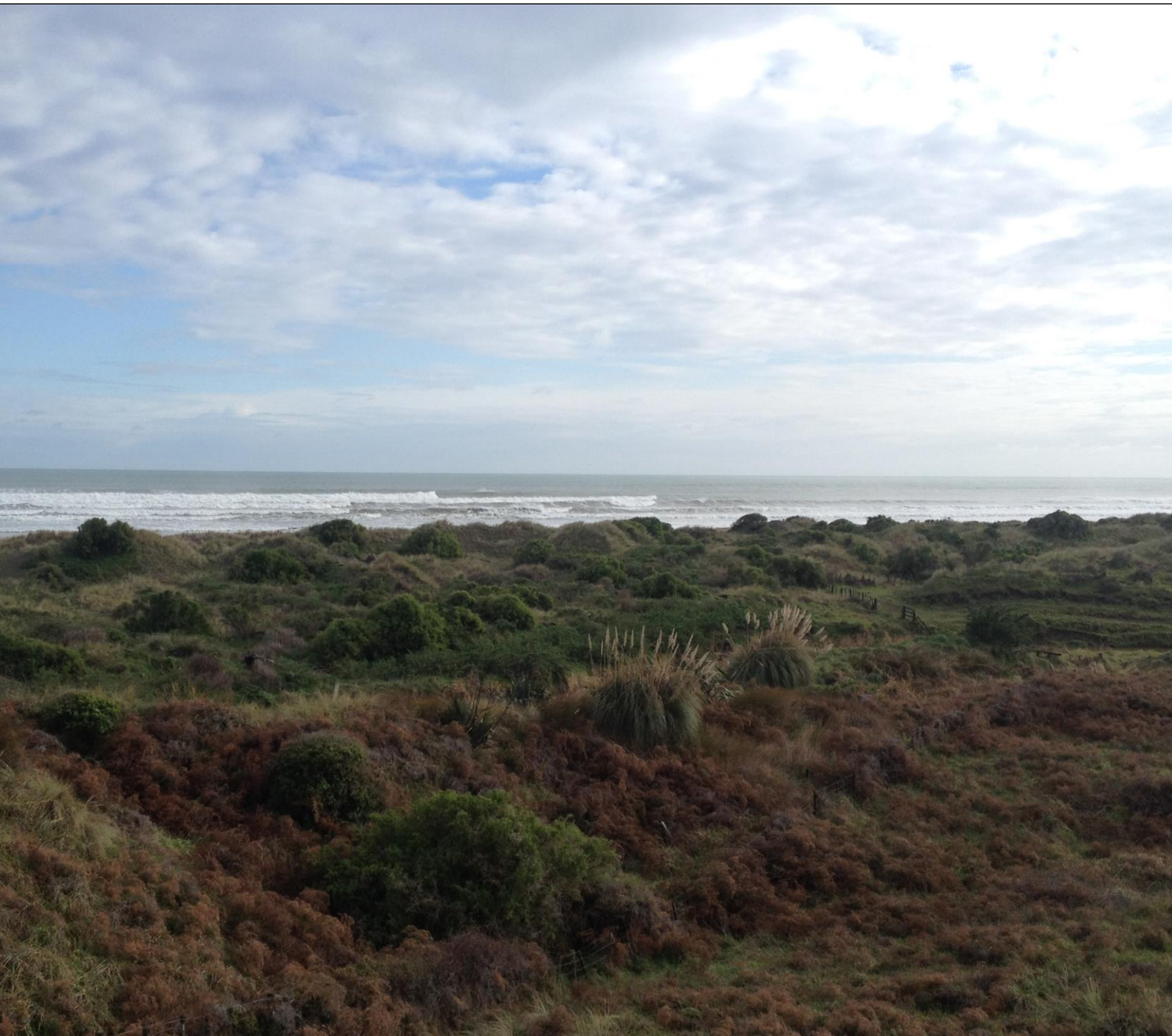
Key Native Ecosystem Operational Plan for Peka Peka Coast

2023-2028



Contents

1. Purpose

The purpose of the five-year Key Native Ecosystem (KNE) Operational Plan for Peka Peka Coast 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 (e.g., 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]. It 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. It 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 Environment Restoration team. 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 commonplace	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, i.e., 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. Peka Peka Coast Key Native Ecosystem site

The Peka Peka Coast KNE site (39 ha) is located on the Kāpiti Coast between Peka Peka Beach and Waikanae Beach townships. It comprises three areas: the Te Kōwhai Stream estuary; the coastal dunes and wetlands of Pharazyn Reserve; and the three-kilometre strip of coastline between the two (see Appendix 1, Map 1). The KNE site includes various coastal ecosystems including sand dunes, wetlands, and a relatively unmodified estuary[6]. These ecosystems provide habitat for various threatened coastal flora and fauna. The vegetated sand dunes behind the beach provide natural protection to inland areas from coastal erosion and seaborn flooding.

5. Parties involved

There are several organisations and groups that play important roles in the management of the KNE site.

5.1 Landowner/Land Manager

Kāpiti Coast District Council (KCDC) owns and manages all lands within the Peka Peka Coast KNE site. The majority of the KNE site is gazetted as a Local Purpose Reserve (Foreshore Protection) under the Reserves Act 1977 whilst Pharazyn Reserve and Te Kōwhai Stream estuary, which is part of the wider Ngāwhakangutu Reserve, are designated as Local Purpose Reserves (Passive Recreation).

5.2 Operational delivery

Within Greater Wellington, three teams are responsible for delivering the Peka Peka Coast KNE operational plan.

- The Environment Restoration team is the lead department for Greater Wellington and is responsible for the longer-term planning and coordination of biodiversity management activities, and advice within the KNE site
- The Pest Plants and Pest Animals teams coordinate and implement ecological weed and animal control measures at the KNE site. Funding is provided by the Environment Restoration team's KNE programme budget.

KCDC funds and delivers biodiversity management activities within the KNE site in accordance with KCDC's District Plan[7], as well as the Pharazyn Reserve Landscape and Ecological Restoration Plan[8], and the Ngāwhakangutu Reserve Management Plan[9]. Activities undertaken by KCDC include revegetation planting and additional ecological weed control.

Volunteers also contribute to operational work. The Pharazyn Reserve Focus Group undertake pest animal control and revegetation planting, while the Peka Peka Restoration Group also contributes to revegetation.

5.3 Mana whenua partners

The Peka Peka Coast KNE site is located within the rohe (district) of Ngā Hapū o Ōtaki, who are one of Greater Wellington's six mana whenua partners in the region. The KNE site is a site of significance for Ngā Hapū o Ōtaki (see Table 1) and they are aware that their areas of interest are located on territorial authority land. Greater Wellington is committed to identifying ways in which kaitiakitanga can be strengthened by exploring opportunities on how Ngā Hapū o Ōtaki wish to be further involved in the operational delivery of the KNE site.

Table 1: Mana whenua sites of significance in Peka Peka Coast KNE site[10]

Sites of significance	Mana whenua values
Kōwhai Stream and mouth	mahinga kai, ara waka, papa kāinga, puna raranga, tohu ahurea, kauhoe, wai ora, wai tai, wāhi whakawātea, wāhi whakarite

5.4 Stakeholders

The Peka Peka Guardians have a general interest in the management of the Peka Peka beach 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 its management contributes to the maintenance of regional biodiversity.

6.1 Ecological designations

Table 2, below, lists ecological designations at all or part of the Peka Peka Coast KNE site.

Table 2: Designations at the Peka Peka Coast KNE site

Designation level	Type of designation
District	Part of the Peka Peka Coast KNE has been identified by KCDC as Ecological Sites of Significance (See Appendix 1, Map 2) and/or a Natural Open Space Zone. They are listed in the Operative Kāpiti Coast District plan 2021[11] as: • Pharazyn Reserve: K236 (41.6 ha) • Ngāwhakangutu reserve (19 ha)

6.2 Ecological significance

The Peka Peka Coast KNE site is 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 such as unmodified estuaries and active sand dunes
- 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.

Representativeness

The Singers and Rogers[12] classification of pre-human forest vegetation indicates the KNE site would likely have been comprised of three dominant ecosystem types (Appendix 1, Map 3). These ecosystem types would have included:

- spinifex-pīngao grassland/sedgeland (DN2) dominating the foredunes
- a coastal sand dunes mosaic of spinifex-pīngao grassland/sedgeland (DN2) and oioi, and knobby clubrush sedgeland (DN5) dominating the back dunes of Pharazyn Reserve and Te Kōwhai estuary.
- kahikatea-pukatea forest (WF8) would have been present in the wetland areas of Te Kōwhai estuary and the wetlands in the east of the Pharazyn Reserve.

The following species would have been found amongst the foredunes: mānuka (*Leptospermum scoparium*), kānuka (*Kunzea amathicola*), tutu (*Coriaria arborea*), toetoe (*Austroderia toetoe*), and tauhinu (*Ozothamnus leptophyllus*). In addition,

according to the botanist Cockayne, small plant species such as *Cordyline australis*, *Macropiper excelsum*, *Sophora microphyla,,* and *Pittosporum tenuifolium,* would have been present amongst the Peka Peka dunes.

There are pockets of spinifex-pīngao grassland/sedgeland still present along the coast and regenerating through management of competing species such as *Ammophilia arenaria* (Marram grass). Remnants of kahikatea-pukatea forest can be found in the wetlands within this KNE site.

The Threatened Environment Classification[13] (Appendix 1, Map 4) indicates that most of the KNE site is classified as Chronically Threatened because there is only 10-20% of native vegetation remaining on these types of land in New Zealand.

Rarity/distinctiveness

Several naturally uncommon ecosystem types are present within the KNE site. Unmodified estuaries, active sand dunes, and stable sand dunes are Naturally Rare ecosystem types at a national scale[14]. Estuaries have been classified as Vulnerable and the other types of ecosystems as Endangered[15]. Wetlands are considered uncommon in the Wellington region with less than 3% of the original extent remaining today [16].

New Zealand's national threat classification system[17] lists several nationally 'Threatened' or 'At Risk' plant and bird species within the KNE site. Several species have also been listed as regionally threatened. Appendixes 2 and 3 contain lists of nationally and regionally threatened species found within the KNE site.

Diversity

Peka Peka coast contains several ecosystem types including, coastal dunes, wetlands, estuaries and coastal forest. This KNE site supports a high diversity of coastal flora and fauna.

Ecological context

This KNE site is part of a strip of coastal habitats under protection in this part of the Kāpiti Coast including Waitohu, Otaki Coast and Waikanae Estuary. Coastal birds can move up and down the coast between these sites for foraging and resting. The KNE site is also part of the patchwork of wetland under management in the Kāpiti district which include Te Harakeke, Te Hapua, and Ngā Manu KNE sites. These wetlands provide habitat through the landscape for wetland bird species.

6.3 Ecological features

The KNE site is in the Foxton Ecological District that is typically characterised by coastal sand dune ecosystems [18]. Foxton ecological district has warm summers and mild winters. It has annual rainfall of 800-1,200 mm, prevailing westerly to north-westerly winds, and relatively frequent gales.

Vegetation communities and plants

Te Kōwhai estuary

The plant communities of the estuary include mainly native sedges and rushes with the occasional harakeke (*Phormium tenax*), toetoe (*Austroderia toetoe*), and taupata (*Coprosma repens*). The lower estuary is dominated by three-square (*Schoenoplectus*

pungens) and sand sedge (*Carex pumila*), with small patches of bachelor's buttons (*Cotula coronipifolia*). The upper estuary is dominated by *Carex geminata,* which forms thick bands adjacent to the stream edge amongst a mosaic of native rushes, reeds, sedges, and exotic grasses.

Active foredunes

The native vegetation present in the foredunes largely consists of spinifex (*Spinifex hirsutus*), pīngao (*Ficinia spiralis*), sand gossamer grass (*Lachnogrostis billiardierei*), sand piripiri (*Acmaena pallidus*), shore convolvulus (*Calystegia soldanella*), and wīwī (*Ficinia nodosa*). Taupata, pōhuehue (*Muehlenbeckia complexa*), toetoe, and harakeke are present but distributed sparsely across this ecosystem.

The foredunes at Marram Way have had native species planted such as pīngao, speckled sedge (*Carex testacea*), sand tussock (*Poa billardierei*), and New Zealand sand daphne (*Pimelia prostrata* subsp*. prostrata*)*.*

Backdunes with wetland swales

The backdunes in the Te Kōwhai and Pharazyn areas are currently in a degraded state with poor native cover. However, pōhuehue, taupata, native spinach (*Tetragonia trigyna*), bracken fern (*Pteridium esculatum*), and the occasional mature kānuka (*Kunzea amathicola*) are present. In the back dunes of the Pharazyn Reserve and coastal foredune areas, large scale revegetation has been underway for several years bringing a measure of native plant presence and diversity back into these areas.

The wetland swale within Pharazyn Reserve contains raupō (*Typha orientalis*) in standing water with other native species including harakeke, wīwī (*Juncus edgariae*), *Isolepis prolifer*, giant umbrella sedge (*Cyperus ustulatus*), and pūrei (*Carex secta*) present in damp areas.

Species

Birds

Native bird species present in the KNE site include: banded dotterel/pohowera (*Charadrius bicinctus*), black-billed gull/tarāpuka (*Larus bulleri*), pied shag/kāruhiruhi *(Phalacrocorax varius*), variable oystercatcher/tōrea pango (*Haematopus unicolor*), pied stilt/poaka (*Himantopus himantopus*), black fronted dotterel (*Elseyornis melanops*), red-billed gull/tarāpunga (*Larus novaehollandiae*), swamp harrier/kāhu (*Circus approximans*), spur winged plover (*Vanellus miles*), black-backed gull/karoro (*Larus dominicanus*), grey warbler/riroriro (*Gerygone igata*), welcome swallow/warou (*Hirundo neoxena*), and South Island pied oystercatcher/tōrea (*Haematopus finschi*). Other birds of note that have been recorded irregularly at the site are Caspian tern/taranui (*Hydroprogne caspia*) and white-fronted tern/tara (*Sterna sterna striata*).

Fish

The estuary has been known to support longfin eel (*Anguilla dieffenbachia*), shortfin eel (*A. australis*), banded kōkopu (*Galaxias fasciatus*), and īnanga (*Galaxias maculatus*)[19], and is likely to be important for other migratory fish species.

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 Peka Peka Coast KNE site.

7.1 Key threats

The primary threats to the ecological values of the Peka Peka Coast KNE site are ecological weed species, pest animals, and adverse impacts from human activities.

Ecological weeds are widespread throughout the KNE site and are considered the greatest threat to the ecological values of the dune and estuarine ecosystems. The key weed species are marram grass (*Ammophila arenaria*), boxthorn (*Lycium ferocissimum*), pampas grass (*Cortaderia selloana/C. jubata*), iceplant (*Carpobrotus edulis*), and kikuyu grass (*Pennisetum clandestinum*). These species are threatening to out-compete native plant species and prevent natural regeneration.

Marram grass is known to be an ecological transformer. It dominates sand dune vegetation and alters the sand dune structure and function. Due to the presence of marram grass, the dunes at Peka Peka Coast KNE site are much higher and steeper than what would naturally occur in a native spinifex dominated system. This leads to the dunes being more vulnerable to erosion during storms. Furthermore, spinifex dominated dunes have the advantage of being able to recover after storm events due to the sand trapping nature of spinifex plants. Marram grass doesn't have this same ability.

Some pest animal species threaten values of the KNE site. Rats (*Rattus* spp.) and mustelids (*Mustela* spp.) are present and are likely to be preying on native species causing their decline and altering the ecosystem dynamics. Rabbits (*Oryctolagus cuniculus)* are also a major threat in the KNE site as they browse on native plants, including recently planted vegetation. If rabbits are not controlled, there will be a high risk of new plantings failing and biodiversity loss occurring.

Informal recreation activities, including off road motor biking and 4-wheel driving, have caused erosion, habitat loss, and the spread of ecological weeds.

8. Vision and objectives

8.1 Vision

An array of healthy and resilient coastal ecosystems that support thriving communities of native flora and fauna

8.2 Objectives

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

The following objectives will guide the operational activities at the Peka Peka Coast KNE site.

1. ***To improve the indigenous dominance and functionality of the various ecosystems***
2. ***To prioritise dune restoration and stabilisation***
3. ***To improve the habitat for and abundance of native birds and fish***

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).

Several management/restoration plans have been prepared for specific areas within the KNE site. These include the Pharazyn Reserve Landscape and Ecological Restoration Plan 2011[20], the Peka Peka Dunes 5-year Restoration Plan[21], and the Ngāwhakangutu Reserve Management Plan 2012[22]. These plans guide the work undertaken within the KNE site and provide more detail on restoration planting.

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

For practicality, some areas of the KNE site have been divided into operational areas based on their ecological features (See Appendix 1, Map 5). These are:

A: Pharazyn Reserve (13.98 ha)

B: Coastal Foredunes (5.77 ha)

C: Te Kōwhai Estuary (12.18 ha)

9.1 Ecological weed control

Ecological weed control is being undertaken across the KNE site to increase the native plant dominance and provide conditions for natural regeneration. To achieve this, an ecological weed control approach has been developed that has identified and prioritised ecological weeds present within the KNE site, based on the severity of the ecological impacts that particular weed species pose.

Greater Wellington undertakes control of the weed species that have the greatest negative impact such as ice plant, marram, boxthorn, and pampas throughout the site. This control work generally commences from the coastline and progresses inland, with the intent of allowing native species like spinifex and pīngao to naturally re-colonise the ecosystem.

In addition to the above weed species, kikuyu, mercer grass (*Paspalum distichum),* and blackberry (*Rubus* sp. (*R. fruticosus* agg.)) are targeted in Pharazyn Reserve (Operational area A, Map 5). These species, along with agapanthus (*Agapanthus praecox* subsp. *orientalis)* and licorice plant (*Helichrysum petiolare*) will be targeted in the coastal foredunes (Operational Area B, Map 5). In the Te Kōwhai estuary (Operational Area C, Map 5) the main target for weed control is boxthorn.

Each year, weed control is undertaken in Operational Areas A and C in preparation for revegetation planting. This work will include spot spraying of exotic grasses and ground covering weeds.

Appendix 5, Table 9 contains a full list of weed species and their ecological impacts at the site

9.2 Pest animal control

The purpose of pest animal control at the KNE site is to protect native wetland species from rabbit browsing, and shorebird populations from predation.

Predator control targeting rats and mustelids is currently focused on Pharazyn Reserve (Operational Area A) (see Appendix 1, Map 6). A small network of seven DOC 200 traps is serviced monthly by the Pharazyn Reserve Group and the bait supplied by KCDC. In addition, KCDC supports rabbit control at Pharazyn Reserve by funding night shooting undertaken by the pest animal team. This will contribute to decreasing the browsing pressure of rabbits on native vegetation and consequently, increase native dominance at the site.

During the first year of this plan, the potential of expanding the predator control network to cover more of the site will be looked at.

9.3 Revegetation

Revegetation is funded and delivered by KCDC across the Peka Peka KNE site (see Appendix 6, Table 10). This is in accordance with the Peka Peka Five-Year Restoration Plan[23], and the Pharazyn Reserve Landscape and Ecological Restoration Plan[24].

Revegetation allows for an increase in native plant cover and reintroduces absent native plants to the site. This revegetation also contributes to stabilising degraded sand dune areas, and provides a seed source for ongoing regeneration. Plantings are protected by rabbit guards as there is a large presence of rabbits at the site.

KCDC, working with the Peka Peka Restoration Group, will undertake annual revegetation planting within the coastal foredunes (Operational Area B) using 200-300 eco-sourced plants including species such as shore spurge, pīngao, and sand coprosma (*Coprosma acerosa*) to complement the native species currently present.

Plants for this planting area will be chosen from the following species:

- Harakeke (*Phormium tenax*)
- Pīngao (*Ficinia spiralis*)
- Wīwī (*Ficinia nodosa*)
- Speckled sedge (*Carex testacea*)
- Sand tussock (*Poa billardierei*)
- New Zealand sand daphne (*Pimelia prostrata* subsp. *prostrata*)

KCDC, with the Pharazyn Reserve Focus Group will plant 500 native plant species annually within the Pharazyn Reserve (Operational Area A). Plants for this planting area will be chosen from the following species:

- Red matipo (*Myrsine australis*)
- Taupata (*Coprosma repens*)
- Ngaio (*Myoporum laetum*)
- Toetoe (*Austroderia toetoe*)
- Harakeke (*Phormium tenax*)
- Kānuka (*Kunzea amathicola*)

- Akeake (*Dodonaea viscosa*)

KCDC will plant 100 harakeke plants in Te Kōwhai estuary (Operational Area C) annually.

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 provide information to further our understanding of the present ecological values and how to protect them.

10.1 Survey for īnanga spawning habitat

Īnanga are a diadromous species - they are born in saltwater, migrate upstream to freshwater to mature and then mature fish move back downstream to lay their eggs on estuary banks, and the cycle starts again.

It is possible that Te Kōwhai estuary provides spawning habitat for īnanga (*Galaxias maculatus*). A survey of the estuary for īnanga eggs could determine if īnanga spawning is occurring here. Obtaining this information could help guide further management of the area. Te Kōwhai stream is an area of significance to Ngā Hapū o Ōtaki, sosurveying would be planned and undertaken in collaboration with them.

Īnanga have been recorded in Te Kōwhai stream and the thick bands of *Carex germinata* along the estuary banks indicating that the estuary could be good spawning habitat for the species.

10.2 Increase in signage along the beach

Additional signage could be installed at the KNE site, especially along the beach, to protect the fragile dune ecosystem and shorebird populations. Signage would aim to deter motorbikes and other disruptive activities along the beach, which degrade the sand dunes and scare native birds. As this site is adjacent to Kapiti Island it is expected that Peka Peka coast acts as a linkage between the island and the mainland for native birds.

11. Operational delivery schedule

The operational delivery schedule shows the actions planned to achieve the stated objectives for the Peka Peka Coast KNE site for the five-year period from 1 July 2023 to 30 June 2028. The budget for years 2024/25 to 2027/28 is 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 Peka Peka Coast KNE site

Objective	Operational area	The Actions: Description/detail	Intended 5-year outcome	Implementing party	Annual budget
1	Whole KNE site	Ecological weed control Control of target species	Reduction in distribution of weeds	Pest Plants Team	$11,960
3	A	Pest animal control Service predator traps monthly	Reduced pressure of introduced predators on native flora and fauna	Pharazyn Reserve Focus Group and KCDC (bait supply)	$1,200*
1	Whole KNE site	Look at expanding the predator control to cover more of the KNE site Night shooting is undertaken to control rabbits in the Pharazyn Reserve.	Reduced pressure of introduced predators on native flora and fauna	Pest Animals Team	†
1,2	A	Revegetation Plant 500 native plants of dune scrub and wetland species	70% plant survival	KCDC and Pharazyn Reserve Focus Group	$3,750^
1,2	B and C	Revegetation Plant 200-300 native plants of dune species annually in Area B Plant 100 harakeke plants annually in Area C	70% plant survival	KCDC and Peka Peka Restoration Group (Area B only)	$500*
Total					**$16,410**

*Subject to funding from the KCDC Coastal Restoration Fund

^Subject to KCDC Pharazyn Reserve Management Fund

†Cost of predator control expansion has not been determined at this time

12. Funding contributions

12.1 Budget allocated by Greater Wellington

The budget for the years 2024/25 to 2027/28 are indicative only and subject to change.

Table 4: Greater Wellington allocated budget for the Peka Peka Coast KNE site

Management activity	Annual budget
Ecological weed control	$5,980
Total	$5980

12.2 Budget allocated by Kapiti Coast District Council

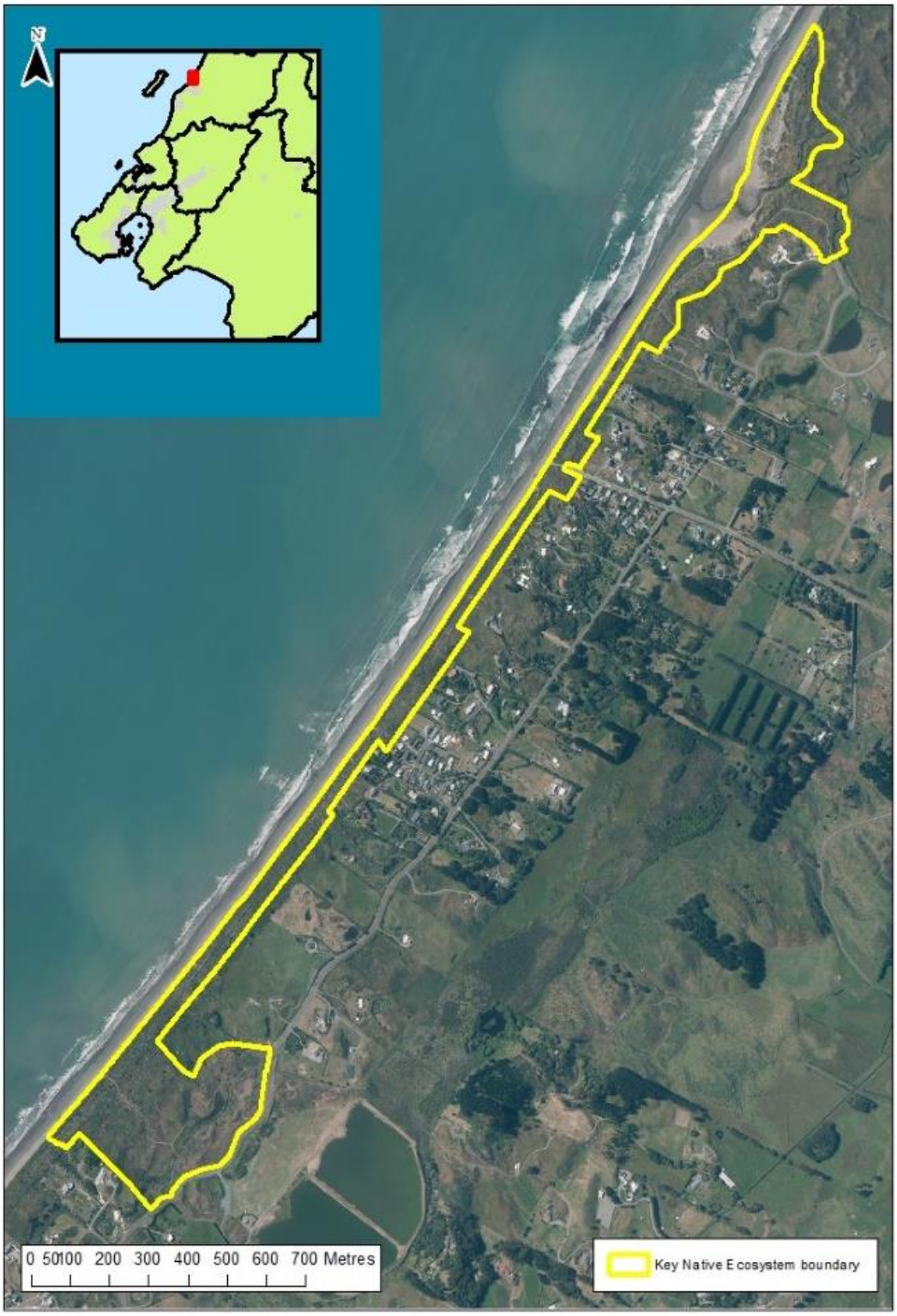
The budget is subject to confirmation through KCDC's ten-year planning process.

Table 5: KCDC allocated budget for the Peka Peka Coast KNE site

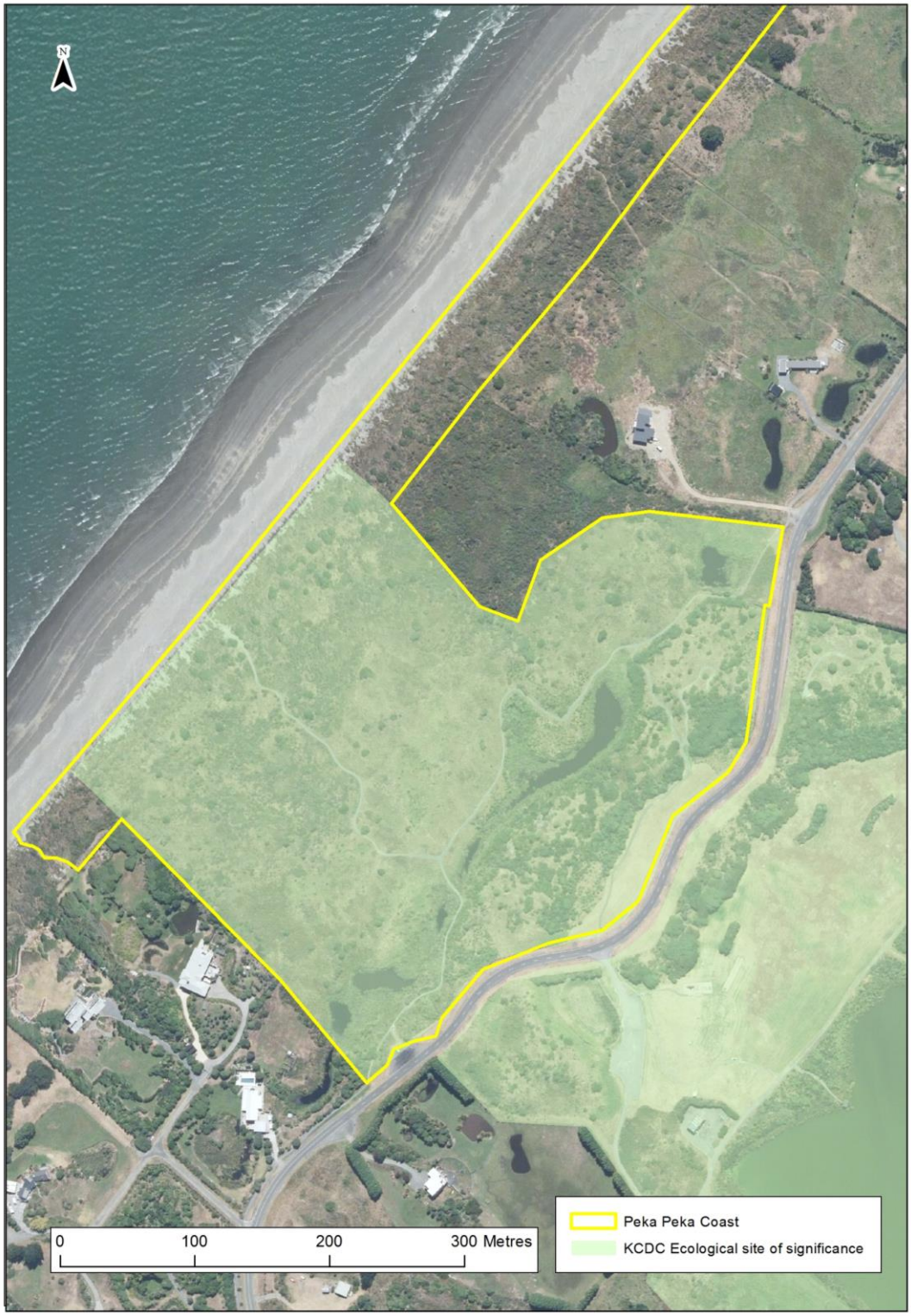
Management activity	Annual budget
Ecological weed control	$5,980
Pest animal control	$1,200*
Revegetation	$4,250*^
Total	$10,430

*Subject to funding from the KCDC Coastal Restoration Fund
^ Subject to KDCDC Pharazyn Reserve Management Fund

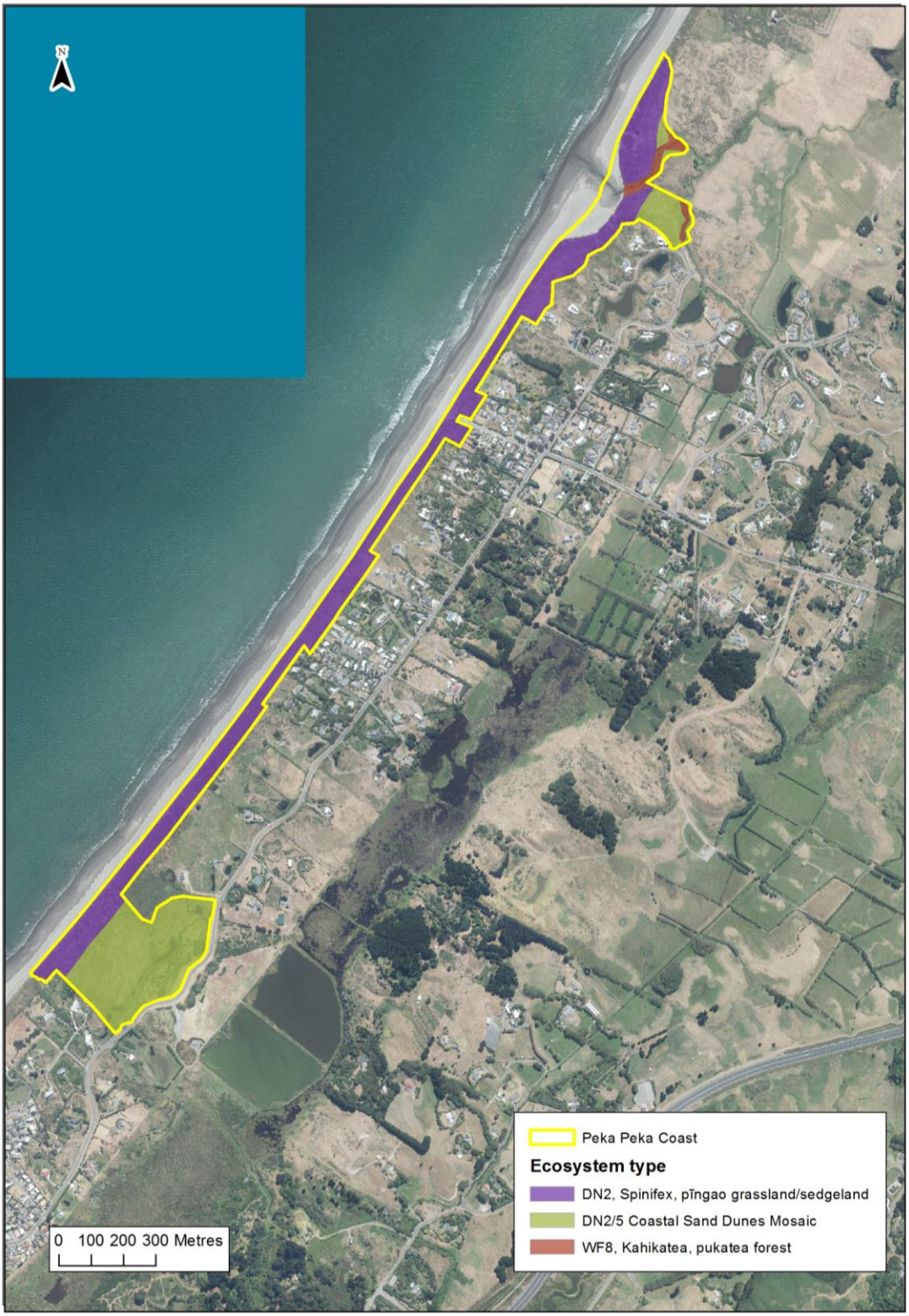
Appendix 1: Peka Peka Coast KNE site maps



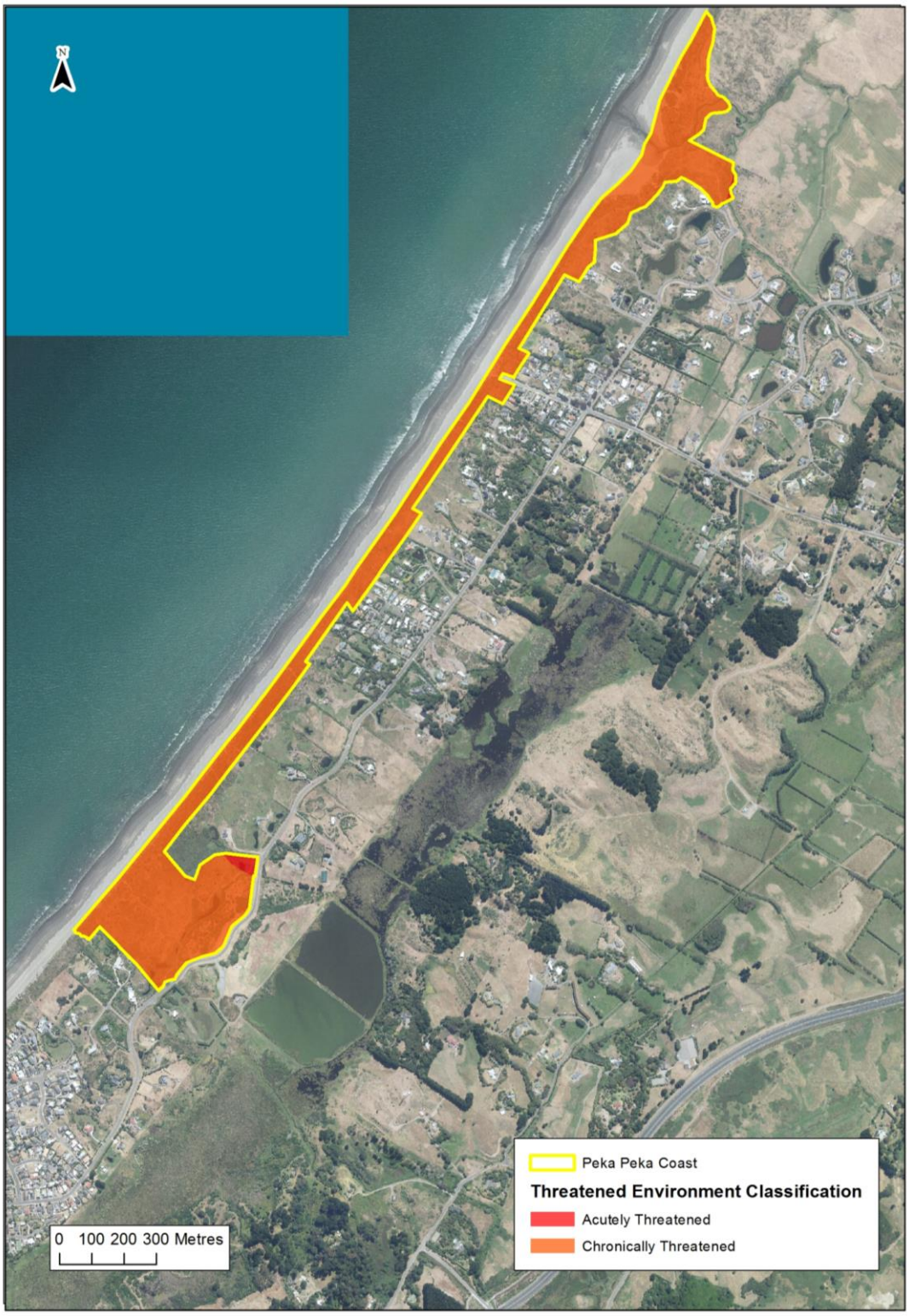
Map 1: The Peka Peka Coast KNE site boundary



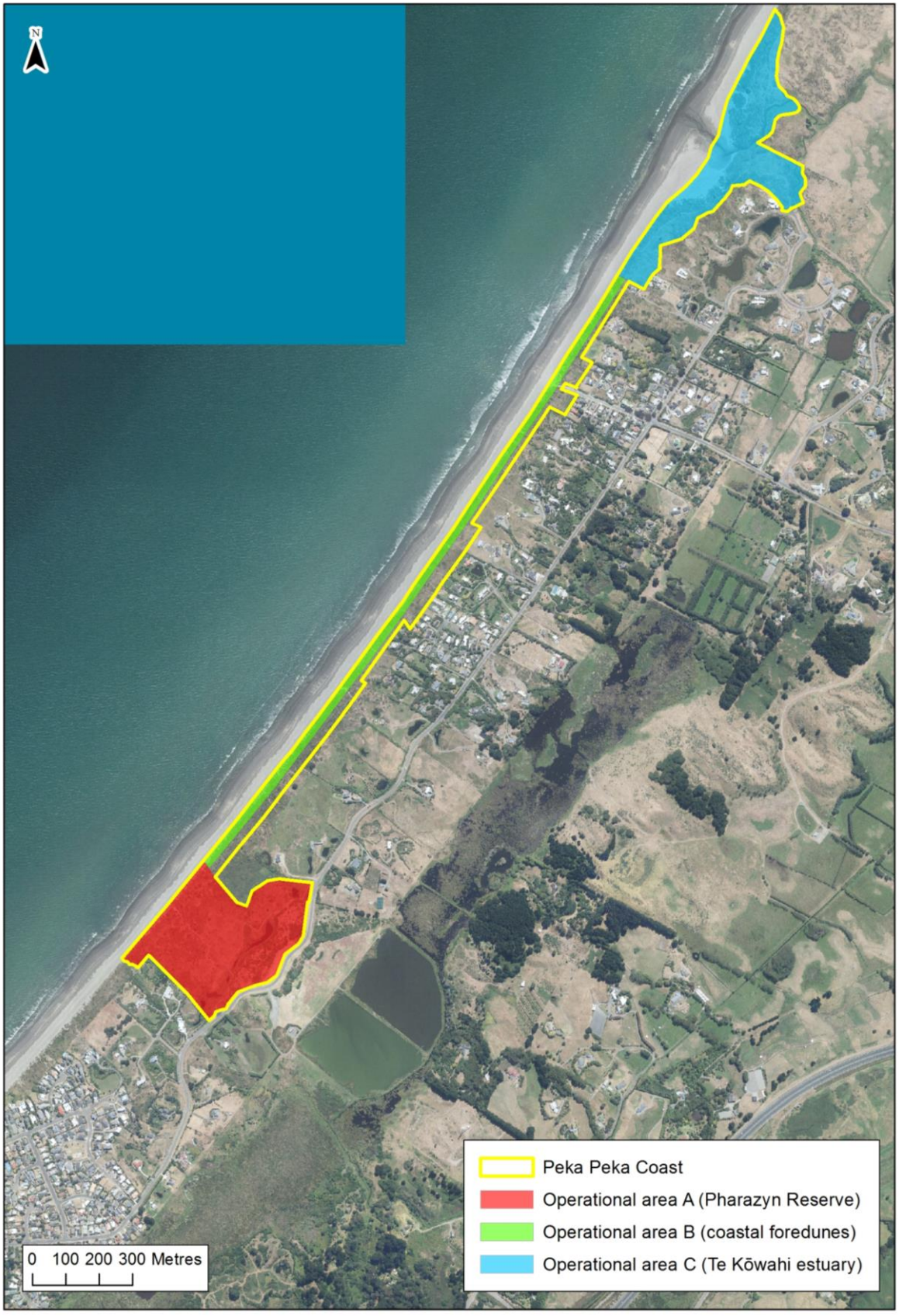
Map 2: Kapiti Coast District Council Ecological Site of Significance



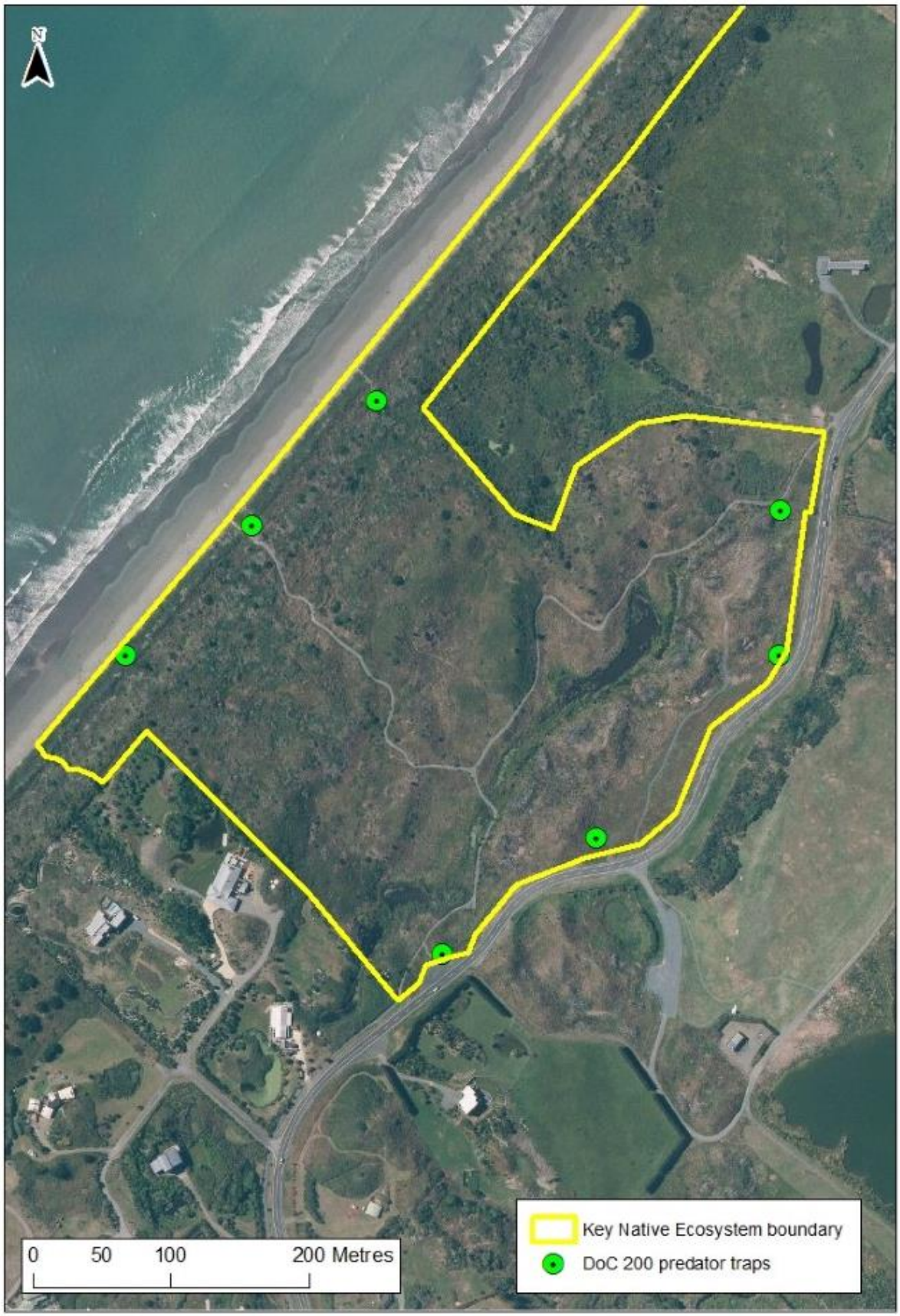
Map 3: Ecosytem cover classifications for the Peka Peka Coast KNE site



Map 4: LENZ Threatened Classification system



Map 5: Operational areas in the Peka Peka Coast KNE site



Map 6: Pest animal control in the Peka Peka Coast KNE site - Pharazyn Reserve (Operational Area A)

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[25,26,27]. 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 Peka Peka Coast KNE site.

Table 6: Threatened and At Risk species at the Peka Peka Coast KNE site

Scientific name	Common name	Threat status	Observation
Plants(vascular)[28]			
Euphorbia glauca (planted)	Shore spurge	At Risk – Declining	Peka Peka Restoration Group
Ficinia spiralis (natural and planted)	Pīngao	At Risk – Declining	Mike Urlich, Greater Wellington, pers. Obs. 2014
Kunzea amathicola	Rawiritoa	Threatened – Nationally vulnerable	Mike Urlich, Greater Wellington, pers. Obs. 2015
Birds[29]			
Elseyornis melanops	Black fronted dotterel	At risk – Naturally uncommon	eBird 2021
Haematopus finschi	South Island pied oystercatcher	At Risk – Declining	eBird 2021
Haematopus unicolor	Variable oystercatcher	At Risk – Recovering	Todd et al. undated[30]
Larus bulleri	Black billed gull	At Risk – Declining	eBird 2021
Larus novaehollandiae	Red-billed gull	At Risk – Declining	Todd et al. undated
Phalacrocorax varius	Pied shag	At Risk – Recovering	Todd et al. undated

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 (e.g., 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 Peka Peka Coast KNE site.

Table 7: Regionally threatened species recorded in the Peka Peka Coast KNE site

Scientific name	Common name	Threat status	Observation
Plants[31]			
Ficinia spiralis	Pīngao	Regionally vulnerable	Robyn Smith, Greater Wellington, pers comm 2015
Pimelia aff. *Arenaria* AK 21633	Sand daphne	Regionally vulnerable	Robyn Smith, Greater Wellington, pers comm 2015
Birds[32]			
Elseyornis melanops	Black fronted dotterel	Threatened – vulnerable	eBird 2021
Haematopus finschi	South Island pied oystercatcher	Regional migrant	eBird 2021
Haematopus unicolor	Variable oystercatcher	Threatened – vulnerable	eBird 2021
Himantopus himantopus	Pied silt	Threatened – vulnerable	eBird 2021
Larus bulleri	Black billed gull	Threatened – Critical	eBird 2021
Larus novaehollandiae	Red billed gull	Threatened – vulnerable	Todd et al. undated
Phalacrocorax varius	Pied shag	Threatened – vulnerable	Todd et al. undated

Appendix 4: Threat table

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

Table 8: Threats to the Peka Peka Coast 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 exotic ice plant (*Carpobrotus edulis*), agapanthus (*Agapanthus praecox*), and purple groundsel (*Senecio elegans*) (see full list in Appendix 5)	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 lupin (*Lupinus arboreus*), boxthorn (*Lycium ferocissimum)*, boneseed (*Chryanthemoides monilifera*), and the non-local native karo (*Pittosporum crassifolium*) (see full list in Appendix 5)	Entire KNE site
EW-3	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 blackberry (*Rubus* spp.), convolvulus (*Convolvulus* spp.), climbing dock (*Rumex sagittatus*), and Cape ivy (*Senecio angulatus*) (see full list in Appendix 5)	Entire KNE site
EW-4	Aquatic weeds out-compete native aquatic species and choke watercourses. Key weed species include: Reed sweet grass *(Glyceria maxima),* Manchurian rice grass *(Zizania latifolia)*, mercer grass (*Paspalum distichum*), lagarosiphon* (*Lagarosiphon major*), and monkey musk* (*Mimulus guttatus*) (see full list in Appendix 5)	A and E
Pest animals		
PA-1*	Possums (*Trichosurus vulpecula*) browse palatable canopy vegetation until it can no longer recover[33,34]. This destroys the forest's structure, diversity and function. Possums may also prey on native birds and invertebrates[35]	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[36,37]	Entire KNE site
PA-3	Mustelids (stoats[38,39] (*Mustela erminea*), ferrets[40,41] (*M. furo*) and weasels[42,43] (*M. nivalis*)) prey on native birds, lizards and invertebrates, reducing their breeding success and potentially causing local extinctions	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
PA- 4*	Hedgehogs (*Erinaceus europaeus*) prey on native invertebrates[44], lizards[45] and the eggs[46] and chicks of ground-nesting birds[47]	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[48,49]	Entire KNE site
PA-6*	Pest and domestic cats (*Felis catus*) prey on native birds[50], lizards[51] and invertebrates[52], reducing native fauna breeding success and potentially causing local extinctions[53]	Entire KNE site
PA- 7	Rabbits (*Oryctolagus cuniculus*) and hares (*Lepus europaeus*) graze on palatable native vegetation and prevent natural regeneration in some environments[54]. 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
Human activities		
HA-1	Garden waste dumping often leads to ecological weed invasions into natural areas. Common weed species introduced at this KNE site include: agapanthus (*Agapanthus praecox* subsp. *Orientalis*) and pampas (*Cortaderia selloana*).	Entire KNE site
HA- 2*	Creation of informal beach access paths by residents living adjacent to the KNE and by the general public causes damage to native plants through trampling and dune erosion	Entire KNE site
HA-3*	Recreational vehicles such as 4WDs and motorbikes can cause damage to dune systems and disturbance of the native ecosystem	Entire KNE site
Other threats		
OT-1	Habitat degradation and fragmentation has increased the edge effect on the ecosystem exposing the KNE site to increased light, wind and plant invasion, and greater susceptibility to the effects of extreme weather events and climate change	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 Peka Peka Coast 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 9: Ecological weed species recorded in the Peka Peka Coast KNE site

Scientific name	Common name	Priority	Level of distribution	Management aim	Notes
Agapanthus praecox subsp. *orientalis*	Agapanthus	1	Widespread and abundant	Suppression	Seeds are spread by the wind. Can become locally dominant
Chrysanthemoides monilifera	Boneseed	1	Patchy and dense	Suppression	Establishes in light gaps. Seeds are spread by wind
Correa alba	White correa	1	Patchy and sparse	Surveillance	Seeds are spread by birds into light gaps
Cotoneaster glaucophyllus	Cotoneaster	1	Patchy and sparse	Suppression	Seeds are spread by birds and can establish in shade
Crocosmia × *crocosmiiflora*	Montbretia	1	Localized and dense	Suppression	Forms dense clumps excluding native seedlings. Produces small cormels on the flower head and on existing corms and sends out creeping rhizomes to extend the colony

Scientific name	Common name	Priority	Level of distribution	Management aim	Notes
Dipogon lignosus	Mile-a-minute	1	Widespread and abundant	Suppression	Vigorous climber capable of smothering forest edges
Elaeagnus × *reflexa*	Elaeagnus	1	Patchy and sparse	Surveillance	Seeds are spread by birds and invade all types of shrublands
Hedera helix subsp. *helix*	Ivy	1	Patchy and dense	Suppression	Vigorous climber of forest edges. Seeds are spread by birds and can establish in shade
Tradescantia fluminensis	Tradescantia	1	Patchy and abundant	Suppression	Dense ground cover can prevent indigenous regeneration
Ammophila arenaria	Marram	1	Widespread and abundant	Suppression	Smothers native plants along the Coastline
Glyceria maxima	Reed sweet grass	1	Localized and dense	Suppression	Competes with native species along the ground
Lycium ferocissimum	Boxthorn	1	Localized and dense	Suppression	Can dominate native species and reduce their density
Paspalum distichum	Mercer grass	1	Widespread and abundant	Suppression	Floating grass which forms dense mats
Pennisetum clandestinum	Kikuyu grass	1	Widespread and abundant	Suppression	Forms dense mats which exclude native species
Helichrysum petiolare	Licorice plant	1	Widespread and abundant	Suppression	Competes with native species

Scientific name	Common name	Priority	Level of distribution	Management aim	Notes
Corynocarpus laevigatus	Karaka	2	Localised and dense	Surveillance	Dominates Wellington forests and prevents local natives from growing under them
Crassula multicava subsp. *multicava*	Fairy crassula	2	Patchy and sparse	Surveillance	Forms dense cover preventing native seedling germination
Pinus radiata	Radiata pine	2	Localized and sparse	Suppression	Spreads into light gaps
Prunus sp.	Ornamental cherry	2	Localized and sparse	Surveillance	Seeds are spread by birds
Quercus sp.	Oak	2	Patchy and sparse	Surveillance	Planted along some tracks
Rubus sp. (*R. fruticosus* agg.)	Blackberry	2	Patchy and sparse	Suppression	Occupies wet areas
Rhamnus alaternus	Evergreen buckthorn	2	Localized and dense	Suppression	Forms dense stands that are hard to eradicate
Carpobrotus edulis	Ice plant	2	Localized and dense	Suppression	Forms a mat which dominates over native species

Scientific name	Common name	Priority	Level of distribution	Management aim	Notes
Cortaderia selloana	Pampas	2	Patchy and dense	Suppression	Disperses quickly and easily
Gazania rigens	Gazania	2	Localized and dense	Suppression	Competes with native species
Lupinus arboreus	Lupin	2	Widespreadand dense	Suppression	Out competes native species
Pittosporum crassifolium	Karo	2	Patchy and sparse	Suppression	Not native to this region
Paraserianthes lophantha	Brush wattle	3	Localized and abundant	Suppression	Establishes on disturbed sites
Senecio angulatus	Cape ivy	3	Patchy and sparse	Surveillance	Establishes on disturbed sites
Tropaeolum majus	Nasturtium	3	Patchy and sparse	Surveillance	Establishes on disturbed sites
Ulex europaeus	Gorse	3	Widespread and abundant	Suppression	Regional Pest Management Strategy requires boundary control
Banksia integrifolia	Banksia	3	Patchy and sparse	Suppression	Tolerant to a wide range of habitats
Acacia melanoxylon	Tasmainian Blackwood	3	Patchy and sparse	Suppression	Vigorous climber smothers native plant species
Convolvulus sp.	Convolvulus	3	Localized and dense	Suppression	Vigorous climber smothers native plant species

Scientific name	Common name	Priority	Level of distribution	Management aim	Notes
Cupressus macrocarpa	Macrocarpa	3	Patchy and sparse Patchy and sparse	Suppression	Out competes native species
Rumex sagittatus	Climbing dock	3	Localized and dense	Suppression	Out competes native species
Schedonorus arundinaceus	Tall fescue	3	Patchy and sparse	Suppression	Ground cover which excludes natives
*Metrosideros excelsa***	Pohutukawa	3	Patchy and sparse	Suppression	Not native to this region
Sambucus nigra	Elderberry	3	Patchy and sparse	Suppression	Disperses easily
Senecio elegans	Purple groundsel	3	Patchy and sparse	Suppression	Out competes native species

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

Appendix 6: Revegetation plant list

Plants from the following table will be used in any revegetation planting as per Section 9.3.

Table 10: Revegetation plant list for use within the Peka Peka Coast KNE site

Scientific name	Common name	Operational area
Myrsine australis	Red matipo	A
Coprosma repens	Taupata	A
Myoporum laetum	Ngaio	A
Austroderia toetoe	Toetoe	A
Phormium tenax	Harakeke	A, B and C
Kunzea amathicola	Kānuka	A
Dodonaea viscosa	Akeake	A
Ficinia spiralis	Pīngao	B
Ficinia nodosa	Wīwī	B
Carex testacea	Speckled sedge	B
Poa billardierei	Sand tussock	B
Pimelia prostrata subsp. prostrata	New Zealand sand daphne	B

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