not be undertaken. Experience in the use of this control method indicates this target will be met

**TTI = Tracking Tunnel Index. The control regime has been designed to control rats/mustelids to this level but monitoring will not be undertaken. Experience in the use of this control method indicates this target will be met

† = The timeframe for this action is indicative only and may be undertaken at any time over the duration of this plan

^ = This work is subject to the results of the weed survey and will be determined and confirmed by the Biodiversity Advisor

12. Funding contributions

12.1. Budget allocated by Greater Wellington

The budget for the years 2023/24 to 2026/27 are indicative only and subject to change.

Table 4: Greater Wellington allocated budget for the Porirua Western Forest KNE site

Management activity	Timetable and resourcing				
	2022/23	2023/24	2024/25	2025/26	2026/27
Ecological weed control	\$5,661	\$5,774	\$5,890	\$6,008	\$6,128
Pest animal control	\$23,154	\$23,617	\$24,090	\$24,572	\$25,063
Small mammal monitoring	\$3,600	\$3,600	\$3,600	\$3,600	\$3,600
Total	\$32,414	\$32,991	\$33,580	\$34,180	\$34,791

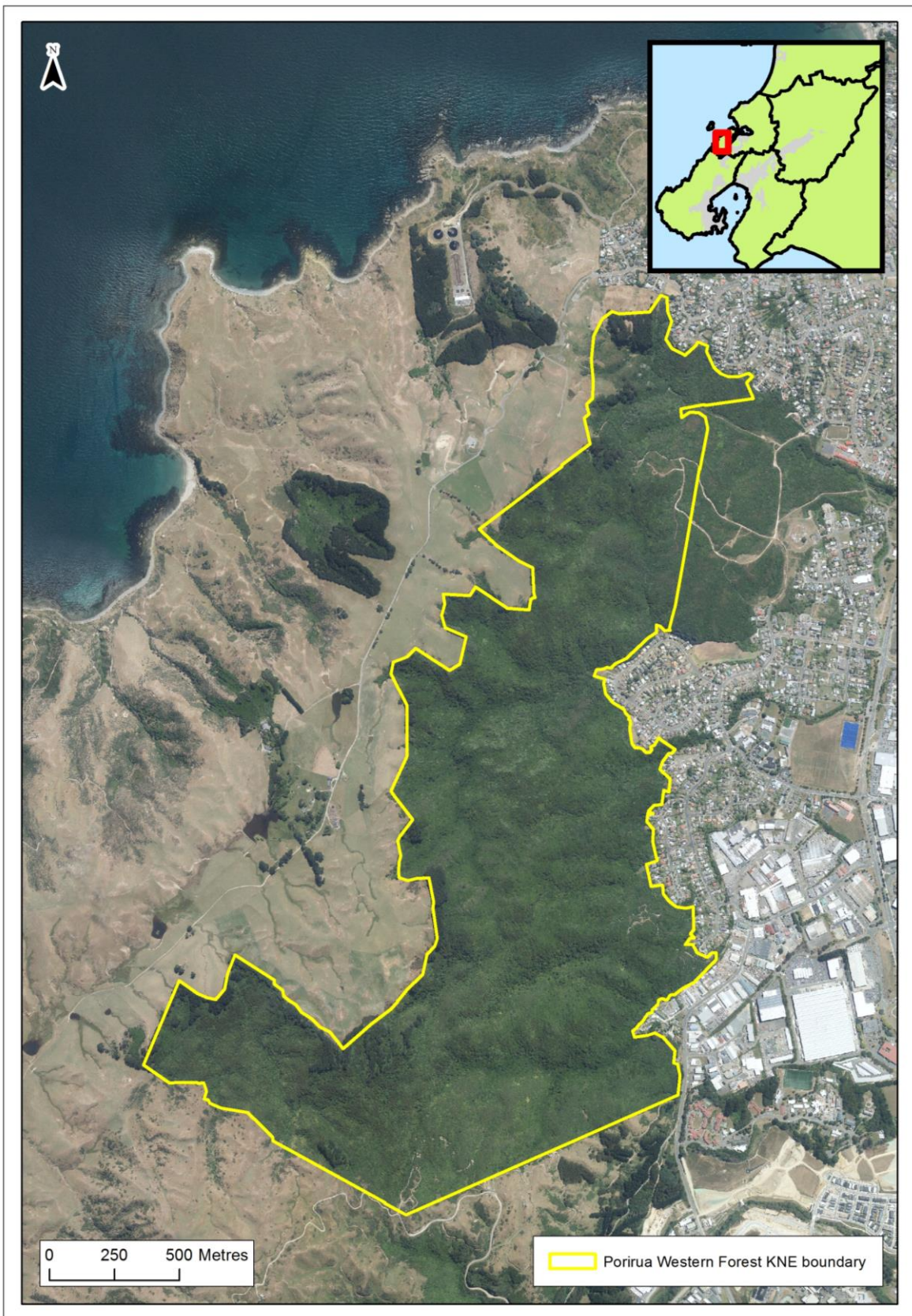
12.2. Budget allocated by PCC

The budget is subject to confirmation through PCC's ten-year planning process.

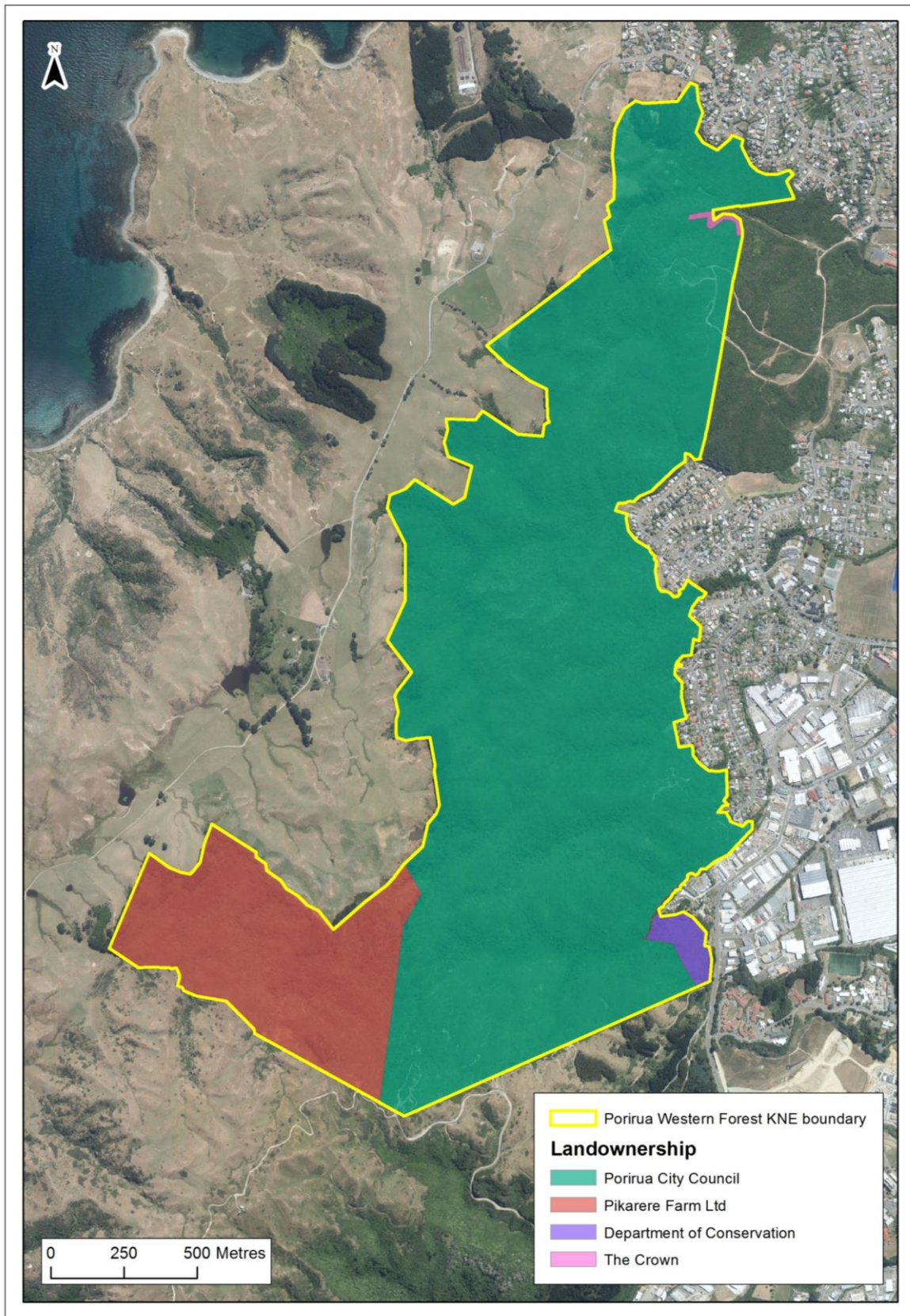
Table 5: PCC allocated budget for the Porirua Western Forest KNE site

Management activity	Timetable and resourcing				
	2022/23	2023/24	2024/25	2025/26	2026/27
Ecological weed control	\$4,029	\$4,110	\$4,192	\$4,276	\$4,362
Pest animal control	\$16,116	\$16,438	\$16,767	\$17,102	\$17,444
Total	\$20,145	\$20,548	\$20,959	\$21,378	\$21,806

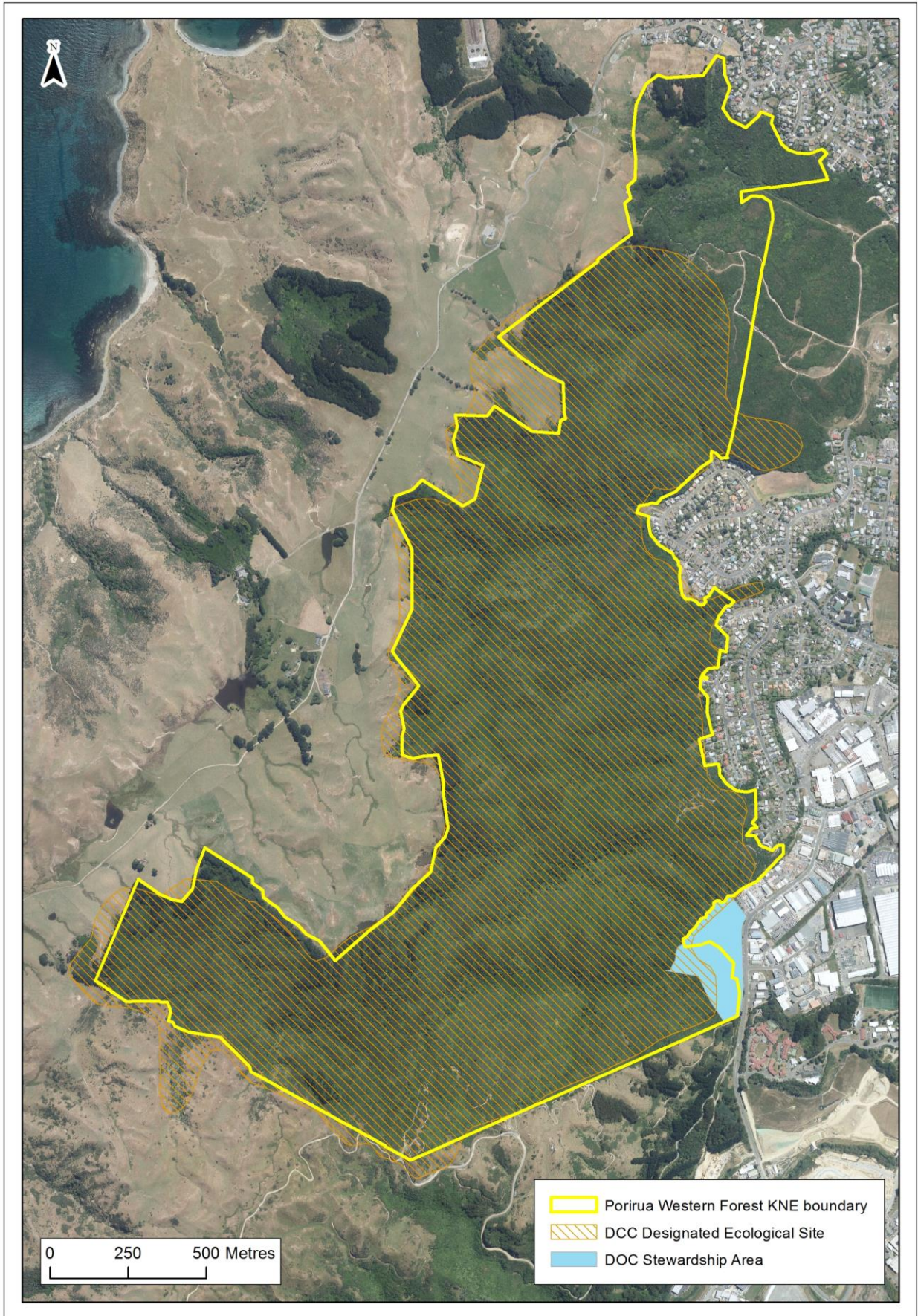
Appendix 1: Porirua Western Forest KNE site maps



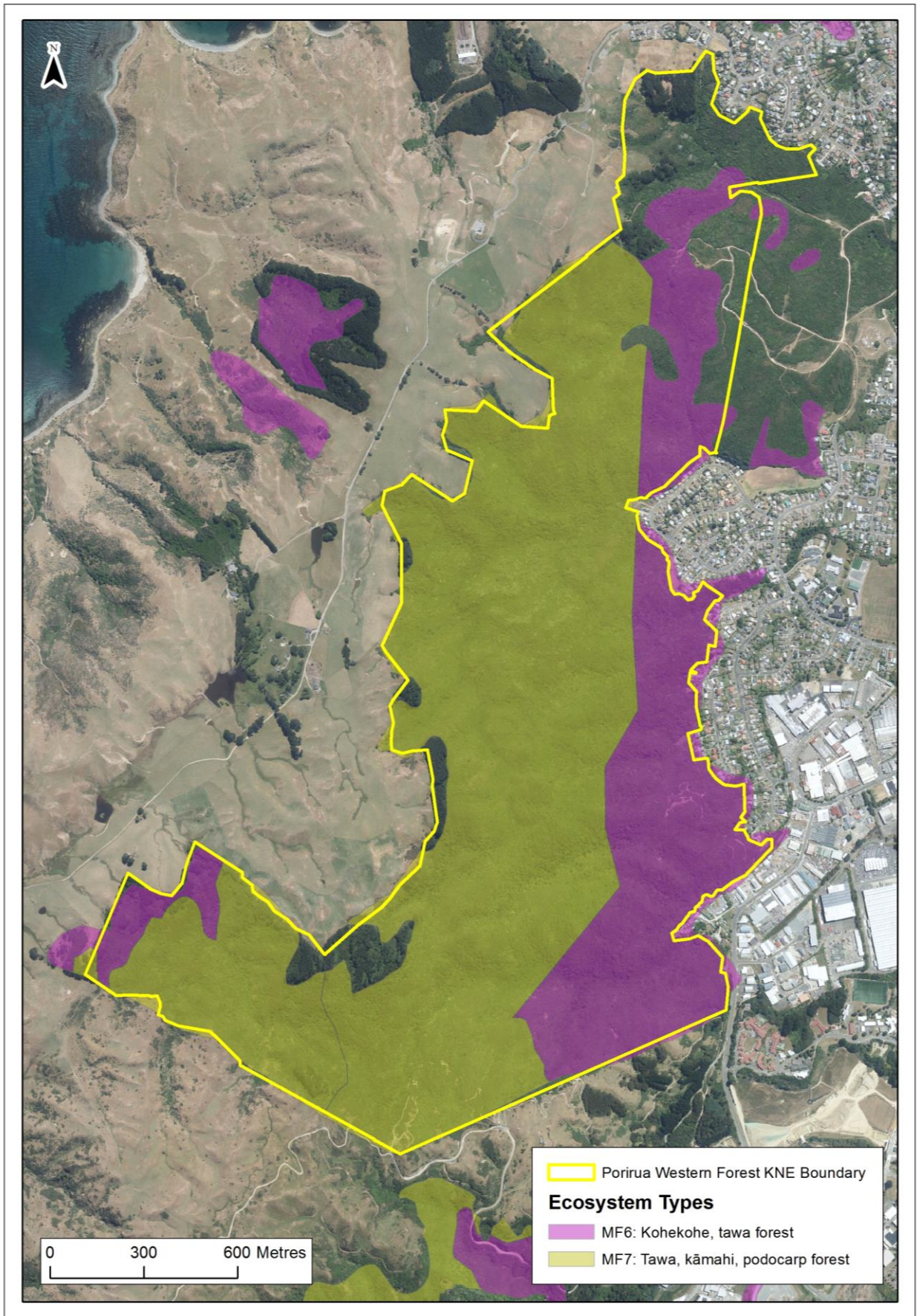
Map 1: The Porirua Western Forest KNE site boundary



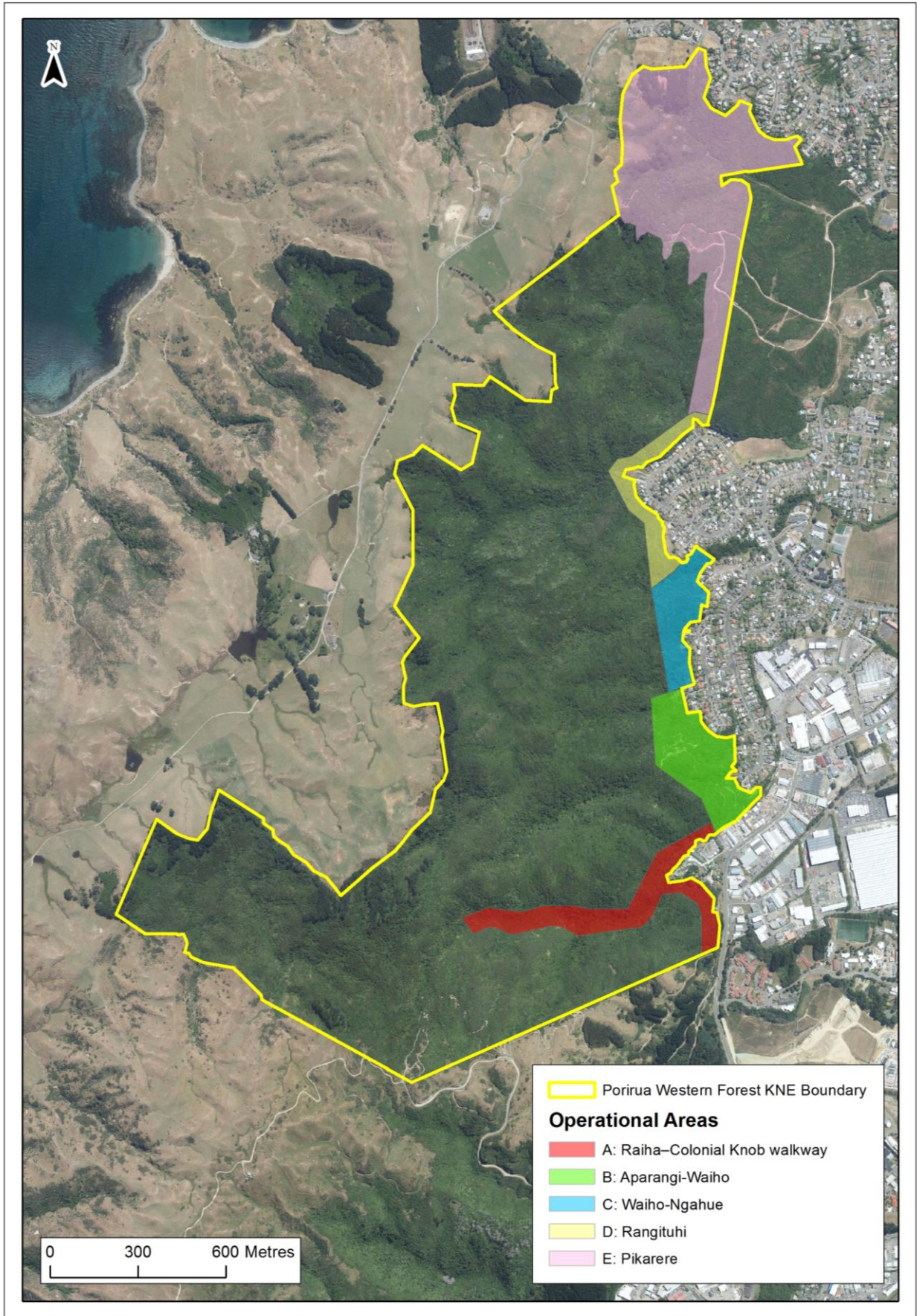
Map 2: Landownership boundaries within the Porirua Western Forest KNE site



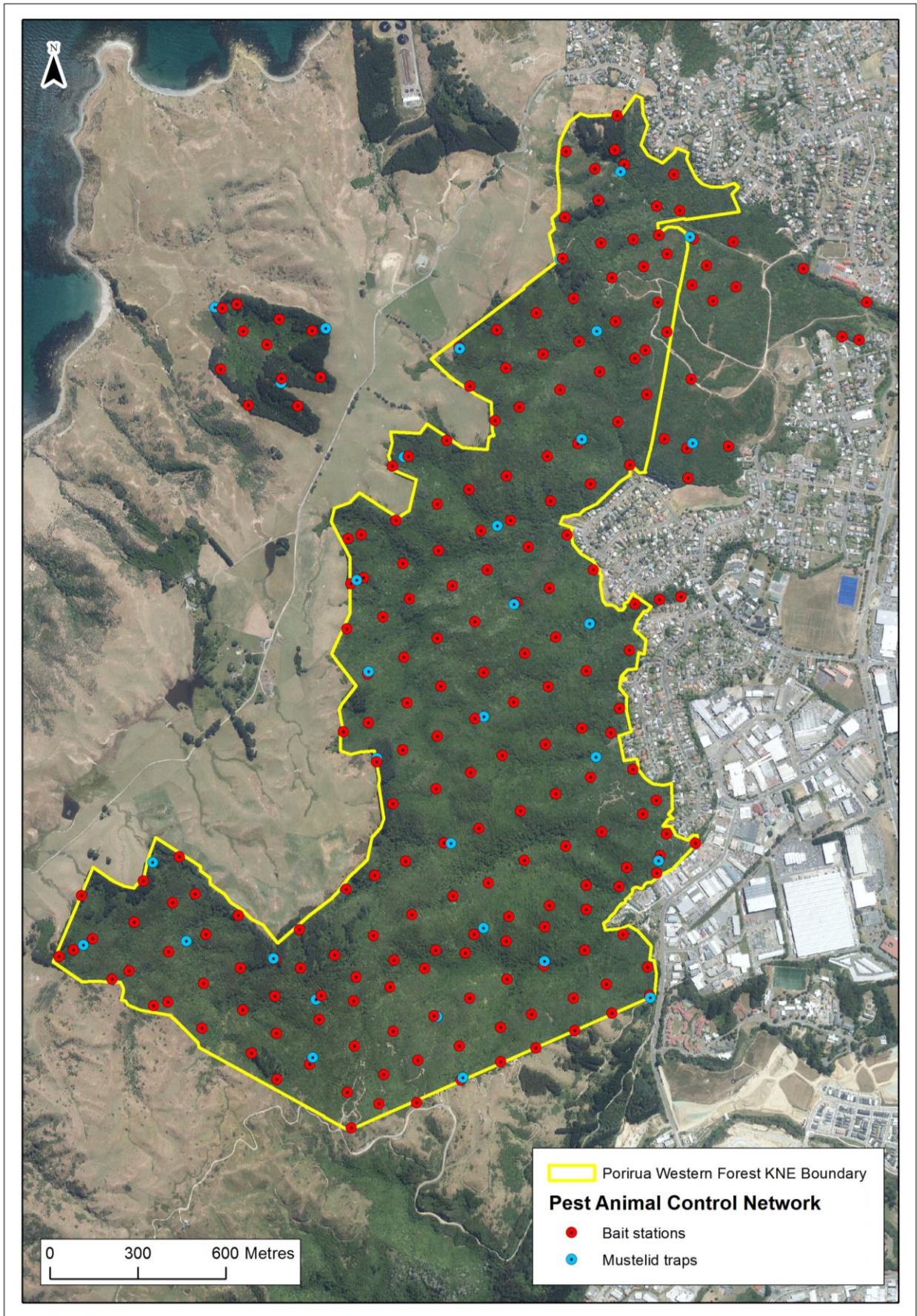
Map 3: DOC Designated Ecological Sites and stewardship area within the Porirua Western Forest KNE site



Map 4: Remaining extent of the Singers and Rogers classification of pre-human vegetation types for the Porirua Western Forest KNE site



Map 5: Operational areas in the Porirua Western Forest KNE site



Map 6: Pest animal control network in the Porirua Western Forest KNE site

Appendix 2: Nationally threatened species list

The New Zealand Threat Classification System lists species according to their threat of extinction. The status of each species group (plants, reptiles, etc) is assessed over a five-year cycle^{43,44,45}. Species are regarded as Threatened if they are classified as Nationally Critical, Nationally Endangered or Nationally Vulnerable. They are regarded as At Risk if they are classified as Declining, Recovering, Relict or Naturally Uncommon. The following table lists Threatened and At Risk species that are resident in, or regular visitors to, the Porirua Western Forest KNE site.

Table 6: Threatened and At Risk species at the Porirua Western Forest KNE site

Scientific name	Common name	Threat status	Observation
Plants(vascular) ⁴⁶			
<i>Aciphylla squarrosa</i> var. <i>squarrosa</i>	Speargrass, taramea	At Risk – Declining	Abel and Mason, 2005 ⁴⁷ ; Enright <i>et al</i> , 2007 ⁴⁸
<i>Geranium microphyllum</i>	Geranium microphyllum	At Risk – Naturally Uncommon	Enright <i>et al</i> , 2007
<i>Kunzea ericoides</i>	Kānuka	Threatened – Nationally Vulnerable	Abel and Mason, 2005
<i>Kunzea robusta</i>	Kānuka	Threatened – Nationally Vulnerable	Enright <i>et al</i> , 2007
<i>Leptospermum scoparium</i> var. <i>scoparium</i>	Mānuka	At Risk – Declining	Abel and Mason, 2005; Enright <i>et al</i> , 2007
<i>Lophomyrtus bullata</i>	Ramarama	Threatened – Nationally Critical	Abel and Mason, 2005; Enright <i>et al</i> , 2007
<i>Metrosideros diffusa</i>	White rātā	Threatened – Nationally Vulnerable	Abel and Mason, 2005; Enright <i>et al</i> , 2007
<i>Metrosideros fulgens</i>	Climbing rātā	Threatened – Nationally Vulnerable	Abel and Mason, 2005; Enright <i>et al</i> , 2007
<i>Metrosideros perforata</i>	Akatea	Threatened – Nationally Vulnerable	Abel and Mason, 2005; Enright <i>et al</i> , 2007
<i>Metrosideros robusta</i>	Northern rātā	Threatened – Nationally Vulnerable	Enright <i>et al</i> , 2007
<i>Mida salicifolia</i>	Willow leaved maire	At Risk – Declining	Enright <i>et al</i> , 2007
<i>Pterostylis porrecta</i>	Shrimp-flowered greenhood orchid	At Risk – Naturally Uncommon	Enright <i>et al</i> , 2007
<i>Solanum aviculare</i> var. <i>aviculare</i>	Poroporo	Threatened – Nationally Vulnerable	Enright <i>et al</i> , 2007

Scientific name	Common name	Threat status	Observation
<i>Streblus banksii</i>	Large-leaved milk tree, tūrepo	At Risk – Relict	Enright <i>et al</i> , 2007
Birds ⁴⁹			
<i>Cyanoramphus auriceps</i>	Yellow-crowned parakeet, kākāriki	At Risk – Declining	McArthur, 2021 ⁵⁰
<i>Cyanoramphus novaezelandiae</i>	Red-crowned parakeet, kākāriki	At Risk – Relict	McArthur, 2021
<i>Falco novaeseelandiae</i>	New Zealand Falcon, kārearea	Threatened – Nationally Vulnerable	Wildlands, 2014 ⁵¹ ; McArthur, 2021
<i>Mohoua albicilla</i>	Whitehead	Not Threatened	McArthur, 2021
<i>Nestor meridionalis septentrionalis</i>	North Island kākā	At Risk – Recovering	Wildlands, 2014; Hurley, 2021 ⁵² ; eBird database ⁵³
Reptiles ⁵⁴			
<i>Mokopirirakau “southern North Island”</i>	Ngahere gecko	At Risk – Declining	Romijn, 2021 ⁵⁵
<i>Naultinus punctatus</i>	Barking gecko	At Risk – Declining	Romijn, 2021
Freshwater fish ⁵⁶			
<i>Anguilla dieffenbachii</i>	Longfin eel	At Risk – Declining	NIWA, 2017 ⁵⁷
<i>Gobiomorphus huttoni</i>	Redfin bully	At Risk – Declining	NIWA, 2017

Appendix 3: Regionally threatened plant species list

A methodology to create regional threat lists was developed by a collaborative group comprising representatives from DOC, regional councils and a local authority. The resulting regional threat listing methodology leverages off the NZTCS, but applies a species population threshold adjusted to the regional land area under consideration (relative to the national land area) for species that are not nationally threatened. The assigned regional threat status cannot be lower than that of the national threat status, but can be higher, (eg, a Nationally Vulnerable species could be assessed as being Regionally Critical). Other assessments made in the regional threat listing process include identifying populations that are national strongholds and the use of regional qualifiers, such as natural or historic range limits.

The following table lists regionally threatened species that have been recorded in the Porirua Western Forest KNE site.

Table 7: Regionally threatened species recorded in the Porirua Western Forest KNE site

Scientific name	Common name	Threat status	Observation
Plants ⁵⁸			
<i>Aciphylla squarrosa</i> var. <i>squarrosa</i>	Speargrass, taramea	Regionally Vulnerable	Enright <i>et al</i> , 2007 ⁵⁹
<i>Adiantum diaphanum</i>	Tuberous maidenhair	Regionally Naturally Uncommon	Enright <i>et al</i> , 2007
<i>Adiantum fulvum</i>	Maidenhair	Regionally Naturally Uncommon	Enright <i>et al</i> , 2007
<i>Epilobium chionanthum</i>	Marsh willowherb	Regionally Naturally Uncommon	Enright <i>et al</i> , 2007
<i>Hypolepis lactea</i>	<i>Hypolepis lactea</i>	Regionally Naturally Uncommon	Enright <i>et al</i> , 2007
<i>Pterostylis porrecta</i>	Shrimp-flowered greenhood	Regionally Critical	Enright <i>et al</i> , 2007
<i>Raukaua edgerleyi</i>	Raukaua	Regionally Naturally Uncommon	Enright <i>et al</i> , 2007; Wellington Botanical Society, 2014
<i>Streblus banksii</i>	Large-leaved milk tree, tūrepo	Regionally Relict	Enright <i>et al</i> , 2007
Birds ⁶⁰			
<i>Cyanoramphus auriceps</i>	Yellow Crowned Parakeet	Regionally Endangered	McArthur, 2021 ⁶¹
<i>Cyanoramphus novaezelandiae</i>	Red-crowned parakeet, kākāriki	Regionally Recovering	McArthur, 2021
<i>Falco novaeseelandiae</i>	New Zealand Falcon	Regionally Critical	McArthur, 2021
<i>Hemiphaga novaeseelandiae</i>	New Zealand Pigeon	Regionally Recovering	Hurley, 2021 ⁶² ; McArthur, 2021

Scientific name	Common name	Threat status	Observation
<i>Nestor meridionalis septentrionalis</i>	North Island kākā	Regionally Recovering	Wildlands, 2014 ⁶³ ; Hurley, 2021 ⁶⁴ ; eBird database ⁶⁵
Lizards ⁶⁶			
<i>Mokopirakau southern North Island</i>	Southern North Island	At Risk – Regionally Declining	Romijn, 2021 ⁶⁷
<i>Naultinus punctatus</i>	Barking gecko	Threatened – Regionally Vulnerable	Romijn, 2021
Invertebrates			
<i>Wainuia urnula</i>	Carnivorous snail	Regionally Sparse	Molluscs of New Zealand database ⁶⁸

Appendix 4: Threat table

Appendix 4 presents a summary of all known threats to the Porirua Western Forest KNE site including those discussed in section 7.

Table 8: Threats to the Porirua Western Forest KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
Ecological weeds		
EW-1	Climbing weeds smother and displace native vegetation often causing canopy collapse, inhibit indigenous regeneration, and alter vegetation structure and composition. Key climbing ecological weed species include; climbing asparagus, old man's beard and Japanese honeysuckle (see full list in Appendix 5).	Entire KNE site
EW-2	Ground covering ecological weeds smother and displace native vegetation, inhibit indigenous regeneration, and alter vegetation structure and composition. Key ground covering ecological weed species for control include; African clubmoss, stinking iris and oxeye daisy (see full list in Appendix 5).	Entire KNE site
EW-3	Woody weed species displace native vegetation, inhibit indigenous regeneration, and alter vegetation structure and composition. Key woody ecological weed species include; boneseed, evergreen buckthorn and cherry (see full list in Appendix 5).	Entire KNE site
Pest animals		
PA-1	Possums (<i>Trichosurus vulpecula</i>) browse palatable canopy vegetation until it can no longer recover ^{69,70} . This destroys the forest's structure, diversity and function. Possums may also prey on native birds and invertebrates ⁷¹ .	Entire KNE site
PA-2	Rats (<i>Rattus</i> spp.) browse native fruit, seeds and vegetation. They compete with native fauna for food and can reduce forest regeneration. They also prey on invertebrates, lizards and native birds ^{72,73} .	Entire KNE site
PA-3	Mustelids (stoats ^{74,75} (<i>Mustela erminea</i>), ferrets ^{76,77} (<i>M. furo</i>) and weasels ^{78,79} (<i>M. nivalis</i>)) prey on native birds, lizards and invertebrates, reducing their breeding success and potentially causing local extinctions.	Entire KNE site
PA-4	Hedgehogs (<i>Erinaceus europaeus</i>) prey on native invertebrates ⁸⁰ , lizards ⁸¹ and the eggs ⁸² and chicks of ground-nesting birds ⁸³ .	Entire KNE site
PA-5*	House mice (<i>Mus musculus</i>) browse native fruit, seeds and vegetation, and prey on invertebrates. They compete with native fauna for food and can reduce forest regeneration. They also prey on invertebrates, lizards and small eggs and nestlings ^{84,85} .	Entire KNE site
PA-6*	Pest and domestic cats (<i>Felis catus</i>) prey on native birds ⁸⁶ , lizards ⁸⁷ and invertebrates ⁸⁸ , reducing native fauna breeding success and potentially causing local extinctions ⁸⁹ .	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
PA-7*	Rabbits (<i>Oryctolagus cuniculus</i>) and hares (<i>Lepus europaeus</i>) graze on palatable native vegetation and prevent natural regeneration in some environments ⁹⁰ . Rabbits are particularly damaging in sand dune environments where they graze native binding plants and restoration plantings. In drier times hares especially, will penetrate into wetland forest areas browsing and reducing regenerating native seedlings.	Entire KNE site
PA-8*	Wasps (<i>Vespula</i> spp.) adversely impact native invertebrates and birds through predation and competition for food resources. They also affect nutrient cycles in beech forests ⁹¹ .	Entire KNE site
PA-9*	Goats (<i>Capra hircus</i>) browsing affects the composition and biomass of native vegetation in the understory tiers of forest habitats, preventing regeneration of the most palatable understory species and reducing species diversity ⁹² .	Entire KNE site
PA-10*	Feral pigs (<i>Sus scrofa</i>) root up the soil and eat roots, invertebrates, seeds and native plants preventing forest regeneration ⁹³ .	Entire KNE site
PA-11*	Canada geese (<i>Branta Canadensis</i>) foul water and graze native plants.	Western KNE boundary
Human activities		
HA-1*	Garden waste dumping often leads to ecological weed invasions into natural areas.	Eastern KNE boundary
HA-2*	Encroachment of residential gardens into the KNE site from urban areas causes habitat loss and introduces ecological weeds.	Eastern KNE boundary
HA-3*	Recreational use such as tramping and mountain biking can cause damage and disturbance of the native ecosystem. It is also likely to disturb native fauna and introduce ecological weeds.	Entire KNE site
HA-4	Poor water quality affects a range of species in the streams. High nutrient levels and contaminants within watercourses are often caused by upstream land management practices and pollution events including development practices, forestry and agricultural practices, rubbish dumping, road run-off and storm water entering the watercourses.	Watercourses within KNE site
HA-5*	Agricultural practices, particularly grazing livestock can result in pugging soils, grazing native vegetation inhibiting regeneration, wildlife disturbance and increasing nutrient content of soils and watercourses ⁹⁴ .	Western KNE boundary
HA-6*	Plantation forestry on adjoining land parcels to the KNE site have the potential to cause habitat loss or degradation, disturb native wildlife, damage boundary fencing and increase sediment load in watercourses via surface run-off during harvesting operations.	Southern KNE boundary
HA-7*	Barriers to native fish passage are present in streams within the KNE site preventing migrating fish from completing their life cycle.	Watercourses within KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
HA-8*	Dogs (<i>Canis lupus familiaris</i>), if uncontrolled/unleashed can disturb or kill nesting birds and chicks, and lizards within the KNE site, particularly in close proximity to walking tracks ⁹⁵ .	Entire KNE site

*Threats marked with an asterisk are not addressed by actions in the operational delivery schedule

Appendix 5: Ecological weed species

The following table lists key ecological weed species that have been recorded in the Porirua Western Forest KNE site.

The distribution and density of individual species is recorded. Three levels of distribution (localised, patchy and widespread) and density (sparse, abundant and dense) are used to describe the aspects of infestations of each species.

Table 9: Ecological weed species recorded in the Porirua Western Forest KNE site

Scientific name	Common name	Priority	Level of distribution	Management aim
<i>Asparagus scandens</i>	Climbing asparagus	Very high	Widespread and abundant	Suppression
<i>Chrysanthemoides monilifera</i>	Boneseed	Very high	Localised and sparse	Eradication
<i>Clematis vitalba</i>	Old man's beard	Very high	Patchy and abundant	Suppression
<i>Jasminum polyanthum</i>	Jasmine	Very high	Patchy and dense	Suppression
<i>Lathyrus latifolius</i>	Everlasting pea	Very high	Patchy and abundant	Suppression
<i>Lonicera japonica</i>	Japanese honeysuckle	Very high	Widespread and abundant	Suppression
<i>Parietaria judaica</i>	Pellitory of the wall	Very high	Patchy and abundant	Suppression
<i>Passiflora tripartita</i> var. <i>mollissima</i>	Banana passionfruit	Very high	Patchy and abundant	Suppression
<i>Rhamnus alaternus</i>	Evergreen buckthorn	Very high	Patchy and sparse	Suppression
<i>Senecio angulatus</i>	Cape ivy	Very high	Patchy and abundant	Suppression
<i>Hedera helix</i> subsp. <i>helix</i>	Ivy	High	Patchy and dense	Suppression
<i>Ilex aquifolium</i>	Holly	High	Patchy and dense	Suppression
<i>Myoporum</i> aff. <i>insulare</i>	Tasmanian ngaio, boobialla	High	Localised and sparse	Suppression
<i>Prunus</i> sp.	Ornamental cherry	High	Patchy and dense	Suppression
<i>Selaginella kraussiana</i>	African clubmoss	High	Patchy and sparse	Suppression
<i>Calystegia silvatica</i>	Greater bindweed	Moderate	Widespread and abundant	Suppression
<i>Cortaderia selloana</i>	Pampas	Moderate	Localised and sparse	Suppression
<i>Cotoneaster glaucophylla</i>	Cotoneaster	Moderate	Patchy and dense	Suppression

Scientific name	Common name	Priority	Level of distribution	Management aim
<i>Crocoshia × crocosmiiflora</i>	Montbretia	Moderate	Patchy and abundant	Suppression
<i>Cupressus macrocarpa</i>	Macrocarpa	Moderate	Patchy and sparse	Surveillance
<i>Cytisus scoparius</i>	Broom	Moderate	Widespread and abundant	Surveillance
<i>Erica lusitanica</i>	Spanish heath	Moderate	Patchy and sparse	Surveillance
<i>Eucalyptus</i> sp.	Eucalyptus	Moderate	Patchy and sparse	Surveillance
<i>Iris foetidissima</i>	Stinking iris	Moderate	Patchy and abundant	Suppression
<i>Laurus nobilis</i>	Bay tree, sweet bay	Moderate	Patchy and sparse	Surveillance
<i>Leucanthemum vulgare</i>	Oxeye daisy	Moderate	Localised and sparse	Suppression
<i>Paraserianthes lophantha</i>	Brush wattle	Moderate	Localised and sparse	Suppression
<i>Pinus radiata</i>	Radiata pine	Moderate	Patchy and sparse	Surveillance
<i>Pittosporum crassifolium</i> *	Karo	Moderate	Widespread and abundant	Suppression
<i>Rubus fruticosus</i> agg.	Blackberry	Moderate	Widespread and abundant	Suppression
<i>Salix</i> sp.	Willow	Moderate	Patchy and sparse	Suppression
<i>Senecio glastifolius</i>	Purple ragwort	Moderate	Widespread and abundant	Surveillance
<i>Tradescantia fluminensis</i>	Tradescantia	Moderate	Widespread and abundant	Suppression
<i>Vinca major</i>	Periwinkle	Moderate	Widespread and abundant	Suppression
<i>Zantedeschia aethiopica</i>	Arum lily	Moderate	Patchy and sparse	Suppression
<i>Actinidia deliciosa</i>	Kiwifruit	Low	Patchy and dense	No management
<i>Allium triquetrum</i>	Wild onion	Low	Patchy and dense	No management
<i>Foeniculum vulgare</i>	Fennel	Low	Patchy and dense	No management
<i>Phytolacca octandra</i>	Inkweed	Low	Patchy and dense	No management
<i>Quercus</i> sp.	Oak	Low	Patchy and sparse	No management
<i>Ulex europaeus</i>	Gorse	Low	Widespread and abundant	No management

* Denotes a New Zealand native plant that is not local to the KNE site

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