Key Native Ecosystem Plan for Whangaimoana Coast

2016-2019

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Contents

1. Key Native Ecosystem programme

The Wellington region's native biodiversity has declined since people arrived and the ecosystems that support it face ongoing threats and pressures. Regional councils have responsibility to maintain indigenous biodiversity, as well as to protect significant vegetation and habitats of threatened species, under the Resource Management Act 1991 (RMA).

Greater Wellington Regional Council's (GWRC) Biodiversity Strategy 2015-25[1] sets a framework that guides how GWRC protects and manages biodiversity in the Wellington region in response to its legal requirements and has the following vision:

Vision

Healthy ecosystems thrive in the Wellington region and provide habitat for native biodiversity

The Strategy provides a common focus across the council's departments, and guides activities relating to biodiversity under this overarching vision and is underpinned by four operating principles and three strategic goals. Goal One drives the delivery of the Key Native Ecosystem (KNE) programme.

Goal One

Areas of high biodiversity value are protected or restored

The KNE programme is a non-regulatory voluntary programme that seeks to protect some of the best examples of original (pre-human) ecosystem types in the Wellington region by managing, reducing, or removing threats to their ecological values. Sites with the highest biodiversity values have been identified and prioritised for management within the KNE programme. Sites are identified as of high biodiversity value for the purposes of the KNE programme under the following four ecological significance criteria:

Representativeness	Rarity/ Distinctiveness	Diversity	Ecological context
High representativeness values are given to ecosystems and habitats that were once typical in the region and are no longer common place.	Ecosystems containing Threatened/At-risk species, or species at their geographic limit, or where rare or uncommon ecosystems are present.	High levels of natural ecosystem diversity present i.e. two or more original ecosystem types present.	The site provides important core habitat, has high species diversity, or an ecosystem identified as a national priority for protection on private land.

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

KNE sites can be located on private or publically owned land. However, Department of Conservation (DOC) managed lands are largely excluded from this programme.

KNE sites are managed in accordance with three-year KNE plans, such as this one, prepared by the GWRC's Biodiversity department in collaboration with the landowners and other stakeholders. These plans outline the ecological values, threats, management objectives and describe the operational activities such as ecological weed and pest animal control. KNE plans are reviewed regularly to ensure the activities undertaken to protect and restore the KNE site are informed by experience and improved knowledge about the site.

2. Whangaimoana Coast Key Native Ecosystem

The Whangaimoana Coast KNE site (33ha) is a coastal area made up of various interconnected ecosystem types including sand dunes, a coastal wetland, riparian and estuarine habitats and coastal cliffs. The site is located at the end of Whangaimoana Beach Road in Palliser Bay, South Wairarapa; 32km southwest of Martinborough (see Appendix 1, Map 1).

The multiple ecosystem types and their interconnectivity, coupled with good natural regeneration and restoration planting make it a high priority area for biodiversity management. In addition, the site is significant habitat for several threatened species, primarily coastal birds.

The majority of the site is legally protected under a QEII National Trust (QEII) open space covenant and is surrounded by agricultural land and at the end of Whangaimoana Beach Road numerous small baches and permanent residences. It does, however, link directly with Onoke Lagoon and Onoke Spit (part of the multi-agency Wairarapa Moana Wetlands Project[2]) to the west, and with DOC's Coastal Cliffs Conservation Area to the east. Both these areas contain significant biodiversity values that are being protected and restored.

3. Landowners, management partners and stakeholders

GWRC works in collaboration with landowners, management partners and stakeholders where appropriate to achieve shared objectives for the site. GWRC also recognises that effective working relationships are critical for achieving the management objectives for each KNE site. In preparing this plan GWRC has sought input from landowners, management partners and relevant stakeholders, and will continue to involve them as the plan is implemented.

3.1. Landowners

The majority of the KNE site is on private land within the Moanatahi property, which is owned by Michael and Robyn Warren. The KNE site has been fenced off and retired from stock grazing for several years after being covenanted by the former owner in 2009. The Warren's support biodiversity management activities being undertaken and Moanatahi already works under an active Farm Environment Plan (FEP) with GWRC's Land Management department. This FEP is primarily based on reducing erosion and loss of soil, which has positive effects on water quality and the biodiversity values present in this KNE site.

The remainder of the KNE site (beach and strand area) is Crown land administered by DOC, who supports the KNE plan.

3.2. Management partners

As most of the KNE site is legally protected by a QEII open space covenant and QEII are a management partner. See Appendix 2, Map 2 for a map showing the covenanted area. To date the local QEII representative has undertaken ecological weed control, restoration planting work and also advises the local community group (the Whangaimoana Dunes Care Group) on their restoration plans and activities.

The Whangaimoana Dunes Care Group (WDCG) was established in 2009 as part of GWRC's Take Care Programme (now ceased) which supported community efforts in ecological restoration. WDCG will carry on being supported by GWRC's Biodiversity department to continue their weed control, restoration planting and maintenance of previous plantings. WDCG are committed to protecting and restoring the site, have regular interactions with visitors to the beach and dunes and also have a good relationship with the local community. Currently led by Alistair Sutherland and Sarah Barton, the original focus of WDCG was to restore the dune system at the end of Whangaimoana Beach Road. Initial works consisted of cleaning up rubbish/debris and installing a bollard and rope fence to prevent access onto the dunes, followed by ecological weed control and restoration planting. More recently WDCG have undertaken restoration planting on the banks of the Whangaimoana stream and in the dunes further east. Sand dune restoration activities are the main focus for WDCG for the foreseeable future. In 2014, in partnership with GWRC's Biodiversity department they erected interpretation boards to raise awareness of the biodiversity values of the area and to manage motorised vehicle use of the shingle beach and its effects on native nesting shore birds. A restoration plan was prepared by GWRC in 2009 to guide the activities of WDCG's weed control and restoration planting activities[3].

The South Wairarapa Biodiversity Group (SWBG) are also active within the KNE site and in the wider area, carrying out activities such as beach cleanups and annual restoration planting work with Pirinoa School along the coast between Whangaimoana and Onoke Lagoon.

Within GWRC, the management partners are the Biodiversity, Biosecurity and Land Management departments. The Biodiversity department is the overarching lead department for GWRC on the coordination of biodiversity management activities and advice within the KNE site. The Biosecurity department coordinates and carries out pest control activities. The Land Management department plans and advises on sustainable land use, soil conservation and water quality.

3.3. Stakeholders

The following organisations are stakeholders.

DOC administers the Crown land within the KNE site. While supportive of this plan they will not be involved in its implementation.

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

The South Wairarapa District Council (SWDC) maintains Whangaimoana Beach Road and part of the road-end inside the KNE boundary. They periodically remove dumped rubbish and have erected various signs at the road end.

4. 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.

The Whangaimoana Coast KNE site is an area comprising of various interconnected ecosystem types including sand dunes, a coastal wetland, riparian and estuarine habitats and coastal cliffs. The KNE site is located in the Wairarapa Plains ecological district[4] and contains various designated ecosystems and important ecological features typical of this ecological district.

4.1. Ecological designations

Table 1 below lists ecological designations at all or part of Whangaimoana Coast KNE site.

Table 1: Designations at the Whangaimoana Coast KNE site

Designation level	Type of designation
Regional	The Whangaimoana Stream mouth is scheduled under GWRC's proposed Natural Resources Plan (pNRP) as: • Inanga spawning habitat (Schedule F1) • A Significant Natural Wetland (Schedule F3)
Other	QEII Open Space Covenant 5-07-631

4.2. Ecological significance

The Whangaimoana Coast KNE site is considered to be of regional significance because:

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

Representativeness

The KNE site contains land environments that are classified respectively as Acutely Threatened environments (having less than 10% of its indigenous cover remaining nationally), Chronically Threatened (having 10-20% indigenous cover remaining nationally) and At Risk (having 20-30% indigenous cover remaining nationally)[5]. See Appendix 1, Map 3 for a LENZ map of the KNE site.

Rarity/distinctiveness

Several naturally uncommon ecosystem types are present within the KNE site. These are active sand dunes (threat status Endangered), stable sand dunes (Endangered), a lagoon (Vulnerable) and a shingle beach (Endangered)[6].

Within the KNE site there are known to be four Nationally Threatened or At Risk plant species. The KNE site also provides habitat for ten Nationally Threatened or At Risk bird species, two Nationally Threatened or At Risk native fish species and one At Risk - Declining invertebrate species. Nationally threatened species are listed in Appendix 2 and regionally threatened species in Appendix 3.

Diversity

The KNE site contains several inter-connected ecosystems types including sand dunes, a coastal wetland, riparian and estuarine habitats and coastal cliffs.

Ecological context

The KNE site is an important part of the wider southern coastal ecosystems of the Wairarapa and is typical of the long stretches of shingle beach and coastal cliffs found in this district. The KNE site forms a continuation of protected habitats between the DOC Coastal Cliffs Conservation Area and the Wairarapa Moana multi-agency project.

4.3. Ecological features

Habitats

The Whangaimoana Stream mouth (identified as a significant natural wetland under GWRC's proposed Natural Resources Plan) is usually blocked off from the sea by a gravel bank. However, in storm events and very high tides this gravel bank can be breached by ocean swells, causing the stream to be periodically inundated with sea water.

The Whangaimoana Stream mouth and wetland contains raupō (*Typha orientalis*) in the water of the stream and lagoon, with a mosaic of oioi (*Aposdasmia similis*), wīwī (*Juncus edgariae*) and knobby clubrush (*Ficinia nodosa*) on the edges. *Carex germinata*, swamp flax (*Phormium tenax*) and umbrella sedge (*Cyperus ustulatus*) dominate the stream's northern bank.

The backdune behind the Whangaimoana Stream's northern bank contains typical indigenous backdune species where more mature sandy soil is present. This area contains threatened native plants such as pīngao (*Ficinia spiralis*)[7] and native spinach or kōkihi (*Tetragonia tetragonoides*)[8]. The area east the backdune contains a wider variety of species including taupata (*Coprosma repens*), shore bindweed (*Calystegia soldanella*), native spinach (*Tetragonia tetragonoides*), NZ ice plant (*Disphyma australe*) and coastal tree daisy (*Olearia solandri*).

There are modified foredunes at the road-end and relatively unmodified foredunes along the base of the coastal cliffs in the southeast of the KNE site. Pīngao, sourced from sandy gullies to the west, has recently been planted in the dune at the road-end, amongst an area of spinifex or kōwhangatara (*Spinifex sericeus*). This area is a mix of naturally occurring and planted specimens[9]. The foredunes further east from the road-end along the base of the cliffs are relatively undisturbed and the vegetation mainly

consists of large areas of spinifex. Pīngao and sand tussock (*Poa billardierei*) are being replanted here by the WDCG.

The cliff vegetation is regenerating and contains species such as coastal flax or whararikі (*Phormium cookianum*), toetoe (*Austroderia toetoe*), thick-leaved māhoe (*Melicytus crassifolius*[10]), silver tussock (*Poa cita*), sand tussock, akiraho (*Olearia paniculata*) and coastal tree daisy[11].

Species

Birds

Threatened bird species that have been observed in the KNE site include New Zealand falcon (*Falco novaeseelandiae*), banded dotterel (*Charadrius bicinctus*), white-fronted tern (*Sterna striata*), black shag (*Phalacrocorax carbo novaehollandiae*), pied shag (*Phalacrocorax varius*), red-billed gull (*Larus novaehollandiae*), pied stilt (*Himantopus himantopus*), NZ pipit (*Anthus novaseelandiae*), Caspian tern (*Hydroprogne caspia*), variable oystercatcher (*Haematopus unicolor*) and the little (blue) penguin (*Eudyptula minor*).

Unidentified species of albatross or mollymawk have been recorded on the beach, particularly during southerly storm events. Australasian gannets (*Morus serrator*) and unidentified shearwater species have also been recorded[12].

Non-threatened species such as tūī (*Prosthemadera novaeseelandiae*), bellbird (*Anthornis melanura*), fantail (*Rhipidua fulginosa*), morepork (*Ninox novaeseelandiae*), silvereye (*Zosterops lateralis*), grey warbler (*Gerygone igata*) harrier (*Circus approximans*), white-faced heron (*Egretta novaehollandiae* and southern black-backed gull (*Larus dominicanus*) have also been observed in the KNE site[13].

Fish and crustaceans

Four species of native fish have been recorded at the KNE site, being banded kōkopu (*Galaxias fasciatus*), upland bully (*Gobiomorphus breviceps*)[14], longfin eel (tuna, *Anguilla dieffenbachia*) and inanga (*Galaxias maculatus*). Whangaimoana Stream[15] is also identified as being an inanga spawning area[16]. Kōura (*Paranephrops sp.*) have also been recorded[17].

Invertebrates

Threatened katipō spiders (*Lactrodectus katipo*) have been recorded in the dune vegetation[18] and are known to be found in several sites on the southeastern coastline from Onoke Spit to Cape Palliser.

Reptiles

Skinks have been observed in the site[19] but their species has yet to be determined.

Other[20]

Palliser Bay is seasonal and/or core habitat for a variety of marine mammals, with NZ fur seals (*Arctocephalus forsteri*) occasionally seen on the beach, and Hector's dolphin (*Cephalorhynchus hectori)*, southern right whale (*Eubalaena australis*), orca (*Orcinus*

orca), common dolphin (*Delphinus delphis*) and Cuvier's beaked whale (*Ziphius cavirostris*) observed close to shore.

5. Threats to ecological values at the KNE site

Ecological values can be threatened by human activities, and by introduced animals and plants that change the ecosystem dynamics. The key to protecting and restoring biodiversity as part of the KNE programme is to manage threats to the ecological values at each KNE site.

5.1. Key threats

Ecological weeds are widespread throughout the KNE site. As a result they are considered the primary threat to the site's ecological values as these displace native plant species that perform an important ecological function in dune habitats, such as pīngao and spinifex. These two species bind sand together thereby providing stability for the whole dune ecosystem.

Marram grass (*Ammophila arenaria*) is the most dominant ecological weed present within the KNE site. Marram-dominated dunes have a higher and steeper dune structure that is more unstable than the naturally occurring pīngao and spinifex-dominated dune system. Due to the growth habits of pīngao and spinifex compared to marram dunes native dune ecosystems are able to recover and repair faster following storm events. The KNE site's south-facing aspect results in the storm events being severe and frequent.

Other ecological weeds found in the KNE site include boneseed (*Chrysanthemoides monilifera*), gazania (*Gazania* sp.), African daisy or arctotis (*Arctotis stoechadifolia*), cape ivy (*Senecio angulatus*), horned poppy (*Glaucium flavium*), pampas (*Cortaderia selloana*), crack willow (*Salix fragilis*) and lupin (*Lupinus arboreus*). Gorse (*Ulex europaeus*), while not often targeted as a key threat, is present in the backdunes and coastal cliffs. Gorse can out-compete native plant species in this ecosystem as the natural climax community would have consisted of low statured scrub that couldn't shade out gorse.

Pest animal species are present within the KNE site and are known to predate nesting bird species. The main pest animal threats at the KNE site are considered to be mustelids (*Mustela* spp.), hedgehogs (*Erinaceus europeaeus*) and feral cats (*Felis catus*). Rabbits (*Oryctolagus cuniculus*) and hares (*Lepus europaeus*) are also common and browse native vegetation, including new revegetation plantings.

Recreation activities within the KNE site, such as motor biking, quad biking and 4W driving can damage the sand dunes and shingle beach habitats and disturb wildlife, including nesting native birds. In addition, uncontrolled dogs can disturb and kill breeding birds and their chicks.

While the key threats discussed in this section are recognised as the most significant, a number of other threats to the KNE site's values have also been identified. Table 2 presents a summary of all known threats to the Whangaimoana Coast KNE site (including those discussed above), detailing which operational areas they affect, how each threat impacts on ecological values, and whether they will be addressed by the management activities.

Table 2: Summary of all threats to ecological values present at the Whangaimoana Coast KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
Ecological weeds		
EW-1	Marram grass outcompetes and excludes native dune species such as spinifex and pīngao. This alters dune form and function and the ability for dunes to recover after storm events	Foredunes and backdunes
EW-2	Woody ecological weeds (exotic and non-local native) displace native species and inhibit natural regeneration which alters ecosystem structure and function. Key species include crack willow (*Salix fragilis*), cape ivy (*Senecio angulatus*), lupin (*Lupinus arboreus*), boneseed (*Chrysanthemoides monilifera*) and gorse (*Ulex europaeus*)	Backdunes and estuary
EW-3	Groundcovering weeds such as Tradescantia *(Tradescantia fluminensis*), horned poppy (*Glaucium flavium*), African daisy (*Arctotis stoechadifolia*) and montbretia (*Crocosmia x crocosmiflora*) outcompete and prevent natural regeneration of native plant species, altering ecosystem structure and function	Backdunes and estuary
Pest animals		
PA-1	Mustelids (stoats[21,22] (*Mustela erminea*), ferrets[23,24] (*M. furo*) and weasels[25,26] (*M. nivalis*)) prey on native birds, lizards and invertebrates, reducing their breeding success and potentially causing local extinctions	Entire KNE site
PA-2	Feral and domestic cats (*Felis catus*) prey on native birds[27], lizards[28] and invertebrates[29], reducing native fauna breeding success and potentially causing local extinctions[30]	Entire KNE site
PA-3	Hedgehogs (*Erinaceus europaeus*) prey on native invertebrates[31], lizards[32] and the eggs[33] and chicks of ground-nesting birds[34]	Entire KNE site
PA-4	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[35,36]	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[37,38]	Entire KNE site
PA-6*	Possums (*Trichosurus vulpecula*) browse palatable canopy vegetation until it can no longer recover[39,40]. This destroys the vegetation structure, diversity and function. Possums may also prey on native birds[41] and invertebrates	Entire KNE site
PA-7*	Rabbits (*Oryctolagus cuniculus*) and hares (*Lepus europaeus*) are known to graze on palatable native vegetation and prevent natural regeneration in some environments[42] 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 damaging regenerating native seedlings	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
Human activities		
HA-1	People and vehicles accessing the site (mainly for recreation purposes) can damage native vegetation, disturb native fauna and introduce the seeds of ecological weeds	Foredunes and beach
HA-2	Grazing by stock animals inhibits most regeneration processes, reducing indigenous plant species richness and in some cases causing local extinctions of palatable indigenous shrubs, terrestrial orchids and ferns[43]	Entire KNE site
HA-2*	Poor water quality affects a range of species in the estuary and stream. High nutrient levels and contaminants within watercourses are often caused by upstream land-use practices and pollution events including development practices, forestry and agricultural practices, road run-off and storm water entering the watercourse, and sceptic tank leakages	Stream and estuary

***Threats marked with an asterisk are not addressed by actions in the operational plan.**

The codes alongside each threat correspond to activities listed in the operational plan (Table 3), and are used to ensure that actions taken are targeted to specific threats.

6. Management objectives

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

The following objectives will guide the management activities at the Whangaimoana Coast KNE site.

1. **To improve the structure* and function† of native plant communities**
2. **To improve the habitat for threatened native animals (coastal birds)**

* The living and non-living physical features of an ecosystem. This includes the size, shape, complexity, condition and the diversity of species and habitats within the ecosystem.
† The biological processes that occur in an ecosystem. This includes seed dispersal, natural regeneration and the provision of food and habitat for animals

7. Management activities

Management activities are targeted to work towards the objectives above (Section 6) by responding to the threats outlined in Section 5. The broad approach to management activities is described briefly below and specific actions with budget figures attached are set out in the operational plan (Table 3).

It is important to note that not all threats identified in Section 5 can be adequately addressed. This can be for a number of reasons including financial, legal, and/or capacity restrictions.

Based on habitat type the site has been broadly divided into five operational areas for these management activities. See Appendix 1, Map 4 for a map of operational areas.

7.1. Ecological weed control

The aim of weed control is to reduce the density and distribution of targeted high impact pest plants to improve the structure and function of native plant communities.

A restoration plan for the area was prepared by GWRC in 2009. This recommended plans for weed control activities[44]. As a result an ecological weed survey of the dunes and riparian area at the end of Whangaimoana Beach Road was completed in 2013 by GWRC Biosecurity[45]. Following the development of the 2009 plan, targeted marram control at the road-end dunes began in 2010. In 2013 other coastal pest species such as cape ivy along the riparian/estuarine zone and horned poppy on the shingle beach were included for control. In the back dunes control of ecological weeds including crack willow, cape ivy, lupin, karo (*Pittosporum crassifolium*, a non-local native) and gorse began in 2013. These pest plant work programs are still ongoing and will continue to be undertaken annually by GWRC Biosecurity department.

In addition, if resources allow, GWRC Biosecurity will undertake pest plant surveys along the cliffs and foredunes in the eastern third of the KNE site for species such as gorse, boneseed and cape ivy. Furthermore, if resources allow, GWRC Biosecurity will control marram in the eastern foredunes in tandem with restoration planting by the WDCG where marram is considered to be increasing its range and density[46].

7.2. Pest animal control

The aim of pest animal control is to reduce predator numbers so to improve the habitat for native birds.

A line of 12 predator control sites, each containing a DOC250 kill-trap and Timms kill-trap, runs through the KNE site and was installed in 2012 (See Appendix 1, Map 5). These sites are checked monthly by GWRC Biosecurity department and are designed to catch mustelids, feral cats and hedgehogs primarily, but will also catch rats.

This pest animal control work links directly with similar work being done to the west in the Onoke Lagoon and Spit area as part of the Wairarapa Moana project (a trap line of DOC250 and Timms traps that runs continuously from Onoke Lagoon to the western end of the KNE site) and further east with the work being done by the Aorangi Trust and DOC.

7.3. Revegetation

The aim of revegetation at the KNE site is to improve the structure, composition and function of native plant communities. This is being done by controlling pest plants (e.g. marram) and replacing them with native plants. This will increase biodiversity by reintroducing native species such as sand coprosma (*Coprosma acerosa*) and matagouri (*Discaria toumatou*) that would have likely occurred in the backdunes. This revegetation work is also expected to improve the habitat for threatened bird species, and will be carried out by WDCG in consultation with GWRC Biodiversity. WDCG are currently working towards restoration work in the eastern foredunes at the foot of the coastal cliffs (see Appendix 1, Map 4) and GWRC Biodiversity provides plants to the group for this work.

Plants from the following table will be used in any revegetation planting.

Table 3: Revegetation plant list for use within the Whangaimoana Coast KNE site

Scientific Name	Common Name	Operational Area
Coprosma repens	Taupata	Backdunes
Discaria toumatou	Matagouri	Backdunes
Ficinia spiralis	Pīngao	Foredunes
Phormium cookianum	Coastal flax	Backdunes and cliffs
Phormium tenax	Swamp flax	Estuary and riparian areas
Plagianthus divaricatus	Saltmarsh ribbonwood	Estuary

7.4. Fencing

GWRC Biodiversity will work with QEII Trust and the landowner to ensure the fencing remains stock-proof.

8. Operational plan

The operational plan shows the actions planned to achieve the stated objectives for Whangaimoana and their timing and cost over the three-year period from 1 July 2016 to 30 June 2019. The budget for the 2017/18 and 2018/19 years are indicative only and subject to change.

Table 4: Three-year operational plan for the Whangaimoana KNE site

Objective	Threat	Activity	Operational area	Delivery	Description/detail	Target	Timetable and resourcing		
							2016/17	2017/18	2018/19
1 and 2	EW-1 EW-2 EW-3	Ecological weed control	Entire KNE site	GWRC Biosecurity	Weed control will target marram, groundcover and woody weeds throughout the KNE site	Reduction in abundance and distribution of target ecological weed species	$3,000	$3,000	$3,000
1 and 2	PA-1 PA-2	Pest animal control	Entire KNE site	GWRC Biosecurity	Service DOC250 predator kill-traps monthly Timms traps alongside DOC250 traps are serviced monthly	Mustelids <2% TTI*	$3,800	$3,800	$3,800
1 and 2	EW-1 EW-2 EW-3	Revegetation	Entire KNE site	Volunteers GWRC Biodiversity	Planting of native dune plants, including where marram has been controlled Native planting in riparian and backdune habitats to improve habitat structure and function	70% plant survival	$1,000	$1,000	$1,000
1 and 2	HA-2	Fencing	Entire KNE site	GWRC Biodiversity	Monitor the fenceline annually for any breaches and report to landowner	Fence remains intact and stock-proof	Nil	Nil	Nil
						Total	**$7,800**	**$7,800**	**$7,800**

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

9. Funding contributions

9.1. Budget allocated by GWRC

The budget for the 2017/18 and 2018/19 years are indicative only and subject to change.

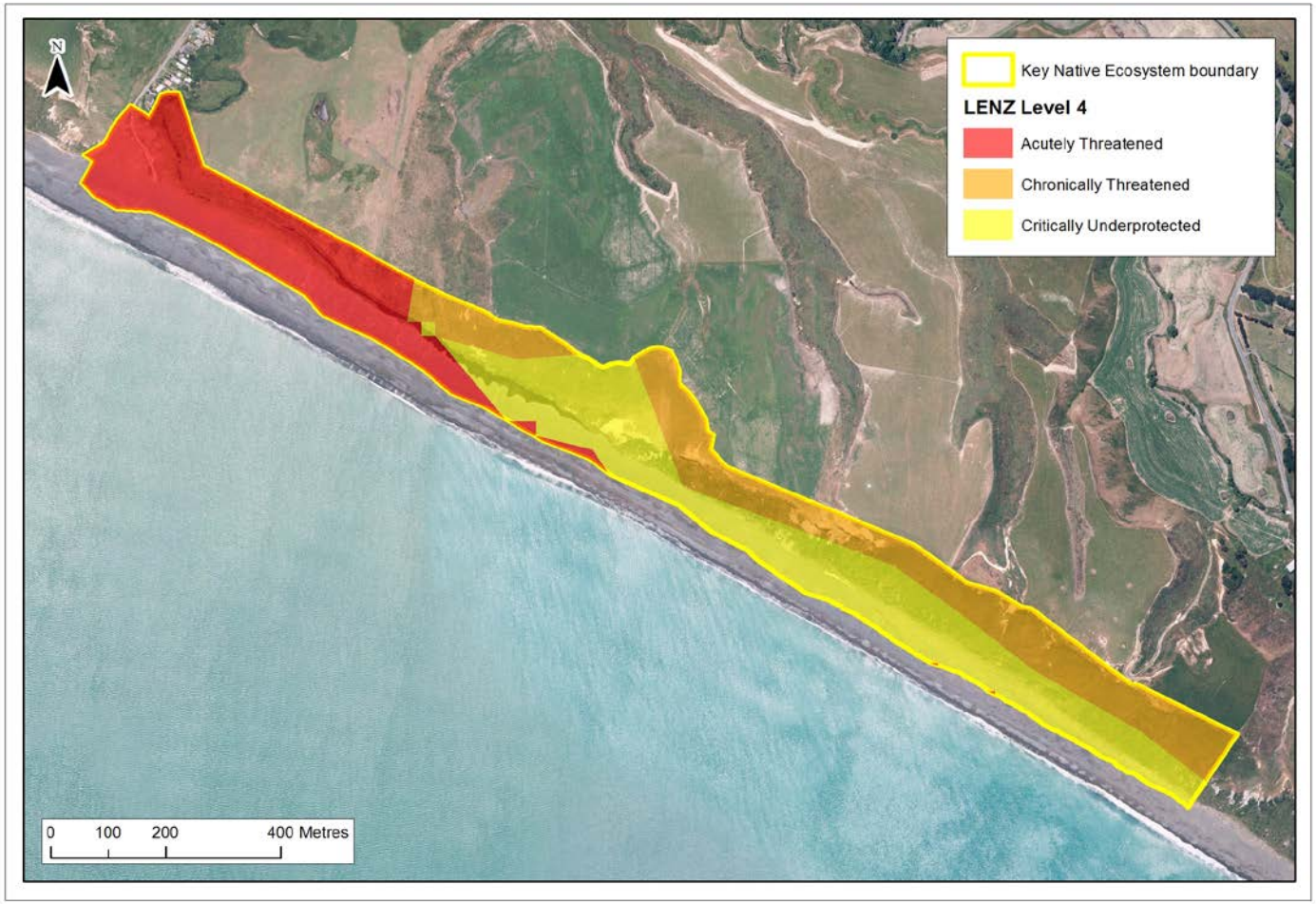
Table 5: GWRC allocated budget for the Whangaimoana KNE site

Management activity	Timetable and resourcing		
	2016/17	2017/18	2018/19
Ecological weed control	$3,000	$3,000	$3,000
Pest animal control	$3,800	$3,800	$3,800
Re-vegetation	$1,000	$1,000	$1,000
Total	**$7,800**	**$7,800**	**$7,800**

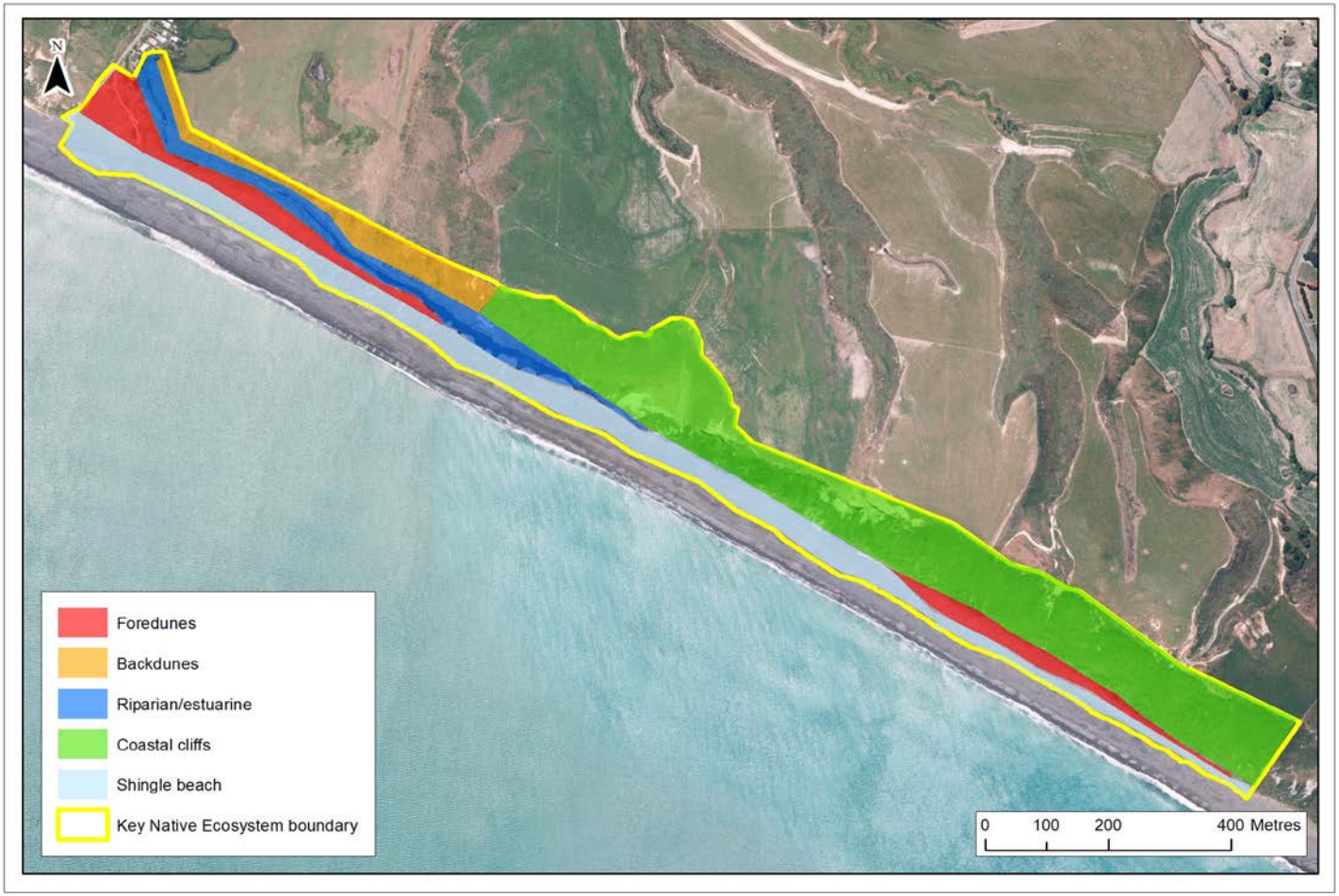
10. Appendix 1: Site maps

Map 1: The Whangaimoana Coast KNE site boundary

Map 2: Area protected under a QEII National Trust open space covenant in the Whangaimoana Coast KNE site



Map 3: Land Environment New Zealand threat classification map for the Whangaimoana Coast KNE site



Map 4: Operational areas (by habitat type) in the Whangaimoana Coast KNE site

Map 5: Pest animal control in the Whangaimoana Coast KNE site

11. 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 three-year cycle[47] with the exception of birds that are assessed on a five-year cycle[48]. 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 Whangaimoana KNE site.

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

Scientific name	Common name	Threat status	Observation
Plants(vascular)[49]			
Ficinia spiralis	Pīngao	At Risk - Declining	Enright, P. 2010[50]
Melicytus crassifolius	Thick-leaved māhoe	At Risk - Declining	Justin McCarthy, GWRC, pers obs 2015
Poa billardierei	Sand tussock	At Risk - Declining	Enright, P. 2010
Tetragonia tetragonoides	Kōkihi, NZ spinach	At Risk - Naturally Uncommon	Enright, P. 2010
Birds[51]			
Anthus novaeseelandiae	NZ Pipit	At Risk - Declining	Justin McCarthy, GWRC, per obs 2015
Charadrius bicinctus	Banded dotterel	Threatened – Nationally Vulnerable	Rebergen, A. 2012[52]
Falco novaeseelandiae	NZ falcon	Threatened – Nationally Vulnerable	S. Barton, pers comm 2016
Himantopus himantopus	Pied stilt	At Risk - Declining	Rebergen, A. 2012
Haematopus unicolor	Variable oystercatcher	At Risk - Recovering	Tim Park, GWRC, pers obs 2012
Hydropogne caspia	Caspian tern	Threatened – Nationally Vulnerable	S. Barton, pers comm 2014
Larus novaehollandiae	Red-billed gull	Threatened – Nationally Vulnerable	S. Barton, pers comm 2014
Phalacrocorax carbo novaehollandiae	Black shag	At Risk - Naturally Uncommon	S. Barton, pers comm 2016
Phalacrocorax varius varius	Pied shag	Threatened - Nationally Vulnerable	S. Barton, pers comm 2016
Sterna striata	White-fronted tern	Threatened – Nationally Vulnerable	S. Barton, pers comm 2014
Freshwater fish[53]			
Anguilla dieffenbachii	Longfin eel	At Risk - Declining	S. Barton, pers comm 2014

Scientific name	Common name	Threat status	Observation
Galaxias maculatus	Inanga	At Risk - Declining	Taylor & Kelly, 2003[54]
Invertebrates (Araneae – spiders)[55]			
Lactrodectus katipo	Katipō spider	At Risk - Declining	Matiu Park, pers obs 2011

12. Appendix 3: Regionally threatened plant species list

The following table lists regionally threatened species that have been documented at the Whangaimoana Coast KNE site.

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

Scientific name	Common name	Threat status	Observation
Plants[56]			
Coprosma acerosa	Sand coprosma	Gradual Decline	Wairarapa Plains Ecological District report[57]
Ficinia spiralis	Pīngao	Gradual Decline	Wairarapa Plains Ecological District report
Plagianthus divaricatus	Saltmarsh ribbonwood	Sparse	Wairarapa Plains Ecological District report

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