

Key Native Ecosystem Plan for Mātaikonā Coast

2016-2019



greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao



Contents

1. Key Native Ecosystem programme	1
2. Mātaikonā Coast Key Native Ecosystem	3
3. Landowners, management partners and stakeholders	4
3.1. Landowners	4
3.2. Management partners	4
3.3. Treaty partners	4
3.4. Stakeholders	4
4. Ecological values	5
4.1. Ecological designations	5
4.2. Ecological significance	5
4.3. Ecological features	7
5. Threats to ecological values at the KNE site	10
5.1. Key threats	10
6. Management objectives	13
7. Management activities	13
7.1. Ecological weed control	13
7.2. Revegetation	14
8. Operational plan	15
9. Funding contributions	16
9.1. Budget allocated by GWRC	16
9.2. Budget allocated by Masterton District Council (MDC)	16
Appendix 1: Site maps	17
Appendix 2: Nationally threatened species list	20
Appendix 3: Regionally threatened plant species list	22
Appendix 4: Revegetation plant list	23
References	24

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 2015-25¹ 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
The extent to which ecosystems and habitats represent those that were once typical in the region but are no longer common place	Whether ecosystems contain Threatened/At-risk species, or species at their geographic limit, or whether rare or uncommon ecosystems are present	The levels of natural ecosystem diversity present 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 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, tangata whenua 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. Mātaikonā Coast Key Native Ecosystem

The Mātaikonā Coast KNE site (22ha) is located in the eastern Wairarapa 10km north of the coastal settlement of Castlepoint, and 53km north-east of Masterton. The KNE site lies between the coastal settlements of Sandy Bay and Mātaikonā (see Appendix 1, Map 1).

The KNE site contains multiple ecosystem types but primarily consists of coastal rushland habitat on a rocky platform on the seaward side of Mātaikonā Road. Other ecosystems present include a large river mouth, riparian and estuary habitats, sand dunes, shingle beaches and coastal wetland sites.

This ecologically diverse site provides habitat for several Nationally Threatened bird, fish, plant and invertebrate species as well as other important flora and fauna in the district. This coupled with the natural regeneration occurring onsite and restoration planting make the KNE site a high priority area for biodiversity management.

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

Masterton District Council (MDC) administers the majority of the KNE site as it is public land designated as road reserve. Most of their operational work is focussed on road maintenance.

DOC, on behalf of the Crown, administers the land below the high-tide mark and coastal land below MDC's road reserve.

3.2. Management partners

MDC administers the public land making up the majority of the site. Whilst they primarily fund road maintenance and road reserve work, they also part-fund the ecological weed control and revegetation planting that is detailed in this KNE plan and managed by the GWRC Biodiversity department.

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 detailed in this plan. The Land Management department is working with the neighboring Owhanga Station under a Farm Environment Plan (FEP). Land Management is advising on sustainable land use practices with particular regard to soil conservation and water quality. They will also be able to advise landowners around the new rules provided by the Council's proposed Natural Resources Plan² (PNRP) with regard to stock access restrictions to Category 1 surface water bodies such as the Mātaikonā River.

3.3. Treaty partners

Both Wairarapa iwi (represented by Rangitāne o Wairarapa inc. and Ngati Kahungungu inc.) are also stakeholders. The whole coastal area from the Whakataki River in the south to the Mātaikonā River in the north is significant to both Wairarapa iwi. Four sites within the KNE site boundary are listed as Sites of Significance to Mana Whenua in the PNRP. These sites are important for a number of reasons including pā, papa kāinga (semi-permanent settlements), urupā (burial ground), mahinga kai (food gathering areas) and ngakinga (cultivations) sites.

3.4. Stakeholders

DOC are a stakeholder and while supportive of the biodiversity management activities they will not be actively involved in implementation of this KNE plan.

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.

4.1. Ecological designations

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

Table 1: Designations at the Mātaikonā Coast KNE site

Designation level	Type of designation
Regional	<p>Parts of the Mātaikonā Coast KNE site are designated under GWRC's proposed Natural Resources Plan (PNRP) as:</p> <ul style="list-style-type: none"> • A river with high macroinvertebrate community health (Schedule F1): The Ōkau Stream and all tributaries • Rivers and lakes with significant indigenous ecosystems - habitat for 6 or more migratory indigenous fish species (Schedule F1): Mātaikonā River • A river and parts of the coastal marine area containing inanga spawning habitat (Schedule F1b): Mātaikonā River • Habitats for indigenous birds in the coastal marine area (Schedule F2c): Mātaikonā rivermouth • A Site with significant indigenous biodiversity values in the coastal marine area (Schedule F4): Mātaikonā rivermouth/estuary and Mātaikonā Reefs
District	<p>Part of the Sandy Bay dune area is listed in DOC's 2004 Recommended Area for Protection Appendix 7 – Other areas of biological importance (Waipori Dune System)³</p>
Other (non-ecological designations of relevance)	<p>Parts of the Mātaikonā Coast KNE site are designated under GWRC's proposed Natural Resources Plan (PNRP) as:</p> <ul style="list-style-type: none"> • Sites of Significance for Mana Whenua (Schedule C): Mātaikonā river mouth, Mātaikonā reefs and Owhanga coast, Te Rerenga o Te Aohuruhuru (Suicide Rock) and Whakataki coast • Significant geological feature in the coastal marine area (Schedule J): Mātaikonā shore platforms • Category 1 Surface Water Body restricting stock access to the Mātaikonā River <p>Much of the KNE site is designated by MDC as Road Reserve</p>

4.2. Ecological significance

The Mātaikonā Coast KNE site is considered to be of regional importance because:

- It contains highly **representative** ecosystems that were once typical or commonplace in the region
- It contains ecological features that are **rare** or **distinctive** in the region

- It contains high levels of ecosystem **diversity**, with several ecosystem types represented within the KNE site boundary, including several naturally uncommon ecosystems
- Its **ecological context** is valuable at the landscape scale as it contains a variety of interconnected habitats, ecosystems identified as a national priority for protection and provides core/seasonal habitat for numerous threatened indigenous species within the KNE site.

Representativeness

The Threatened Environment Classification system⁴ indicates that a large part of the KNE site is classified as Acutely Threatened (having less than 10% of its indigenous cover remaining nationally). The remainder is classed as either Chronically Threatened (10-20% indigenous cover remaining nationally) or At Risk (20-30% indigenous cover remaining nationally)⁵. See Appendix 1, Map 2.

The KNE site is located in the Eastern Wairarapa Ecological District⁶ and contains coastal habitats that are representative of coastal dune and rocky platform ecosystems. These ecosystems were formerly more extensive in this ecological district⁷.

Wetlands are now considered an uncommon habitat type in the Wellington region with less than 3% remaining of their original extent⁸.

Rarity/distinctiveness

Several naturally uncommon ecosystem types are present within the KNE site. These are active and stable sand dunes and dune slack wetlands (threat status Endangered), estuaries (Vulnerable), shingle beach (Endangered) and coastal turfs (Critically Endangered)⁹.

Within the KNE site there are three plant species, nine bird species, five freshwater fish species and one invertebrate species listed in New Zealand's national threat classification system¹⁰ as being Nationally Threatened or At-Risk. Two plant species present have also been listed as regionally threatened. Nationally Threatened/At Risk species are listed in Appendix 2 and regionally threatened species in Appendix 3.

Diversity

The KNE site contains several ecosystems types including coastal rushland, river mouth, riparian and estuary habitats, sand dunes, shingle beaches and coastal freshwater wetland sites.

Ecological context

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

The KNE site is also adjacent to the Owhanga Coast KNE site (to the immediate north). These KNE sites when combined provide a large coastal strip (approximately 12km)

that is managed for biodiversity. These KNE sites also provide seasonal and/or core habitat for a number of Threatened species.

4.3. Ecological features

For ease of description and management, the site has been divided into the seven operational areas listed below. See Appendix 1, Map 3 for a map of operational areas.

- A - Mātaikonā River
- B - Mātaikonā village dunes
- C - Pimelea Point
- D - Suicide Rock (Te Rerenga o Aohuruhuru)
- E - Mātaikonā dune system
- F - Ōkau Stream
- G - Sandy Bay dunes

Habitats and vegetation

River mouth and estuary (operational areas A & F)

The Mātaikonā River (operational area A) has a tidal river mouth estuary constrained by a long gravel bank-sand spit and drains through a narrow outlet. The river mouth is often fully closed when easterly storms deposit large amounts of sand and gravel, forming a lagoon. During flood events the river cuts through the sand and gravel bank at various points. The river can have a tidal influence for up to two kilometers upstream¹¹. The steep-sided nature and loose soil and gravel of the Mātaikonā River tidal margins mean there is minimal saltmarsh habitat, though three-square (*Schoenoplectus pungens*) is found along the base of the northern river bank and on the mudflats adjacent to the lagoon. Most of the riverbank is dominated by tall fescue (*Schedonorus arundinaceus*), however native vegetation is scattered throughout the area mainly consisting of toetoe (*Cortaderia toetoe*), cabbage tree (*Cordyline australis*) and wīwī (*Ficinia nodosa*).

The Ōkau stream estuary (operational area F) is mainly vegetated with tall fescue, with some scattered sea rush (*Juncus kraussii*) and sand sedge (*Carex pumila*). The riparian area of the Ōkau Stream is dominated by marram (*Ammophila arenaria*) and tall fescue but also contains wīwī, oioi (*Apodasmia similis*), coastal tree daisy (*Olearia solandri*), taupata (*Coprosma repens*), ngaio (*Myoporum laetum*), giant umbrella sedge (*Cyperus ustulatus*) and cabbage tree.

Rushland and dunes (operational areas A, B, C, E, F & G)

Pimelea Point (operational area C) is one of the most intact and unmodified areas remaining in the KNE site. This area is informally named for the abundant sand daphne (*Pimelea arenaria*) found here, a plant listed nationally as being in Serious Decline and regionally as Vulnerable. Sand coprosma (*Coprosma acerosa*), and wīwī is extensive throughout much of this rushland area with scattered sand wind grass (*Lachnagrostis billardierei*). Oioi dominates the lower-lying areas.

The Mātaikonā River system (operational area A) has a stable sand dune populated with wīwī, oioi, giant umbrella sedge and cabbage trees.

The Mātaikonā village dunes (operational area B) and the Mātaikonā dune system (operational area E) are rushland habitat populated with sand daphne, sand coprosma, wind grass and wīwī. Scattered cabbage trees, marsh ribbonwood (*Plagianthus divaricatus*) and giant umbrella sedge are found in lower-lying areas.

The sand dunes on the northern side of the Ōkau Stream mouth (operational area F), although dominated by marram, contain spinifex or kōwhangatara (*Spinifex sericeus*), sand sedge, wīwī, oioi, giant umbrella sedge and cabbage trees.

The Sandy Bay dunes (operational area G) contain sand daphne, sand coprosma and spinifex in the foredunes. The backdunes are vegetated with toetoe, coastal tree daisy and cabbage tree.

Beaches and coastal rock platform (operational areas D & F)

The coastal rock platforms known as the Mātaikonā reefs and shore platforms (entire KNE site) have an unusual geomorphology which has created a diversity of micro-habitats which provide environments for a particularly-rich marine algal flora¹².

Foreshore throughout the KNE site such as at Ōkau Stream (operational area F) and Suicide Rock (operational area D) contains shore plants such as shore buttercup (*Ranunculus acaulis*), glasswort (*Sarcocornia quinqueflora*), sea primrose (*Samolus repens*) and remuremu (*Selliera radicans*). These combine to form coastal turf communities.

Operational area D contains cliff habitat with typical hardy low-growing native plants present such as taupata and coastal flax (*Phormium cookianum*), and ngaio in more sheltered parts.

Coastal wetlands (operational areas A, B & G)

The Mātaikonā Village dunes (operational area B) contains a dune slack wetland with species such as giant umbrella sedge (*Cyperus ustulatus*), giant rush (*Juncus pallidus*), raupō (*Typha orientalis*), toetoe, swamp flax or harakeke (*Phormium tenax*), cabbage tree and oioi.

In the damper, low lying areas of the Sandy Bay dunes (operational area G) are more dune slack wetlands, with species such as harakeke, toetoe, raupō, three-square (*Schoenoplectus tabernaemontani*; regionally sparse) and rautahi (*Carex geminata*) present.

Species

Birds

The KNE site provides important seasonal or core habitat for a range of native coastal and shore bird species including threatened and common species.

The Mātaikonā River estuary is particularly important supporting nine Threatened or At-Risk bird species such as the black-billed gull (*Chroicocephalus bulleri*), pied shag (*Phalacrocorax varius*) and banded dotterel (*Charadrius bicinctus bicinctus*), caspian

tern (*Hydroprogne caspia*), black shag (*Phalacrocorax carbo*), red-billed gull (*Chroicocephalus scopulinus*), pied stilt (*Himantopus himantopus*), royal spoonbill (*Platalea regia*) and variable oystercatcher (*Haematopus unicolor*)¹³.

The Ōkau stream mouth is known to support variable oystercatcher, red-billed gull¹⁴, banded dotterel, Caspian tern and pied stilt¹⁵.

Other more common species present throughout the KNE site include the southern black-backed gull (*Larus dominicanus*), white-faced heron (*Egretta novaehollandiae*), paradise shelduck (*Tadorna variegata*), swamp harrier (*Circus approximans*) and New Zealand kingfisher (*Todiramphus sanctus*).

Fish

The Mātaikonā River provides seasonal or core habitat for seven migratory native freshwater fish species, five of which are listed as Nationally Threatened (At Risk – Declining): inanga (*Galaxias maculatus*), redfin bully (*Gobiomorphus huttoni*), kōaro (*Galaxias brevipinnis*), torrentfish (*Cheimarrichthys fosteri*) and longfin eel (*Anguilla dieffenbachii*). Common bully (*Gobiomorphus cotidianus*) and shortfin eels (*Anguilla australis*) have also been recorded¹⁶.

Invertebrates

Katipō spiders (*Lactrodectus katipo*) were recorded in 2011 near Pimelea Point (operational area C)¹⁷.

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 considered the primary threat to the values of the KNE site. They can displace native plant species performing important structural and ecological functions in these coastal habitats, such as forming sand dunes. Ecological weeds are widespread throughout the KNE site. These weeds range from wilding pine trees to ground-covering plants and are affecting the regeneration of native coastal plant communities, and inhibiting the establishment of revegetation planting sites.

Crack willow (*Salix fragilis*), gorse (*Ulex europaeus*), lupin (*Lupinus arboreus*), wilding radiata pine (*Pinus radiata*) and brush wattle (*Paraserianthes lophantha*) are threats to the river mouth and estuary habitats.

Marram, gorse, tall fescue, wilding pine, agapanthus (*Agapanthus praecox*), gazania (*Gazania* sp.), pampas (*Cortaderia selloana*), kikuyu (*Cenchrus clandestinus*), blackberry (*Rubus fruticosus*) cape ivy (*Senecio angulatus*) and brush wattle are threats to the dune, rushland and wetland habitats. Parts of the Sandy Bay backdunes at Sandy Bay (operational area G) have been planted with non-indigenous species such as lavender (*Lavandula* sp.), geranium (*Pelargonium* sp.), arum lily (*Zantedeschia aethiopica*), alyssum (*Lobularia maritima*), karo (*Pittosporum crassifolium*), pampas, agapanthus, pig's ear (*Cotyledon orbiculata*) and an akeake (*Dodonaea viscosa*) cultivar.

Tall fescue, gorse and marram are threats to the beaches and rock platforms. Suicide Rock (operational area D) also contains areas of planted Tasmanian ngaio or boobialla (*Myoporum insulare*).

There are several informal walking tracks throughout the dune areas which are used by local residents, fisherman and boat users. It is important to keep the number of informal tracks to a minimum to prevent trampling of native plant species, which can lead to localised sand erosion and create open areas for weed species to colonise and spread.

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 Mātaikonā 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 table of all threats to ecological values present at the Mātaikonā Coast KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area
Ecological weeds		
EW-1	Marram grass (<i>Ammophila arenaria</i>) 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	A, B, C, E, G
EW-2	Woody ecological weeds (exotic and non-local native) displace native species and inhibit natural regeneration which alters ecosystem structure and function. Key weed species include crack willow (<i>Salix fragilis</i>), cape ivy (<i>Senecio angulatus</i>), lupin (<i>Lupinus arboreus</i>) and gorse (<i>Ulex europaeus</i>)	A, D, F
EW-3	Ground-covering weeds such as pampas (<i>Cortaderia selloana</i>), kikuyu (<i>Cenchrus clandestinus</i>), blackberry (<i>Rubus fruticosus</i>) and cape ivy (<i>Senecio angulatus</i>) outcompete and prevent natural regeneration of native plant species, altering ecosystem structure and function	Entire KNE site
Pest animals		
PA-1*	Mustelids (stoats ^{18,19} (<i>Mustela erminea</i>), ferrets ^{20,21} (<i>M. furo</i>) and weasels ^{22,23} (<i>M. nivalis</i>)) 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 (<i>Felis catus</i>) prey on native birds ²⁴ , lizards ²⁵ and invertebrates ²⁶ , reducing native fauna breeding success and potentially causing local extinctions ²⁷	Entire KNE site
PA-3*	Hedgehogs (<i>Erinaceus europaeus</i>) prey on native invertebrates ²⁸ , lizards ²⁹ and the eggs ³⁰ and chicks of ground-nesting birds ³¹	Entire KNE site
PA-4*	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 ^{32,33}	Entire KNE site
PA-5*	House mice (<i>Mus musculus</i>) browse native fruit, seeds and vegetation, and prey on invertebrates. They compete with native fauna for food and can reduce forest regeneration. They also prey on invertebrates, lizards and small eggs and nestlings ^{34,35}	Entire KNE site
PA-6*	Possums (<i>Trichosurus Vulpecula</i>) browse palatable canopy vegetation until it can no longer recover ^{36,37} . This destroys the forest's structure, diversity and function. Possums may also prey on native birds ³⁸ and invertebrates	Entire KNE site
PA-7*	Rabbits (<i>Oryctolagus cuniculus</i>) and hares (<i>Lepus europaeus</i>) are known to graze on palatable native vegetation and prevent natural regeneration in some environments ³⁹ . Rabbits are particularly damaging in sand dune environments where they graze native binding plants and restoration plantings	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area
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	Entire KNE site
HA-2*	Agricultural practices, particularly grazing livestock can result in pugging soils, grazing native vegetation inhibiting regeneration, wildlife disturbance and increasing nutrient content of soils and watercourses ⁴⁰	A
HA-3*	MDC as majority landowner is primarily focused on road construction and maintenance activities. These activities can threatened the biodiversity values throughout the site via habitat loss, sedimentation, and ecological weed spread via machinery and ground disturbance. Plantings for bank stability may also spread weeds or contain inappropriate species	Entire KNE site

*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. A map of operational areas can be found in Appendix 1 (Map 3).

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 Mātaikonā Coast KNE site:

- 1. To improve the structure* and function† of native plant communities**
- 2. To improve the habitat for threatened native species (e.g. 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 7) by responding to the threats outlined in Section 6. 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 6 can be adequately addressed. This can be for a number of reasons including financial, legal, or capacity restrictions. For example widespread predator and browser control within the KNE site is not feasible at this stage due to insufficient resources.

7.1. Ecological weed control

The aim of weed control at this KNE site is to reduce the density and distribution of targeted plant species that adversely impact upon the structure and function of native plant communities present. Improving the structure and function of these communities will in turn improve the habitat for native birds. Weed control focusses on species having the most impact on the values identified. All ecological weed control is undertaken by GWRC's Biosecurity department on an annual basis.

Marram and tall fescue will be controlled with herbicide at Pimelea Point (operational area C) to release competitive pressure on the rare plant species sand daphne. Gorse, lupin, pampas and wilding pine will also be controlled with herbicide.

Wilding pine, gorse, pampas, karo, lupin and tall fescue will be controlled at Ōkau Stream and dunes (operational area F).

Groundcover weeds such as gazania, agapanthus, pampas, blackberry and cape ivy will be controlled with herbicide at the Sandy Bay dunes (operational area G).

Should control be successful in the above operational areas within the life-time of this KNE plan, control operations will be undertaken around the Mātaikonā River (operational area A), Suicide Rock (operational area D) and Mātaikonā dune system (operational area E) to expand the weed control coverage within the KNE site, and to link with control undertaken in other operational areas.

7.2. Revegetation

The aim of revegetation at the KNE site is to improve the structure, composition and function of native plant communities. This will in turn improve the habitat for native birds. Revegetation is undertaken using two strategies; firstly by replacing pest plants with eco-sourced native plants and secondly; by planting species that would have likely occurred on the site or been more widespread in the past.

Approximately 400 eco-sourced plants will be planted each winter in various operational areas. The GWRC Biodiversity department will plan and provide the plants and the GWRC Biosecurity department will undertake the planting. Plant protectors will be used to protect new restoration plantings from rabbit and hare browsing.

Replanting work will be carried out at the Ōkau Stream estuary and riparian area (operational area F), using species such as swamp flax (*Phormium tenax*), coastal tree daisy, *Olearia virgata*, toetoe, cabbage tree and karamū (*Coprosma robusta*).

Backdunes species such as sand coprosma (*Coprosma acerosa*), matagouri (*Discaria toumatou*) and taupata (*Coprosma repens*) will be planted at the Sandy Bay dunes (operational area G).

Depending on planting survival rates, weed control success and available resources, planting will continue in both these sites for at least the first two years of this KNE plan. In year three, replanting may be undertaken in the the northern margins of the Mātaikonā River and the associated wetland with suitable native plants such as rautahi (*Carex geminata*), oioi, toetoe, giant umbrella sedge and salt marsh ribbonwood. Fore-dune species such as pīngao and spinifex and backdune species such as sand coprosma, matagouri, sand daphne, wīwī and swamp flax may be replanted in the Mātaikonā village dunes (operational area B). Fore-dune planting may be carried out in the dunes at the Ōkau Stream (operational area F). Other operational areas may also be included for revegetation work as resources allow.

A list of plants to be used in any revegetation planting can be found in Appendix 4.

8. Operational plan

The operational plan shows the actions planned to achieve the stated objectives for Mātaikonā 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 3: Three-year operational plan for the Mātaikonā 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	C, F, G	GWRC Biosecurity department	Marram, tall fescue, gorse, lupin, pampas and wilding pine will be controlled in operational area C to release competitive pressure on native plants Wilding pine, karo and lupin will be controlled in operational area F to improve native habitat and prepare the site for revegetation replacement work Gazania, agapanthus, pampas, blackberry and cape ivy will be controlled in operational area G to improve native habitat and prepare the site for revegetation replacement work	Reduction in abundance and distribution of target ecological weed species Marram and tall fescue controlled to release competitive pressure on native species Sites adequately prepared for revegetation replacement work	\$7,000	\$7,000	\$7,000
1 and 2	EW-1 EW-2 EW-3	Restoration planting	F, G (years 1,2) Year 3 to be confirmed	GWRC Biodiversity and Biosecurity departments	Approximately 400 eco-sourced plants planted annually, supplied and planted by GWRC	Target of 70% plant survival in year one	\$3,000	\$3,000	\$3,000
Total							\$10,000	\$10,000	\$10,000

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 4: GWRC allocated budget for the Mātaikonā KNE site

Management activity	Timetable and resourcing		
	2016/17	2017/18	2018/19
Ecological weed control	\$4,500	\$4,500	\$4,500
Re-vegetation	\$3,000	\$3,000	\$3,000
Total	\$7,500	\$7,500	\$7,500

9.2. Budget allocated by Masterton District Council (MDC)

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

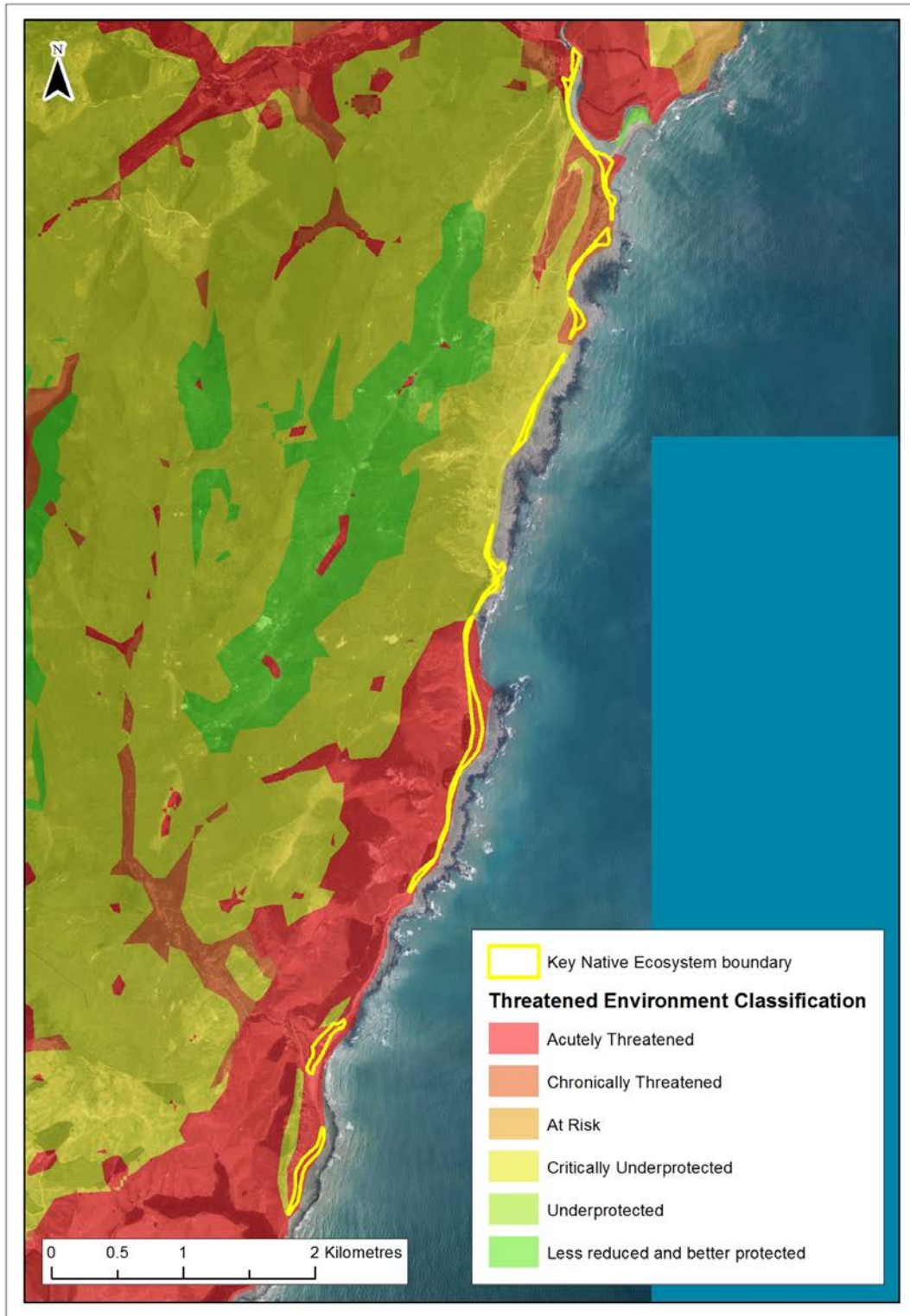
Table 5: MDC allocated budget for the Mātaikonā Coast KNE site

Management activity	Timetable and resourcing		
	2016/17	2017/18	2018/19
Ecological weed control	\$2,500	\$2,500	\$2,500
Total	\$2,500	\$2,500	\$2,500

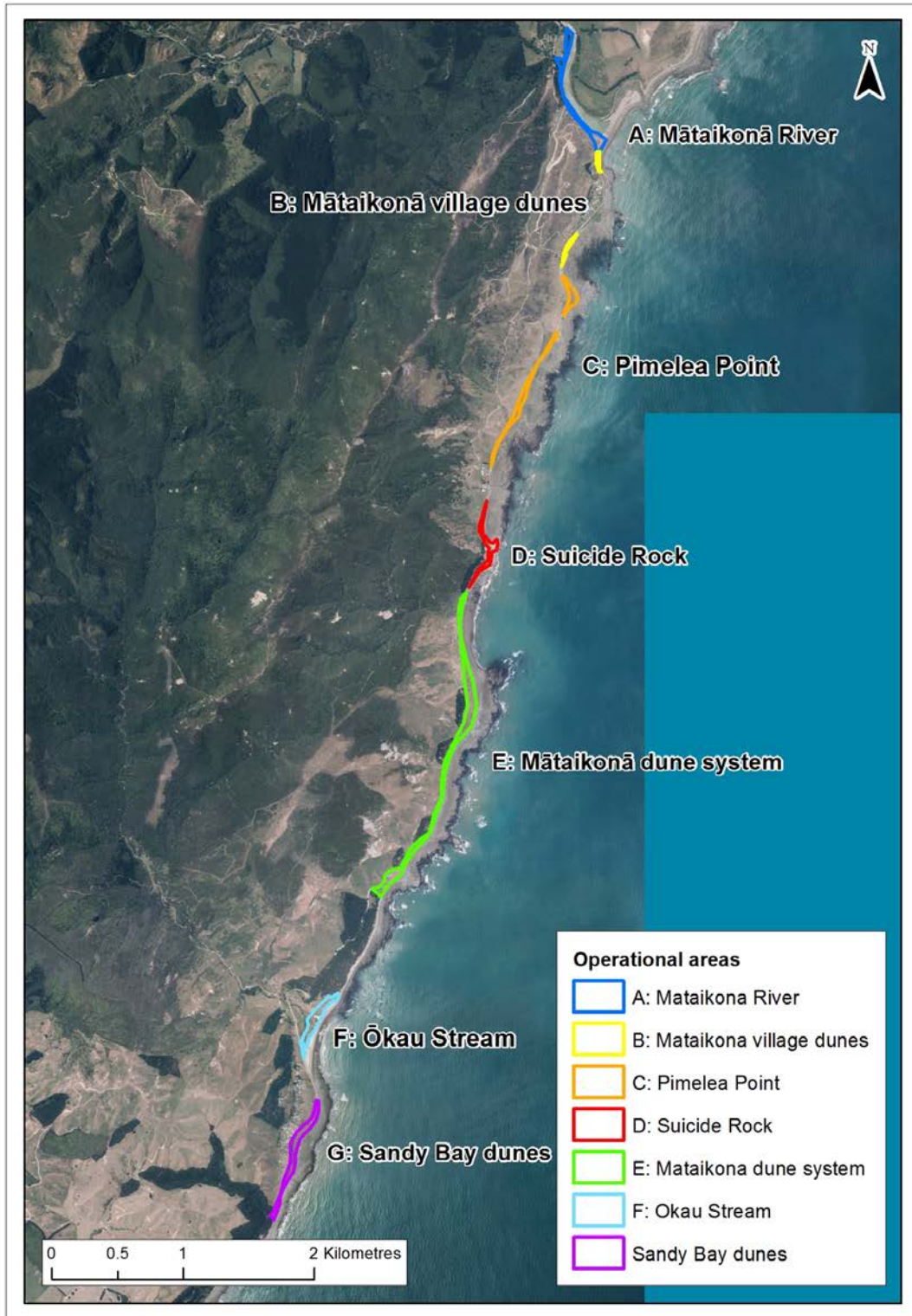
Appendix 1: Site maps



Map 1: The Mātaikonā Coast KNE site boundary



Map 2: Land Environment New Zealand threat classification map for the Mātaikonā Coast KNE site



Map 3: Operational areas in the Mātaikonā Coast KNE site

Appendix 2: Nationally threatened species list

The New Zealand Threat Classification System lists species according to their threat of extinction. The status of each species group (plants, reptiles, etc.) is assessed over a three-year cycle⁴¹ with the exception of birds that are assessed on a five-year cycle⁴². 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 Mātaikonā KNE site.

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

Scientific name	Common name	Threat status	Observation
Plants(vascular)⁴³			
<i>Coprosma acerosa</i>	Sand coprosma	At Risk - Declining	Eastern Wairarapa Ecological District report ⁴⁴
<i>Ficinia spiralis</i>	Pīngao	At Risk - Declining	Eastern Wairarapa Ecological District report
<i>Pimelea arenaria</i>	Sand daphne	At Risk - Declining	Eastern Wairarapa Ecological District report
Birds⁴⁵			
<i>Charadrius bicinctus bicinctus</i>	Banded dotterel	Threatened - Nationally Vulnerable	Rebergen, A. 2012 ⁴⁶
<i>Chroicocephalus bulleri</i>	Black-billed Gull	Threatened - Nationally Critical	Rebergen, A. 2012
<i>Chroicocephalus scopulinus</i>	Red-billed Gull	Threatened - Nationally Vulnerable	eBird records
<i>Haematopus unicolor</i>	Variable oystercatcher	At Risk - Recovering	Rebergen, A. 2012
<i>Himantopus himantopus</i>	Pied stilt	At Risk - Declining	Rebergen, A. 2012
<i>Hydroprogne caspia</i>	Caspian Tern	Threatened - Nationally Vulnerable	eBird records
<i>Phalacrocorax carbo</i>	Black shag	At Risk - Naturally Uncommon	eBird records
<i>Phalacrocorax varius</i>	Pied shag	Threatened - Nationally Vulnerable	eBird records
<i>Platalea regia</i>	Royal spoonbill	At Risk - Naturally Uncommon	McArthur & Lawson, 2014 ⁴⁷
Freshwater fish⁴⁸			
<i>Anguilla dieffenbachia</i>	Longfin eel	At Risk - Declining	Taylor & Kelly, 2003 ⁴⁹
<i>Cheimarrichthys fosteri</i>	Torrentfish	At Risk - Declining	Taylor & Kelly, 2003

Scientific name	Common name	Threat status	Observation
<i>Galaxias brevipinnis</i>	Kōaro	At Risk - Declining	Taylor & Kelly, 2003
<i>Galaxias maculatus</i>	Inanga	At Risk - Declining	Taylor & Kelly, 2003
<i>Gobiomorphus huttoni</i>	Redfin bully	At Risk - Declining	Taylor & Kelly, 2003
Invertebrates (Araneae – spiders)⁵⁰			
<i>Lactrodectus katipo</i>	Katipō	At Risk - Declining	Park, M. 2011 pers. obs.

Appendix 3: Regionally threatened plant species list

The following table lists regionally threatened species that have been recorded in the Mātaikonā Coast KNE site.

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

Scientific name	Common name	Threat status	Observation
Plants⁵¹			
<i>Pimelea arenaria</i>	Sand daphne	Regionally vulnerable	Eastern Wairarapa Ecological District report ⁵²
<i>Schoenoplectus tabernaemontanii</i>	Three-square; Kuawa	Sparse	Eastern Wairarapa Ecological District report

Appendix 4: Revegetation plant list

The following table lists species which will be used in any revegetation planting at the Mātaikonā Coast KNE site.

Table 8: Revegetation plant list for the Mātaikonā Coast KNE site

Scientific Name	Common Name	Habitat type
<i>Coprosma acerosa</i>	Sand coprosma	Dunes
<i>Coprosma repens</i>	Taupata	Dunes
<i>Cordyline australis</i>	Cabbage tree	Estuary/riparian
<i>Discaria toumatou</i>	Matagouri	Dunes
<i>Ficinia spiralis</i>	Pīngao	Dunes
<i>Olearia solandri</i>	Coastal tree daisy	Backdune/riparian/dunes
<i>Phormium cookianum</i>	Coastal flax	Dunes
<i>Phormium tenax</i>	Swamp flax	Estuary/riparian
<i>Pimelea arenaria</i>	Sand daphne	Dunes
<i>Plagianthus divaricatus</i>	Saltmarsh ribbonwood	Estuary/riparian
<i>Spinifex sericeus</i>	Spinifex	Dunes

References

- ¹ Greater Wellington Regional Council. 2016. Biodiversity Strategy 2015-25. 25 p.
- ² Greater Wellington Regional Council. 2015. Proposed Natural Resources Plan. <http://www.gw.govt.nz/regional-plan-review/>
- ³ Beadel SM, Bibby CJ, Perfect AJ, Rebergen AL, Sawyer JWD. 2004. Eastern Wairarapa Ecological District: survey report for the Protected Natural Areas programme. Department of Conservation, Wellington Conservancy, unabridged. Appendix 7. p. 262.
- ⁴ Walker S, Cieraad E, Grove P, Lloyd K, Myers S, Park T, Porteous T. 2007 Guide for users of the threatened environment classification, Version 11, August 2007 Landcare Research New Zealand. 34 p. plus appendix.
- ⁵ Walker S, Cieraad E, Grove P, Lloyd K, Myers S, Park T, Porteous T. 2007. Guide for the users of the Land Environments Classification. Landcare Research Manaaki Whenua.
- ⁶ McEwen MW (compiler). 1987. Ecological Regions and Districts of New Zealand. New Zealand Biological Resources Centre Publication No. 5. Department of Conservation, Wellington.
- ⁷ Department of Conservation. 1987. Ecological Regions and Districts of New Zealand.
- ⁸ Ausseil A-G, Gerbeaux P, Chadderton W, Stephens T, Brown D, Leathwick J. 2008. Wetland ecosystems of national importance for biodiversity. Landcare Research Contract Report LC0708/158 for Chief Scientist, Department of Conservation.
- ⁹ Holdaway RJ, Wisser SK and Williams PA. 2012. Status assessment of New Zealand's naturally uncommon ecosystems. Conservation Biology 26(4): 619-629.
- ¹⁰ New Zealand Threat Classification System (NZTCS) <http://www.doc.govt.nz/about-us/science-publications/conservation-publications/nz-threat-classification-system/>
- ¹¹ Todd M, Graeme C, Kettles H, Sawyer J. 2011. Estuaries in Wellington Hawke's Bay Conservancy (excluding Hawke's Bay and Chatham Islands Areas) - Current status and future management. Department of Conservation, Wellington. 275 p.
- ¹² Greater Wellington Regional Council. 2015. Proposed Natural Resources Plan. <http://www.gw.govt.nz/regional-plan-review/>
- ¹³ McArthur N, Lawson J. 2014. Coastal and freshwater sites of significance for indigenous birds in the Wellington region, September 2013. No. Publication No. GW/ESCI-T-14/67. Environmental Science Department, Greater Wellington Regional Council, Wellington.
- ¹⁴ McArthur N, Lawson J. 2014. Coastal and freshwater sites of significance for indigenous birds in the Wellington region, September 2013. No. Publication No. GW/ESCI-T-14/67. Environmental Science Department, Greater Wellington Regional Council, Wellington.
- ¹⁵ Todd M, Graeme C, Kettles H, Sawyer J. 2011. Estuaries in Wellington Hawke's Bay Conservancy (excluding Hawke's Bay and Chatham Islands Areas) - Current status and future management. Department of Conservation, Wellington. 275 p.
- ¹⁶ Todd M, Graeme C, Kettles H, Sawyer J. 2011. Estuaries in Wellington Hawke's Bay Conservancy (excluding Hawke's Bay and Chatham Islands Areas) - Current status and future management. Department of Conservation, Wellington. 275 p.
- ¹⁷ M. Park, pers obs 2011.
- ¹⁸ Murphy E, Maddigan F, Edwards B, Clapperton K. 2008. Diet of stoats at Okarito Kiwi Sanctuary, South Westland, New Zealand. New Zealand Journal of Ecology 32(1): 41-45.
- ¹⁹ King CM, Murphy EC 2005. Stoat. in: King CM ed. The handbook of New Zealand mammals. Oxford University Press. Pp. 261-287.
- ²⁰ Ragg JR. 1998. Intraspecific and seasonal differences in the diet of feral ferrets (*Mustela furo*) in a pastoral habitat, east Otago, New Zealand. New Zealand Journal of Ecology 22(2): 113 – 119.
- ²¹ Clapperton BK, Byron A. 2005. Feral ferret. In: King CM ed. The handbook of New Zealand mammals. Oxford University Press. Pp. 294-307.
- ²² King CM. 2005. Weasel. In: King CM ed. The handbook of New Zealand mammals. Oxford University Press. Pp. 287-294.

-
- ²³ King CM, Flux M, Innes JG, Fitzgerald BM. 1996. Population biology of small mammals in Pureora Forest Park: 1. Carnivores (*Mustela erminea*, *M.furo*, *M.nivalis* and *Felis catus*). New Zealand Journal of Ecology 20(2): 241 – 251.
- ²⁴ King CM, Flux M, Innes JG, Fitzgerald BM. 1996. Population biology of small mammals in Pureora Forest Park: 1. Carnivores (*Mustela erminea*, *M.furo*, *M.nivalis* and *Felis catus*). New Zealand Journal of Ecology 20(2): 241 – 251.
- ²⁵ Reardon JT, Whitmore N, Holmes KM, Judd LM, Hutcheon AD, Norbury G, Mackenzie DI. 2012. Predator control allows critically endangered lizards to recover on mainland New Zealand. New Zealand Journal of Ecology 36(2): 141 – 150.
- ²⁶ King CM, Flux M, Innes JG, Fitzgerald BM. 1996. Population biology of small mammals in Pureora Forest Park: 1. Carnivores (*Mustela erminea*, *M.furo*, *M.nivalis* and *Felis catus*). New Zealand Journal of Ecology 20(2): 241 – 251.
- ²⁷ Gillies C, Fitzgerald BM 2005. Feral cat. In: King CM ed. The handbook of New Zealand mammals. Oxford University Press. Pp. 308-326.
- ²⁸ Jones C, Sanders MD. 2005. European hedgehog. In: King CM ed. The handbook of New Zealand mammals. 2nd edition. Melbourne, Oxford University Press. Pp. 81–94.
- ²⁹ Spitzen-van der Sluijs AM, Spitzen J, Houston D, Stumpel AHP. 2009. Skink predation by hedgehogs at Macraes Flat, Otago, New Zealand. New Zealand Journal of Ecology 33(2): 205-207.
- ³⁰ Jones C, Moss K, Sanders M. 2005. Diet of hedgehogs (*Erinaceus europaeus*) in the upper Waitaki Basin, New Zealand. Implications for conservation. New Zealand Journal of Ecology 29(1): 29-35.
- ³¹ Jones C, Sanders MD. 2005. European hedgehog. In: King CM ed. The handbook of New Zealand mammals. 2nd edition. Melbourne, Oxford University Press. Pp. 81–94.
- ³² Daniel MJ. 1973. Seasonal diet of the ship rat (*Rattus r. rattus*) in lowland forest in New Zealand. Proceedings of the New Zealand Ecological Society 20: 21-30.
- ³³ Innes JG. 2005. Ship rat. In: King CM ed. The handbook of New Zealand mammals. Oxford University Press. Pp. 187-203.
- ³⁴ Ruscoe WA, Murphy EC. 2005. House mouse. In: King CM ed. The handbook of New Zealand mammals. Oxford University Press. Pp. 204-221.
- ³⁵ Newman DG. 1994. Effect of a mouse *Mus musculus* eradication programme and habitat change on lizard populations on Mana Island, New Zealand, with special reference to McGregor's skink, *Cyclodina macgregori*. New Zealand Journal of Ecology 21: 443-456.
- ³⁶ Pekelharing CJ, Parkes JP, Barker RJ. 1998. Possum (*Trichosurus vulpecula*) densities and impacts on fuchsia (*Fuchsia excorticata*) in South Westland, New Zealand. New Zealand Journal of Ecology 22(2): 197-203.
- ³⁷ Nugent G, Sweetapple P, Coleman J, Suisted P. 2000. Possum feeding patterns: dietary tactics of a reluctant folivore. In: Montague TL ed. The brushtail possum: Biology, impact and management of an introduced marsupial. Lincoln, Manaaki Whenua Press. Pp. 10-19.
- ³⁸ Sweetapple PJ, Fraser KW, Knightbridge PI. 2004. Diet and impacts of brushtail possum populations across the invasion front in South Westland, New Zealand. New Zealand Journal of Ecology 28(1): 19-33.
- ³⁹ Norbury G, Flux JEC. 2005. Brown hare. in: King CM ed. The handbook of New Zealand mammals. Oxford University Press. Pp. 151-158.
- ⁴⁰ Smale MC, Dodd MB, Burns BR, Power IL. 2008. Long-term impacts of grazing on indigenous forest remnants on North Island hill county, New Zealand. New Zealand Journal of Ecology 32(1): 57 -66.
- ⁴¹ Department of Conservation. 2008. New Zealand Threat Classification System manual
- ⁴² Hugh Robertson, Department of Conservation, pers comm 2015.
- ⁴³ de Lange PJ, Rolfe JR, Champion PD, Courtney SP, Heenan PB, Barkla JW, Cameron EK, Norton DA, Hitchmough RA. 2013. Conservation status of New Zealand indigenous vascular plants, 2012. New Zealand Threat Classification Series 3. 70 p.
- ⁴⁴ Beadel S, Bibby CJ, Perfect AJ, Rebergen A, Sawyer JWD. 2004. Eastern Wairarapa Ecological District. Survey report for the Protected Natural Area Programme. Department of Conservation, Wellington. 382 p.
- ⁴⁵ Robertson HA, Dowding JE, Elliot GP, Hitchmough RA, Miskelly CM, O'Donnell CFS, Powlesland RG, Sagar PM, Scofield P, Taylor GA. 2013. Conservation status of New Zealand birds, 2012. New Zealand Threat Classification Series 4. 22 p.

⁴⁶ Rebergen A. 2012. Birds on Wairarapa rivers and coast in 2011-12 breeding season. Forest and Bird, Wellington.

⁴⁷ McArthur N, Lawson J. 2014. Coastal and freshwater sites of significance for indigenous birds in the Wellington region, September 2013. No. Publication No. GW/ESCI-T-14/67. Environmental Science Department, Greater Wellington Regional Council, Wellington.

⁴⁸ Goodman JM, Dunn NR, Ravenscroft PJ, Allibone RM, Boubee JAT, David BO, Griffiths M, Ling N, Hitchmough RA, Rolfe JR. 2014. Conservation status of New Zealand freshwater fish, 2013. New Zealand Threat Classification Series 7. 12 p.

⁴⁹ Taylor MJ, Kelly GR. 2003. Inanga spawning habitats in the greater Wellington Region. Part 2 Wairarapa. NIWA Client Report No. CHC01/67. Prepared for the Greater Wellington Regional Council. 34 p.

⁵⁰ Sirvid PJ, Vink CJ, Wakelin MD, Fitzgerald BM, Hitchmough RA, Stringer IAN. 2012. The conservation status of New Zealand Araneae. *New Zealand Entomologist* 35(2): 85–90.

⁵¹ Sawyer JWD. 2004. Plant Conservation Strategy. Wellington Conservancy (excluding Chatham Islands) 2004-2010. Department of Conservation, Wellington. 91 p.

⁵² Beadel S, Bibby CJ, Perfect AJ, Rebergen A, Sawyer JWD. 2004. Eastern Wairarapa Ecological District. Survey report for the Protected Natural Area Programme. Department of Conservation, Wellington. 382 p.

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