Key Native Ecosystem Plan for Kaitoke Regional Park

2014-17

KNE
KEY NATIVE ECOSYSTEM

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Contents

1. Key Native Ecosystem plans

New Zealand's indigenous biodiversity continues to decline nationally, and in the Wellington region. Major reasons for the decline are that native species are preyed on or outcompeted by invasive species and ecosystems and habitats are lost or degraded through human resource use and development. Active management to control threats is required to protect indigenous biodiversity. 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's) vision for biodiversity is:

> *"The Wellington region contains a full range of naturally occurring habitats and ecosystems that are in a healthy functioning state and supporting indigenous biodiversity"*

GWRC's Biodiversity Strategy 2011-21[1] provides a common focus across the council's departments, and guides activities relating to biodiversity. One of its goals is: High value biodiversity areas are protected.

In order to achieve this vision and goal, the Key Native Ecosystem (KNE) programme seeks to protect some of the best examples of ecosystem types in the Wellington region by managing, reducing, or removing threats to their values. Sites with the highest biodiversity values have been identified and then prioritised for management. Active management of KNE sites can involve control of ecological weeds and pest animals, fencing to exclude stock, restoration planting and helping landowners to legally protect these areas.

KNE sites are managed in accordance with three-year KNE plans, such as this one, prepared for each area by the GWRC's Biodiversity department in collaboration with the landowners and other stakeholders. These plans outline the ecological values and threats specific to each KNE site, set out objectives for biodiversity management, and prescribe the operational actions and budget required to work towards achieving the objectives.

Much of the work planned in KNE sites will be carried out by GWRC staff or contractors engaged by GWRC. For example, the Biosecurity department carries out ecological weed and pest animal control to achieve the objectives set out in KNE plans.

GWRC also recognizes that working relationships between the management partners are critical for achieving the objectives for the KNE site. Under the KNE programme, GWRC staff also work with landowners and volunteer community groups involved in protection or restoration work within KNE sites.

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. Kaitoke Regional Park Key Native Ecosystem

The Kaitoke Regional Park KNE site is located in the southern foothills of the Tararua Range, approximately 7km north-east of Upper Hutt and 16km south-east of Waikanae. It is wholly within Kaitoke Regional Park (see Appendix 1, Map 1). It is comprised of a large area of rising hill country steeply incised by the Hutt River and several small tributaries, and also includes the Hutt and Pakurātāhi river flats at Te Mārua and Kaitoke. The river terraces at the southern extent of the site at Te Mārua are within the Wellington ecological district while the rest of the site is in the Tararua ecological district[2].

The KNE site adjoins the Hutt Water Collection Area KNE site to the north-east and privately owned bush-clad land to the west. It is about 2,700 hectares in size and is mostly covered in original or selectively-logged native forest[3]. The river terrace areas feature significant recreational amenities including a camping ground, picnic areas, walking tracks and grassed open spaces. The steeper hill country, comprising most of the site, is remote in nature with no vehicle access or maintained walking tracks.

Landowner and stakeholders

GWRC 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 GWRC has sought input from landowners and relevant stakeholders, and will continue to involve them as the plan is implemented.

Landowner

All land in the KNE site is owned by GWRC for the purposes of water supply, recreation and forestry, and the whole site is managed by the Parks department of GWRC as part of Kaitoke Regional Park. Management of Kaitoke Regional Park as a whole is guided by the GWRC Parks Network Plan[4] (PNP). The PNP guides the recreational and amenity uses of the park as well as identifying opportunities to protect biodiversity values. This KNE plan is consistent with the wider objectives and policies of the PNP. The Biodiversity and Parks departments will work collaboratively to efficiently deliver the activities in these plans.

Management partners and key stakeholders

The management partners to this plan are the Parks, Biodiversity and Biosecurity departments of GWRC. The Parks department manages recreational access and maintains assets such as roads, tracks and amenity areas. The Biodiversity department plans and coordinates biodiversity management activities and provides biodiversity advice. The Biosecurity department carries out pest control activities.

Wellington Water has an influence on the management of the site as significant water supply infrastructure passes through the site and lies on its immediate boundaries.

The Wellington Botanical Society (WBS) and the Upper Hutt Branch of the Royal Forest and Bird Protection Society (UHF&B) are both key stakeholders at the site. A combined effort from these groups has been instrumental in the protection and restoration of Te

Mārua Bush, a significant one hectare remnant of lowland river terrace forest which lies within the KNE site. Since 1991, WBS and UHF&B have carried out large amounts of weed control and rubbish removal, and have planted native trees on the edges of the remnant to bolster its resilience to the impacts of ecological weeds. These plantings have contributed to the substantial increase in the size of Te Mārua Bush from 0.6 hectare in the original bush to 1 hectare in 2014, with a resultant increase in the area-to-edge ratio[5].

UHF&B members have grown most of the native plants that have been used in the restoration of Te Mārua Bush. Plants have been propagated from seed collected from plants within or nearby the forest remnant, to ensure plant species and genetics are appropriate for the site. Members of WBS have provided expert botanical advice on forest health and the selection of species for planting.

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 Kaitoke Regional Park KNE site is recognised as a regionally important site because it contains a large area of mature indigenous forest representative of the original Akatarawa-Hutt Valley vegetation types; low altitude podocarp/broadleaved forest, hard/red beech forest and other hardwood types. Also significant within the site is one of the few remaining lowland forest remnants of its type in the Wellington region; Te Mārua Bush. This stand of mataī (*Prumnopitys taxifolia*), tōtara (*Podocarpus totara*) and black maire (*Nestegis cunninghamii*) is situated at the southern tip of the KNE site. The KNE site also contains several threatened plant species (see Appendices 2 and 3).

Although the composition of the forest on the rising hill country has been modified by selective logging and the impacts of pests, the forest types present prior to human arrival still remain. The forest is essentially a podocarp/broadleaf/beech forest with a large component of beech. Hard beech (*Fuscospora truncata*) and black beech (*Fuscospora solandri*) are common on the lowland hills. These are replaced by red beech (*Fuscospora fusca*) on damper more fertile sites, grading into silver beech (*Lophozonia menziesii*) at higher elevations.

There is a rich diversity in the podocarp/broad-leaved forest in places. In the gorges and terraces of the Hutt River, mataī, northern rātā (*Metrosideros robusta*) and kahikatea (*Dacrycarpus dacrydioides*) emerge over a canopy of kāmahi (*Weinmannia racemosa*), hīnau (*Elaeocarpus dentatus*), miro (*Prumnopitys ferruginea*), tawa (*Beilschmiedia tawa*) and black and swamp maire (*Syzygium maire*), with many understory species present. In the Kororipo and Putaputa streams, northern rātā, rimu (*Dacrydium cupressinum*), miro and pukatea (*Laurelia novae-zelandiae*) mix with kāmahi, silver beech and red beech in a largely podocarp forest. Orchid species are

common and the rare Kirk's daisy (*Brachyglottis kirkii* var. *kirkii*) and red mistletoe (*Peraxilla tetrapetala*) are present[6].

The original vegetation on the river terraces at Kaitoke and Te Mārua is thought to have contained pockets of tōtara, mataī, kahikatea, rimu and northern rātā amongst broadleaf/beech forest with pukatea occurring in swampy sites[7]. The only semblance of the original forest that remains is found in Te Mārua Bush. This is a closed-canopy secondary stand of mataī-tōtara forest, 13-16m high, growing on an old alluvial terrace of the Hutt River. The soils of this site are exceptionally stony. Mataī-tōtara forest has not been recognised elsewhere in the Hutt catchment and is now a rare type of forest on a national scale. Although very small and secondary in origin, Te Mārua Bush is probably replicating the composition of the forest originally present on the site. Such forest would have formerly grown on some of the younger terraces of the Hutt River where stony but otherwise fertile soils predominated[8]. Small areas of tawa-tītoki (*Beilschmiedia tawa-Alectryon excelsus*) forest are also present near Benge Stream.

Most of the river terraces and valley floors at Te Mārua and Kaitoke are classed as "At Risk" or "Chronically Threatened" by the LENZ Threatened Environment Classification tool[9]. Some areas of the KNE site including Te Mārua Bush are classed as "Acutely Threatened" (see Appendix 1, Map 2).

All of the fifteen native forest bird species that are still naturally surviving in the wild in the Wellington region have been recorded in the KNE site, including yellow-crowned parakeet (*Cyaronamphus auriceps auriceps*) and the threatened North Island kākā (*Nestor meridionalis septentrionalis*). A significant gathering of kererū (*Hemiphaga novaeseelandiae*) occurs in September every year in trees on the river terrace at Kaitoke. They gather here to feed on fresh willow and tree lupin foliage.

The forest gecko (*Mokopirirakau* "southern North Island") is the only lizard species that has been recorded in the KNE site, but it is likely that green gecko (*Naultinus punctatus*) as well as common (*Oligosoma polychroma*) and ornate skink (*O. ornatum*) are also present, as these species have been recorded nearby.

Native freshwater crayfish (kōura, *Paranephrops planifrons*) and eight species of native fish have been recorded in the KNE site. Five of these fish species are threatened (see Appendix 2). There are no barriers to fish passage within the KNE site, however, the water intake weir on the Hutt River immediately beyond the boundary of the KNE site prevents the passage of many species further up this river.

Key threats to ecological values at the site

Sometimes 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.

Ecological weeds, pest animals and human activities are all impacting or have the potential to impact the ecological values of the Kaitoke Regional Park KNE site. The most significant threats come from a range of ecological weeds and pest animals.

There is a suite of ecological weeds present that are of significant concern due to their highly invasive nature. They are mostly sparse and localized within the large forested

areas, but some are present in dense stands in outlying areas, particularly in paddock hedgerows in the Te Mārua area. A larger suite of ecological weeds is present in and around Te Mārua Bush, with the potential to impact the integrity of this highly threatened forest type.

Possums (*Trichosurus vulpecula*) are generally present in very low numbers due to regular aerial control operations carried out in the past. However it is likely that possums will move into the KNE site from surrounding areas where they are uncontrolled and increase in numbers to levels that will impact forest vitality. Possums will feed on preferred species until the species can no longer recover. Some preferred species in the KNE site are northern and southern rātā (*Metrosideros robusta* and *M. umbellata*), tree fuchsia (*Fuchsia excorticata*) and mistletoe (*Ileostylus micranthus, Korthalsella lindsayi, Peraxilla colensoi* and *P. tetrapetala*).

Feral goats (*Capra hircus*) are present in moderate numbers and are inhibiting regeneration of the forest. They are most prevalent in the lower valleys.

Rats (*Rattus* spp.) and stoats (*Mustela erminea*) are likely to be present in moderate numbers. These species prey on native invertebrates, lizards and birds.

The table below shows the identified threats at the site, which operational areas of the KNE site they affect, and how the threats impact on ecological values. 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 (Map 3).

Table 1: Key threats to ecological values present at Kaitoke Regional Park KNE site.

Threat code	Threat and impact on biodiversity in the KNE site	Operational area
Ecological weeds		
EW-1	Ground cover, woody and climbing weed species have the potential to prevent native forest regeneration and displace native plant species. Climbers can also cause the collapse of native forest canopy.	A & B
EW-2	Ecological weeds pose an increased level of threat to the forest remnants at Te Mārua due to the small size and the large edge to area ratio of the remnants.	C
Pest animals		
PA-1	Possums browse preferred plant species continuously until species can no longer recover. They also prey on native insects and the chicks and eggs of native birds.	D & E
PA-2	Feral goats browse native vegetation inhibiting regeneration and altering forest structure and diversity. They particularly impact regeneration on disturbed sites such as slip faces.	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area
PA-3	Feral deer (*Cervus elaphus scoticus*) preferentially browse seedlings and saplings inhibiting regeneration and altering forest structure and diversity.	Entire KNE site
PA-4*	Feral pigs (*Sus scrofa*) eat native invertebrates and the roots of native plants, in the process rooting up soil and destroying habitats for native invertebrates.	Entire KNE site
PA-5*	Rats and mice (*Mus musculus*) eat the seeds of native plants slowing the regeneration of native forest. They also prey on the chicks and eggs of native birds, insects and lizards.	Entire KNE site
PA-6*	Cats (*Felis catus*), ferrets (*Mustela furo*), stoats, weasels (*Mustela nivalis*) and hedgehogs (*Erinaceus europaeus*) prey on native animals including invertebrates, lizards, birds, chicks and eggs.	Entire KNE site
Human activities		
HA-1	Hunting and tramping can cause the accidental introduction of weed species through the carriage of seeds and plant fragments on clothing, equipment and dogs.	Entire KNE site
HA-2	Road and track maintenance, the installation of structures, ecological monitoring and other management activities can all cause the accidental introduction of weed species through the carriage of seeds and plant fragments on machinery, equipment and clothing.	Entire KNE site
HA-3	Fire can be destructive to native flora and fauna and create conditions for pest plant invasion.	Entire KNE site
HA-4	Garden waste and general rubbish dumping can introduce ecological weeds and cause pollution and degradation of soils and forest understory.	C

***Threats marked with an asterisk are not addressed by actions in the operational plan. Not all threats can be adequately addressed. Threats might not be managed for a number of reasons including financial, legal, or capacity restrictions. However, in order to manage the KNE site as a whole, it is important to be aware of all threats to ecological values.**

3. Objectives and management activities

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

Objectives

The following objectives will guide the management activities at Kaitoke Regional Park KNE site:

1. **To increase native plant dominance**
2. **To increase native plant regeneration**
3. **To increase abundance of threatened plants**

4. **To increase populations of native birds**
5. **To increase populations of threatened animal species**
6. **To raise community awareness of the ecological values of the KNE site**
7. **To engage the community in management of the KNE site**

Management activities

Management activities are targeted to work towards the objectives above by responding to the threats outlined in Table 1. The management activities are described briefly below, and specific actions, with budget figures attached, are set out in the operational plan (Table 2).

Ecological weed control

All ecological weeds located within and on the edges of the large forested area will be controlled annually (see operational areas A & B in Appendix 1, Map 3). This area will be searched for ecological weeds through surveillance of historic infestation sites and locations likely to be prone to infestation; through cursory observations from suitable advantage points; and through investigation of reports from GW staff and the public. The pest plant control plan for Kaitoke Regional Park published in 2005 and the associated survey data will be used to identify historic infestation sites[10]. Ecological weed species that have been present and controlled in the past include old man's beard (*Clematis vitalba*), Japanese honeysuckle (*Lonicera japonica*), climbing asparagus (*Asparagus scandens*), convolvulus (*Calystegia silvatica*), wandering willie (*Tradescantia fluminensis*), African club moss (*Selaginella kraussiana*) barberry (*Berberis glaucocarpa*), hawthorn (*Crataegus monogyna*), holly (*Ilex aquifolium*), willow (*Salix* spp.) and sycamore (*Acer pseudoplatanus*).

Additionally, any highly invasive climbers such as old man's beard, Japanese honeysuckle and climbing asparagus located in outlying areas will also be controlled. In years two and three of the plan some individual woody weeds that are providing substantial seed sources and are no longer critical to amenity values, such as large holly and hawthorn trees, will be removed from paddock hedgerows. Less invasive species in outlying areas will not be controlled.

Specimens of *Hoheria populnea,* a New Zealand native tree species not native to this region (non-local native), are growing in amenity plantings in the camping ground at Kaitoke. All individual *Hoheria populnea* plants will be identified and removed to avoid this species spreading into the native forest.

A higher level of ecological weed control will be applied to Te Mārua Bush (see operational area C, Appendix 1, Map 3). This is because this site is of very high ecological significance and at great risk of ongoing infestation by ecological weeds due to its small size and location next to large seed sources. The control of ecological weeds at Te Mārua Bush will be carried out by members of WBS and UHF&B during annual working-bees, and subsequently by the GWRC Biosecurity department. Members of the WBS and UHF&B will control as much of the weed infestation as they are able within their capacity and with the methods available to them (pulling and treating cut-stumps). GWRC will follow up with searches and control of remaining plants.

All weedy exotic plant species will be controlled at Te Mārua Bush, including the following:

Arum lily (*Zantedeschia aethiopica*)
Banksia (*Banksia integrifolia*)
Barberry (*Berberis glaucarpa*)
Blackberry (*Rubus fruiticosus*)
Black nightshade (*Solanum nigrum*)
Broom (*Cytisus scoparius*)
Celandine (*Ranunculus ficaria*)
Cherry (*Prunus* spp.)
Climbing asparagus (*Asparagus scandens*)
Convolvulus (*Calystegia silvatica*)
Cotoneaster (*Cotoneaster glaucophyllus*)
English ivy (*Hedera helix*)
Gorse (*Ulex europaeus*)
Hawthorn (*Crataegus monogyna*)
Himalayan honeysuckle (*Leycesteria formosa*)
Holly (*Ilex aquifolium*)
Japanese honeysuckle (*Lonicera japonica*)
Jerusalem cherry (*Solanum diflorum*)
Karo (*Pittosporum crassifolium*)
Lacebark (*Hoheria populea)*
Montbretia (*Crocosmia* x *crocosmiiflora*)
Montpellier broom (*Teline monspessullana*)
Old man's beard (*Clematis vitalba*)
Briar rose (*Rose* spp.)
Stinking iris (*Iris foetidissima*)
Sycamore (*Acer pseudoplatanus*)
Wandering willie (*Tradescantia fluminensis*)
Wild onion (*Allium veneale*)
Wild strawberry (*Fragaria virginiana*)
Willow (*Salix* spp.)

Pest animal control

Possums will be controlled on a regular basis to keep the overall possum population density below 5% RTC (residual trap catch). This will be done by continuing the current cyclic use of a combination of aerially-sown 1080 (sodium fluoroacetate) and ground-based trapping and poisoning with 1080 and brodifacoum.

A possum control operation was carried out in operational area D (see Appendix 1, Map 4) in September 2014. Subsequent operations will be carried out in this area when possum population monitoring results rise over 5% RTC or the equivalent BMI (bite mark index). Past monitoring results have shown that this is likely to occur every five years meaning the next operation is likely to be required in 2019.

Control operations in this area will be carried out over two financial years with the planning and purchase of materials in one financial year and the sowing of both the pre-feed and toxic baits in the first part of the following financial year. This timing will

be used as it has been proven that poisoning operations are most effective when carried out around the middle of winter. Possum population monitoring will be carried out soon after the completion of poisoning operations to assess their effectiveness.

Research has shown that aerial 1080 possum control operations also control rats and mustelids to very low levels. However this control is short lived with populations returning to pre-control levels within two years. Native plants and animals may still gain in the long term from these periods of reduced threats.

Rat and possum populations will be kept to very low levels in the south-eastern corner of operational area F (see Appendix 1, Map 5) between the cyclic possum control operations. This area of river terrace podocarp-rātā forest is deemed to have high biodiversity and recreational value. Control will be achieved by dispensing brodifacoum or a similar toxin from a network of bait stations. It is hoped that volunteers supported by the GWRC Parks department will undertake this work.

Possum control within operational area E (see Appendix 1, Map 4) will be funded and carried out by TBfree New Zealand as part of the national strategy to eradicate bovine tuberculosis from New Zealand. Possums are vectors of bovine tuberculosis and this part of the KNE site is within an area where bovine tuberculosis has been found in wildlife. TBfree NZ will carry out possum population monitoring to assist in assessing when the next control operation is required.

Feral goats and deer will be culled annually to reduce the populations of each to a level that allows a professional hunter to destroy no more than one animal per eight hours of hunting on foot or five animals per one hour of hunting from a helicopter. This will be achieved through using a combination of ground-based hunting, using helicopter transportation when necessary to access remote areas, and aerial hunting.

Revegetation

Native trees will be planted on the edges of, and in areas adjacent to, the forest remnants at the southern (Te Mārua) end of the KNE site, including Te Mārua Bush (see Appendix 4, Planting Plan). This will increase their area-to-edge ratio which will improve resilience to weed incursions. Additionally, where practicable, the remnants will be connected by planting vegetated corridors between them to provide pathways for native animals and plants to spread through.

Planting at area 1 (Te Mārua Bush) will be arranged and carried out by members of WBS and UHF&B, and overseen by the GWRC Parks department. All plants for Te Mārua Bush and adjacent areas will be grown by UHF&B from propagules sourced from Te Mārua Bush itself.

Planting at the three northern remnants will be managed by the GWRC Parks department and will be funded by the Parks Environmental Enhancement Fund along with some money from the Honda Tree Fund (see Appendix 4, Table 7). This planting will principally involve corporate groups undertaking the work. Only eco-sourced pioneer species that are proven to survive well at the site will be planted.

Community engagement

An effort will be made to increase the local community's advocacy for and active involvement in the KNE site. This will be done by raising awareness of the KNE site and its management during community events and programmes and through the use of local media when opportunities arise.

Human activities

Biosecurity guidelines[11] for checking and removing seeds and plant fragments from vehicles, equipment and clothing will be used by all management staff when entering and working in the KNE site. A condensed and more specific version of the guidelines will be developed for issuing to hunting, trapping and research permit holders with their permits and to trampers when the opportunity arises.

To reduce the chance of uncontrolled fires occurring in the KNE site, the present restriction of open fires to the riverbed only will be continued.

The Parks department will erect signs on the State Highway 2 edge of Te Mārua Bush requesting that people refrain from dumping garden waste and general rubbish in and on the margins of the bush. These signs will also contain brief information about the biodiversity values of the bush and the adverse effects caused by dumping.

4. Operational plan

The operational plan shows the actions planned to achieve the stated objectives for Kaitoke Regional Park KNE site and their timing and cost. The budgets for the 2015/16 and 2016/17 years are indicative only and subject to change as a result of the 2015-25 Long Term Plan process. A map showing operational areas can be found in Appendix 1 (Map 3).

Table 2: Three-year operational plan for the Kaitoke Regional Park KNE site.

Objectives	Threat	Operational areas	Activity	Delivery	Description/detail	Target	Timetable and resourcing		
							2014/15	2015/16	2016/17
1,2,3	EW-1	A & B	Ecological weed control	GWRC Biosecurity department	Control all ecological weeds in areas of the main forest and highly invasive climbers in outlying areas	Reduce distribution and density of plants	$1,500	$4,800	$4,800
1,2,3	EW-1	A & B	Ecological weed control	GWRC Biosecurity department	Control large seed sources of invasive woody weeds in outlying areas	Reduce distribution and density of plants	Nil	$2,000	$2,000
1,2,3	EW-1 EW-2	C	Ecological weed control	WBS, UHF&B and GWRC Biosecurity department	Control all weedy exotic plant species in Te Mārua Bush	Reduce distribution and density of plants	$1,000	$1,600	$1,600
1,2,3	EW-1	A	Ecological weed control	GWRC Environmental Science & Parks departments	Identify and control *Hoheria populnea*	Control all plants	$500	Nil	Nil
1,2,3,4,5	PA-1	D	Pest animal control	GWRC Biosecurity department	Control possums using aerial 1080	Maintain possum population to below 5% RTC*	$15,000	Nil	Nil

Objectives	Threat	Operational areas	Activity	Delivery	Description/detail	Target	Timetable and resourcing		
							2014/15	2015/16	2016/17
1,2,3,4,5	PA-1	D	Pest animal control	GWRC Environmental Science department	Carry out post-control possum population monitoring (RTC*)	Monitoring completed and reported	$7,500	Nil	Nil
1,2,3,4,5	PA-1 PA-5	D	Pest animal control	GWRC Parks department	Carry out possum and rat control on river terrace opposite the Pakuratahi Fork	Maintain possum population to below 5% RTC* and rat population below 5% TTI**	$300	$300	$300
1,2,3,4,5	PA-1	E	Pest animal control	TBfree NZ	Control possums using aerial 1080	Maintain possum population to below 5% RTC*	Funded by TBfreeNZ	Funded by TBfreeNZ	Funded by TBfreeNZ
1,2,3	PA-2 PA-3	Entire KNE site	Pest animal control	GWRC Biosecurity department	Control goats and deer, targeting preferred habitats, using ground-based, helicopter-supported and aerial methods	Maintain goat and deer populations to below 1 animal/hunter day or 5 animals/helicopter hunting hour	$13,500	$16,000	$16,000
1,2,3,6	HA-1	Entire KNE site	Human activities	GWRC Biodiversity & Parks departments	Distribute ecological weed biosecurity information to all permit holders through the existing permit systems, and to tramping groups when opportunities arise	Biosecurity precautions disseminated to all permit holders, and to trampers when possible	Nil	Nil	Nil
1,2,3	HA-2	Entire KNE site	Human activities	GWRC Parks, Biodiversity, Biosecurity & Environmental Science departments	Ensure pest plant biosecurity guidelines are adhered to while carrying out all management activities	Procedures available and adhered to in all cases	Nil	Nil	Nil

Objectives	Threat	Operational areas	Activity	Delivery	Description/detail	Target	Timetable and resourcing		
							2014/15	2015/16	2016/17
1,2,3,4,5	HA-3	Entire KNE site	Human activities	GWRC Parks department	Continue policy of open fires being allowed on river beaches only	No human induced wild fires occur	Nil	Nil	Nil
1,2,3,4,5,6,7	EW-2 HA-4	C	Revegetation	WBS, UHF&B and GWRC	Plant edges and adjacent areas of Te Mārua Bush, extend/repair fences, and install refrain from rubbish dumping signs	80% success rate of plantings	$2,850 †	$3,150†	$3,150†
1,2,3,4,5	EW-2	C	Revegetation	GWRC Parks department	Plant edges and adjacent areas of other remnants	80% success rate of plantings	$950††	$950††	$950††
6,7		Entire KNE site	Community engagement	GWRC Parks and Biodiversity departments	Incorporate biodiversity information into community events and media	Increased community awareness of the values of the KNE	Nil	Nil	Nil
						Total	**$43,100**	**$28,800**	**$28,800**

* RTC = Residual trap catch
**TTI = Trapping tunnel index
† = $2,650 funded by GWRC Parks department
†† = Funded by GWRC Parks department

5. Funding summary

GWRC budget

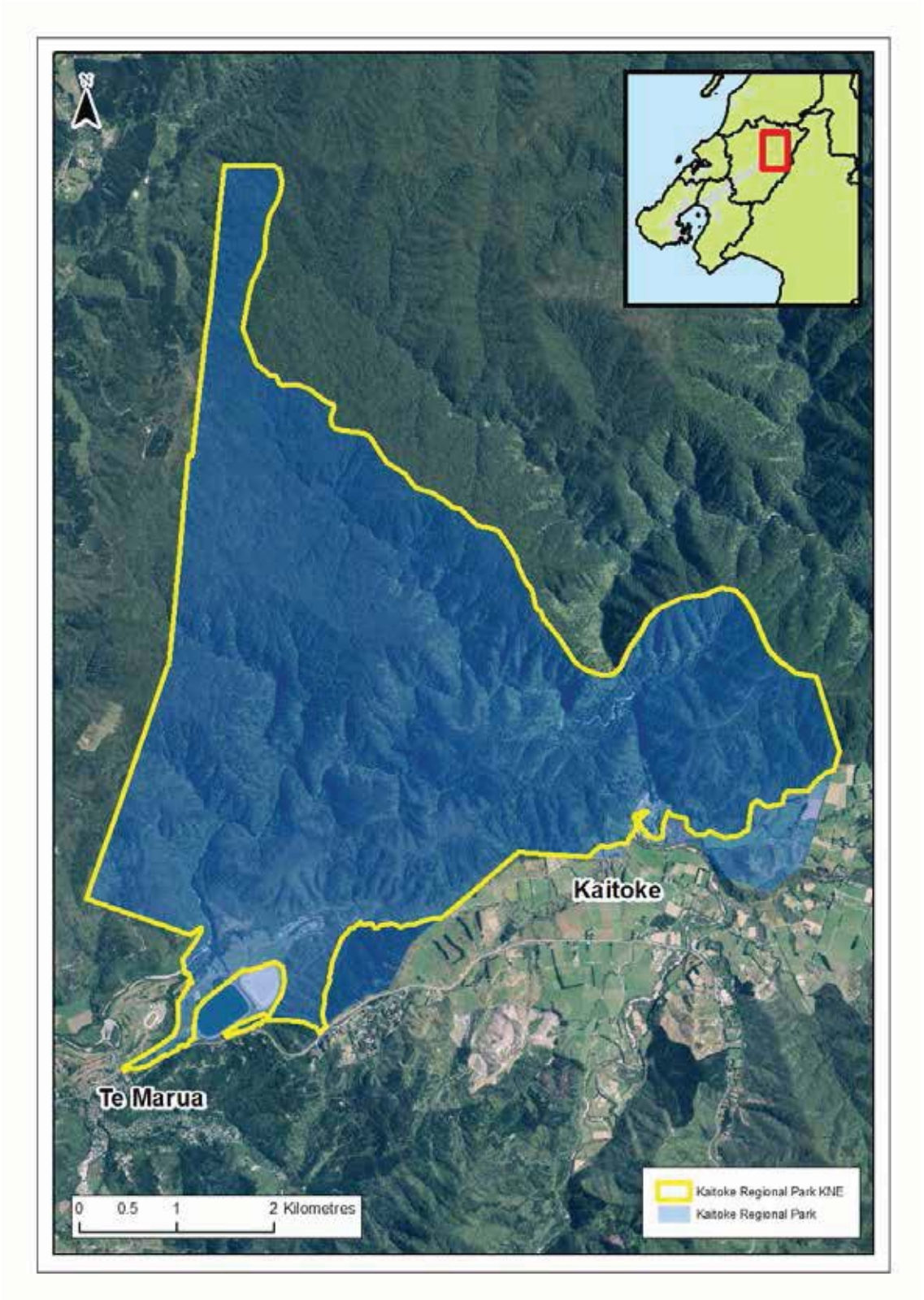
The budgets for the 2015/16 and 2016/17 years are indicative only and subject to change as a result of the 2015-25 Long Term Plan process.

Table 3: GWRC allocated budget for the Kaitoke Regional Park KNE site.

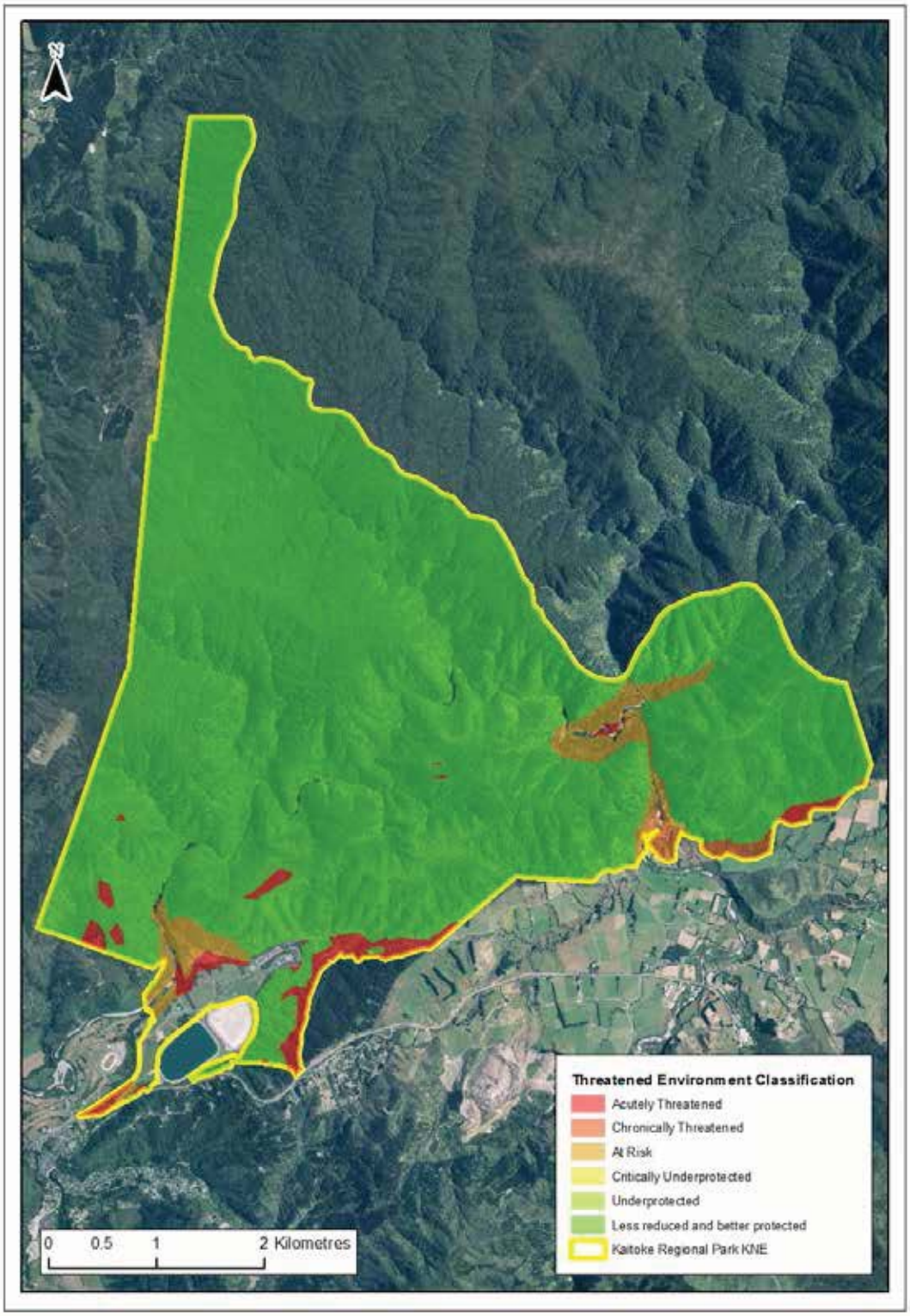
Management activity	Timetable and resourcing		
	2014/15	2015/16	2016/17
Pest plant control	$3,000	$8,400	$8,400
Pest animal control	$36,300	$16,300	$16,300
Human activities	$0	$0	$0
Revegetation	$3,800*	$4,100*	$4,100*
Total	**$43,100**	**$28,800**	**$28,800**

*$3,600 funding from Parks department

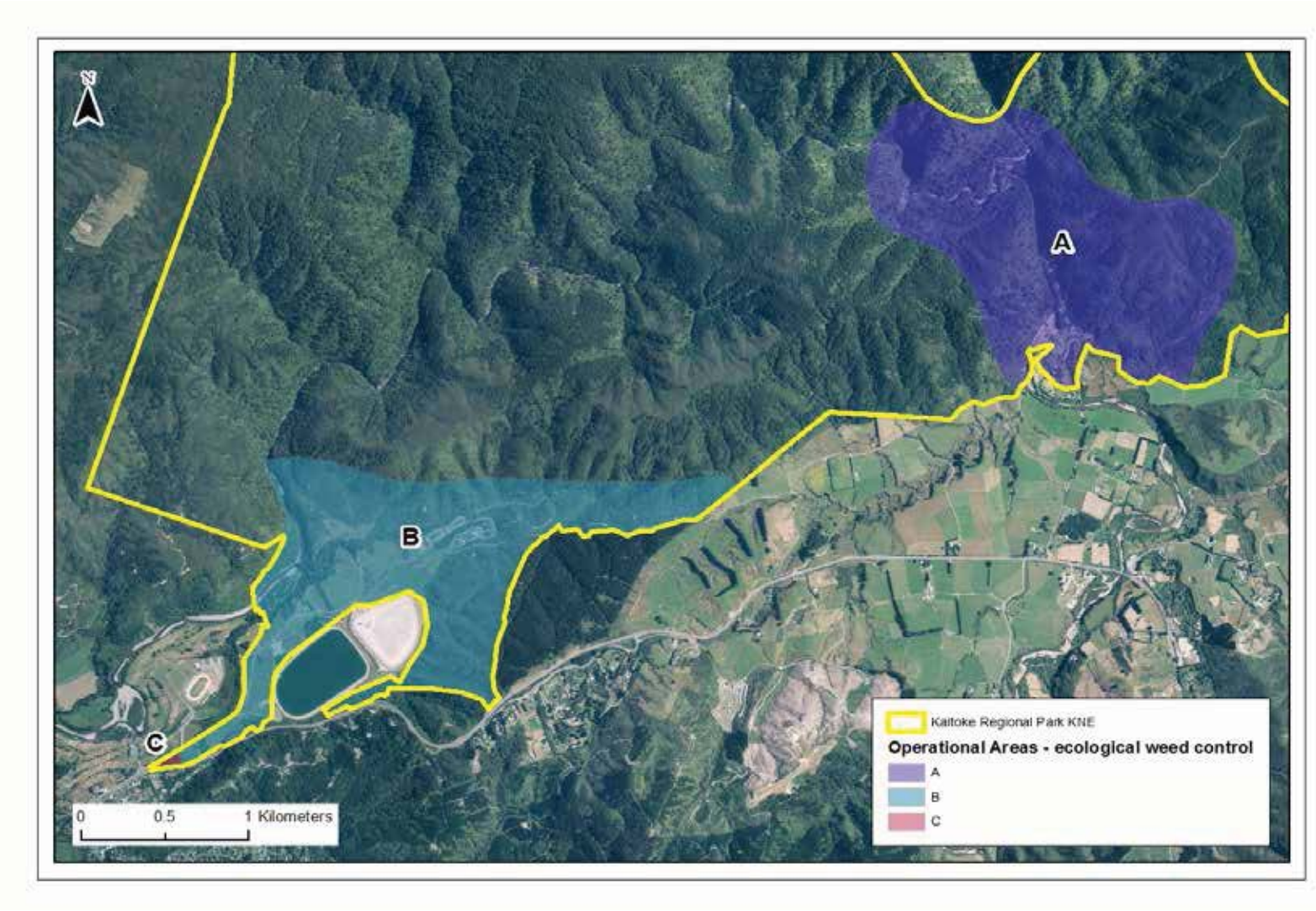
Appendix 1: Site maps



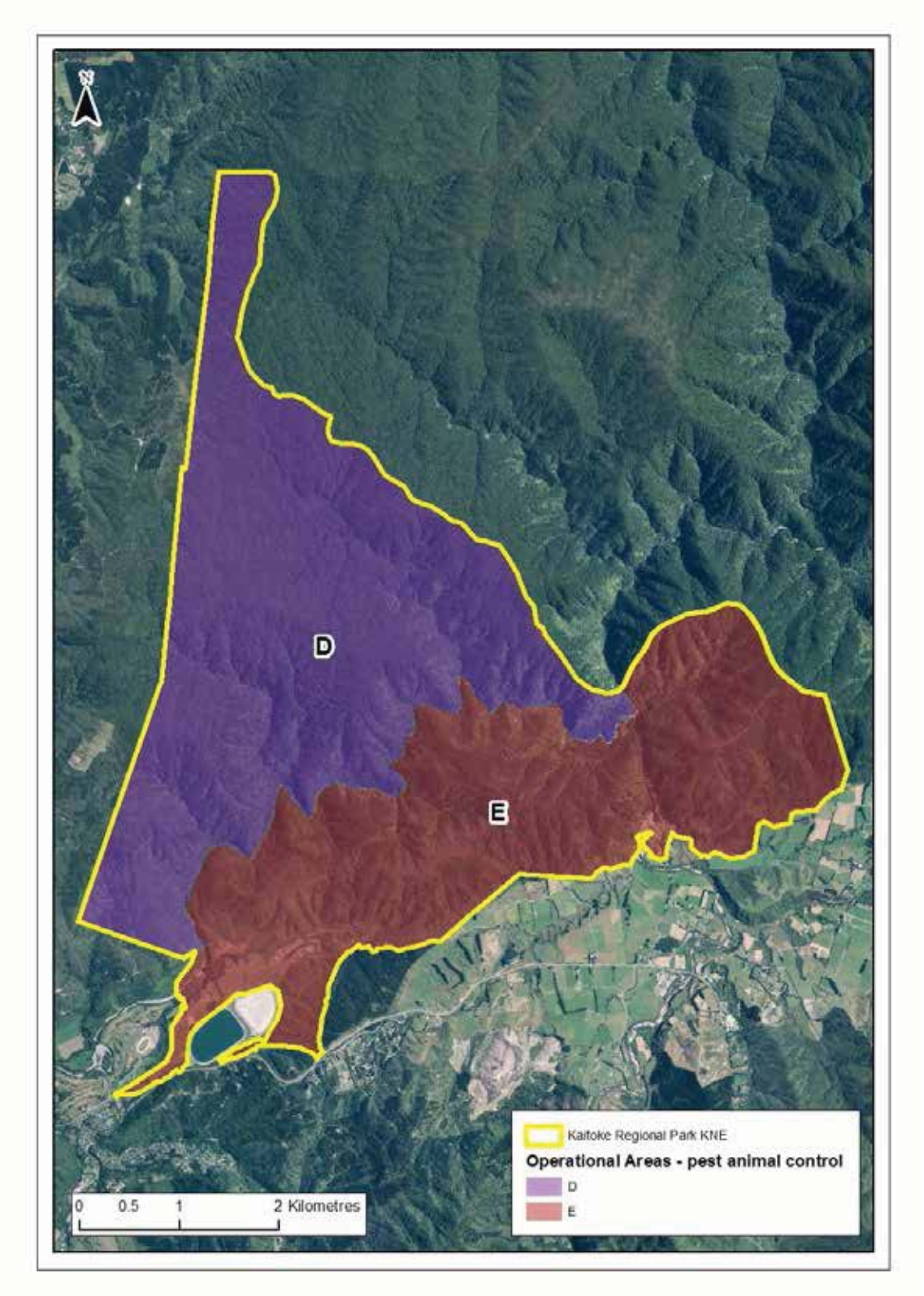
Map 1: Boundaries of the Kaitoke Regional Park KNE site and Kaitoke Regional Park.



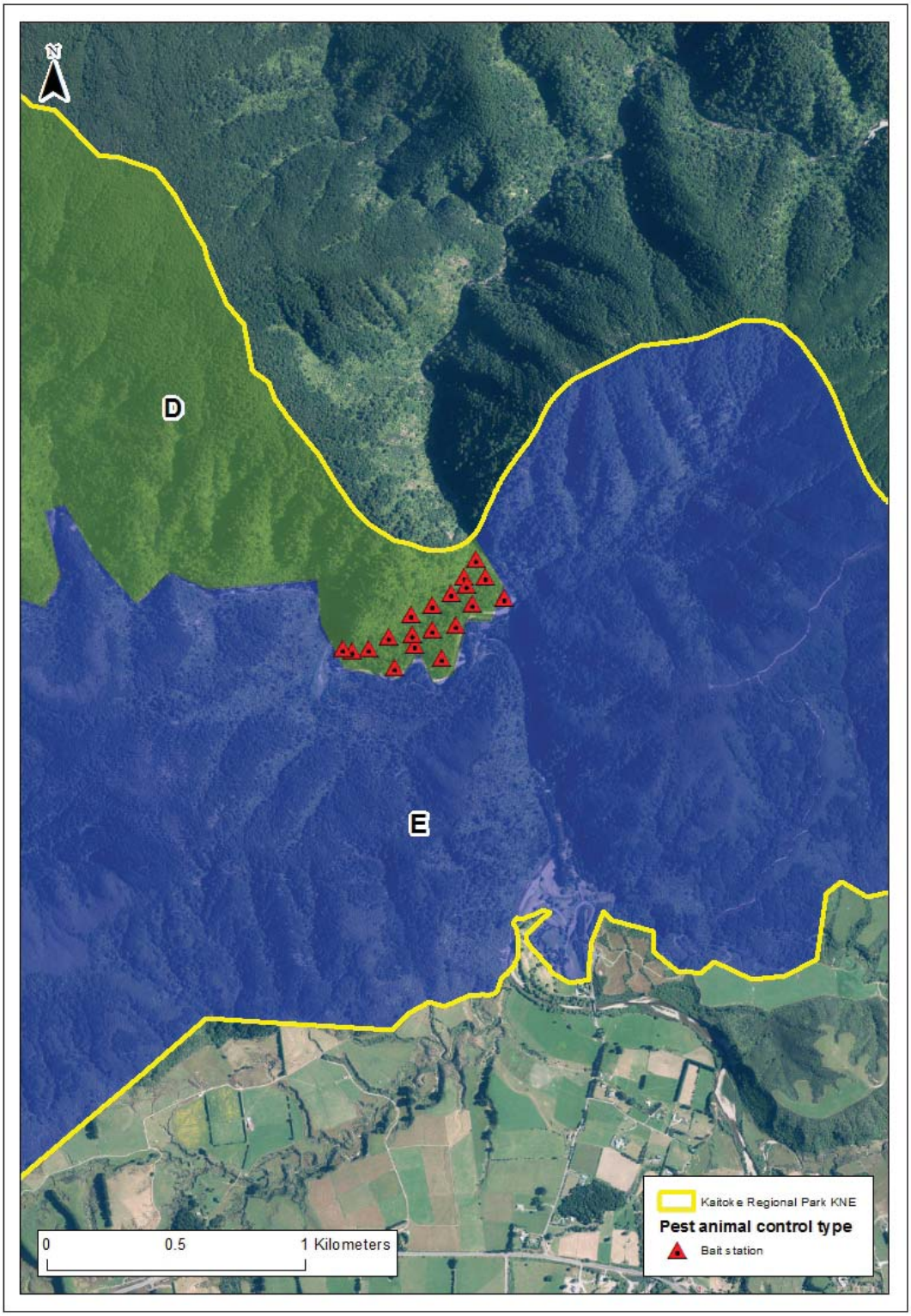
Map 2: Threatened Environments New Zealand classification map for the Kaitoke Regional Park KNE site.



Map 3: Operational areas for ecological weed control in the Kaitoke Regional Park KNE site.



Map 4: Operational areas for pest animal control in the Kaitoke Regional Park KNE site.



Map 5: Bait stations for rat and possum control in the Kaitoke Regional Park KNE site.

Appendix 2: Threatened species list

The New Zealand Threat Classification System lists extant species according to their threat of extinction. The status of each species group (birds, plants, reptiles, etc.) is assessed over a three-year cycle[12]. Species are regarded as Threatened if they are classified as Nationally Critical, Nationally Endangered or Nationally Vulnerable, or 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 known to live within the KNE site.

Table 4: Threatened and At Risk species at the Kaitoke Regional Park KNE site.

Scientific name	Common name	Threat status	Source
Plants(vascular)[13](lichens)[14](bryophytes)[15]			
Brachyglottis kirkii var. *kirkii*	Kirk's daisy	Declining	GWRC 2007[16]
Peraxilla colensoi	Scarlet mistletoe	Declining	GWRC 2007
Peraxilla tetrapetala	Red mistletoe	Declining	GWRC 2007
Plumatochilus tasmanica	Greenhood orchid	Nationally Vulnerable	GWRC 2007
Birds[17]			
Acanthisitta chloris	Rifleman	Declining	http://ebird.org/content/newzealand/ (accessed 22/01/2014)
Cyanoramphus novaezelandiae	Red-crowned parakeet	Relict	http://ebird.org/content/newzealand/ (accessed 22/01/2014)
Eudynamys taitensis	Long-tailed cuckoo	Naturally Uncommon	http://ebird.org/content/newzealand/ (accessed 22/01/2014)
Falco novaeseelandiae	New Zealand falcon	Nationally Vulnerable	http://ebird.org/content/newzealand/ (accessed 22/01/2014)
Phalacrocorax carbo	Black shag	Naturally Uncommon	http://ebird.org/content/newzealand/ (accessed 22/01/2014)
Reptiles[18]			
Mokopirirakau "southern North Island"	Southern North Island forest gecko	Declining	GWRC Reptile distribution database (accessed 2014)
Freshwater fish[19]			
Anguilla dieffenbachii	Longfin eel	Declining	GWRC 2007
Galaxias brevipinnis	Kōaro	Declining	GWRC 2007

Scientific name	Common name	Threat status	Source
Galaxias divergens	Dwarf galaxias	Declining	GWRC 2007
Gobiomorphus hubbsi	Bluegill bully	Declining	GWRC 2007
Gobiomorphus huttoni	Redfin bully	Declining	GWRC 2007

Appendix 3: Regionally threatened species list

The following table lists regionally threatened species that are known to live within the KNE site.

Table 5: Regionally threatened species at the Kaitoke Regional Park KNE site.

Scientific name	Common name	Threat status	Source
Plants			
Cyathea cunninghammii	Gully tree fern	Regionally sparse	Department of Conservation 2004[20]
Raukaua edgerleyi	Raukawa	Regionally sparse	Department of Conservation 2004

Appendix 4: Planting plan

Below are the details of the revegetation work that will be undertaken in the Kaitoke Regional Park KNE site. Plant species to be used are listed and the table identifies numbers of plants that will be used and all costs associated with the planting programme. Planting areas are shown in Map 6 (page 23) and 7 (page 25).

Planting plan for Area 1

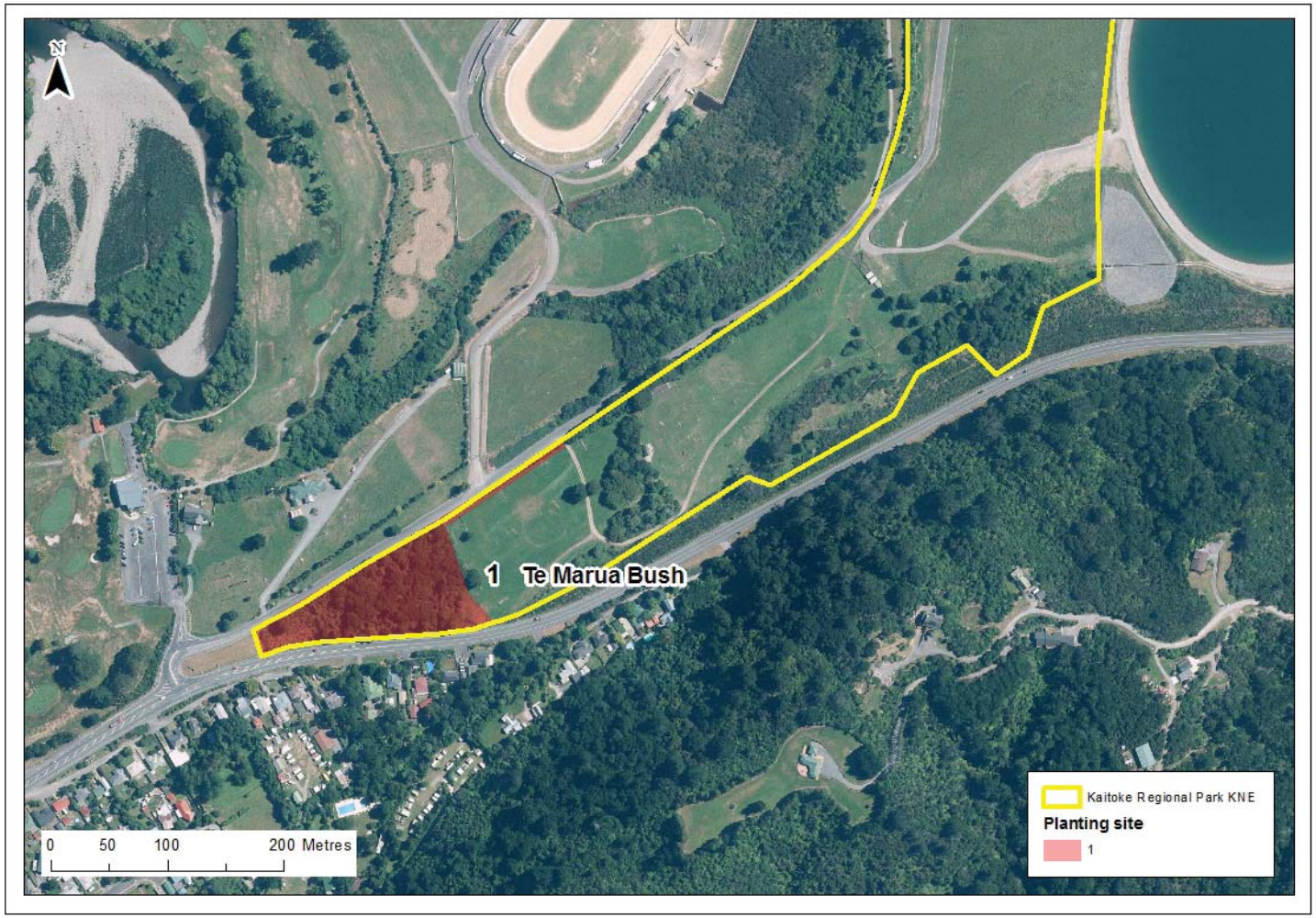
Area size: 10,000 m^2

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

tōtara *(Podocarpus totara)*
cabbage tree *(Cordyline australis)*
karamū *(Coprosma robusta)*
koromiko *(Hebe stricta* var. *stricta)*
kānuka *(Kunzea ericoides)*
five-finger *(Pseudopanax arboreus)*

Table 6: Planting cost for area 1.

Item	2014/15		2015/16		2016/17	
	Number	Total ($)	Number	Total ($)	Number	Total ($)
Plants: as above **Funding is for potting mix and other material required by F&B for growing plants**	100	200	100	500	100	500
Other material costs for planting: **Includes general supportive activities such as fence repairs/extensions, signage, rubbish removal**		2,650		2,650		2,650
Site preparation spray: **Undertaken by Parks staff**		0		0		0
Planting labour: **All volunteer**		0		0		0
Maintenance spray: **Releasing done by volunteers**		0		0		0
Total		**2,850**		**3,150**		**3,150**



Map 6: Planting area 1 in the Kaitoke Regional Park KNE site.

Planting plan for areas 2, 3 and 4

Area size: 8,300 m^2

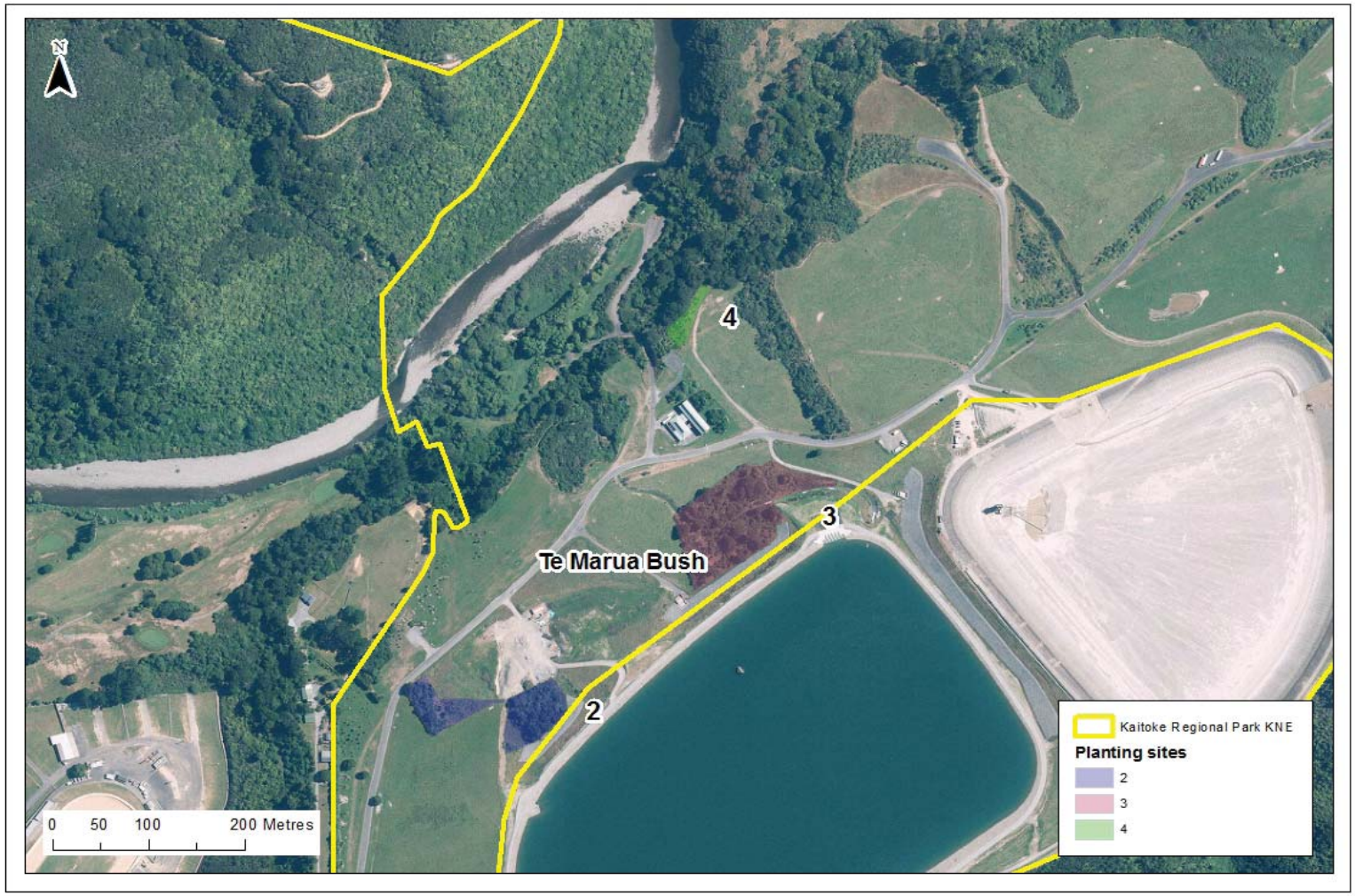
Plants for this planting area will be chosen from the following species:

tarata/lemonwood (*Pittosporum eugenioides*)
tōtara (*Podocarpus totara*)
mānuka (*Leptospermum scoparium*)

Table 7: Planting cost for areas 2, 3 and 4.

Item	2014/15		2015/16		2016/17	
	Number	Total ($)	Number	Total ($)	Number	Total ($)
Plants: as above	300	900	300	900	300	900
Other material costs for planting (stakes, guards, fertilizer tablets etc): **Stakes & fertilizer tablets in stock now for next 3 years**		0		0		0
Site preparation spray: **Undertaken by Parks staff supervising Department of Corrections community workers**		0		0		0
Planting labour: **Volunteers either from Accor group (1 day 300 plants) or Department of Correction Community workers, supervised by the Park Ranger**		50*		50*		50*
Maintenance spray: **Hand releasing will be done by Department of Corrections community workers**		0		0		0
Total		**950**		**950**		**950**

*Refreshments



Map 7: Planting areas 2, 3 and 4 in the Kaitoke Regional Park KNE site.

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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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