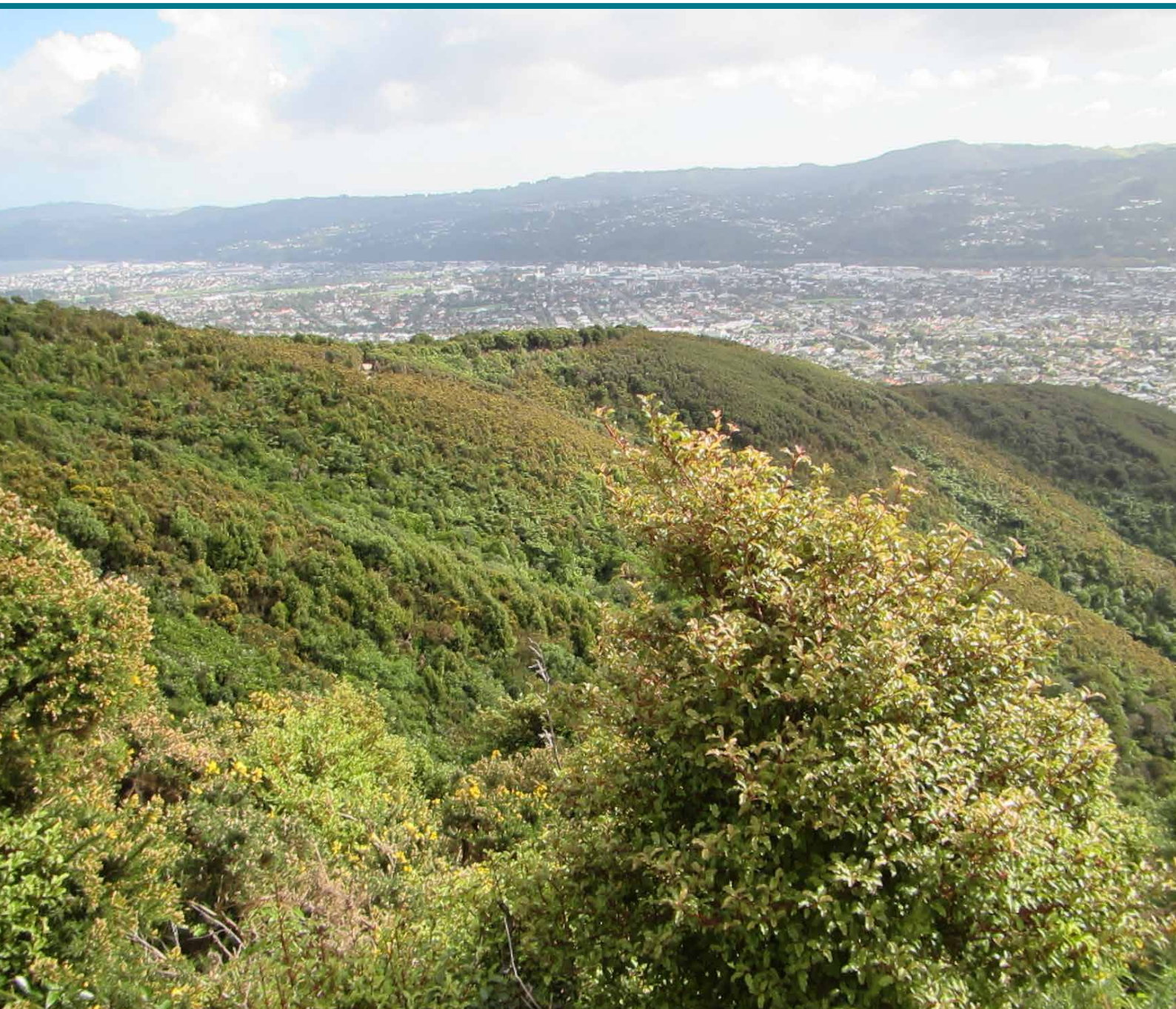
Key Native Ecosystem Plan for Haywards Scenic Reserve

2018-2021

KNE
KEY NATIVE ECOSYSTEM

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao



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1. The 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 for maintaining indigenous biodiversity, as well as protecting significant vegetation and habitats of threatened species, under the Resource Management Act 1991 (RMA).

The Greater Wellington Regional Council's (Greater Wellington) Biodiversity Strategy[1] sets a framework that guides how Greater Wellington protects and manages biodiversity in the Wellington Region to work towards the vision below.

Greater Wellington's vision for biodiversity

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

The Strategy provides a common focus across Greater Wellington's departments and guides activities relating to biodiversity. The vision 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. Sites are identified as of high biodiversity value for the purposes of the KNE Programme by applying the four ecological significance criteria described below.

Representativeness	Rarity/ distinctiveness	Diversity	Ecological context
The extent to which ecosystems and habitats represent those that were once typical in the region but are no longer common place	Whether ecosystems contain Threatened/At Risk species, or species at their geographic limit, or whether rare or uncommon ecosystems are present	The levels of natural ecosystem diversity present, ie, two or more original ecosystem types present	Whether the site provides important core habitat, has high species diversity, or includes an ecosystem identified as a national priority for protection

A site must be identified as ecologically significant using the above criteria and be considered sustainable for management in order to be considered for inclusion in the KNE Programme. Sustainable for the purposes of the KNE Programme is defined as: a

site where the key ecological processes remain intact or continue to influence the site and resilience of the ecosystem is likely under some realistic level of management.

KNE sites can be located on private or publically owned land. However, land managed by the Department of Conservation (DOC) is generally excluded from this programme.

KNE sites are managed in accordance with three-year KNE plans, such as this one, prepared by Greater Wellington's Biodiversity department in collaboration with the landowners, tangata whenua and other partners. These plans outline the ecological values, threats, and management objectives for sites and describe 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. Haywards Scenic Reserve Key Native Ecosystem

The Haywards Scenic Reserve KNE site is a 122 ha lowland beech forest with podocarp remnants. The KNE site is located on the Hutt Valley's Eastern Hills overlooking Lower Hutt City (see Appendix 1, Map 1). The KNE site contains Haywards Eastern Hills Scenic Reserve and adjacent areas of regenerating native lowland beech forest and is bisected by the Te Whiti Firebreak, with the Konini Firebreak forming the KNE site's eastern boundary. The KNE site is located within the Hutt Valley's forested eastern hill ranges providing linkages for wildlife between Upper Hutt and Wainuiomata.

2.1 Landowners, management partners and stakeholders

Greater Wellington works in collaboration with landowners and other interested parties (management partners and stakeholders) where appropriate to achieve shared objectives for the site. In preparing this plan Greater Wellington has sought input from landowners and relevant stakeholders, and will continue to involve them as the plan is implemented.

Landowner

Hutt City Council (HCC) owns and administers all of the land contained within the KNE site boundary. HCC manage the reserve in accordance with the Bush Reserves Management Plan[2].

Management partners and key stakeholders

HCC and Greater Wellington are the main management partners and have worked collaboratively to manage the KNE site's pest control operations for a number of years.

Within Greater Wellington, the Biodiversity and Biosecurity departments are involved in the management of the KNE site. The Biodiversity department plans and coordinates biodiversity management activities and provides biodiversity advice. The Biosecurity department carries out pest control activities.

HCC undertakes ecological weed control, manages recreational activities such as mountain biking and tramping, and provide the primary contact for community groups.

The Friends of Waiwhetu's Haywards Scenic Reserve are an active community group who help maintain the scenic reserve's track network, undertake pest weed control and replant native trees where needed.

Another volunteer services some of the Greater Wellington pest animal control network within the KNE site.

2.2 Ecological values

Ecological values are a way to describe indigenous biodiversity found at a site, and what makes it special. These ecological values can be various components or attributes of ecosystems that determine an area's importance for the maintenance of regional biodiversity. Examples of values are the provision of important habitat for a threatened species, or particularly intact remnant vegetation typical of the ecosystem

type. The ecological values of a site are used to prioritise allocation of resources to manage KNE sites within the region.

The KNE site is a lowland beech forest that also contains a wide variety of podocarp and broadleaved species. In addition, the KNE site contains the only pukatea (*Laurelia novae-zelandiae*) forest remnant in the Wellington Region[3] and has a high diversity of plant species supporting populations of native birds, lizards, and land-snails.

The lower slopes of the KNE site are located within the Wellington Ecological District, with the upper slopes within the Tararua Ecological District[4]. Both ecological districts are characterised by steep, strongly faulted hill ranges and have windy, wet and mild climates[5].

Of note in recognising the ecological values of the Haywards Scenic Reserve KNE site are the following:

Threatened environments: The Threatened Environment Classification[6] indicates that the KNE site predominately consists of habitat that is either At Risk (lower slopes) or Well Protected (upper slopes), see Appendix 1, Map 2. The lower slopes of the KNE site are representative of habitat that has been much reduced and fragmented with only 20-30% of indigenous habitat in this type of environment remaining nationally.

Threatened species: One At Risk bird species and one At Risk lizard species have been recorded within the KNE Site (see Appendix 2). One plant species is considered regionally uncommon (See Appendix 3).

The Singers and Rogers (2014)[7] classification of pre-human vegetation indicates the KNE site was once characterised by hard beech forest (MF20), and a small area of kahikatea (*Dacrycarpus dacrydioides*), pukatea forest (WF8). There is considered to be 51% and 1% respectively of these forest types remaining in the Wellington Region compared to their original extent[8].

Within the KNE site, more than 100 plant species have been recorded, including 40 species of trees and shrubs, 20 species of fern, 8 climbers and 6 orchid species[9]. The KNE site contains a sizable area of podocarp-broadleaf forest consistent with the original MF20 and WF8 forest types immediately south of the Te Whiti Firebreak[10] where large rimu (*Dacrydium cupressinum*), miro (*Prumnopitys ferruginea*), hard beech (*Fuscospora truncata*) and puketea emerge above a canopy of tawa (*Beilschmiedia tawa*), hīnau (*Elaeocarpus dentatus*) and māhoe (*Melicytus ramiflorus*). This area is considered to have the highest ecological value within the KNE site given its mature status and species present. Other flora of note in this area includes rengarenga lily (*Arthropodium cirratum*), kōtukutuku (*Fuchsia excorticata*) and tōtara (*Podocarpus totara*).

The remainder of the KNE site is largely comprised of regenerating lowland forest containing hard beech, black beech (*Fuscospora solandri*), and maire taike (*Mida salicifolia*) as canopy trees. Other species present include red matipo (*Myrsine australis*), tarata/lemonwood (*Pittosporum eugenioides*), mataī (*Prumnopitys taxifolia*), lancewood (*Pseudopanax crassifolius*), ngaio (*Myoporum laetum*), heketara (*Oleria rani*), kōhūhū, (*Pittosporum tenuifolium*) and kahikatea. The drier slopes and ridgelines consist of kāmahi (*Weinmannia racemosa*), hīnau, rewarewa (*Knightia excelsa*),

northern rātā (*Metrosideros robusta*), mānuka (*Leptospermum scoparium*) and kānuka (*Kunzea robusta*).

The reserve contains a well-developed understory of broadleaf species which includes five finger (*Pseudopanax arboreus*), rangiora (*Brachyglottis repanda*), hangehange (*Geniostoma ligustrifolium* var*. ligustrifolium*), karamū (*Coprosma lucida*) and mamaku (*Cyathea medullaris*). Hook grass (*Uncinia* sp.), fern species, supplejack (*Ripogonum scandens*) and kiekie (*Freycinetia banksii*) are all present in the forest understorey. Nīkau palm (*Rhopalostylis sapida*) is common in the gullies[11].

The upper slopes have been subject to fire damage and as a result are characterised by regenerating native scrub vegetation such as mānuka, flax (*Phormium cookianum*), broadleaf (*Griselinia littoralis*), five finger, hangehange and mamaku growing through dense gorse (*Ulex europaeus*).

The New Zealand falcon (kārearea; *Falco novaeseelandiae*) is thought to be breeding locally, with regular reports of pairs sighted within the KNE site provided by local residents[12]. Bellbird (*Anthornis melanura*), whitehead (*Mohoua albicilla*) and other common indigenous forest birds such as fantail (*Rhipidura fuliginosa*), tūī (*Prosthemadera novaeseelandiae*), silvereye (*Zosterops lateralis*), kererū (*Hemiphaga novaeseelandiae*), grey warbler (*Gerygone igata*), and morepork (*Ninox novaeseelandiae*) are present within the KNE site[13].

The KNE site supports reptile species including the barking gecko (*Naultinus punctatus*) and ngahere gecko (*Mokopirirakau* "southern North Island")[14] and has a high diversity of native land snails. Fifty-seven species of land snail have been recorded in the Haywards Scenic Reserve KNE site with micro snails especially numerous[15].

Banded kōkopu (*Galaxias fasciatus*), longfin eel (*Anguilla dieffenbachii*), shortfin eel (*Anguilla australis*), and giant kōkopu (*Galaxias argenteus*) are known to be present in the Waiwhetu Stream[16] downstream and may occur in the tributaries contained within the KNE site.

2.3 Key threats to ecological values at the site

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

The primary threats to the ecological values of the KNE site are from ecological weeds, pest animals and wild fire.

Ecological weeds are widespread throughout the KNE site and range from mature pine trees (*Pinus* spp.) to ground-covering plant species. The largest infestations present within the KNE site are of climbing asparagus (*Asparagus scandens*). The KNE site has a large suburban fringe and high visitor usage resulting in the reinvasion of significant numbers of weed species. A 2011 survey by Greater Wellington[17] found several ecological weed species including climbing asparagus, banana passionfruit (*Passiflora tripartita* var. *mollissima*), pampas (*Cortaderia selloana*), tradescantia (*Tradescantia fluminensis*), kahili ginger (*Hedychium gardnerianum*), African club moss (*Selaginella*

kraussiana), and Japanese honeysuckle (*Lonicera japonica*), within properties adjacent to the KNE site.

The priority pest animal threats within the KNE site are possums (*Trichosurus vulpecula*), rats (*Rattus* spp.) and mustelids (*Mustela* spp.), as these species are known to have the greatest impact on native forest regeneration, food resource availability and can prey on native birds and their eggs, and lizards. Additional pest animal threats include feral, stray and domestic cats (*Felis catus*) that are likely to predate on native birds and their eggs within the KNE site. Pest animals are likely to reinvade from outside the KNE site and are likely to be an enduring threat to the biodiversity values within the KNE site.

Wildfires have historically affected the integrity of the KNE site since the arrival of the first European settlers to the Wellington Region[18]. While firebreaks are in place, there is still a risk of fire causing damage to the KNE site given the presence of gorse in the landscape which is highly flammable.

The KNE site is an area of high recreational usage with an extensive network of multi-use tracks regularly used for tramping, dog walking, mountain biking and horse riding. A new multi-purpose recreational use track known as the Te Whiti Riser was built by HCC over 2015/2016 in Operational Area B. This track is primarily used by day-walkers and mountain bikers. Effective management of these tracks is required to ensure they do not impact on the biodiversity values of the KNE site.

While the key threats discussed in this section are recognised as the most significant, a number of other threats to the KNE site have also been identified. Table 1 presents a summary of all known threats to the KNE site (including those discussed above), detailing which operational areas they affect, how the threat impacts on ecological values, and whether they will be addressed by the proposed management activities.

Table 1: Summary of all threats to ecological values present at the Haywards Scenic Reserve KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Location
Ecological weeds		
EW-1	Ground covering or scrambling ecological weeds smother and displace native vegetation, inhibit indigenous regeneration, and alter vegetation structure and composition. Key weed species include tradescantia and African club moss (see Appendix 4)	Entire KNE site
EW-2	Woody ecological weed species displace native vegetation, inhibit indigenous regeneration, and alter vegetation structure and composition. Key weed species include boneseed (*Chrysanthemoides monilifera*), prickly moses (*Acacia ulicifolia*), hawthorn (*Crataegus monogyna*), wattle species (*Fabaceae* spp.), radiata pine (*Pinus radiata*), and blackberry (*Rubus fruticosus* agg.) (see Appendix 4)	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Location
EW-3	Climbing weeds can smother and displace native vegetation, inhibit indigenous regeneration, and alter vegetation structure and composition. Key weed species include climbing asparagus, Japanese honeysuckle, old man's beard (*Clematis vitalba*), banana passionfruit, German ivy (*Delairea odorata*), mile-a-minute (*Dipogon lignosus*) and Himalayan honeysuckle (*Leycesteria formosa*) (see Appendix 4)	Entire KNE site
EW-4*	Non-local native tree species are present and can displace locally-native vegetation. Key species for control include karaka (*Corynocarpus laevigatus*), lacebark (*Hoheria populnea*) and pūriri (*Vitex lucens*)	Entire KNE site
Pest animals		
PA-1	Possums (*Trichosurus vulpecula*) browse palatable canopy vegetation until it can no longer recover[19,20]. This destroys the forest's structure, diversity and function. Possums may also prey on native birds[21] and invertebrates	Entire KNE site
PA-2	Rats (*Rattus* spp.) browse native fruit, seeds and vegetation. They compete with native fauna for food and can reduce forest regeneration. They also prey on invertebrates, lizards and native birds[22,23]	Entire KNE site
PA-3	Mustelids (stoats[24,25] (*Mustela erminea*), ferrets[26,27] (*M. furo*) and weasels[28,29] (*M. nivalis*)) prey on native birds, lizards and invertebrates, reducing their breeding success and potentially causing local extinctions	Entire KNE site
PA-4*	Feral pigs (*Sus scrofa*) root up the soil and eat roots, invertebrates, seeds and native plants preventing forest regeneration[30]	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[31,32]	Entire KNE site
PA-6*	Hedgehogs (*Erinaceus europaeus*) prey on native invertebrates[33] lizards[34] and the eggs[35] and chicks of ground-nesting birds[36]	Entire KNE site
PA-6*	Feral, stray and domestic cats (*Felis catus*) prey on native birds[37], lizards[38] and invertebrates[39], reducing native fauna breeding success and potentially causing local extinctions[40]	Entire KNE site
Human activities		
HA-1*	Garden waste dumping can lead to pest plant invasions. Common species include tradescantia, plectranthus (*Plectranthus ciliatus*), agapanthus (*Agapanthus praecox*), Japanese aralia (*Fatsia japonica*), lily of the valley tree (*Clethra arborea*) and montbretia (*Crocosmia* × *crocosmiiflora*)	KNE site boundary (urban sections)
HA-2*	Recreational use and track creation causes damage and disturbance of the native forest. It is also likely to disturb native fauna and introduce ecological weeds	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Location
HA-3*	Structures in the waterways and the water quality of the Waiwhetu Stream may prevent migration of aquatic species. This could result in loss of aquatic species from within the KNE site	Streams in the KNE site
Other threats		
OT-1*	Fire causes habitat loss and creates conditions suitable for ecological weed invasion	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 2), and are used to ensure that actions taken are targeted to specific threats. A map of operational areas can be found in Appendix 1 (see Map 3).

3. Management objectives and activities

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

3.1 Management objectives

The following objectives will guide the management activities at the Haywards Scenic Reserve KNE site:

1. **To improve the structure* and function† of native plant communities**
2. **To improve the habitat for native birds**
3. **To improve the habitat for native invertebrates (land snails)**

* 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.

3.2 Management activities

Management activities contribute to the objectives above by responding to the threats outlined in Section 2. 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 2).

It is important to note that not all threats identified in Section 2 can be adequately addressed. This can be for a number of reasons including financial, legal, or capacity restrictions.

Greater Wellington's primary focus at the KNE site is ongoing ecological weed control targeting climbing asparagus, and servicing the pest animal control network that targets possums, rats and mustelids across the KNE site (see Appendix 1, Maps 3 and 4).

HCC focuses on broad-scale ecological weed control throughout the reserve targeting a range of species, especially along urban boundaries and tracks[41]. HCC are also responsible for managing the recreational use of the reserve and are the primary liaison for the Friends of Waiwhetu's Haywards Scenic Reserve, supporting their activities within the KNE site.

The management activities undertaken by Greater Wellington, HCC and community groups aim to control pest plants and animals to low levels, enabling regeneration of the native forest cover, and supporting viable populations of native birds and land snails.

Ecological weed control

Ecological weed control will be undertaken throughout the KNE site to maintain native plant dominance and encourage native forest regeneration.

Greater Wellington will focus on controlling climbing asparagus, which is widespread throughout the KNE site, with some areas dominated by heavy infestations that have out-competed the native understory vegetation.

Greater Wellington will undertake targeted grid searches to identify and treat climbing asparagus primarily in Operational Area A and secondarily in Operational Area B. This grid search and control operation started in 2015 within the mature core forest area immediately south of Te Whiti firebreak (which is the highest biodiversity value area) in Operational Area A. The grid searches will expand out from the core forest during the three-years of this plan sweeping north to south within Operational Area A, and south to north within Operational Area B. This is aimed at initially protecting the highest value biodiversity areas and isolating the heavy infestations for targeted control. During the targeted grid searches for climbing asparagus, other key weed species, as listed in Appendix 4 of this plan (i.e. Japanese honeysuckle, banana passionfruit, tradescantia, etc) will be controlled if observed.

HCC undertake ecological weed control throughout the whole KNE with the majority of their pest plant control undertaken on infestations located along the urban-edges of the KNE site, and adjacent to firebreaks and tracks. HCC have identified a number of key weed species that they target specifically for control across the KNE site. These are old man's beard, banana passionfruit, Japanese honeysuckle, and mile-a-minute. A full list of ecological weed species and their priority for control are listed in Appendix 4.

Pine trees within the KNE have previously been controlled through ring-barking and/or poison application. HCC will monitor the progress of the pine control within the KNE site.

The Friends of Waiwhetu's Haywards Scenic Reserve undertake climbing asparagus control within the KNE site. They are supported and managed by HCC.

Pest animal control

Pest animal control is targeted at controlling possums, rats, and mustelids at the KNE site. This reduces browsing pressure on native vegetation, and predation pressure on native birds and land snails that inhabit the KNE site. It also helps to facilitate regeneration of the native forest and an increased abundance of food resources for native fauna.

A Pelifeed® bait station network was installed in Operational Area A in 2015 and was extended to Operational Area B in 2016 to run along the Te Whiti Riser mountain bike track, the top of the northern firebreak and along the northern most edge of the KNE site boundary (see Appendix 1, Map 4). Greater Wellington service the bait stations with an anticoagulant bait on a three-monthly basis. This control method is known to keep possums and rats to low densities. This bait station network is continuous with a large bait station network bordering the KNE site to the south-east. These bait-stations are managed by HCC targeting possums and rats and will help to prevent incursions into the KNE site.

A network of DOC 200 kill-traps were installed in 2016 within Operational Area A (the highest value biodiversity area of the KNE site) and Operational Area B (along the Te Whiti Riser mountain bike track, the top of the northern firebreak and along the northern most edge of the KNE boundary) to target mustelids, which have been

identified as potential threats to native birds within the KNE site (see Appendix 1, Map 4). These kill-traps are usually baited with dehydrated rabbit meat and serviced on a three-monthly basis by Greater Wellington.

A volunteer services some of the Greater Wellington pest animal control network on the Te Whiti Riser mountain bike track in between the quarterly servicing by Greater Wellington. Greater Wellington provide support for this.

Monitoring

Annual monitoring of control work for climbing asparagus will be undertaken via fixed photopoints that were established by Greater Wellington in 2015/16. The photopoints will be used to monitor the success of the control work and to assess the regeneration rate of native vegetation.

4. Operational plan

The operational plan shows the actions planned to achieve the stated objectives for Haywards Scenic Reserve KNE site, and their timing and cost over the three-year period from 1 July 2018 to 30 June 2021. The budget for each year is indicative only. A map of Operational Areas can be found in Appendix 1 (see Map 3).

Table 2: Three-year operational plan for Haywards Scenic Reserve KNE site

Objective	Threat	Activity	Operational area	Delivery	Description/detail	Target	Timetable and resourcing		
							2018/19	2019/20	2020/21
1	EW – 1,2,3	Ecological weed control	A & B	Biosecurity department	Climbing asparagus grid search and control using herbicide [control of other key weed species in Appendix 4 if observed]	Reduction in the distribution and abundance of ecological weed species	$12,000	$12,000	$12,000
1	EW – 1,2,3	Ecological weed control	A & B	HCC	Weed sweep targeting a range of species using a broad-spectrum herbicide (see Appendix 4 for species list)	Reduction in the distribution and abundance of ecological weed species	***	***	***
1,2	PA – 1,2,3	Pest animal control	A & B	Biosecurity department	Service all bait stations and DOC 200 kill-traps quarterly to control possums, rats and mustelids	Possums <5% RTC * Rats < 10% TTI** Mustelids <5% TTI**	$9,000	$9,000	$9,000
1	EW – 1,2,3	Monitoring	A & B	Biodiversity department	Review photo point monitoring locations	Annual monitoring of photo points set-up in 2015/16	Biodiversity Advisor time	Biodiversity Advisor time	Biodiversity Advisor time
						Total	**$21,000**	**$21,000**	**$21,000**

*RTC = Residual Trap Catch. The control regime has been designed to control possums to this level but monitoring will not be undertaken. Experience in the use of this control method indicates this target will be met

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

***Variable costs determined annually by HCC that cannot be detailed at this time

5. Funding summary

5.1 Greater Wellington budget

The budget for each year is indicative only and subject to change.

Table 3: Greater Wellington allocated budget for the Haywards Scenic Reserve KNE site

Management activity	Timetable and resourcing		
	2018/19	**2019/20**	**2020/21**
Ecological weed control	$6,000	$6,000	$6,000
Pest animal control	$4,500	$4,500	$4,500
Total	**$10,500**	**$10,500**	**$10,500**

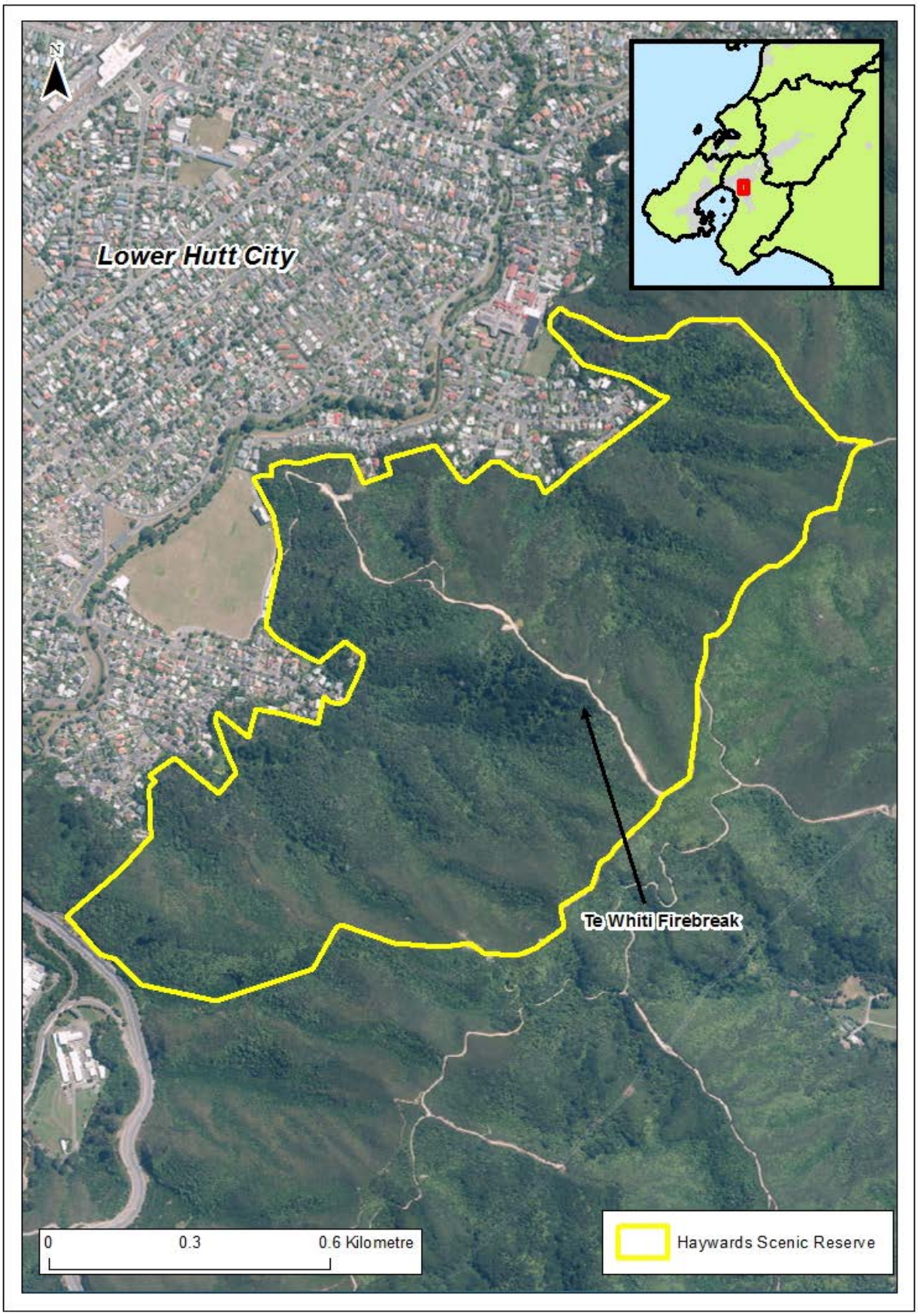
5.2 Other contributions

The budget for each year is indicative only and subject to change.

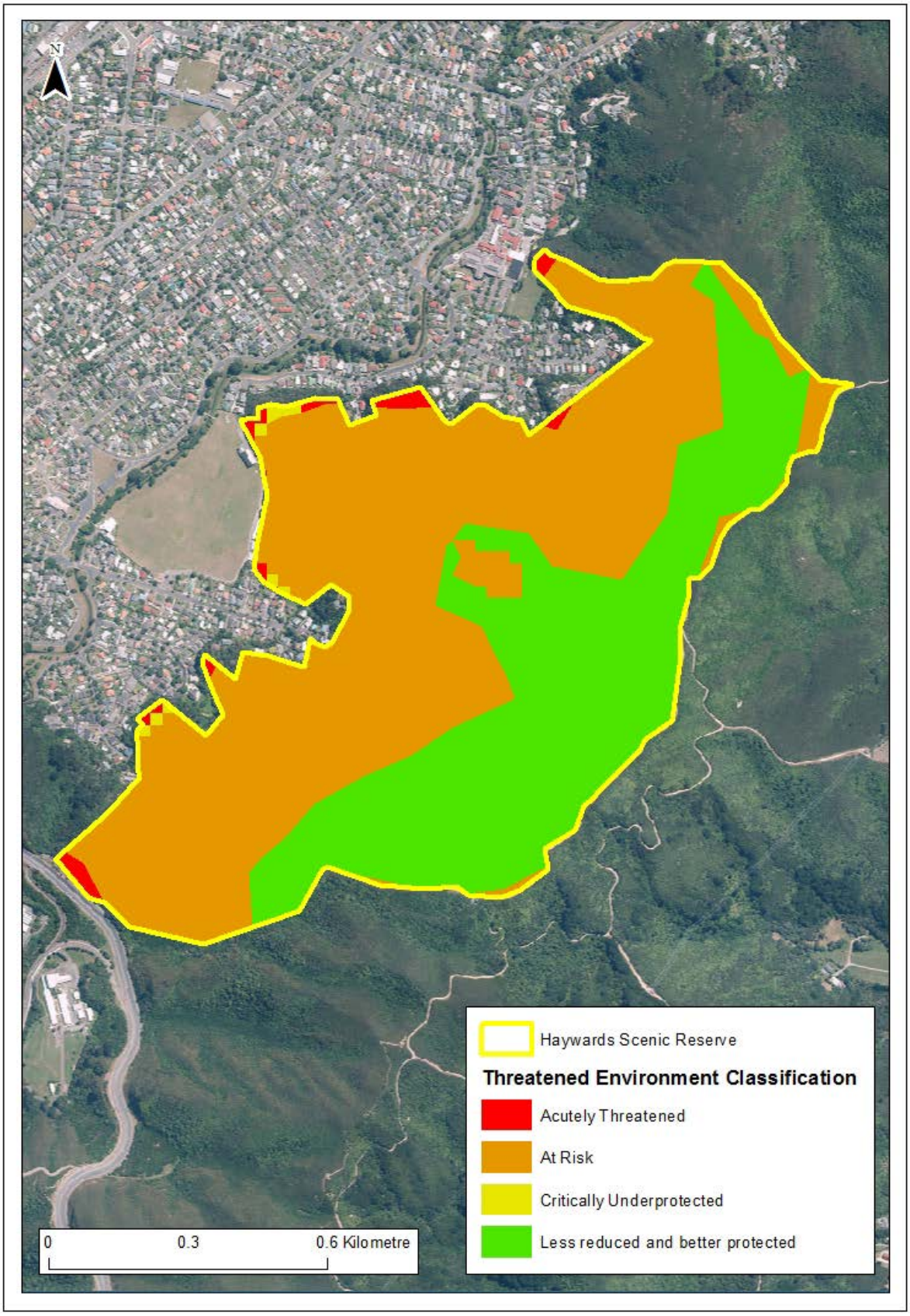
Table 4: Additional allocated budget for the Haywards Scenic Reserve KNE site from HCC

Management activity	Timetable and resourcing		
	2018/19	**2019/20**	**2020/21**
Ecological weed control	$6,000	$6,000	$6,000
Pest animal control	$4,500	$4,500	$4,500
Total	**$10,500**	**$10,500**	**$10,500**

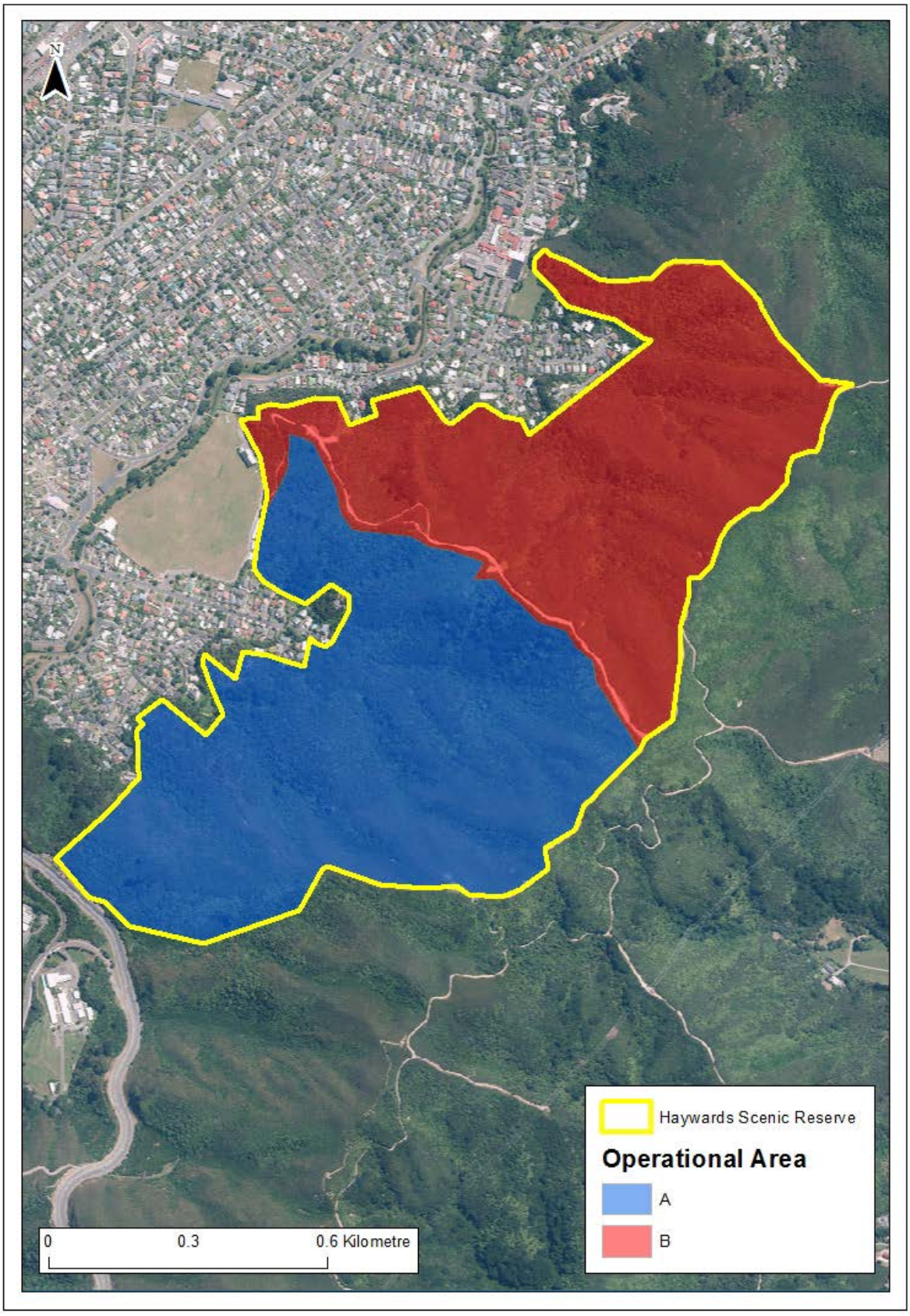
Appendix 1: Site maps



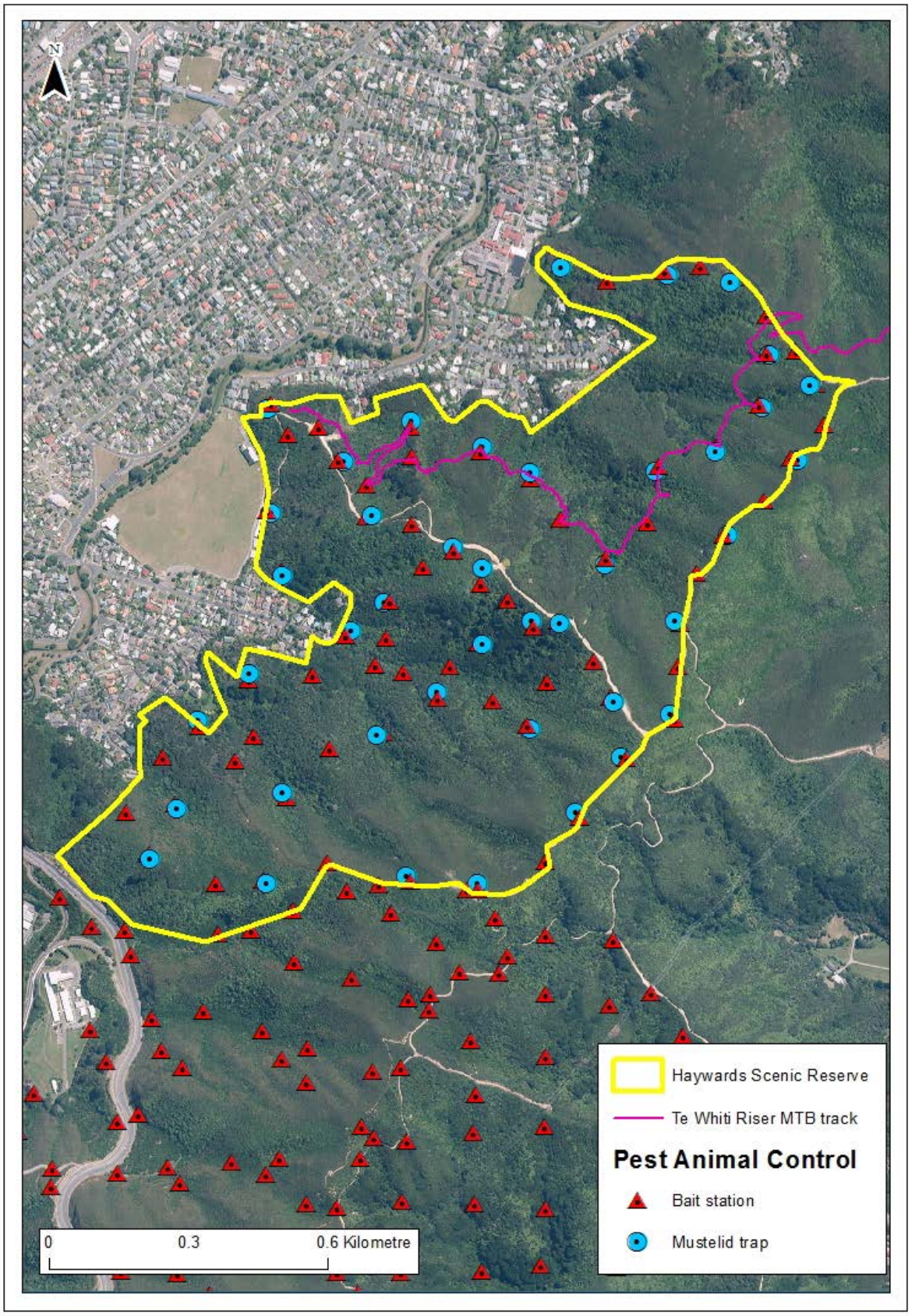
Map 1: The Haywards Scenic Reserve KNE site boundary



Map 2: Land Environment New Zealand (LENZ) threat classifications for the Haywards Scenic Reserve KNE site (copyright Ministry for the Environment/Landcare Research)



Map 3: Operational areas in the Haywards Scenic Reserve KNE site



Map 4: Pest animal control in the Haywards Scenic Reserve KNE site. [Note also shows the location of bait stations outside the KNE to the south and east, and the Te Whiti Riser MTB track that Erich Kusel services]

Appendix 2: Nationally threatened species list

The New Zealand Threat Classification System lists extant species according to their threat of extinction. The status of each species group (plants, reptiles, etc) is assessed over a five-year cycle[42]. Species are regarded as At Risk if they are classified as Declining, Recovering, Relict or Naturally Uncommon. The following table lists At Risk species that are resident in, or regular visitors to, the Haywards Scenic Reserve KNE site.

Table 5: At Risk species at the Haywards Scenic Reserve KNE site

Scientific name	Common name	Threat status	Observation
Birds[43]			
Falco novaeseelandiae	New Zealand falcon, kārearea	At Risk - Recovering	Bell 2014[44]
Reptiles[45]			
Naultinus punctatus	Barking gecko	At Risk - Declining	Department of Conservation 2014[46]

Appendix 3: Regionally threatened species list

The following table lists a regionally threatened species that has been recorded in the Haywards Scenic Reserve KNE site. This species has been identified in the Plant Conservation Strategy, Wellington Conservancy 2004-2010[47].

Table 6: Regionally threatened species recorded in Haywards Scenic Reserve KNE site

Scientific name	Common name	Threat status	Observation
Plants[48]			
Arthropodium cirratum	Rengarenga lily	Regionally threatened	Department of Conservation 1999[49]

Appendix 4: Ecological weed species

Ecological weeds recorded and indicated as priority weed species in a survey undertaken in 2011 by Greater Wellington[50] within Haywards Scenic Reserve KNE site are listed in Table 7 below. Plant species are listed in priority order. This list is used by HCC to inform which species to control during their weed sweep.

Table 7: Ecological weed species recorded in the Haywards Scenic Reserve KNE site

Scientific Name	Common name	Priority
Akebia quinata	Chocolate vine, five leaf akebia	1
Asparagus aethiopicus	Bushy asparagus	1
Asparagus scandens	Climbing asparagus	1
Bomarea sp.	Bomarea	1
Clematis vitalba	Old man's beard	1
Delairea odorata	German ivy	1
Dipogon lignosus	Mile-a-minute vine	1
Euonymus japonicus	Japanese spindleberry	1
Hedera helix subsp. *helix*	Ivy	1
Hedychium gardnerianum	Kahili ginger	1
Jasminum polyanthum	Jasmine	1
Leycesteria formosa	Himalayan honeysuckle	1
Lonicera japonica	Japanese honeysuckle	1
Pandorea pandorana	Wonga wonga vine	1
Passiflora tripartita var. *mollissima*	Banana passionfruit	1
Tradescantia fluminensis	Tradescantia	1
Acacia ulicifolia	Prickly Moses	2
Acer pseudoplatanus	Sycamore	2
Buddleja davidii	Buddleia	2
Chrysanthemoides monilifera	Boneseed	2
Convolvulus arvensis	Convolvulus	2
Cortaderia selloana	Pampas	2
Cotoneaster glaucophylla	Cotoneaster	2
Crataegus monogyna	Hawthorn	2
Crocosmia ×crocosmiiflora	Montbretia	2
Ehrharta erecta	Veldt grass	2
Elaeagnus ×reflexa	Elaeagnus	2
Galeobdolon luteum	Aluminium plant (Artillery plant)	2
Ilex aquifolium	Holly	2
Iris foetidissima	Stinking iris	2

Scientific Name	Common name	Priority
Ligustrum lucidum	Tree privet	2
Nephrolepis cordifolia	Tube ladder fern	2
Plectranthus ciliatus	Plectranthus	2
Rubus sp. (*R. fruticosus* agg.)	Blackberry	2
Sambucus nigra	Elderberry	2
Selaginella kraussiana	African clubmoss, selaginella	2
Syzygium smithii	Lillypilly, monkey apple	2
Tropaeolum majus	Nasturtium	2
Zantedeschia aethiopica	Arum lily	2
Acacia longifolia	Sydney golden wattle	3
Agapanthus praecox	Agapanthus	3
Allium triquetrum	Onion weed	3
Cytisus scoparius	Broom	3
Erica lusitanica	Spanish heath	3
Erigeron karvinskianus	Mexican daisy	3
Genista monspessulana	Montpellier broom	3
Vinca major	Periwinkle	3
Chamaecytisus palmensis	Tree lucerne	4
Corynoccarpus laevigatus	Karaka	4
Foeniculum vulgare	Fennel	4
Hoheria populnea	Lacebark	4
Pinus radiata	Radiata pine	4
Ulex europaeus	Gorse	4
Vitex lucens	Puriri	4

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The Greater Wellington Regional Council's purpose is to enrich life in the Wellington Region by building resilient, connected and prosperous communities, protecting and enhancing our natural assets, and inspiring pride in what makes us unique

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