

Key Native Ecosystem Operational Plan for Te Hāpua Wetland Complex

2024-2029



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1. Purpose

The purpose of this five-year Key Native Ecosystem (KNE) operational plan for Te Hāpua Wetland Complex KNE site is to:

- Identify the parties involved in preparing and delivering the operational plan
- Summarise the ecological values of the site and identify the threats to those values
- Outline the vision and objectives that guide management decision-making
- Describe the operational activities undertaken to improve ecological conditions (e.g. ecological weed control), who will undertake the activities and the allocated budgets.

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 outlined 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.

Funding for the KNE programme is allocated under the Greater Wellington Long Term Plan (2021-2031)² and is managed in accordance with the Greater Wellington Biodiversity Strategy³. This 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 Natural Resources Plan for the Wellington region (NRP)⁴ 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. Greater Wellington has identified sites with the highest biodiversity values and prioritized them for management⁶.

KNE sites are managed in accordance with five-year KNE operational plans prepared by Greater Wellington’s Environment Restoration team. Greater Wellington works with 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 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, 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 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. Te Hāpua Wetland Complex Key Native Ecosystem site

The Te Hāpua Wetland Complex KNE site (62 ha) is situated 400 m from the coast between the communities of Pekapeka and Te Horo, on the Kāpiti Coast (see Appendix 1, Map 1). The KNE site consists of a collection of closely situated wetlands, separated by Te Hāpua Road, agricultural land, and residences.

The KNE site is a group of palustrine swamp and fen wetlands, separated by remnant sand dunes. It is a significant remnant of an extensive dune wetland complex that once occupied the coastal plains from the Manawatu River to Paekākāriki^{7,8}. Most of the KNE site is scheduled as an Outstanding Natural Wetland in the NRP⁹ for its representativeness, diversity, and rarity, with other areas of the KNE site deemed to be a Significant Natural Wetland in the NRP¹⁰.

The KNE site contains a highly diverse mix of ecologically significant vegetation and habitat types including open water, harakeke flaxland, raupō reedland, *Carex* sedgeland, *Isolepis* sedgeland, *Juncus* rushland, and *Coprosma* and mānuka shrubland¹¹. The diverse habitat supports a high concentration of indigenous bird and plant species of national and regional conservation concern, and it is an important feeding and breeding habitat for wetland birds.

5. Parties involved

Several organisations and individuals play important roles in the care of the Te Hāpua Wetland Complex KNE site.

5.1. Landowners

The Te Hāpua Wetland Complex KNE site is privately owned by 16 landowners (see Appendix 1, Map 2). The landowners are actively engaged in biodiversity restoration activities within the KNE site to varying degrees; undertaking restoration planting, ecological weed control or pest animal control. Several landowners propagate their own eco-sourced native plants to plant within the KNE site.

5.2. Operational delivery

Within Greater Wellington, four teams are responsible for delivering the Te Hāpua Wetland Complex KNE operational plan.

- The Environment Restoration team leads the strategic planning, funding 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 pest animal control measures at the KNE site with funding from the Environment Restoration team's KNE programme budget
- The Knowledge and Insights function undertakes State of the Environment (SOE) wetland health monitoring at the KNE site.

Most of the KNE site is protected by Queen Elizabeth II National Trust (QEII) open space covenants (see Appendix 1, Map 3). QEII supports landowners with covenants in the protection and enhancement of the biodiversity values of their properties. QEII provides funding for initial fencing and other management activities in covenants. A Memorandum of Understanding (MOU)¹² outlines how Greater Wellington and QEII work in partnership to support landowners.

Kāpiti Coast District Council (KCDC) has provided funding to landowners in the KNE site in the past for planting, covenant support and weed control through its Nature Heritage Fund. This funding is available to landowners in the KNE site for preservation and management of their land identified as part of one of the three Ecological Sites of Significance in the site (see Appendix 1, Map 4). Landowners can apply for funding from the contestable fund on an annual basis.

5.3. Mana whenua partners

The Te Hāpua Wetland Complex KNE site area is significant to Ngā Hapū o Ōtaki (Ngā Hapū), who are mana whenua partners with Greater Wellington.

The area has been identified in the Natural Resources Plan for the Wellington Region (NRP)¹³ as culturally important, recognising that it is an area where mana whenua

lived and undertook customary practices, and that provided sustaining resources (see table 1).

Greater Wellington is committed to identifying ways in which kaitiakitanga can be strengthened by exploring opportunities for mana whenua partners to participate in the development or delivery of KNE operational plans.

Table 1: Mana whenua sites of significance in Te Hāpua Wetland Complex KNE site¹⁴

Site of significance	Mana whenua values
Ngāwhakangutu Wetland (Te Hāpua wetland complex A)	mahinga kai, ara waka, papa kāinga, puna raranga, pā, tohu ahurea, kauhoe, wai ora, puna rongoā, wāhi tapu, wāhi whakawātea, wāhi whakarite

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 Te Hāpua Wetland Complex KNE site.

Table 2: Designations at the Te Hāpua Wetland Complex KNE site

Designation level	Type of designation
National	<p>Part of the Te Hāpua Wetland Complex KNE site has been identified by DOC as a Recommended Area for Protection (RAP):</p> <ul style="list-style-type: none"> • RAP 9: Te Hāpua Road Swamp (16.5 ha) <p>Parts of the Te Hāpua Wetland Complex KNE site have been identified by DOC as Designated Ecological Sites:</p> <ul style="list-style-type: none"> • Te Hāpua Road Swamp A: 334 (90.6 ha) • Te Hāpua Road Swamp B: 689 (5.5 ha) • Te Hāpua Road Swamp C: 691 (15 ha) <p>See Appendix 1, Map 5 for locations</p>
Regional	<p>Parts of the Te Hāpua Wetland Complex KNE site are designated in the NRP¹⁵ as a:</p> <ul style="list-style-type: none"> • Wetland with outstanding indigenous biodiversity values: Te Hāpua Wetland A (Schedule A3) • Significant Natural Wetland: Te Hāpua Wetland C, Te Hāpua Swamp Complex D and F (Schedule F3) • River with Significant Indigenous Ecosystems – Habitat for indigenous fish species of conservation interest: Mangaone Stream and its tributaries (Schedule F1) <p>See Appendix 1, Map 6 for scheduled wetlands</p>
District	<p>Parts of the Te Hāpua Wetland Complex KNE site are identified by KCDC as Ecological Sites of Significance (See Appendix 1, Map 4). They are listed in KCDC's Operative District Plan¹⁶ as:</p> <ul style="list-style-type: none"> • K055 - Te Hāpua Road Swamp A • K057 - Te Hāpua Road Swamp C • K194 - Te Hāpua Road
Other	<p>Parts of the Te Hāpua Wetland Complex KNE site are legally protected by QEII open space covenants:</p> <ul style="list-style-type: none"> • 5-07-356 • 5-07-320 • 5-07-571 • 5-07-443 • 5-07-771 • 5-07-772 • 5-07-642

	<ul style="list-style-type: none"> • 5-07-291.1 • 5-07-291.2 • 5-07-446 • 5-07-468 • 5-07-736
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6.2. Ecological significance

The Te Hāpua Wetland Complex 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, including several naturally uncommon ecosystems,
- It contains high levels of ecosystem **diversity**, with several ecosystem types represented,
- Its **ecological context** is valuable at the landscape scale as it contains a variety of inter-connected habitats, is part of an ecological corridor, and provides core and seasonal habitat for threatened indigenous bird and fish species.

Representativeness

The Singers and Rogers¹⁷ classification of pre-human ecosystems in New Zealand indicates that the KNE site would have comprised four ecosystem types. The first of these was a swamp mosaic of flaxland (WL18), raupō reedland (WL19) and coprosma, twiggy tree daisy scrub (WL20). The swamp mosaic ecosystem types are still evident within the KNE site today, albeit in a modified condition. The wetland complex was fringed by pukatea, kahikatea forest (WF8) and totara, matai, broadleaved forest (WF6). These ecosystem types, which are regionally critically endangered with only 1% and 2% remaining today respectively¹⁸, are no longer present. The coastal edges of the wetland were fringed by a coastal sand dunes mosaic (DN2/5) which is still evident today.

The less modified components of the KNE site comprise a significant remnant of the 'Great Swamp' which was a 9,200 ha dune, lake and swamp complex that extended from the Manawatu River to Paekākāriki^{19,20}. Less than 3% of the Great Swamp remains today having been impacted by drainage, farming and urbanization, with the remaining wetland remnants highly modified and fragmented²¹.

The Threatened Environment Classification system defines ecosystem and habitat threat categories nationally, based on percentage of indigenous cover remaining²². This system indicates the majority of the KNE site on the flat plains is considered as Acutely Threatened because there is less than 10% native vegetation remaining on this type of land in New Zealand²³. A small portion of the western-most extent of the KNE site on the flat coastal sandplains is considered Chronically Threatened because there is only 10-20% native vegetation remaining on this type of land.

Rarity/distinctiveness

The KNE site mostly consists of wetland habitat. Wetlands are now considered an uncommon habitat type in the Wellington Region with less than 3% remaining of their original extent²⁴. Wetlands are considered a national priority for conservation as an ecosystem type that has become uncommon on a national scale primarily due to human activity²⁵. Te Hāpua Wetland Complex was ranked 9th priority for conservation effort in the Manawatū to Wairarapa biogeographic area in a study in 2008²⁶.

Several plant, bird and fish species found within the KNE site are classified as nationally 'Threatened' or 'At Risk' through New Zealand's national threat classification system. Similar numbers of species found within the KNE site are also classified as regionally 'Threatened'. Appendices 2 and 3 contain lists of the nationally and regionally threatened species found within the KNE site.

Diversity

The KNE site contains a diversity of habitats; palustrine swamp and fen wetlands, and regenerating wetland and dune forest are present. A vegetation survey undertaken in the KNE site indicates high diversity with as many as 15 vegetation communities present²⁷.

Ecological context

The KNE site is one of several wetlands in the immediate area, which include the 120ha Te Harakeke Swamp. These wetlands provide habitat at a landscape scale for species that can move or spread between these sites, such as birds and plants.

6.3. Ecological features

The Te Hāpua Wetland Complex KNE site is located within the Foxton Ecological District which is characterised by warm summers and mild winters, with annual rainfall of 750 -1,100mm. The prevailing winds are west to north-westerly and gales are relatively frequent.

The KNE site is comprised of small remnant wetlands which vary in size and class with swamps in the lower-lying and flatter western extent associated with Motuiti series soils that formed up to 900 years ago, and fens in the higher dune hill country in the eastern extent of the KNE site associated with Foxton black sand series soils that formed up to 6,500 years ago²⁸. The KNE site is located in the Kāpiti Coastal Groundwater Zone with the wetlands mainly fed by rainfall, surface drainage and seasonal shallow groundwater seepages.

The fen wetlands are mostly contained by dunes and have a low pH and conductivity due to the water regime, whereas the swamp wetlands are generally more hydrologically connected, with some water through-flow between them²⁹. The swamp wetlands are distinguished by 'recharge wetlands' in dune hollows that replenish shallow groundwater and 'discharge wetlands' on flatter land that take water from shallow groundwater³⁰. The hydrology of the wetlands has been modified in historical and recent times by excavation, drainage, grazing, roading and property development, with drains, dams and culverts installed in various

areas. The Mangaone Stream and the artificial drainage channel known as the Puruka Drain bisect the wetlands in the north.

Flora

The KNE site supports an array of wetland vegetation communities as described from various surveys over the years^{31,32,33}.

Large areas of raupō (*Typha orientalis*) reedland reside with harakeke (*Phormium tenax*) flax-raupō reedland in shallow water and waterlogged areas throughout the KNE site. Harakeke flaxland is predominantly interspersed with toetoe (*Cortaderia toetoe*), umbrella sedge (*Cyperus ustulatus*) and cabbage tree (*Cordyline australis*), with blackberry (*Rubus fruticosus*) treeland invading.

Sedgeland and tussockland is diverse through the wetland with *Carex* sedgeland and *Isolepis prolifera*-sphagnum sedgeland being predominant. Umbrella sedge, sharp spike sedge (*Eleocharis acuta*), *Baumea* spp. and *Gahnia xanthocarpa* are common. Areas of *Machaerina rubignosa* sedgeland are also present. Areas of mingimingi (*Coprosma propinqua* var. *propinqua*)-swamp coprosma (*Coprosma tenuicaulis*) and kānuka (*Kunzea ericoides*)-mānuka (*Leptospermum scoparium*) shrubland are commonly interspersed with *Muehlenbeckia* spp. throughout.

Open water areas in the complex commonly host the native *Azolla rubra* and/or exotic *Azolla pinnata*³⁴. Small areas of herbfield are common surrounding open water areas with water purslane (*Ludwigia palustris*), common duckweed (*Lemna dispersa*), red pondweed (*Potamogeton cheesemanii*), water-meal (*Wolffia australiana*), *Persicaria decipiens*, small-flowered nightshade (*Solanum americanum*) and the native violet (*Viola lyallii*) having been recorded. Mudfield and algaefield are present amongst these areas. The exotic plant beggars' ticks (*Bidens frondosa*) commonly emerge in areas that dry out in the summer, and die back over winter when it becomes saturated.

Pockets of native bracken (*Pteridium esculentum*) fernland with kiokio (*Parablechnum* sp.) and *Hypolepis ambigua* are common along with *Juncus* sp. rushland. Yorkshire fog (*Holcus lanatus*)-tall fescue grassland is common in the drier areas. Higher dune areas surrounding the wetland are commonly dominated by tree lupin (*Lupinus arboreus*) and pasture grass species.

Notable native plant species that have been recorded in the KNE site^{35,36,37} include:

- Dwarf mistletoe (*Korthalsella salicornioides*, Threatened - Nationally Critical),
- Wetland turf species *Amphibromus fluitans* (Threatened - Nationally Vulnerable),
- Swamp buttercup (*Ranunculus macropus*, Regionally Data Deficient),
- *Carex dipsacea* (Regionally Naturally Uncommon),
- Swamp willowherb (*Epilobium pallidiflorum*, Regionally Naturally Uncommon),
- Silverweed (*Potentilla anserinioides*, Regionally Naturally Uncommon),

- Other species becoming uncommon in the Wellington region including *Gratiola sexdentata*, jointed twig rush (*Baumea articulata*) and kapungawha (*Schoenoplectus tabernaemontani*).

Also recorded in the KNE site are the nationally threatened liverwort *Ricciocarpos natans*³⁸ (Nationally Endangered) and the native moss *Drepanocladus aduncus*³⁹.

Fauna

Birds

The KNE site is considered an important breeding and feeding site for wetland birds in the wider landscape. Threatened bird species recorded in the KNE site include Australasian bittern (*Botaurus poiciloptilus*, Threatened - Nationally Critical), New Zealand dabchick (*Poliiocephalus rufopectus*, Threatened – Nationally Increasing), marsh crake (*Porzana pusilla affinis*, At Risk - Declining), spotless crake/pūweto (*Porzana tabuensis tabuensis*, At Risk - Declining), North Island fernbird (*Bowdleria punctata vealeae*, At Risk - Declining), royal spoonbill (*Platalea regia*, At Risk - Naturally Uncommon) and little black shag (*Phalacrocorax sulcirostris*, At Risk - Naturally Uncommon)^{40,41}. The most recent survey undertaken within the KNE site detected spotless crake/pūweto in large numbers (>20)⁴², suggesting the KNE site supports a regionally significant population of this species⁴³.

More common native bird species that have been recorded in the KNE site include swamp harrier (*Circus approximans*), grey teal (*Anas gracilis*), Australasian shoveler (*Anas rhynchos*), white faced heron (*Egretta novaehollandiae*), New Zealand kingfisher (*Todiramphus sanctus vagans*), shining cuckoo (*Chrysococcyx lucidus lucidus*), tūi (*Prothemadera novaeseelandiae novaeseelandiae*) and grey warbler (*Geryone igata*)⁴⁴.

Freshwater fish

The Mangaone Stream and its tributaries which are connected to the northern part of the KNE site are recognized for their habitat value for indigenous fish species⁴⁵. A fish survey conducted in the KNE site in 2017 detected four species of native fish. These were inanga (*Galaxias maculatus*, At Risk-Declining), brown mudfish (*Neochanna apoda*, At Risk-Declining), shortfin eel (*Anguilla australis*) and common bully (*Gobiomorphus cotidianus*)⁴⁶.

Invertebrates

Native coastal copper butterfly (*Lycaena edna*) and the introduced giant diving beetles (*Rhantus* sp.) have been observed in the KNE site⁴⁷.

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. Key threats to the Te Hāpua Wetland Complex KNE site are discussed below and all known threats to the KNE site are summarised in Appendix 4.

7.1. Key threats

The primary threats to the ecological values of the KNE site currently are ecological weeds, pest animals, surrounding land-use development impacting on the hydrology of the wetland and barriers to fish passage.

Ecological weeds including woody, climbing, ground-covering and aquatic weeds have been controlled over many years in the KNE site (See Appendix 5 for a list of weeds recorded at the KNE site). The priority ecological weeds within the KNE site are blackberry (*Rubus fruticosus* agg.), beggars' ticks (*Bidens frondosa*) and bittersweet (*Solanum dulcamara*). These weeds are known to displace native species, prevent natural regeneration and alter vegetation structure and composition within the site. Blackberry is abundant throughout the northern wetlands in amongst harakeke flaxland with smaller areas of infestation in the south. Bittersweet is interspersed with blackberry, and beggars' ticks is common in open water areas on several properties. Purple loosestrife (*Lythrum salicaria*) has been observed in an isolated area of the KNE site over several years. Purple loosestrife is an unwanted organism under the Biosecurity Act⁴⁸ and is listed as a pest in the Greater Wellington Regional Pest Management Plan 2019-2039⁴⁹ (RPMP) to be managed under the progressive containment programme.

The priority pest animal threats within the KNE site are stoats (*Mustela erminea*), ferrets (*Mustela furo*), weasels (*Mustela nivalis*), cats (*Felis catus*), dogs (*Canis lupus familiaris*), hedgehogs (*Erinaceus europaeus*) and rats (*Rattus* spp.). These species are known to have the greatest impact on threatened spotless crane and other wetland bird species which inhabit the KNE site⁵⁰. Rabbits (*Oryctolagus cuniculus*) are another major threat, in this case to the native plant communities. The KNE site has one of the highest rabbit population densities in the district. Rabbits heavily browse the vegetation in and around the wetlands, severely affecting regeneration and distorting species representation. They also cause erosion of sand dunes and support mustelid and feral cat populations by providing an abundant food source. Pest animals are likely to reinvade from outside the KNE site and are likely to be an enduring threat to the biodiversity values within it.

Surrounding land-use and development could cause changes to the hydrological regime in the KNE site which would impact biodiversity values. Land subdivision, roading projects, and agricultural practices are potential threats to the hydrology⁵¹.

Barriers to the passage of native fish are present within the KNE site. There is evidence that migratory access is unavailable in some areas preventing migrating fish from completing their life cycles⁵².

8. Vision and objectives

8.1. Vision

The Te Hāpua Wetland Complex KNE site is dominated by healthy native wetland vegetation communities supporting thriving populations of spotless crane and other native wetland birds, fish and invertebrates.

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 Te Hāpua Wetland Complex KNE site.

- 1. To protect, and increase the dominance and diversity of native wetland plant communities**
- 2. To provide safe nesting habitat and refuges for wetland birds, in particular spotless crane**
- 3. To improve the KNE site's ability to support native fish**
- 4. To support landowners to protect, enhance and restore wetland values on their properties**
- 5. To support Ngā Hapū to connect with the site**

9. Operational activities

Operational activities are targeted to work towards the objectives listed above (Section 8). The broad approach to operational activities is described below, and specific actions, with budget figures attached, are set out in the operational delivery schedule in Section 11 (Table 3).

9.1. Ecological weed control

The aim of ecological weed control at the KNE site is to reduce the distribution and abundance of key weed species to protect intact native wetland plant communities and increase native dominance and diversity. The KNE site contains many ecological weed species (listed in Appendix 5). Some of these have been controlled over many years. Greater Wellington makes a priority of controlling three species: blackberry, beggars' ticks and bittersweet. This is due to the level of infestation and the ecological impact of these species on the KNE site values.

Blackberry has been controlled across the KNE site for many years using ground-based methods and it is under control in some areas. However, an aerial survey of the KNE site in 2017 found that blackberry was prolific in some northern areas that are inaccessible by foot, due to tall, dense stands of vegetation. Aerial control is the only practical way of controlling blackberry in these areas. Therefore, a resource consent to aurally spray the blackberry in these areas using a drone was obtained in 2022 and aerial control was undertaken in 2022 and 2024 (see Appendix 1, map 7). This control has been effective in controlling most of the blackberry (with minimal to no visual effects on surrounding native vegetation). However, seedlings are continuing to emerge.

Follow-up aerial control operations may be required to manage regrowth of the blackberry and control any new blackberry infestations that are discovered in other areas with difficult access. Aerial control uses a spot spraying applicator, which, compared to ground-based application methods such as a gun and hose application, poses less risk of non-target damage and uses less chemical herbicide.

As required by the resource consent, the effects of each aerial application of herbicide to wetland areas will be monitored. The results of this monitoring will inform the adaptive management of any future aerial application requirements and will also be discussed with the appropriate authority and landowners prior to future aerial control.

Areas of the wetland complex, not subject to aerial control, will be subject to ground-based weed control (ie, using hand-powered knapsack or gun and hose herbicide applicator) to target the key ecological weed species. Larger infestations will be prioritised for control first in this order: blackberry, beggar's ticks, bittersweet.

In addition, weed species listed in Appendix 5 will be monitored across the site during control work to detect any new weed infestations that arise. If large infestations are observed, they will be controlled if the budget allows, with details to be confirmed annually by the Environmental Restoration Advisor for the site.

The historic location of an infestation of purple loosestrife and surrounding areas is monitored by Greater Wellington's Pest Plants team. Any re-growth or new plants found are controlled promptly. Purple loosestrife is listed as an unwanted organism under the Biosecurity Act and as a pest in the RPMP.

Private landowners that undertake their own ecological weed control are encouraged to focus on controlling the weed species listed in Appendix 5.

9.2. Pest animal control

Pest animal control at the KNE site is undertaken to protect nesting habitat and refugia for the spotless crane and other native wetland birdlife that inhabit the area, particularly during the breeding season. This is achieved by controlling ferrets, stoats, rats and hedgehogs using DOC250 and DOC200 kill-traps.

An audit of the pest animal network was undertaken in 2023 to identify the locations of traps and bait stations and future needs. A map showing the locations of the existing traps can be found in Appendix 1, Map 8. Landowners are encouraged to service traps on a regular basis: two-weekly during the sensitive wetland bird breeding season between September and February, and monthly at other times of the year. A Trap.NZ project has been set up for landowners to record trap catch data. Bait for the traps is supplied to the landowners when requested.

Greater Wellington Pest Animals staff undertake an annual service of the trap network to ensure all traps can be operated in a safe and effective manner by the landowners and to undertake any required maintenance of them. Pest Animals staff provide further assistance by undertaking two-monthly checks of traps where landowners have said that this would be helpful to them.

Landowners are encouraged to control their pet cats and dogs by restricting their access to wetland areas, as cats and dogs can disturb and kill wetland birds and their chicks.

9.3. Revegetation

Revegetation at the KNE site is aimed at protecting the core of the wetlands by developing vegetated buffers on wetland edges and surrounding dunes and restoring native plant communities to the dunes.

Landowners are encouraged to continue current revegetation efforts while also focussing on planting rare and uncommon species to expand threatened plant communities. Planting buffer areas around the wetland with species such as kahikatea (*Dacrycarpus dacrydioides*), pukatea (*Laurelia novae-zelandiae*), tōtara (*Podocarpus totara* var. *totara*), mataī (*Prumnopitys taxifolia*) and kāpuka/broadleaf (*Griselinia littoralis*) will increase the surrounding area of protection. A list of recommended plants species for use in the KNE site is provided in Appendix 6.

KCDC has provided funding to several landowners for revegetation within the KNE site via the KCDC Nature Heritage Fund, and landowners are encouraged to apply for funding from this source.

Plants used for revegetation at the KNE site should be eco-sourced from the Foxton Ecological District and plant protectors should be used to protect plants from hare, rabbit and pūkeko browse.

9.4. Legal protection

Legal protection of private land within the KNE site is desirable to ensure that its biodiversity values are safeguarded in perpetuity. Greater Wellington Environment Restoration staff will discuss the QEII covenanting process with the owners of unprotected land within the KNE site and encourage them to legally protect their wetlands. Nine of the landowners at the KNE site already have QEII open space covenants on their land in the KNE site.

9.5. Monitoring

The Te Hāpua Wetland Complex KNE site is included in Greater Wellington's State of the Environment (SOE) wetland health monitoring programme. For this programme, key wetland sites in the region are surveyed every five years by Greater Wellington's Knowledge and Insights function. Scores from the last survey undertaken in the KNE site in 2021/22 indicate an overall improvement in wetland condition.

Plots in the KNE site were first surveyed in 2017/18 and then again in 2021/22. The next survey is due in 2026/27. The wetland health monitoring includes assessments of vegetation composition, soil condition, plant nutrient status, wetland condition and wetland pressure index. Surveys of fish and wetland birds are also undertaken.

Greater Wellington's Knowledge and Insights function also has several water monitoring stations within the KNE site that collect data on water levels and rainfall within the wetland complex.

These monitoring activities are funded by programmes other than the KNE programme.

10. Future opportunities

There are opportunities to add value to the biodiversity management undertaken at the KNE site. These could be explored further and undertaken by landowners, Greater Wellington or other agencies. These include:

- Establishing a robust possum control regime by augmenting the current patchy and ad hoc control being undertaken by some landowners,
- Targeted protection of threatened plant species by controlling impacting weeds by hand weeding or cut and paste treatment,
- Mapping the vegetation communities within the wetland complex using a drone and appropriate analysis software,
- Surveying the terrestrial invertebrate communities within the KNE site to better understand what species exist and what protection of them could be applied,
- Undertaking a thorough analysis of fish passage within the KNE site - this may involve using the National Institute of Water and Atmospheric Research (NIWA) Fish Passage Assessment Survey mobile application (which is based on the New Zealand Fish Passage Guidelines⁵³),
- Creating a remediation plan based off the fish passage assessment described above.

11. Operational delivery schedule

The operational delivery schedule shows the actions planned to achieve the stated objectives for the Te Hāpua Wetland Complex KNE site, and their timing and cost over the five-year period from 1 July 2024 to 30 June 2029. The budgets for the years 2025/26 to 2028/29 are indicative only and subject to change. Operational areas are also subject to change according to operational needs over the course of the operational plan.

Table 3: Five-year operational plan for the Te Hāpua Wetland Complex KNE site

Objective	Activity	Operational area	Intended 5-year outcome	Implementing party	Annual resourcing
1	Ecological weed control: Aerial control of blackberry using a drone in inaccessible areas	Northern parts – see Map 7, Appendix 1	Very little blackberry remains in these areas	Greater Wellington Pest Plants team	\$17,425 (Total for these two activities)
1	Ecological weed control: Ground based control of key wetland weed species	All ground-accessible areas	Improved native plant dominance and reduced pressure on threatened plant species	Greater Wellington Pest Plants team	
1	Ecological weed control: Monitor historic site of purple loosestrife and control all plants found	Locations held in Pest Plants database	Purple loosestrife is eradicated	Greater Wellington Pest Plants team	\$500*
2,4	Pest animal control: Control mustelids, rats and hedgehogs by regular trap servicing Supply landowners with trap baits and undertake safety and effectiveness audit of the trap network	Entire KNE site	Reduced predation of native birds, lizards and insects Traps are effective and safe for landowners to operate	Landowners and Greater Wellington Pest Animals team	\$860

Objective	Activity	Operational area	Intended 5-year outcome	Implementing party	Annual resourcing
2,4	Pest animal control: Control mustelids, rats and hedgehogs by servicing selected traps on a two-monthly basis	Properties of landowners who want assistance with servicing	Reduced predation of native birds, lizards and insects Landowners are supported	Greater Wellington Pest Animals team	\$3,360
1,2,3,4	Revegetation: Undertake restoration planting on wetland edges and on dunelands with financial support from KCDC's Nature Heritage Fund	Wetland edges and dunelands	Improved vegetative buffering of wetlands and increased native plant communities on dunelands	Landowners	**
4	Legal protection: Inform landowners of legal protection by QEII open space covenanting and encourage them to protect their wetlands by covenanting	Non-QEII covenanted wetlands	More land within the KNE site is legally protected by QEII open space covenants	Greater Wellington Environment Restoration Advisor and landowners	***
1,2,3,5	Monitoring: Undertake State of the Environment wetland health monitoring in 2026/27	Plots throughout the KNE site	Trends in wetland health outcomes are identified and used to inform future management activities and funding	Greater Wellington Knowledge and Insights function	****

*Funded by the Regional Pest Management Plan programme.

**Action reliant on landowners obtaining funding through KCDC's Natural Heritage Fund.

*** Only staff time required.

****Funded by the State of the Environment monitoring programme and not defined at this time.

12. Funding contributions

12.1. Annual budget allocated by Greater Wellington

The budgets for the years 2025/26 to 2028/29 are subject to change.

Table 4: Greater Wellington allocated budget for the Te Hāpua Wetland Complex KNE site

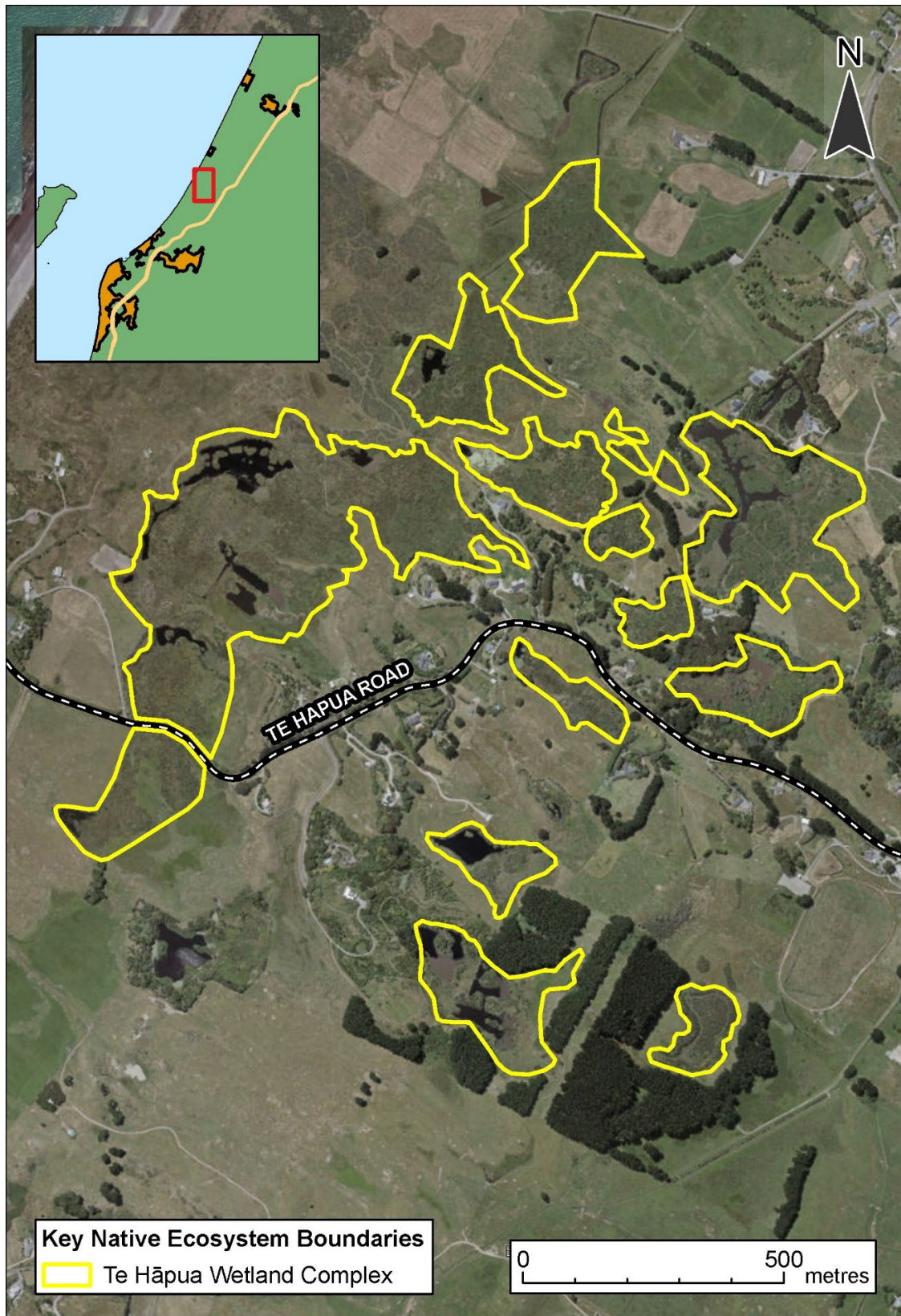
Management activity	Annual resourcing
Ecological weed control	\$17,925*
Pest animal control	\$4,220
Total	\$22,145

* Includes \$500 funding from the Regional Pest Management Plan programme

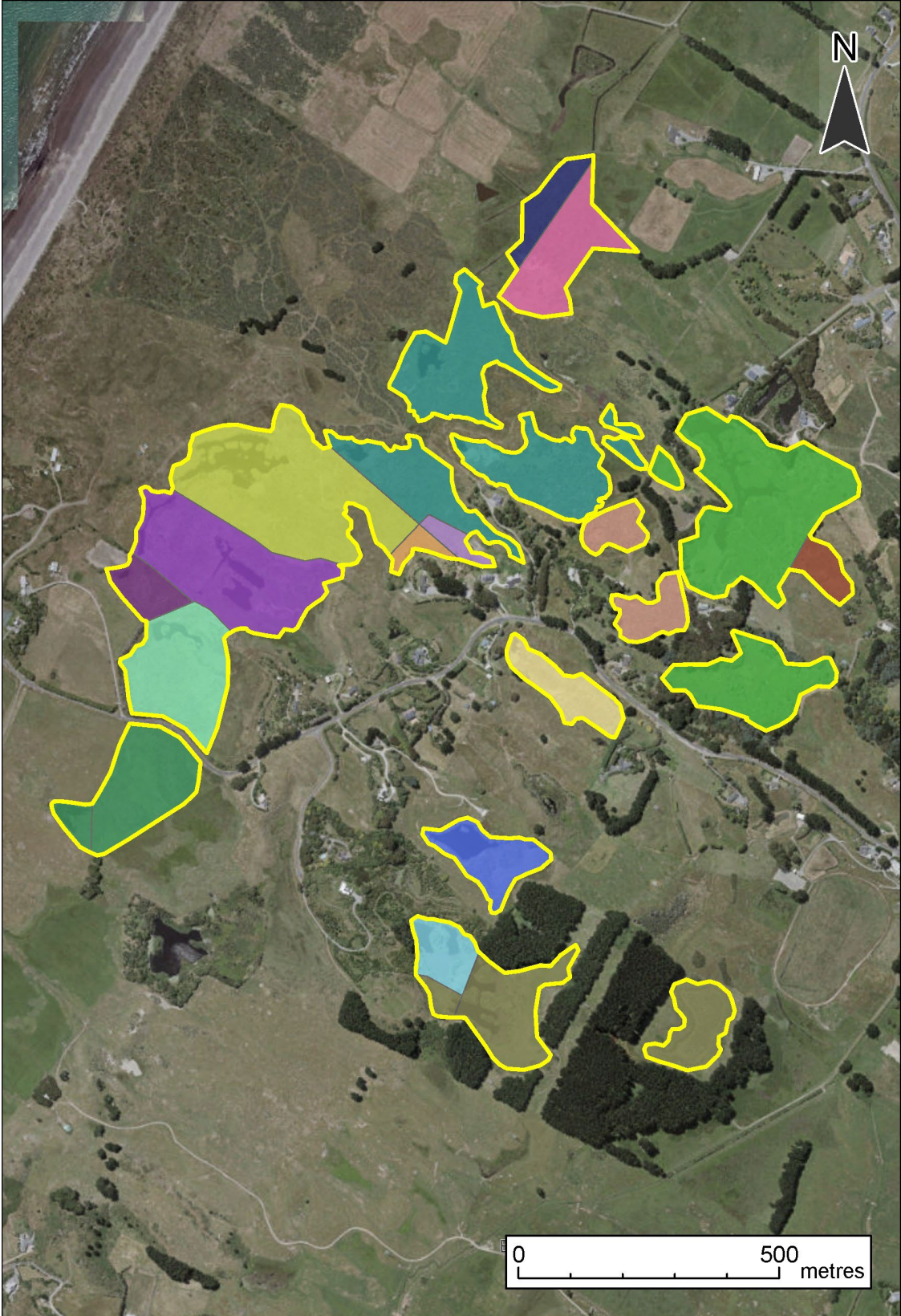
12.2. Budget allocated by KCDC

KCDC provides funding to landowners within the KNE site for revegetation planting, covenant support and ecological weed control through its Nature Heritage Fund. The amount of funding is determined on an annual basis.

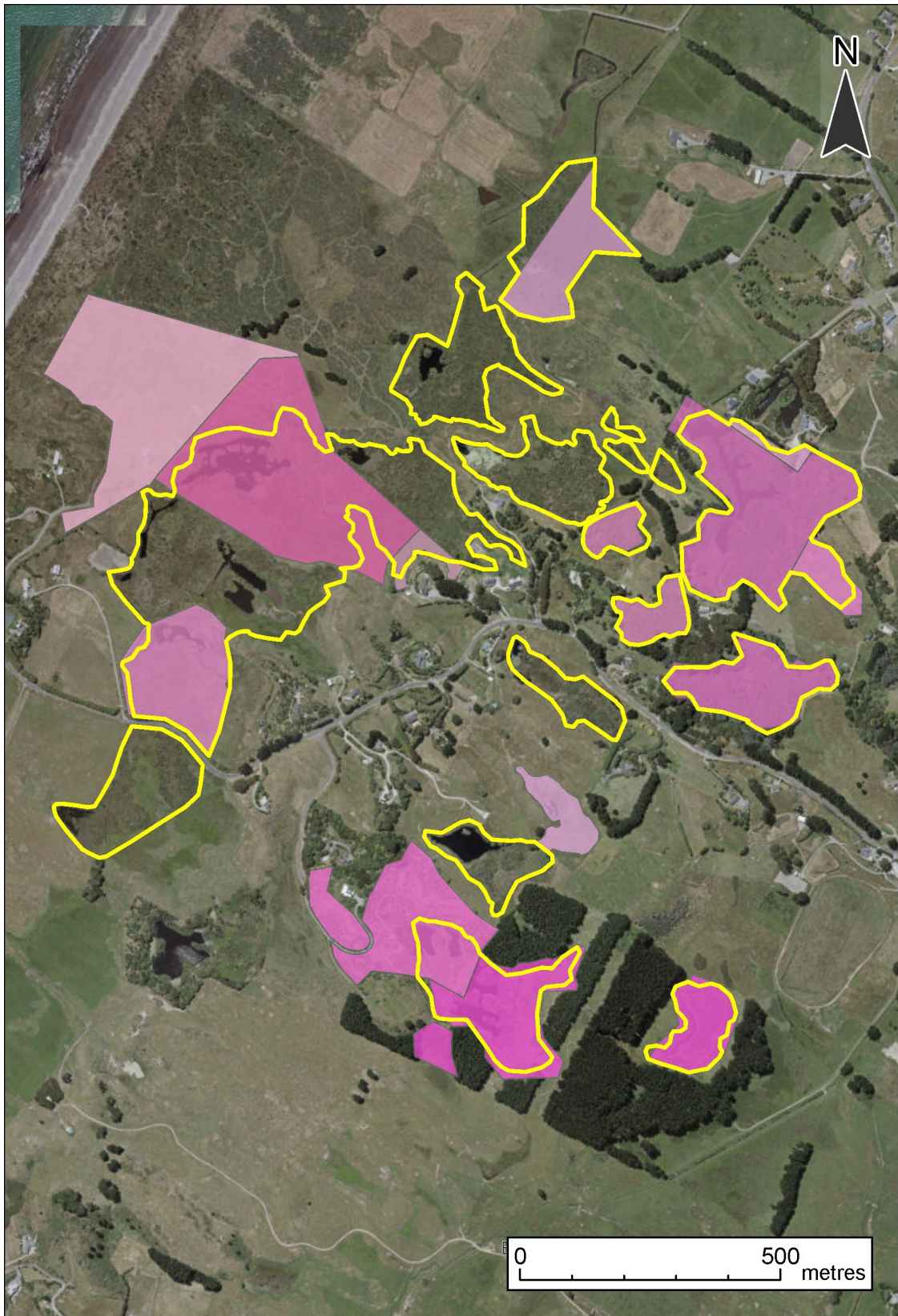
Appendix 1: Te Hāpua Wetland Complex KNE site maps



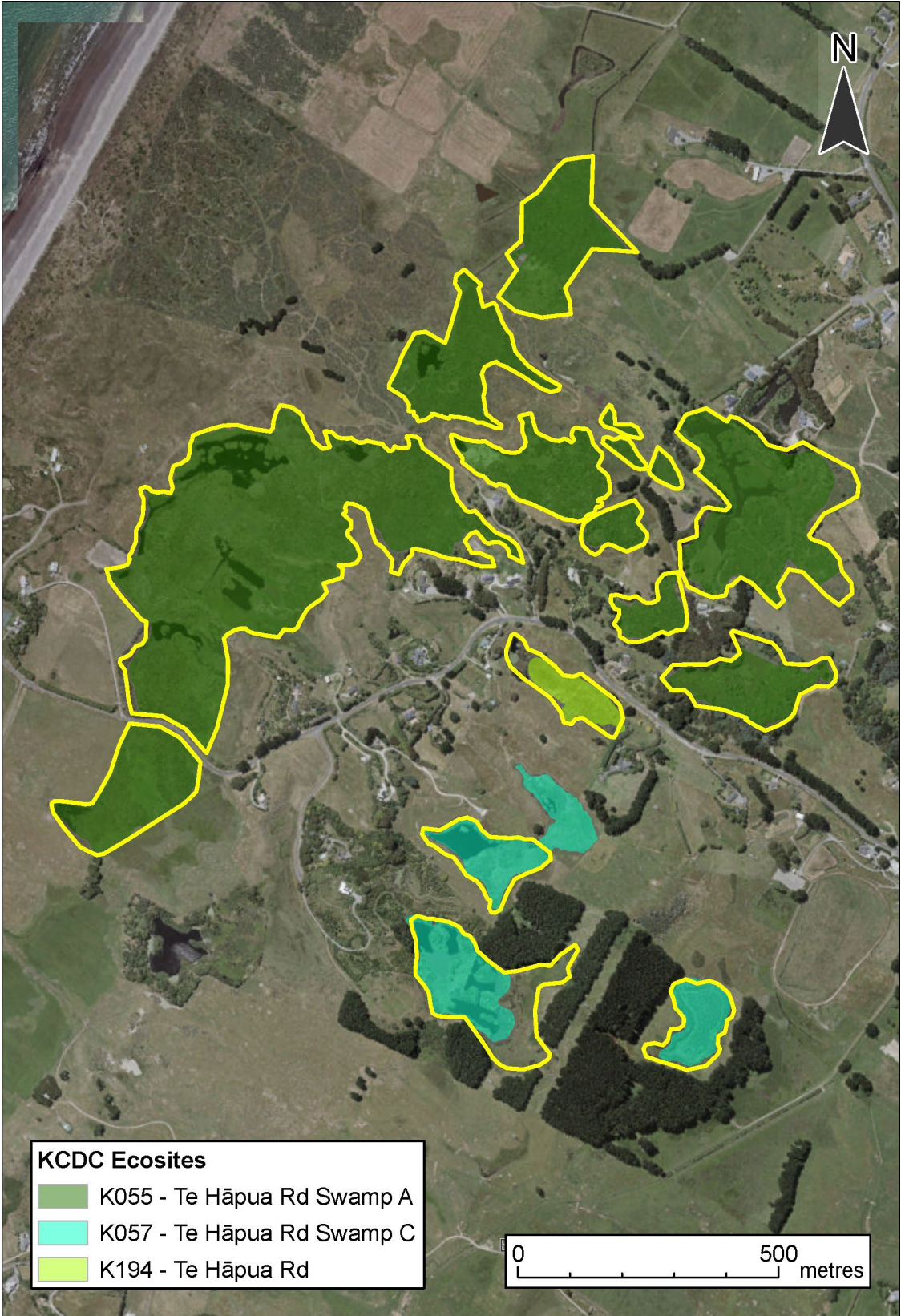
Map 1: Key Native Ecosystem boundary for the Te Hāpua Wetland Complex KNE Site. The inset map shows the KNE site location north of Waikanae and south of Ōtaki, between Kāpiti coast and State Highway 1.



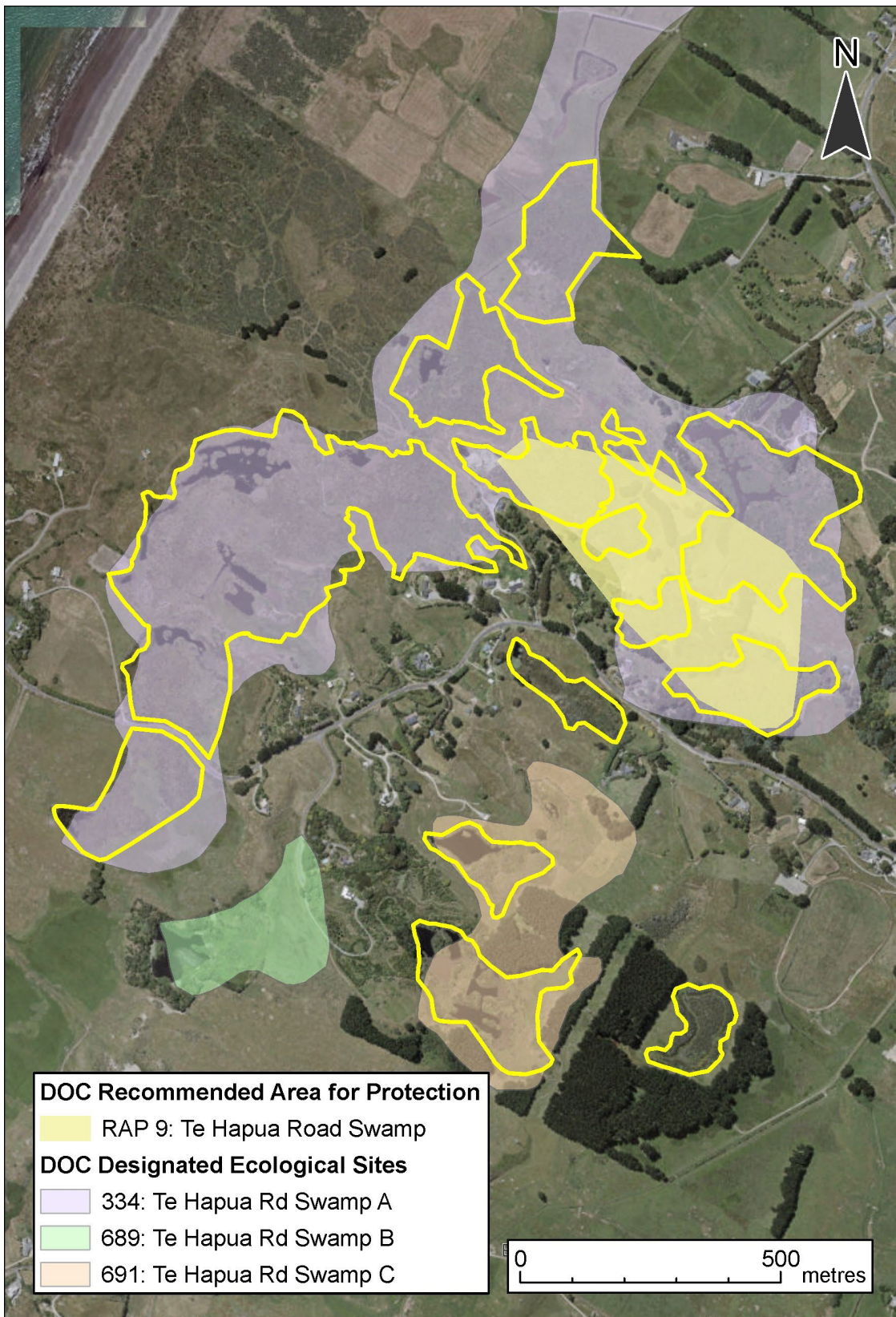
Map 2: The Te Hāpua Wetland Complex KNE site includes the properties of 16 private landowners. Landowner parcels are indicated by different colours but are not labeled for privacy reasons.



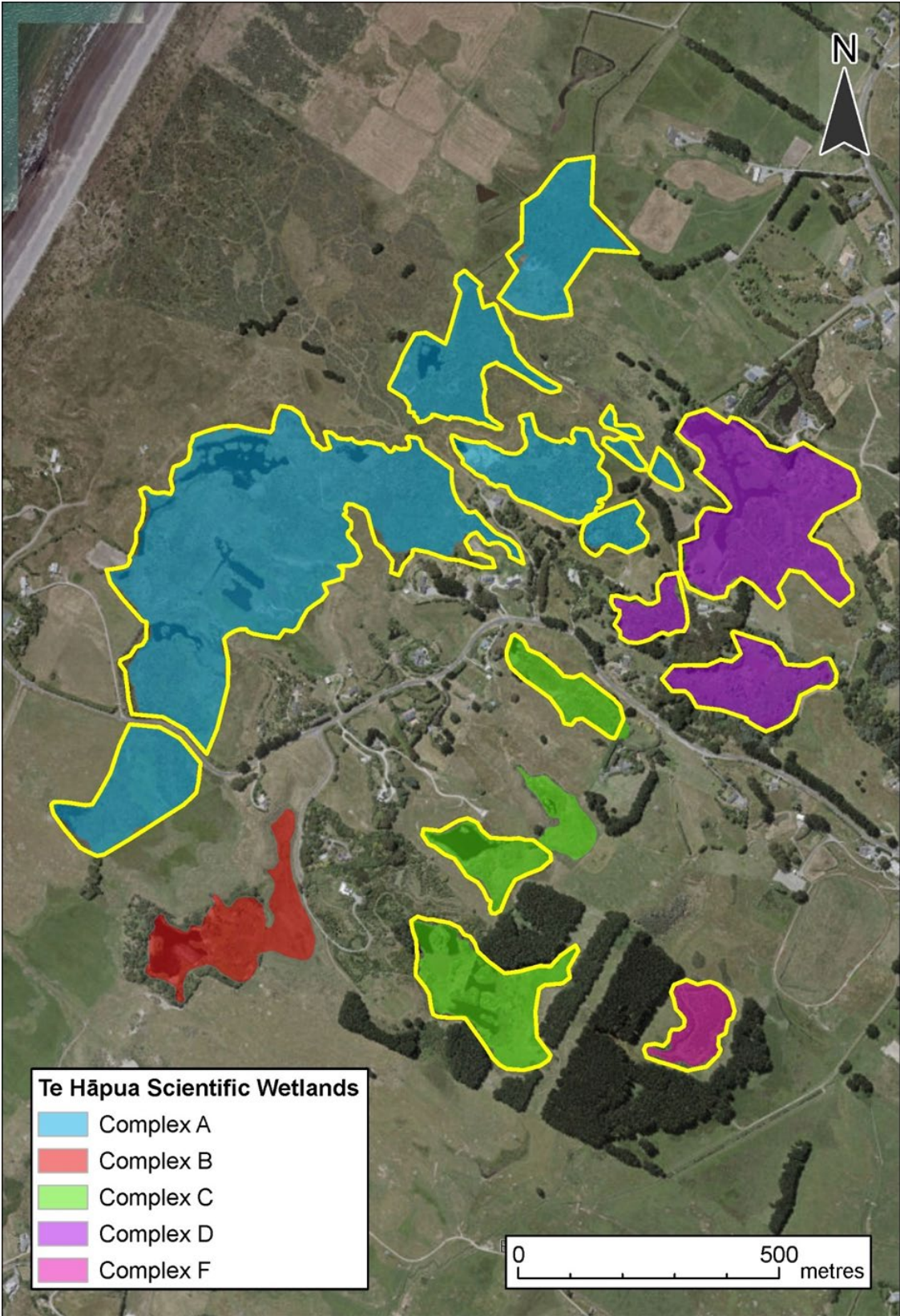
Map 3: QEII open space covenants within and adjacent to the Te Hāpua Wetland Complex KNE site. QEII open space covenants extend beyond wetland areas to cover the surrounding dunes in some instances as shown. Individual covenants not identified for privacy reasons.



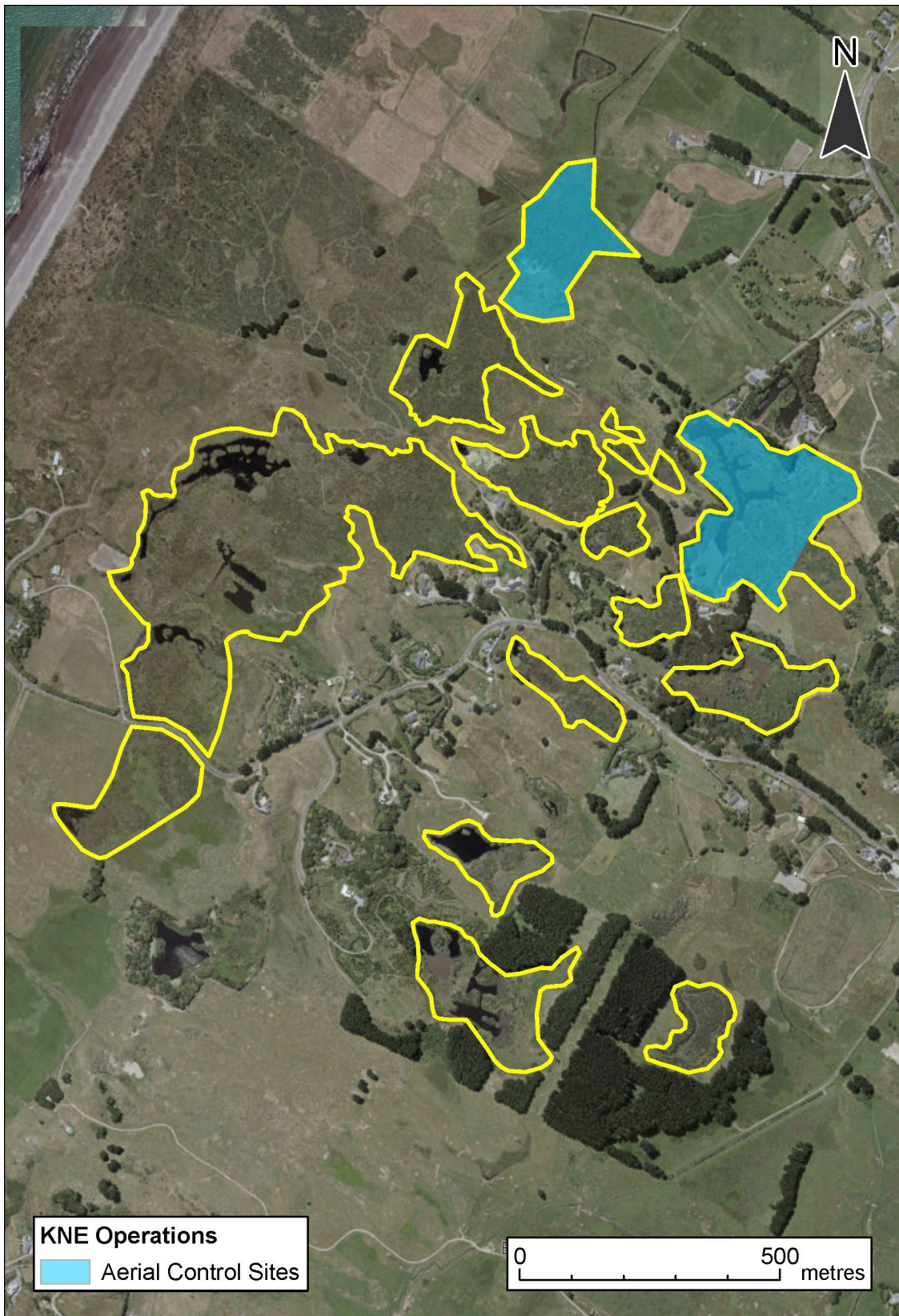
Map 4: Location of KCDC Ecological sites defined by the Kapiti Coast District Plan (Schedule 1) within and immediately adjacent to the Te Hāpua Wetland Complex KNE site



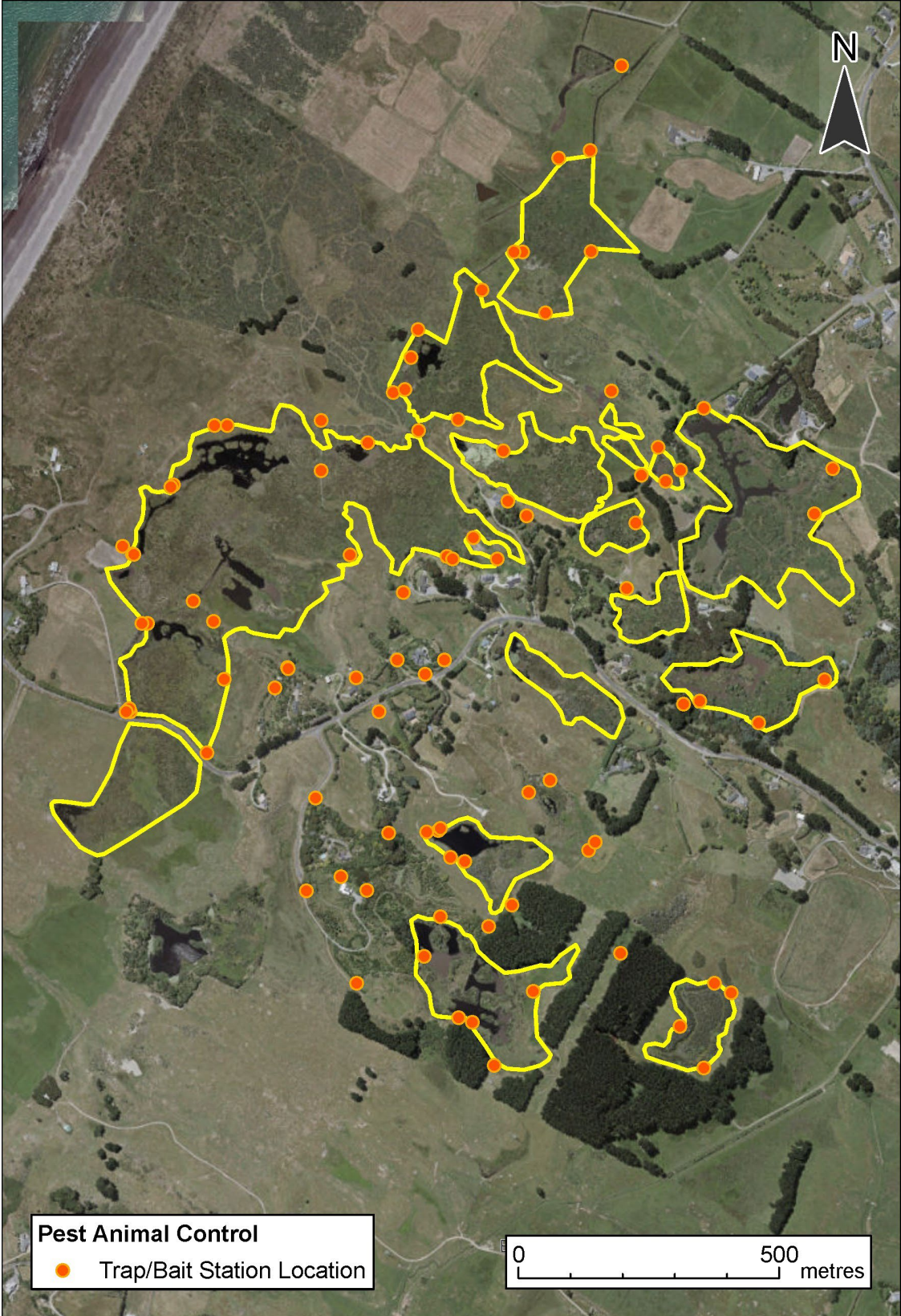
Map 5: DOC Recommended Areas for Protection (RAP) and Designated Ecological Sites within and immediately adjacent to the Te Hāpua Wetland Complex KNE site



Map 6: The Te Hāpua wetlands as delineated in Greater Wellington's Natural Resources Plan. These groupings and naming conventions are utilized by other organizations, with slight variations to wetland extent and inclusion. Note that the KNE site does not encompass all the Te Hāpua wetlands.



Map 7: Aerial ecological weed control sites in the Te Hāpua Wetland Complex KNE site. Ground-based pest plant control occurs site-wide.



Map 8: Pest animal control in the Te Hāpua Wetland Complex KNE site

Appendix 2: Nationally threatened species list

The following table lists nationally Threatened and At Risk species that are resident in, or regular visitors to, the Te Hāpua Wetland Complex KNE site.

The New Zealand Threat Classification System (NZTCS) lists species according to their threat of extinction. The status of each species group (plants, reptiles, etc.) is assessed over a five-year cycle⁵⁴. Species are regarded as Threatened if they are classified as Nationally Critical, Nationally Endangered or Nationally Vulnerable⁵⁵. They are regarded as At Risk if they are classified as Declining, Recovering, Relict or Naturally Uncommon.

Table 6: Nationally Threatened and At Risk species at the Te Hāpua Wetland Complex KNE site

Scientific name	Common name	National threat status	Observation
Plants(vascular) ⁵⁶ (mosses) ⁵⁷			
<i>Amphibromus fluitans</i>	-	Threatened – Nationally Vulnerable	Dean and Hall, 2008 ⁵⁸
<i>Korthalsella salicornioides</i>	Dwarf mistletoe	Threatened – Nationally Critical	Dean and Hall, 2008
<i>Ricciocarpus natans</i>	Liverwort	Threatened – Nationally Endangered	Dean and Hall, 2008
Birds ⁵⁹			
<i>Anthus novaeseelandiae</i>	New Zealand pipit / pīhoihoi	At Risk – Declining	eBird 2021
<i>Botaurus poiciloptilus</i>	Australasian bittern / matuku-hūrepo	Threatened – Nationally Critical	Dean and Hall, 2008
<i>Poodytes punctata vealeae</i>	North Island fernbird / mātāta	At Risk – Declining	Dean and Hall, 2008
<i>Phalacrocorax carbo</i>	Black shag / māpunga	At Risk – Relict	eBird 2021
<i>Phalacrocorax sulcirostris</i>	Little black shag / kawau tūi	At Risk – Naturally Uncommon	Greater Wellington, 2018 ⁶⁰
<i>Platalea regia</i>	Royal spoonbill / kōtuku ngutupapa	At Risk – Naturally Uncommon	Greater Wellington, 2018
<i>Poliiocephalus rufopectus</i>	New Zealand dabchick / wewia	Threatened – Nationally Increasing	Dean and Hall 2008; Greater Wellington, 2018
<i>Zapornia pusilla</i>	Marsh crake / kotoreke	At Risk – Declining	Greater Wellington, 2018

Scientific name	Common name	National threat status	Observation
<i>Zapornia tabuensis tabuensis</i>	Spotless crane / pūweto	At Risk – Declining	Greater Wellington, 2018
Freshwater fish ⁶¹			
<i>Galaxias maculatus</i>	Īnanga	At Risk - Declining	McEwan, 2017 ⁶²
<i>Neochanna apoda</i>	Brown mudfish	At Risk - Declining	McEwan, 2017

Appendix 3: Regionally threatened species list

The following table lists regionally threatened species that have been recorded in the Te Hāpua Wetland Complex KNE site.

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.

Table 7: Regionally threatened species recorded in the Te Hāpua Wetland Complex KNE site

Scientific name	Common name	Regional threat status	Observation
Plants (vascular) ⁶³			
<i>Amphibromus fluitans</i>	-	Endangered	Dean and Hall, 2008 ⁶⁴
<i>Carex dipsacea</i>	-	Naturally Uncommon	Enright and John, 2001
<i>Epilobium pallidiflorum</i>	Swamp willowherb / tarawera	Naturally Uncommon	Enright and John, 2001
<i>Korthalsella salicornioides</i>	Dwarf mistletoe	Critical	Dean and Hall, 2008
<i>Potentilla anserinoides</i>	Silverweed, koohai	Naturally Uncommon	Enright and John, 2001
<i>Ranunculus macropus</i>	Swamp buttercup	Data Deficient	Enright and John, 2001
Birds ⁶⁵			
<i>Anthus novaeseelandiae</i>	New Zealand pipit / pīhoihoi	Threatened - Endangered	eBird 2021
<i>Botaurus poiciloptilus</i>	Australasian bittern / matuku-hūrepo	Threatened - Critical	Dean and Hall, 2008
<i>Phalacrocorax carbo</i>	Black shag / māpunga	Threatened - Critical	eBird 2021
<i>Phalacrocorax sulcirostris</i>	Little black shag / kawau tūi	Threatened - Endangered	Greater Wellington, 2018 ⁶⁶
<i>Platalea regia</i>	Royal spoonbill / kōtuku ngutupapa	Threatened - Endangered	Greater Wellington, 2018
<i>Poliiocephalus rufopectus</i>	New Zealand dabchick / wewia	Threatened - Endangered	Dean and Hall, 2008

Scientific name	Common name	Regional threat status	Observation
<i>Poodytes punctata vealeae</i>	North Island fernbird / mātāta	Threatened - Critical	Dean and Hall, 2008
<i>Zapornia pusilla</i>	Marsh crake / kotoreke	Threatened - Critical	Greater Wellington, 2018
<i>Zapornia tabuensis</i>	Spotless crake / pūweto	Threatened - Endangered	Dean and Hall, 2008
Freshwater fish ⁶⁷			
<i>Galaxias maculatus</i>	Īnanga	Declining	McEwan, 2017 ⁶⁸
<i>Neochanna apoda</i>	Brown mudfish	Vulnerable	McEwan, 2017

Appendix 4: Threat table

Appendix 4 presents a summary of all known threats to the Te Hāpua Wetland Complex KNE site including those discussed in section 7.

Table 8: Threats to the Te Hāpua Wetland Complex KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
Ecological weeds		
EW-1	Woody ecological weeds displace native vegetation, inhibit indigenous regeneration, and alter vegetation structure and composition. Key woody weed species for control in the KNE site include blackberry (<i>Rubus fruticosus</i> agg.), acacia (<i>Acacia sophorae</i>), lupin (<i>Lupinus arboreus</i>) and black alder (<i>Alnus glutinosa</i>) (see full list in Appendix 5)	Entire KNE site
EW-2	Climbing ecological weeds smother and displace native vegetation often causing canopy collapse, inhibit indigenous regeneration, and alter vegetation structure and composition. Key climbing ecological weed species for control in the KNE site include: bittersweet (<i>Solanum dulcamara</i>), convolvulus (<i>Calystegia silvatica</i>), and Japanese honeysuckle (<i>Lonicera japonica</i>) (see full list in Appendix 5)	Entire KNE site
EW-3	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 in the KNE site include: arum lily (<i>Zantedeschia aethiopica</i>) (see full list in Appendix 5)	Entire KNE site
EW-4	Aquatic ecological weeds out-compete native aquatic species and choke watercourses. Key aquatic ecological weed species for control in the KNE site include purple loosestrife (<i>Lythrum salicaria</i>), yellow flag iris (<i>Iris pseudacorus</i>) common water lily (<i>Nymphaea alba</i>) and beggar's ticks (<i>Bidens frondosa</i>) (see full list in Appendix 5)	Entire KNE site
Pest animals		
PA-1	Mustelids (stoats ^{69,70} (<i>Mustela erminea</i>), ferrets ^{71,72} (<i>M. furo</i>) and weasels ^{73,74} (<i>M. nivalis</i>)) prey on native wetland birds, lizards and invertebrates, reducing their breeding success and potentially causing local extinctions ⁷⁵	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 ^{76,77, 78}	Entire KNE site
PA-3	Hedgehogs (<i>Erinaceus europaeus</i>) prey on native invertebrates ⁷⁹ , lizards ⁸⁰ and the eggs ⁸¹ and chicks of ground-nesting birds ⁸²	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
PA-4*	Feral, stray and domestic cats (<i>Felis catus</i>) prey on native birds ^{83,84} , lizards ⁸⁵ and invertebrates ⁸⁶ , reducing native fauna breeding success and potentially causing local extinctions ⁸⁷	Entire KNE site
PA-5*	Possums (<i>Trichosurus vulpecula</i>) browse palatable canopy vegetation until it can no longer recover ^{88,89} . This destroys the forest's structure, diversity and function. Possums may also prey on native birds and invertebrates ⁹⁰	Entire KNE site
PA-6*	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 ^{91,92}	Entire KNE site
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 ⁹³ . Rabbits graze restoration plantings. In drier times hares especially, will penetrate wetland forest areas browsing and reducing regenerating native seedlings	Dryer areas and wetland edges
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 ⁹⁴	Entire KNE site
Human activities		
HA-1*	Agricultural practices, particularly grazing livestock can result in; pugging of soils, grazing and trampling of native vegetation inhibiting regeneration, transport of seeds from ecological weeds, nutrient and bacterial inputs into water from dung and urine, and disturbance of mudfish habitat ⁹⁵	Wetland areas with livestock grazing
HA-2*	Barriers to native fish passage can prevent migrating fish from completing their life-cycle	Entire KNE site
HA-3*	Dogs (<i>Canis lupus familiaris</i>), if uncontrolled/unleashed can disturb or kill nesting birds and chicks, particularly in close proximity to walking tracks ^{96, 97}	Entire KNE site
HA-4*	Boardwalk and track development for recreational use can destroy native vegetation, compact wetland soils and cause sediment runoff into the wetland	Entire KNE site
HA-5*	Land use activities that alter the local hydrology and vegetation communities, such as development schemes, roading projects, sub-divisions and water abstractions can affect the water levels that sustain wetland ecosystems and the plants, birds and fish that rely on them ^{98,99}	Entire KNE site
HA-6*	Recreational vehicles such as 4WDs can cause damage to wetland vegetation and compaction of wetland soils altering hydrology	Entire KNE site
HA-7*	Freshwater activities such as boating and duck shooting can introduce aquatic weed species to waterways	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
Other threats		
OT-1	A lack of legal protection can leave a site at risk of future development or destruction and resources invested in the site may be wasted. Part of this KNE site is private property and uncovenanted, having no protection status	Areas not protected by QEII open space covenants
OT-2*	In ecosystems that aren't in balance, pukeko (<i>Porphyrio melanotus</i>) can impact native vegetation, including plantings by uprooting and grazing palatable plants	Entire KNE site
OT-3*	Climate change is likely to impact on the hydrological cycle and functioning of the wetland complex over time ¹⁰⁰	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 Te Hāpua Wetland Complex KNE site.

Table 9: Ecological weed species recorded in the Te Hāpua Wetland Complex KNE site

Scientific name	Common name	Management aim
<i>Iris pseudacorus</i>	Yellow flag iris	Eradication
<i>Lythrum salicaria</i>	Purple loosestrife	Eradication
<i>Pittosporum crassifolium</i> *	Karo	Eradication
<i>Acetosa sagittata</i>	Climbing dock	Suppression
<i>Bidens frondosa</i>	Beggars' ticks	Suppression
<i>Cortaderia jubata</i>	Purple pampas	Suppression
<i>Cortaderia selloana</i>	Pampas	Suppression
<i>Cupressus macrocarpa</i>	Macrocarpa	Suppression
<i>Lonicera japonica</i>	Japanese honeysuckle	Suppression
<i>Lycium ferocissimum</i>	African boxthorn	Suppression
<i>Rubus fruticosus</i> agg.	Blackberry	Suppression
<i>Salix cinerea</i>	Grey willow	Suppression
<i>Solanum dulcamara</i>	Bittersweet	Suppression
<i>Acacia sophorae</i>	Acacia	Surveillance
<i>Alnus glutinosa</i>	Black alder	Surveillance
<i>Acacia melanoxylon</i>	Australian blackwood	Surveillance
<i>Banksia integrifolia</i>	Banksia	Surveillance
<i>Calystegia sepium</i>	Pink bindweed	Surveillance
<i>Calystegia silvatica</i>	Convolvulus / greater bindweed	Surveillance
<i>Lupinus arboreus</i>	Tree lupin	Surveillance
<i>Pinus radiata</i>	Radiata pine	Surveillance
<i>Prunus campanulata</i>	Taiwan cherry	Surveillance
<i>Racosperma mearnsii</i>	Black wattle	Surveillance
<i>Azolla pinnata</i>	Azolla	No management
<i>Brassica rapa</i> var. <i>rapa</i>	Wild turnip	No management
<i>Conyza sumatrensis</i>	Broad-leaved fleabane	No management
<i>Rumex obtusifolius</i>	Broad leaved dock	No management
<i>Solanum chenopodioides</i>	Velvety nightshade	No management

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

Appendix 6: Revegetation plant list

Plants from the following table are recommended to be used in any revegetation planting at the KNE site as per Section 9.3. Note this is not an exhaustive list and other native species may also be suitable. The Environment Restoration Advisor can provide further guidance in species selection.

Table 10: Revegetation plant list for use within the Te Hāpua Wetland Complex KNE site

Scientific name	Common name	Zone
<i>Amphibromus fluitans</i>	Water brome	Moist
<i>Austroderia toetoe</i>	Toetoe	Moist
<i>Carex dipsacea</i>	Teasel sedge	Saturated
<i>Carex geminata</i>	Cutty grass, rautahi	Saturated/moist
<i>Carex lessoniana</i>	Cutty grass, rautahi	Saturated/moist
<i>Carex maorica</i>	Māori sedge	Saturated/moist
<i>Carex secta</i>	Purei, pukio	Saturated/moist
<i>Carex virgata</i>	Swamp sedge, pukio	Saturated/moist
<i>Coprosma propinqua</i> var. <i>propinqua</i>	Mingimingi	Moist
<i>Coprosma tenuicaulis</i>	Swamp comprosmas, hukihuki	Saturated/ moist
<i>Cordyline australis</i>	Cabbage tree, tī kōuka	Moist
<i>Cyperus ustulatus</i>	Giant umbrella sedge	Moist
<i>Dacrycarpus dacrydioides</i>	Kahikatea	Saturated/moist
<i>Eleocharis acuta</i>	Sharp spike sedge	Saturated
<i>Epilobium pallidiflorum</i>	Swamp willowherb, tarawera	Saturated/moist
<i>Ficinia nodosa</i>	Knobby club rush, wīwī	Moist
<i>Gahnia xanthocarpa</i>	Gahnia, mapere	Permanently damp
<i>Gratiola sexdentata</i>	Gratiola	Open water
<i>Griselinia littoralis</i>	Broadleaf, kapuka	Dry
<i>Isolepis praetextata</i>	-	Moist
<i>Laurelia novae-zelandiae</i>	Pukatea	Saturated/moist
<i>Leptospermum scoparium</i>	Mānuka	Moist/dry
<i>Machaerina arthrophylla</i>	-	Moist
<i>Machaerina articulata</i>	Jointed baumea	Moist/dry
<i>Machaerina rubignosa</i>	Baumea	Saturated/moist
<i>Phormium tenax</i>	Flax, harakeke	Moist/dry
<i>Podocarpus totara</i> var. <i>totara</i>	Tōtara	Dry
<i>Prumnopitys taxifolia</i>	Mātai	Moist
<i>Schoenoplectus tabernaemontani</i>	Kapungawha, kuawa	Standing water
<i>Typha orientalis</i>	Bullrush, raupō	Standing water

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