Key Native Ecosystem Operational Plan for Cape Palliser – Te Mātakitaki a Kupe

2021-2026

Contents

1. Purpose

The purpose of the five-year Key Native Ecosystem (KNE) Operational Plan for Cape Palliser – Te Mātakitaki a Kupe 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 Strategy[3] 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 Plan[4] and the Regional Pest Management Plan 2019-2039[5].

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. Cape Palliser – Te Mātakitaki a Kupe Key Native Ecosystem site

The Cape Palliser – Te Mātakitaki a Kupe KNE site (135 ha) is located at the southernmost point of the North Island in the South Wairarapa district, east of the coastal settlement of Ngawi (see Appendix 1, Map 1).

The KNE site contains a diverse range of coastal ecosystems and landforms, including gravel beaches, coastal rock platforms, regenerating native forest on steep coastal hillslopes, gravel herbfield and coastal turf communities, divaricate shrubland and coastal wetland.

Vegetation clearance on the coastal platform and lower slopes was probably undertaken by early Māori for agriculture, whereas the upper slopes were cleared later by Europeans for grazing. Native vegetation is now regenerating across most of the KNE site following the establishment of a QEII National Trust (QEII) open space covenant in one area in 1991 and the retirement from regular grazing in the early 2000s.

The area is of great cultural and historical importance to Māori. This is highlighted by the area's Māori name and its connection with Kupe (the legendary Polynesian explorer), which translates as 'the view that was Kupe's'. This is a contraction of its full name *Te Mātakitakinga a Kupe ki Kaikōura ki te wāhi i haere ai te tamāhine a Kupe:* 'the gazing of Kupe towards Kaikōura, the place where the daughter of Kupe had gone'[6]. The area contains numerous archaeological sites with what are likely the oldest known remains of Māori settlement in New Zealand dating back to the 12th century, along with several landmarks and features affiliated with Kupe.

5. Parties involved

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

5.1. Landowners

There are four landowners across the KNE site (see Appendix 1, Map 2). All are supportive of the activities and objectives detailed within this KNE plan.

Trevor and Carol Hawkins and their family own a large proportion of the land within the KNE site boundary and are keen to protect and conserve the regenerating native forest on their property. Some areas of rank grass and scrub near their house and baches will continue to be grazed periodically to reduce fire risk. The Hawkins' and the previous owner have planted native plants in several areas. They are doing some pest control around their baches and are fencing and retiring other areas of native vegetation.

The Mātakitaki a Kupe Reserves trustees manage four land parcels (known as Mātakitaki A1, A2, 1C1 and 3). Most of the Mātakitaki 3 land parcel near the main NZ fur seal colony area is grazed for short periods in winter and spring to reduce fire risk. While the seal colony area is open to the public the trustees are interested in managing access, fire risk and impacts on wildlife and the environment in this culturally-sensitive area. The three parcels at the eastern end of the site are restricted to the public and one was covenanted with QEII in 1991 (see Appendix 1, Map 3).

A third area in the east of the KNE site near the lighthouse has multiple owners and has been vested in trust under the Mātakitaki 1B2 Ahu Whenua Trust, and administered by a small group of trustees. This block was covenanted in 1991 with QEII.

Maritime New Zealand owns and manages the Cape Palliser lighthouse and related infrastructure.

5.2. Operational delivery

Within Greater Wellington, two departments are responsible for delivering the 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 budget funds the Biosecurity department to coordinate and carry out pest control activities.
- The Biosecurity department coordinates and implements pest controls measures at the KNE site.

5.3. Mana whenua partners

The Cape Palliser – Mātakitaki coastal area has a long history of Māori habitation. The wider area contains remains of numerous kūmara gardens, stone walls, middens and several pā and urupā sites. Several landmarks and natural features, such as springs and rock formations have significance in Māori oral histories of Kupe and the earliest

Polynesian explorers. The remains of New Zealand's oldest known inhabited Māori dwelling is 4 km inland from the KNE site and dates from the 12th century.

Rangitāne o Wairarapa and Ngāti Kahungunu ki Wairarapa have identified two sites within the KNE site as significant[7]. These values are presented in Table 1 below.

Table 1: Rangitāne o Wairarapa and Ngāti Kahungunu ki Wairarapa sites of significance in Cape Palliser – Te Mātakitaki a Kupe KNE site[8]

Sites of significance	Mana whenua values
Mātakitaki coast	wāhi tīpuna, tauranga waka, wai tai, puna rongoā, mahinga kai, ara waka, tohu ahurea and kai moana.
Ngā rā a Kupe coast	Wāhi tīpuna, wai ora, wai tai and tohu ahurea.

5.4. Stakeholders

The Aorangi Restoration Trust (ART), in partnership with DOC, maintains a network of predator kill-traps and penguin nesting boxes in various locations surrounding Aorangi Forest Park, including the Mangatoetoe Stream near the KNE site. The Trust's vision is to improve the biodiversity of the Aorangi Forest Park and surrounding areas, while maintaining opportunities for recreation and hunting. It is a community-led project with support from a number of groups and agencies including Greater Wellington.

DOC administers (on behalf of the Crown) the marginal strip land between the private land and the high tide mark, within the KNE site and the Kupe's Sail Rock Recreation Reserve on the immediate western boundary of the KNE site. They have carried out activities such as threatened plant protection work (eg, exclusion fencing and translocations for *Muehlenbeckia astonii*) in the past. DOC is the lead agency for marine mammal protection and advice and has signage and public information boards in place about the seal colony. While they will not be involved in the majority of this plan's implementation, they are supportive of the plan and will continue to act in a support and advisory role as they have done for several years.

Heritage New Zealand is a stakeholder due to the extensive archaeological history of the area.

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 Cape Palliser – Te Mātakitaki a Kupe KNE site.

Table 2: Designations at the Cape Palliser – Te Mātakitaki a Kupe KNE site

Designation level	Type of designation
Regional	Parts of the KNE site are designated under Greater Wellington's proposed Natural Resources Plan (PNRP) as a habitat with significant indigenous biodiversity values; High macroinvertebrate community health (Schedule F1): • Kirikiri Stream and all tributaries • Un-named stream draining to the sea at Easting 269 9931, Northing 595 2563 Parts of the KNE site are designated under Greater Wellington's proposed Natural Resources Plan (PNRP) as a significant coastal geological feature (Schedule J): • Cape Palliser/Mātakitaki • Kupe's Sail / Ngā rā a Kupe
District	Parts of the KNE site are designated as a significant natural area in the Wairarapa Combined District Plan (SNs25, SNs50)
Other	Parts of the KNE site is protected by a QEII open space covenant: • 5-07-081A (1991) • 5-07-081B (1991)

6.2. Ecological significance

The Cape Palliser – Te Mātakitaki a Kupe 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 shore birds, lizards species and NZ fur seals within the KNE site

Representativeness

The vegetation communities present, although modified, are highly representative of formerly more-extensive habitats in the ecological district[9].

The Singers and Rogers[10] classification of pre-human forest vegetation indicates the KNE site would likely have comprised of three different forest types, tōtara, mātai, ribbonwood forest (WF2) on the lower hillslopes, tītoki, ngaio forest (WF1) on the upper hillslopes and coastal platforms, and small areas of coprosma, muehlenbeckia shrubland/herbfield (CL3). Only 3.1% of WF2 and WF1 forest types remain of the original extent in the Wellington region[11]. No unmodified remnants of either the WF2 or WF1 forest remains within the KNE site. However, secondary native regeneration is occurring, and the coastal forest is expanding across the KNE site. Significant areas of modified CL3 are thought to remain in the region, though none remain within the KNE site (see Appendix 1, Map 4).

The Threatened Environment Classification system[12] indicates most of the lower reaches and coastline of the KNE site is Chronically Threatened, having 10-20% of its original indigenous vegetation remaining. The upper slopes of the KNE site are classified as Critically Underprotected, with less than 30% remaining of indigenous vegetation and less than 10% of that being protected.

Rarity/distinctiveness

Several naturally uncommon ecosystem types[13] are present within the KNE site. These include coastal wetland, shingle/gravel beaches, coastal turfs and marine mammal haul-out areas. See Appendix 1, Map 5 to view habitat types within the KNE site. Wetlands are now considered an uncommon habitat type in the Wellington Region with less than 3% remaining of their original extent[14].

New Zealand's national threat classification system[15] lists 26 species as nationally Threatened or At Risk within the KNE site, and 23 plant species present have also been listed as regionally threatened. Nationally Threatened species are listed in Appendix 2 and Regionally Threatened species in Appendix 3.

Diversity

The KNE site contains numerous ecosystems types, ranging from gravel backdunes and beach, gravel herbfield communities, wetlands, rock stacks, divaricate shrubland, and coastal hillslopes/gullies.

Ecological context

The designations under the PNRP and diversity of interconnected ecosystems identified within the KNE site make it highly valuable for regional biodiversity at both the habitat and species level, in particular for threatened coastal and shore birds, plants, reptiles and invertebrates.

The KNE site is adjacent to three other managed or protected coastal sites of high biodiversity value: Te Kawakawa KNE site to the west, and Aorangi Forest Park, Kupe's Sail Rock and the Mangatoetoe Reserves all managed by DOC.

6.3. Ecological features

Vegetation communities and plants

Coastal cliffs and upper hillslopes

While nothing remains of the original forest on the cliffs and hillslopes as a result of clearance for grazing, secondary native vegetation is now re-establishing. Kānuka (*Kunzea ericoides*), māhoe (*Melicytus ramiflorus*), cabbage tree (*Cordyline australis*), kōwhai (*Sophora microphylla* and *S. molloyi*), tauhinu (*Ozothamnus leptophyllus*), ngaio (*Myoporum laetum*) and various *Coprosma* species such as *C. propinqua* are most common. Speargass (*Aciphylla squarrosa*) is scattered at low density.

The more remote and inaccessible cliffs and eroding fans throughout the KNE site contain *Coprosma, Muehlenbeckia* shrubland habitat (CL3). Today the KNE site contains a modified example of this, with rare species including as *Muehlenbeckia astonii*, Cook Strait tussock (*Chionochloa beddiei*), *Brachyglottis greyi* and Cook Strait kōwhai (*Sophora molloyi*), along with *Clematis forsteri, Convolvulus waitaha,* New Zealand jasmine (*Parsonsia capsularis*) and New Zealand broom (*Carmichaelia* sp.) present. Taupata (*Coprosma repens*), tauhinu, coastal flax or whaririki (*Phormium cookianum*) and *Poa cita* are common.

Coastal bare rock platforms and gravel beaches

Whilst the shoreline near Kupe's Sail is notable for the steep, cliff-like coastal platforms that are exposed to southerly ocean swells, the sheltered margins in the centre and east of the KNE site have a shallower gradient that has developed gravel beach habitats. *Muehlenbeckia ephedroides* is present in several gravel beach locations, along with more common but scattered New Zealand ice plant (*Disphyma australe*), *Poa cita* and rush species.

Coastal wetland and turf; marine mammal haul-out areas

There is one small permanent wetland area on the coastal platform near the main NZ fur seal colony. It is largely comprised of three-square (*Schoenoplectus pungens*) and *Isolepis prolifera.*

Coastal turf communities are found in saline-influenced damp areas towards the rear of the bare rock coastal platform and contain remuremu (*Selliera radicans*), glasswort or ureure (*Sarcocornia quinqueflora*) and sea primrose (*Samolus repens*).

The presence of the permanent New Zealand fur seal colony promotes turf-like assemblages of low-growing native and exotic grasses and rushes in preferred resting areas just behind the gravel beach areas.

Vegetated coastal platform, rock stacks and divaricate shrubland mosaic

This habitat covers the stable back-beach area up to the base of the vegetated lower hillslopes. Notable species include the blanket fern *Asplenium subglandulosum* and Cook Strait bristle grass (*Rhytidosperma petrosum*) found near gravel beach and bare rock environments. New Zealand ice plant, spinifex (*Spinifex sericeus*), *Pimelea prostrata*, rush species, *Poa cita* and *Zoysia minima* are also present. Further back as the environment is more sheltered with more soil, the vegetation is a mosaic of taupata,

whararikí, rushes and New Zealand ice plant, with low statured māhoe and ngaio in more sheltered locations.

Rock stack habitat contains thick-leaved māhoe (*Melicytus crassifolius*), *Brachyglottis greyi*, *Crassula mataikona*, coastal flax or whararikí, taupata and various fern species (eg, *Asplenium appendiculatum* subsp. *maritimum*, *A. flabelliflorum* and *Pyrrosia eleagnifolia*).

The divaricate shrubland habitat is found along the foot of the hillslopes on the seaward side of the road and scattered on the vegetated coastal platform. It is dominated by pōhuehue (*Muehlenbeckia complexa*), taupata, thick-leaved māhoe, *Crassula mataikona* and tauhinu and contains scattered populations of *Muehlenbeckia astonii.*

Species

Plants

Thirty-one nationally-threatened plants have been recorded here to date. Among these notable species includes *Brachyglottis greyi* (At-Risk – Naturally Uncommon), shrubby toroaro (*Meuhlenbeckia astonii*; Threatened – Nationally Endangered), Cook Strait tussock (*Chionochloa beddiei*; At Risk – Naturally Uncommon), thick-leaved māhoe (*Melicytus crassifolius*; At-Risk – Declining) and leafless pōhuehue (*Meuhlenbeckia ephedroides;* At-Risk – Declining). Twenty-four regionally threatened plants have been recorded to date, including *Leptinella pusilla* and *Melicytus crassifolius.*

Mammals

The coastline in the KNE site is important core habitat for the New Zealand fur seal (*Arctocephalus forsteri*) and supports a significant breeding colony. Southern elephant seal (*Mirounga leonina*) are regular visitors in low numbers[16]. Several species of cetacean such as orca (*Orcinus orca*), southern right whale (*Eubalaena australis*) and humpback whale (*Megaptera novaeangliae*) are occasionally sighted near the shore[17].

Birds

The KNE site is known to provide seasonal or core habitat for nine threatened bird species[18, 19]: New Zealand pipit (*Anthus novaeseelandiae*; At Risk – Declining), red-billed gull (*Larus novaehollandiae*; Nationally Vulnerable), banded dotterel (*Charadrius bicinctus*; Threatened – Nationally Vulnerable), Caspian tern (*Hydropogne caspia*; Threatened – Nationally Vulnerable), variable oystercatcher (*Haematopus unicolor*; At Risk – Recovering), black shag (*Phalacrocorax carbo*; Naturally Uncommon), NZ falcon (*Falco novaeseelandiae*; At Risk – Recovering) and little penguin (*Eudyptula minor*; At Risk – Declining). An Eastern rockhopper penguin (*Eudyptula filholi;* Threatened – Nationally Critical) was recorded for the first time in 2017[20].

Other more common native birds such as silvereye (*Zosterops lateralis*), tūī (*Prosthemadera novaeseelandiae*), bellbird (*Anthornis melanura*), grey warbler (*Gerygone igata*), Australasian harrier (*Circus approximans*), white faced heron (*Egretta novaehollandiae*) and kingfisher (*Halcyon sancta*) have also been recorded[21].

Reptiles

Northern grass skink (*Oligosoma polychroma*; Not Threatened) and raukawa gecko (*Woodworthia maculata;* Not Threatened) have been recorded in the rockstack and

divaricate shrubland habitat in the KNE site[22,23]. Northern spotted skink (*Oligosoma kokowai*; At Risk – Relict) and barking or Wellington green gecko (At Risk – Declining) have been found near the KNE site[24].

Invertebrates

The Wellington *Notoreas* moth (an undescribed relative of *Notoreas perornata;* Threatened – Nationally Critical) has been recorded here[25], along with the uncommon Boulder Copper butterfly (*Lycaena boldenarum*)[26]. Katipō spider (*Lactrodectus katipo;* At Risk – Declining) has been found near the KNE site[22].

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 Cape Palliser – Te Mātakitaki a Kupe KNE site.

7.1. Key threats

The Cape Palliser – Te Mātakitaki a Kupe KNE site has been highly modified by historical activities such as vegetation clearance, fire, grazing and more recently by pest plants and animals.

Ecological pest plants are the key threat at the KNE site as they displace native plant species performing important structural and ecological functions such as providing food sources, shelter, roosts and refuge from predators for native fauna. They also inhibit the natural regeneration of native plant species including the rare or threatened species present. Four pest plant species are widespread across the KNE site and are considered the primary weed threat; pig's ear (*Cotyledon orbiculata*), lupin (*Lupinus arboreus*), boxthorn (*Lycium ferocissimum*), and horned poppy (*Glaucium flavium*).

Several pest animal species are present. However, the impact of these species on the indigenous wildlife at this site is not fully understood and they are therefore not currently controlled.

Stock can cause damage to wetland vegetation and degrade water quality. Wetlands within the KNE site are unmapped, and wetland fencing is either absent or in poor condition, allowing stock to enter wetlands. The wetlands are also vulnerable to mechanical damage.

8. Vision and objectives

8.1. Vision

Healthy and dynamic coastal ecosystems are surrounded by a flourishing forested landscape that supports a multitude of native wildlife.

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 Cape Palliser – Te Mātakitaki a Kupe KNE site.

1. Protect and enhance the coastal platform's biodiversity values

2. Protect and enhance rare and threatened plant species

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 4).

9.1. Ecological weed control

The aim of weed control is to improve the cover and condition of native vegetation along the coastal platform, support the regeneration of the native coastal forest on the escarpment, and prevent the over-shading of threatened plant species. See Appendix 5 for full list of target weed species.

Survey and control work will be completed annually by Greater Wellington and across the KNE site progressively building upon the previous year's control work. Weed species that pose the most immediate danger to native threatened species will be the priority for future control. Weed control is subsequently targeted along the coastal platform north of the coastal road (primarily focusing on potential weed source from bach gardens) and around the lighthouse complex including areas of escarpment.

Lupin, pig's ear, boxthorn and cape ivy around the lighthouse (Maritime NZ) and eastern Mātakitaki blocks have been targeted for control since 2014/15 (see Appendix 1, Map 2 for land ownership), and lupin, pig's ear, boxthorn, and horned poppy have been targeted throughout the entire KNE since 2017. This control has made good progress towards reducing the distribution and abundance of weed species and has supported the regeneration of the native coastal forest.

South African ice plant (*Carpobrotus edulis*), agapanthus (*Agapanthus praecox*), Cape ivy (*Senecio angulatus*), non-local native karo (*Pittosporum crassifolium*), wild broom (*Cytisus scoparius*) and gorse (*Ulex europaeus*) are more scattered and often associated with the gardens of various houses and baches on the lower slopes. While currently at low levels they have the potential to become widespread and are a high priority for control and containment.

Over the course of the operational plan we will work with DOC, who identified this area as a priority area, to review the ability and potential to expand weed control to include the coastal platform on the southern side of the coastal road. This area contains vulnerable species to disturbance and habitat modification including NZ fur seals, shorebirds and lizard species.

9.2. Revegetation

The aim of revegetation work is to increase the diversity and dominance of native plants species in the KNE site and to protect against the ingress of weed species. We will supply selected species to landowners to be planted, particularly where pest plants have been controlled such as around houses and baches.

During the course of this operational plan Greater Wellington will contact more land and bach owners to discuss the potential for replacing environmental weed species present in gardens with similar native species.

9.3. Rare plant protection

The KNE site contains some important nationally and regionally threatened plant species. During the course of this operational plan Greater wellington will map and monitor these populations so effective management can put in place to protect these species. Species high on the priority list for protection include *Muehlenbeckia astonii*, *Brachyglottis greyi,* Cook Strait kōwhai (*Sophora molloyi*) and *Muehlenbeckia ephedroides*.

Potential management options to be explored include fencing, monitoring and targeted weed control. Potential fencing would aim to prevent browsing damage from stock. The feasibility and type of fencing would be determined by the location of the rare plant populations that have been identified for focused management. Monitoring would aim to identify trends of rare plant distribution and abundance to inform future management options. Targeted weed control would aim to prevent weed incursions into the most important rare plant populations within the KNE site.

9.4. Wetland advocacy and protection

Wetlands have recently been afforded greater protection through the development of the National Environmental Standards for Freshwater Regulations 2020. In accordance with these regulations Greater Wellington's Environmental Science team are required to definitively map all natural wetlands and will be working with landowners to help advise them of their obligations in relation to wetland protection.

10. Future opportunities

10.1. Pest Animal Control

Greater Wellington will work with DOC to assess the need for pest animal control within the KNE site, particularly for the protection of lizards and shorebirds. There are opportunities to link up with The Aorangi Restoration Trust, whom maintain predator kill-traps and penguin nesting boxes around the Mangatoetoe Stream on the Western border of the KNE site.

11. Operational delivery schedule

The operational delivery schedule shows the actions planned to achieve the stated objectives for the Cape Palliser – Te Mātakitaki a Kupe KNE site, and their timing and cost over the five-year period from 1 July 2021 to 30 June 2026. The budget for years 2022/23 to 2025/26 are indicative only and subject to change.

Table 3: Five-year operational plan for the Cape Palliser – Te Mātakitaki a Kupe KNE site

Objective	Activity	Operational area	Intended 5 year outcome	Implementing party	Timetable and resourcing where allocated				
					2021/22	2022/23	2023/24	2024/25	2025/26
1	Weed sweep through previously targeted areas along the coastal platform above the road	coastal platform above the road	Native vegetation cover improved	Greater Wellington	✓ $7,000	✓ $7,000	✓ $7,000	✓ $7,000	✓ $7,000
1	Targeted weed control around the lighthouse complex and adjacent escarpment	lighthouse complex and adjacent escarpment	Native vegetation cover improved	Greater Wellington	✓ $8,500	✓ $8,500	✓ $8,500	✓ $8,500	✓ $8,500
2	Rare plant mapping and protection	Entire KNE site	Rare plant populations safeguarded	Greater Wellington	✓ Staff time	✓ Staff time	✓ Staff time	✓ Staff time	✓ Staff time
1	Provision of native plants to local bach owners	Determined annually	Replacement of non-native species with natives	Greater Wellington	✓ $500	✓ $500	✓ $500	✓ $500	✓ $500

12. Funding contributions

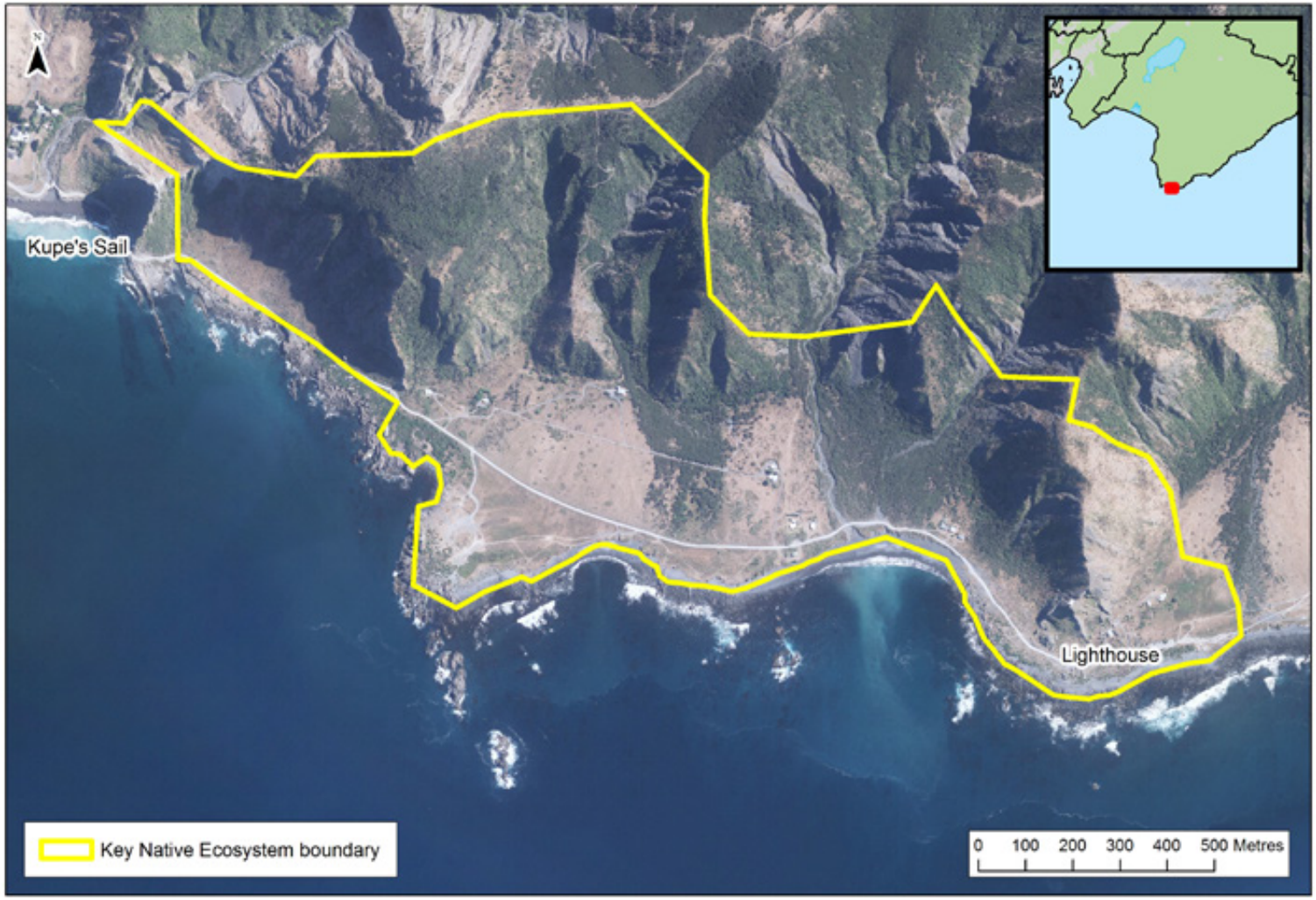
12.1. Budget allocated by Greater Wellington

The budget for the years 2022/23 to 2025/26 are indicative only and subject to change.

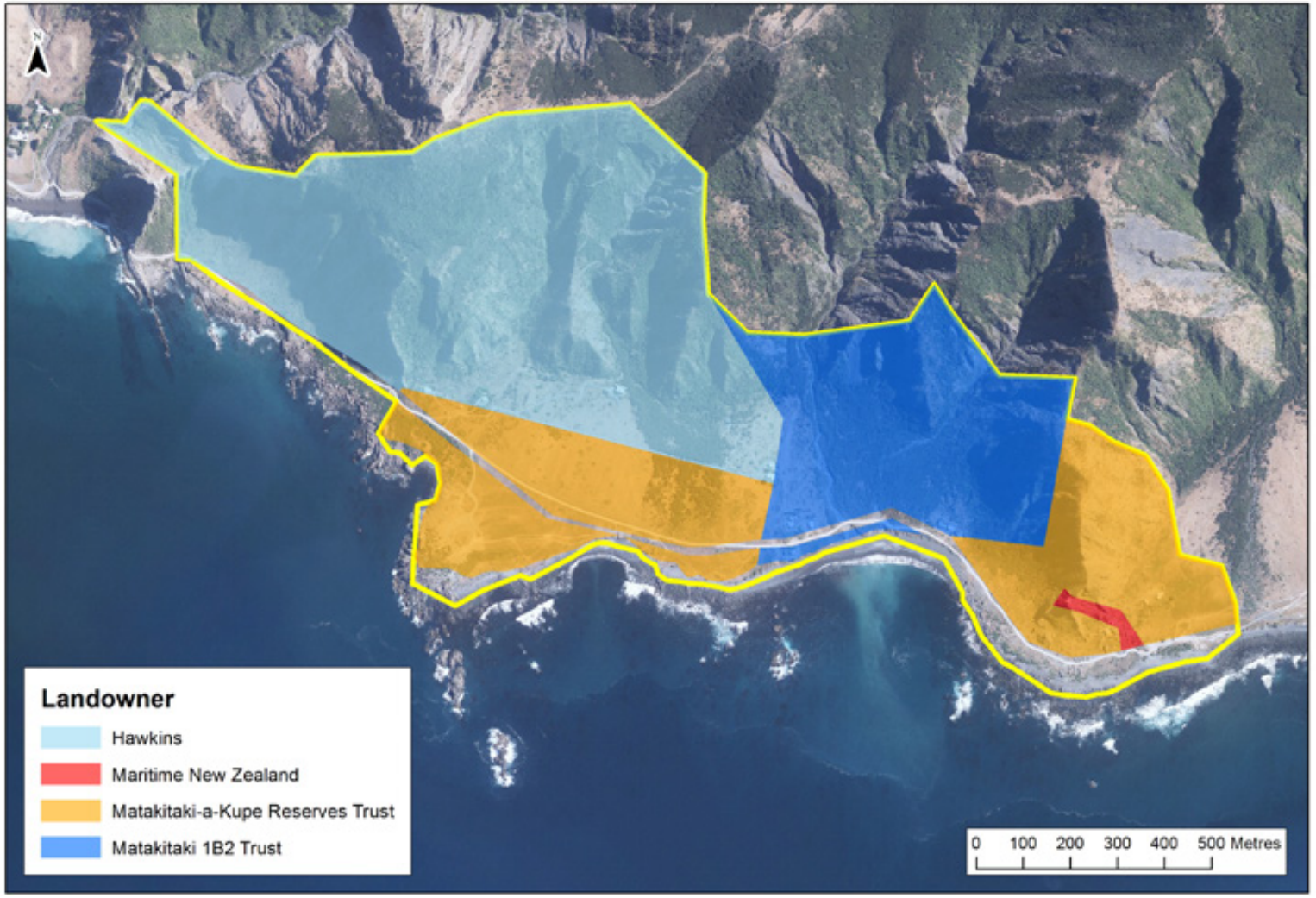
Table 4: Greater Wellington allocated budget for the Cape Palliser – Te Mātakitaki a Kupe KNE site

Management activity	Timetable and resourcing				
	2021/22	2022/23	2023/24	2024/25	2025/26
Ecological weed control	$15,500	$15,500	$15,500	$15,500	$15,500
Revegetation	$500	$500	$500	$500	$500
Total	**$16,000**	**$16,000**	**$16,000**	**$16,000**	**$16,000**

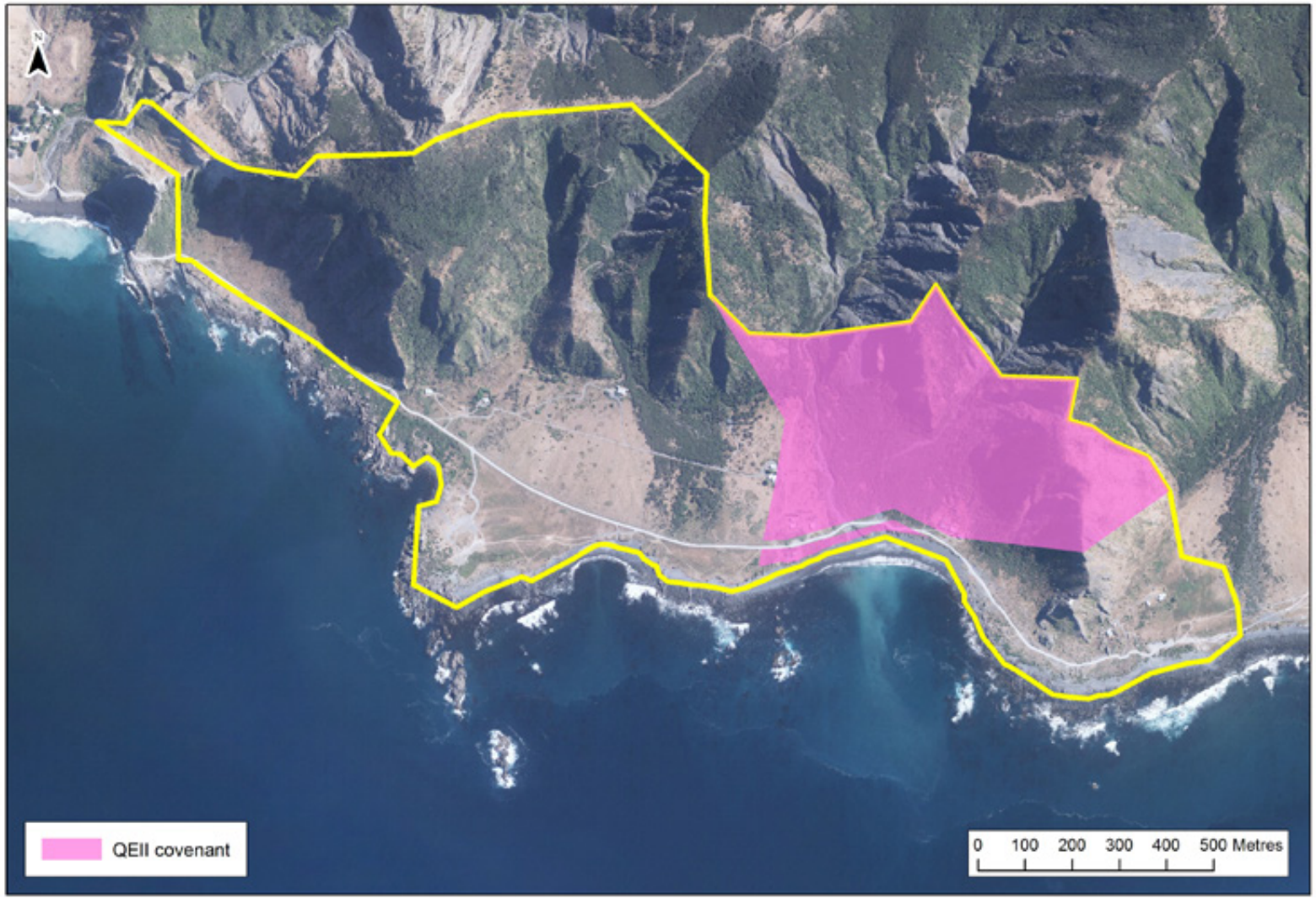
Appendix 1: Site maps



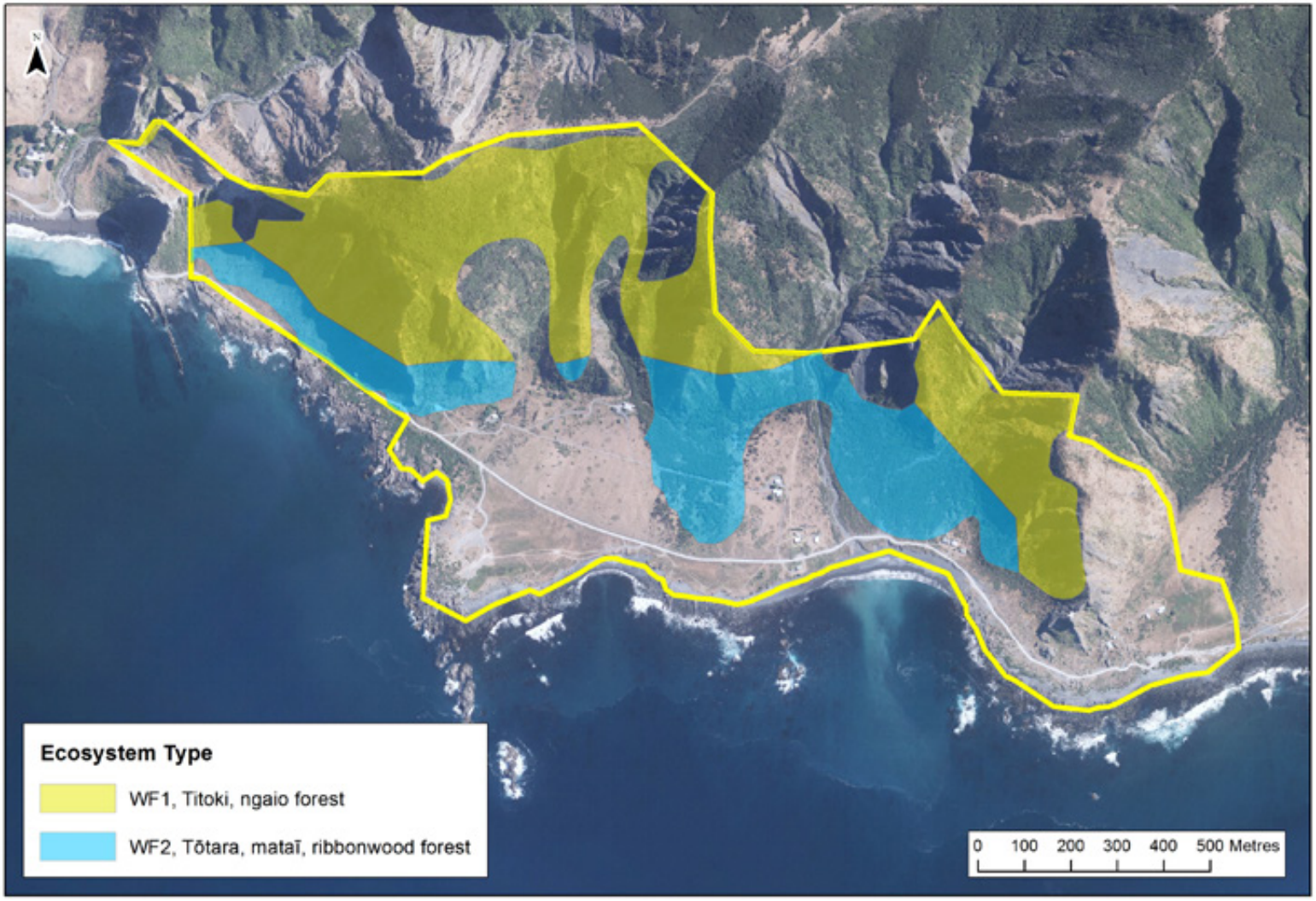
Map 1: The Cape Palliser – Te Mātakitaki a Kupe KNE site boundary



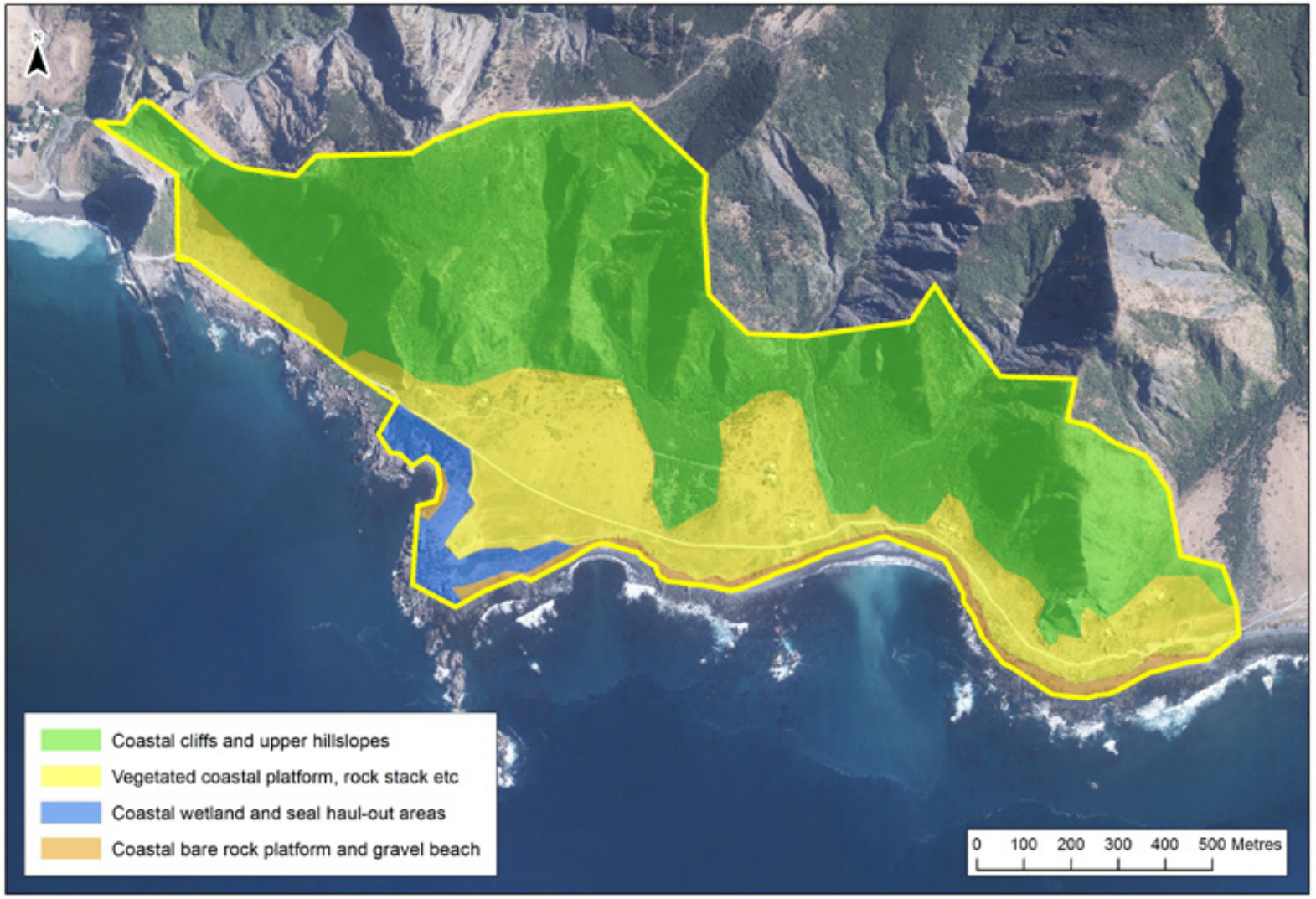
Map 2: Landownership boundaries in the Cape Palliser – Te Mātakitaki a Kupe KNE site



Map 3: QEII covenant areas in the Cape Palliser – Te Mātakitaki a Kupe KNE site



Map 4: Existing Singers and Rogers forest types at the Cape Palliser – Te Mātakitaki a Kupe KNE site



Map 5: Ecosystem type operatioanal areas for weed control

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[27]. 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 Cape Palliser – Te Mātakitaki a Kupe KNE site.

Table 5: Threatened and At Risk species at the Cape Palliser – Te Mātakitaki a Kupe KNE site

Scientific name	Common name	Threat status	Observation
Plants(vascular)[28]			
Aciphylla squarrosa		At Risk – Declining	Enright et al. 2010-15[29]
Anogramma leptophylla	Jersey fern, annual fern	Threatened – Nationally Vulnerable	Druce, 1947-87[30]
Asplenium subglandulosum	Blanket fern	At Risk – Naturally Uncommon	Druce, 1947-87
Brachyglottis greyi	Coastal groundsel	At Risk – Naturally Uncommon	Druce, 1947-87
Caladenia variegata		At Risk – Naturally Uncommon	Druce, 1947-87
Chenopodium allanii		At Risk – Naturally Uncommon	Druce, 1947-87
Chionochloa beddiei	Cook strait tussock	At Risk – Naturally Uncommon	Druce, 1947-87
Coprosma acerosa	Sand coprosma	At Risk – Declining	Druce, 1947-87
Coprosma virescens		At Risk – Declining	Enright et al. 2010-15
Corybas rivularis	Spider orchid, silverback	At Risk – Naturally Uncommon	Tim Park, GW, pers obs 2013.
Craspedia uniflora var. grandis	Woollyhead	At Risk – Declining	Druce, 1947-87
Crassula mataikona		At Risk – Naturally Uncommon	Enright et al. 2010-15
Crassula penducularis		Threatened – Nationally Critical	Druce, 1947-87
Daucus glochidiatus	Native carrot	At Risk – Declining	Druce, 1947-87
Eryngium vesiculosum	Sea holly	Threatened – Nationally Vulnerable	Enright et al. 2010-15
Ficinia spiralis	Pīngao	At Risk – Declining	Druce, 1947-87

Scientific name	Common name	Threat status	Observation
Geranium microphyllum		At Risk – Naturally Uncommon	Enright et al. 2010-15
Geranium solanderi	Solander's geranium	At Risk – Declining	Enright et al. 2010-15
Melicytus crassifolius	Thick-leaved māhoe	At Risk – Declining	Druce, 1947-87
Muehlenbeckia astonii	Shrubby toroaro	Threatened – Nationally Vulnerable	Druce, 1947-87
Muehlenbeckia ephedroides	Leafless muehlenbeckia	Threatened – Nationally Vulnerable	Druce, 1947-87
Poa billardierei	Sand tussock	At Risk – Declining	Druce, 1947-87
Pterostylis foliata	Grassland greenhood	At Risk – Naturally Uncommon	Druce, 1947-87
Rytidosperma petrosum	Cook Strait bristle grass	At Risk – Naturally Uncommon	Druce, 1947-87
Sonchus kirkii	Shore puha, NZ sow thistle	At Risk – Declining	Tim Park, GW, pers obs 2013.
Sophora molloyi	Cook Strait kōwhai	At Risk – Naturally Uncommon	Enright et al. 2010-15
Trisetum antarcticum		At Risk – Declining	Tim Park, GW, pers obs 2013.
Mammals(bats)[31] (marine mammals)[32]			
Mirounga leonina	Southern elephant seal	Threatened – Nationally Critical	Kevin Stevens, GW, pers obs 2014.
Birds[18]			
Anthus novaezelandiae	NZ pipit / pīhoihoi	At Risk – Declining	Justin McCarthy, GW, pers obs 2014.
Charadrius bicinctus	Banded dotterel / pohowera	Threatened – Nationally Vulnerable	Justin McCarthy, GW, pers obs 2016.
Eudyptes filholi	Eastern rockhopper penguin	Threatened – Nationally Vulnerable	Anna Burrows, DOC, pers com 2017.
Eudyptula minor	Little blue penguin / Korora	At Risk – Declining	Tim Park, GW, pers obs 2013.
Falco novaeseelandiae	NZ falcon / Kārearea	At Risk – Recovering	Enright et al 2010[33]
Haematopus unicolor	Variable oystercatcher / tōrea tai	At Risk – Recovering	Rebergen 2012
Hydroprogne caspia	Caspian Tern / taranui; kāhawai	Threatened – Nationally Vulnerable	Justin McCarthy, GW, pers obs 2015.
Larus novaehollandiae scopulinus	Red-billed Gull / tarāpunga	At Risk – Declining	Justin McCarthy, GW, pers obs 2016

Scientific name	Common name	Threat status	Observation
Phalacrocorax carbo novaehollandiae	Black shag / kawau; kawau tuawhenua	At Risk – Naturally Uncommon	Rebergen 2012
Reptiles[34]			
Naultinus elegans punctatus	Wellington green gecko; barking gecko	At Risk – Declining	G. Eloff, QEII Trust, pers comm 2017
Invertebrates[35](Lepidoptera – butterflies and moths)[36]			
Notoreas perornata (Wellington)	Coastal moth	Threatened – Nationally Critical	Patrick, 2004[25]

Appendix 3: Regionally threatened 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 Cape Palliser – Te Mātakitaki a Kupe KNE site.

Table 6: Regionally threatened species recorded in the Cape Palliser – Te Mātakitaki a Kupe KNE site

Scientific name	Common name	Threat status	Observation
Plants[37]			
Aciphylla squarrosa		Threatened – Vulnerable	Enright et al 2010-15[38]
Anogramma leptophylla	Jersey fern, annual fern	Threatened – Endangered	Druce, 1947-87
Asplenium subglandulosum	Blanket fern	Threatened – Critical	Druce, 1947-87
Brachyglottis greyi	Coastal groundsel	Threatened – Endangered	Druce, 1947-87
Caladenia variegata		At Risk – Naturally Uncommon	Druce, 1947-87
Centipeda aotearoana	NZ sneezewort	At Risk – Naturally Uncommon	Druce, 1947-87
Chenopodium allanii		At Risk – Naturally Uncommon	Druce, 1947-87
Chionochloa beddiei	Cook strait tussock	At Risk – Naturally Uncommon	Druce, 1947-87
Coprosma acerosa	Sand coprosma	At Risk – Declining	Druce, 1947-87
Coprosma virescens		Threatened – Endangered	Enright et al 2010-15[39]
Corybas rivularis	Spider orchid, silverback	Data Deficient	Tim Park, GW, pers obs 2013.
Craspedia uniflora	Woollyhead	Data Deficient	Druce, 1947-87
Crassula mataikona		At Risk – Naturally Uncommon	Enright et al. 2010-15
Crassula penducularis		Threatened – Critical	Druce, 1947-87

Scientific name	Common name	Threat status	Observation
Daucus glochidiatus	Native carrot	Threatened – Vulnerable	Druce, 1947-87
Eryngium vesiculosum	Sea holly	Threatened – Critical	Enright et al. 2010-15
Ficinia spiralis	Pīngao	Threatened – Vulnerable	Druce, 1947-87
Geranium solanderi	Solander's geranium	Data Deficient	Enright et al. 2010-15
Melicytus crassifolius	Thick-leaved māhoe	At Risk – Declining	Druce, 1947-87
Muehlenbeckia astonii	Shrubby toroaro	Threatened – Critical	Druce, 1947-87
Muehlenbeckia ephedroides	Leafless muehlenbeckia	Threatened – Critical	Druce, 1947-87
Poa billardierei	Sand tussock	At Risk – Declining	Druce, 1947-87
Pterostylis foliata	Grassland greenhood	At Risk – Naturally Uncommon	Druce, 1947-87
Rytidosperma petrosum	Cook Strait bristle grass	Threatened – Critical	Druce, 1947-87
Sonchus kirkii	Shore puha, NZ sow thistle	At Risk – Declining	Tim Park, GW, pers obs 2013.
Sophora molloyi	Cook Strait kōwhai	Threatened – Critical	Enright et al. 2010-15
Trisetum antarcticum		At Risk – Declining	Tim Park, GW, pers obs 2013.
Birds[40]			
Anthus novaezelandiae	NZ pipit / pīhoihoi	Threatened – Vulnerable	Justin McCarthy, GW, pers obs 2014.
Charadrius bicinctus	Banded dotterel / pohowera	Threatened – Vulnerable	Justin McCarthy, GW, pers obs 2016.
Eudyptes filholi	Eastern rockhopper penguin	Vagrant	Anna Burrows, DOC, pers com 2017.
Eudyptula minor	Little blue penguin / Korora	Threatened – Vulnerable	Tim Park, GW, pers obs 2013.
Falco novaeseelandiae	NZ falcon / Kārearea	Threatened – Critical	Enright et al. 2010
Haematopus unicolor	Variable oystercatcher / tōrea tai	Threatened – Vulnerable	Rebergen 2012
Hydroprogne caspia	Caspian Tern / taranui; kāhawai	Threatened – Critical	Justin McCarthy, GW, pers obs 2015.
Larus novaehollandiae scopulinus	Red-billed Gull / tarāpunga	Threatened – Vulnerable	Justin McCarthy, GW, pers obs 2016.
Phalacrocorax carbo novaehollandiae	Black shag / kawau; kawau tuawhenua	Threatened – Critical	Rebergen 2012

Appendix 4: Threat table

Appendix 4 presents a summary of all known threats to the Cape Palliser – Te Mātakitaki a Kupe KNE site including those discussed in section 7.

Table 7: Threats to the Cape Palliser – Te Mātakitaki a Kupe KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
Ecological weeds		
EW-1	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 pig's ear (*Cotyledon orbiculata*), agapanthus (*Agapanthus praecox*), horned poppy (*Glaucium flavum*) and cape ivy (*Senecio angulatus*). See appendix 5 for a full list of pest plant species.	Entire KNE site
EW-2	Woody weed species displace native vegetation, inhibit indigenous regeneration, and alter vegetation structure and composition. Key woody ecological weed species include boxthorn (*Lycium ferocissimum*) and lupin (*Lupinus arboreous*). See appendix 5 for a full list of pest plant species.	Entire KNE site
Pest animals		
PA-1*	Possums (*Trichosurus vulpecula*) browse palatable canopy vegetation until it can no longer recover[41,42]. This destroys the forest's structure, diversity and function. Possums may also prey on native birds and invertebrates[43].	Entire KNE site
PA-2*	Rats (*Rattus* 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[44,45].	Entire KNE site
PA-3*	Mustelids (stoats[46,47] (*Mustela erminea*), ferrets[48,49] (*M. furo*) and weasels[50,51] (*M. nivalis*)) prey on native birds, lizards and invertebrates, reducing their breeding success and potentially causing local extinctions.	Entire KNE site
PA-4*	Hedgehogs (*Erinaceus europaeus*) prey on native invertebrates[52], lizards[53] and the eggs[54] and chicks of ground-nesting birds[55].	Entire KNE site
PA-5*	House mice (*Mus musculus)* 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[56,57].	Entire KNE site
PA-6*	Pest and domestic cats (*Felis catus*) prey on native birds[58], lizards[59] and invertebrates[60], reducing native fauna breeding success and potentially causing local extinctions[61].	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
PA-7*	Rabbits (*Oryctolagus cuniculus*) and hares (*Lepus europaeus*) graze on palatable native vegetation and prevent natural regeneration in some environments[62]. Rabbits are particularly damaging in sand dune environments where they graze native binding plants and restoration plantings.	Entire KNE site
PA-8*	Wasps (*Vespula* spp.) adversely impact native invertebrates and birds through predation and competition for food resources. They also affect nutrient cycles in beech forests[63].	Entire KNE site
PA-9*	Red deer (*Cervus elaphus*) and fallow deer (*Dama dama*) browse the forest understory and can significantly change vegetation composition by preferential browsing and preventing regeneration[64,65,66].	Entire KNE site
PA-10*	Feral pigs (*Sus scrofa*) root up the soil and eat roots, invertebrates, seeds and native plants preventing forest regeneration[67].	Entire KNE site
PA-11*	Goats (*Capra hircus*) 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[68].	Entire KNE site
Human activities		
HA-1	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[69].	Entire KNE site
HA-2*	Recreational use such as tramping, mountain biking and horse riding 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-3	Garden waste dumping often leads to ecological weed invasions into natural areas.	Entire KNE site
HA-4*	Recreational vehicles such as 4WDs and motorbikes can cause damage to dune systems and disturbance of the native ecosystem.	Entire KNE site
HA-5*	Fires caused by deliberate acts and uncontrolled campfires can quickly spread and burn large areas of vegetation and threaten buildings and assets.	Entire KNE site
Other threats		
OT-1	Operating heavy machinery in or around wetlands can damage native vegetation, alter wetland hydrology, and degrade water quality.	Wetlands within the KNE
OT-2*	Accidental fires caused by natural phenomena such as lightning strikes can lead to large fires burning native vegetation.	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 Cape Palliser – Te Mātakitaki a Kupe KNE site.

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

Table 8: Ecological weed species recorded in the Cape Palliser – Te Mātakitaki a Kupe KNE site

Scientific name	Common name	Level of distribution	Management aim
Agapanthus praecox	Agapanthus	Localised and sparse	Suppression
Chrysanthemoides monilifera subsp. *monilifera*	Boneseed	Localised and sparse	Sustained control as an RPMP species
Cortaderia selloana	Pampas	Localised and sparse	Eradication
Cotyledon orbiculata	Pig's ear	Widespread and dense	Suppression
Cystisus scoparius	Broom	Localised and sparse	Suppression
Gazania linearis	Gazania	Localised and sparse	Suppression
Glaucium flavium	Horned poppy	Widespread and abundant	Suppression
Lupinus arboreus	Tree Lupin	Widespread and abundant	Suppression
Lycium ferocissimum	Boxthorn	Widespread and abundant	Eradication
*Pittosporum carssifolium**	Karo*	Localised and sparse	Eradication
Polypodium vulgare		Localised and sparse	Eradication
Rosa rubiginosa	Briar rose	Localised and sparse	Eradication
Senecio angulatus	Cape ivy	Localised and sparse	Eradication
Ulex europaeus	Gorse	Localised and sparse	Suppression

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

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