

# Key Native Ecosystem Plan for Pakuratahi

2014-17



greater WELLINGTON  
REGIONAL COUNCIL  
Te Pane Matua Taiao





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## 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<sup>1</sup> 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. Pakuratahi Key Native Ecosystem site

The Pakuratahi KNE site is a large area of native forest and regenerating native scrub located on the western side of the Rimutaka Range east of Upper Hutt (see Appendix 1, Map 1). It is bounded by the Rimutaka Forest Park to the east, and the Tararua Forest Park and the Hutt Water Collection Area KNE site to the north. It comprises all of the area managed by the GWRC Parks department as Pakuratahi Forest, apart from commercial exotic forestry plantations located within the area. It also encompasses nearly all of the Pakuratahi River catchment, including land within the Kaitoke Basin. The KNE site is about 7,180 hectares in size.

Over half of the site is very remote in nature with no vehicle access or maintained walking tracks. Recreational amenities, including picnic areas and walking, biking and horse riding trails, are provided in the more accessible areas at Tunnel Gully and on the terraces of the Pakuratahi River.

Sixty-seven hectares of land within the KNE site is due to be gazetted as a Scenic Reserve. This land was gifted to GWRC by the Forest and Bird Protection Society in 2003 for this purpose.

### Landowner and stakeholders

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

#### Landowner

All land within the KNE site is owned by GWRC for the purposes of water supply, recreation and forestry. The whole site is managed by the Parks department of GWRC as part of the regional parks network. Management of Pakuratahi Forest as a whole is guided by the GWRC Parks Network Plan<sup>2</sup> (PNP). The PNP guides the recreational and amenity uses of the forest as well as identifying opportunities to protect biodiversity values.

The forest is a future water collection area and the primary focus of forest management is to ensure the water resource is healthy and its potential as a sustainable source of secure, fresh and clean water in the future is protected, and to provide water supply infrastructure. Secondary considerations are to protect the native forest for biodiversity purposes, preserve heritage values, manage the site for production forestry, provide a range of recreational activities, and undertake no significant development other than for water supply purposes<sup>3</sup>. 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 the road, 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.

A key stakeholder is the Upper Hutt branch of Forest and Bird (UHF&B), whose members have been carrying out possum control in the Tunnel Gully area since 2007. This work will continue to be carried out for the duration of this plan.

The KNE site is a popular area for walkers, cyclists, horse riders and hunters.

## Ecological values

Ecological values are a way to describe indigenous biodiversity found at any 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 are sites that provide 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 Pakuratahi KNE site is located within the Tararua Ecological District<sup>4</sup>. The KNE site is characterised by steep to very steep, dissected hill country rising to 860 metres at Mt Climie. Rainfall is high with an annual mean of about 2200 mm falling in the main valleys. The site has a sheltered north-easterly aspect however strong north-westerly and south-easterly winds occur on exposed faces and ridgelines. A belt of sheared Torlesse greywacke underlies the Pakuratahi area. The greywacke has been folded and lifted by tectonic forces and volcanic and ocean floor material such as basalt, chert and limestone has been incorporated into the rock.

Of note in recognising the ecological values at Pakuratahi KNE site are the following:

**Threatened environments:** Some parts the KNE site are classified as Acutely Threatened, Chronically Threatened or At Risk. There is less than 10%, 10-20% and 20-30% respectively of the original cover of these indigenous vegetation types remaining in New Zealand<sup>5</sup>. These areas of threatened environments within the KNE site are located on river and stream terraces (see Appendix 1, Map 2).

**Threatened species:** One Threatened and one At Risk plant species have been recorded in the KNE site. The site also provides habitat for one Threatened and two At Risk bird species, one At Risk lizard species and four At Risk freshwater fish species. Nationally Threatened and At Risk species are listed in Appendix 2.

Originally, the Pakuratahi KNE site comprised four forest ecosystem types - hard beech, red beech/podocarp, red/silver beech and silver beech forests - as well as a sub-alpine scrub ecosystem at higher altitudes<sup>6</sup>. The present vegetation cover of the KNE site still comprises large areas of these forest types, largely unmodified in the Pakuratahi headwaters to the south, and a mosaic of original and regenerating podocarp remnants and scrub in the north. It is significant that four beech species are found together at this one site. The forest is contiguous with those of the Rimutaka Forest Park and the Hutt Water Collection Area.

The KNE site contains the only remaining example of podocarp-tawa forest on alluvial terrace in the Wellington region, as well as a significant area of swamp maire forest. There is a nationally recognised ground orchid site where over 30 species of orchid

have been recorded, and a 120 hectare area of sub-alpine tussockland which includes the only area of snow tussock (*Chionochloa flavescens*) on the Rimutaka Range. The site also includes Ladle Bend wetland, a 1.5 hectare rain-fed wetland dominated by mānuka (*Leptospermum scoparium*). More detailed accounts of the vegetation types present can be found in Regional Forest Lands Resource Statement, Volume One – Physical Environment<sup>7</sup> and Ecological Assessment of Selected Ridges in Pakuratahi Forest – Mount Climie Area<sup>8</sup>.

The two threatened plant species that have been recorded in the Pakuratahi KNE site are Kirk's daisy (*Brachyglottis kirkii* var. *kirkii*) and greenhood orchid (*Plumatochilus tasmanica*). Many other plant species that are uncommon in the region are also present, including *Pittosporum rigidum*, *Pimelea gnidia*, *Hymenophyllum pulcherrimum* and *Viola filicaulis*.

Most of the native forest birds that have survived in the wild in the Wellington region have been recorded in the KNE site, including New Zealand falcon (*Falco novaeseelandiae*), New Zealand pipit (*Anthus novaeseelandiae*), rifleman (*Acanthisitta chloris*), whitehead (*Mohoua albicilla*) and tomtit (*Petroica macrocephala*).

Wellington green gecko (*Naultinus punctatus*) is the only lizard species that has been recorded in the KNE site, but it is likely that forest gecko (*Mokopirirakau* “southern North Island”), as well as common skink (*Oligosoma polychroma*) and ornate skink (*O. ornatum*) are also present, as these species have been recorded nearby<sup>9</sup>.

Five species of native fish have been recorded at Pakuratahi. These are longfin eel (*Anguilla dieffenbachia*), dwarf galaxid (*Galaxias divergens*), kōaro (*Galaxias brevipinnis*), redfin bully (*Gobiomorphus huttoni*) and Cran's bully (*Gobiomorphus basalis*). All but Cran's bully are in decline<sup>10</sup>. As there is a larger range of native fish species in the Pakuratahi River downstream of the KNE site boundary<sup>11</sup> and there are no barriers to fish passage in the river, it is likely that there are more species present within the KNE site.

## 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 most significant threats to the ecological values of Pakuratahi KNE site come from a range of ecological weeds, browsing and predatory pest animals, and the impacts of some management and recreational activities.

Ecological weeds are prevalent throughout the northern half of the site, although the most dense infestations are concentrated in discrete locations, often sites of historic or present human activity, such as Tunnel Gully and the summit yards. One of the most significant and widespread infestations is of wilding pines. *Pinus radiata* seedlings are spreading through large areas of native forest in the middle section of the KNE site from plantation forestry blocks in the area, and *Pinus contorta* are spreading from abandoned forestry trial stands. Gorse (*Ulex europaeus*) and broom (*Cytisus scoparius*)



are also posing a significant threat to sensitive sub-alpine tussockland habitat on the Climie ridgeline.

Pest animals that are likely to be having the greatest impact on the ecological values of the Pakuratahi KNE site are possums (*Trichosurus vulpecula*), feral goats (*Capra hircus*), feral deer (*Cervus elaphus scoticus*), stoats (*Mustela erminea*) and rats (*Rattus* spp.). Possums are generally present in very low numbers due to regular aerial control operations carried out in the past. If possum control is not ongoing it is likely that they will increase in numbers over time to levels that will impact forest vitality. Possum browse can impact palatable plant species such as northern and southern rātā (*Metrosideros robusta* and *M. umbellata*), tree fuchsia (*Fuchsia excorticata*) and mistletoes (*Ileostylus micranthus*, *Korthalsella lindsayi*, *Peraxilla colensoi* and *P. tetrapetala*) which are all found within the KNE site.

Feral goats and deer are present in low numbers as a result of an ongoing control programme carried out since 2005. However, there are ongoing incursions of animals from adjoining Crown estate and private land and these continue to inhibit the regeneration of the forest.

Rats and stoats are thought to be present in moderate numbers. These species prey on native invertebrates, lizards and birds.

Some management and recreational activities have the potential to impact the ecological values of the KNE site. Activities associated with asset and forestry management, recreation such as hunting, and illegal plant and animal collecting may impact native plant and animal communities if adequate levels of control are not placed upon them.

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 they impact ecological values, and whether they will be addressed by the proposed management activities.

**Table 1: Threats to ecological values present at the Pakuratahi KNE site.**

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, 4 & 5).

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location in KNE site
<b>Ecological weeds</b>		
EW-1	A large (~7 ha) infestation of the woody weed prickly hakea ( <i>Hakea sericea</i> ) is inhibiting native regeneration.	A
EW-2	Tradescantia ( <i>Tradescantia fluminensis</i> ), periwinkle ( <i>Vinca major</i> ) and pampas ( <i>Cortaderia selloana</i> and <i>C. jubata</i> ) are inhibiting natural understory regeneration. Japanese honeysuckle ( <i>Lonicera japonica</i> ) is invading and could dominate the forest canopy, which may cause canopy collapse.	B, D

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location in KNE site
EW-3	Old man's beard ( <i>Clematis vitalba</i> ) is invading and could dominate the forest canopy, which may cause canopy collapse.	C, E, H
EW-4	Buddleia ( <i>Buddleja davidii</i> ) is invading and could dominate regenerating vegetation on slips and dynamic stream-beds.	F, G, H
EW-5	Gorse and broom are invading and displacing native sub-alpine vegetation on mountain ranges.	I
EW-6	Perennial nettle ( <i>Urtica dioica</i> subsp. <i>dioica</i> ) is inhibiting natural regeneration of forest edges and low stature sub-alpine plant communities.	J
EW-7	Two stands of <i>Pinus contorta</i> are dominating the vegetation where they stand and are producing seed that is germinating in the surrounding areas.	K, L
EW-8	Wilding pines are displacing native plants in regenerating forest and in low stature sub-alpine plant communities.	M
EW-9	Hakea, tradescantia, periwinkle, Japanese honeysuckle, pampas, old man's beard, buddleia, cotoneaster ( <i>Cotoneaster glaucophyllus</i> ), hawthorn ( <i>Crataegus monogyna</i> ), holly ( <i>Ilex aquifolium</i> ) and willow ( <i>Salix</i> spp.) are invading and displacing regenerating native vegetation.	Entire KNE site
<b>Pest animals</b>		
PA-1	Possums browse preferred plant species continuously until species can no longer recover. They also prey on the chicks and eggs of native birds, as well as native insects.	N, O
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
PA-3	Feral deer preferentially browse seedlings and saplings, inhibiting regeneration and altering forest structure and diversity.	Entire KNE site
PA-4*	Feral pigs ( <i>Sus scrofa</i> ) 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 ( <i>Mus musculus</i> ) eat the seeds of native plants, slowing the regeneration of native forest. They also prey on the chicks and eggs of native birds, as well as native insects and lizards.	Entire KNE site
PA-6*	Cats ( <i>Felis catus</i> ), ferrets ( <i>Mustela furo</i> ), stoats, weasels ( <i>Mustela nivalis</i> ) and hedgehogs ( <i>Erinaceus europaeus</i> ) prey on native animals including invertebrates, lizards, birds, chicks and eggs.	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location in KNE site
<b>Human activities</b>		
HA-1	Management activities such as road and track maintenance, the installation of structures, pest control and ecological monitoring can cause the accidental introduction of weed species through the carriage of seeds and plant fragments on machinery, equipment and clothing.	Entire KNE site
HA-2	Activities associated with commercial forestry, such as logging truck and road excavator movements, the deposition of roading material and silviculture work can cause the accidental introduction of weed species through the carriage of seeds and plant fragments on machinery and equipment.	Plantation forestry margins
HA-3	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-4	Management activities such as road and track maintenance, and the installation of structures can cause damage to plant and animal communities and the local elimination of species.	Entire KNE site
HA-5*	Herbicide application in plantation forest blocks can result in over-spray or spray-drift that is damaging or destructive to native vegetation.	Plantation forestry margins
HA-6	Fire can be destructive to native flora and fauna and create conditions for pest plant invasion.	Entire KNE site
HA-7	Illegal removal of plants such as orchids and tree ferns, and animals such as lizards can cause the local elimination of species.	Entire KNE site

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

### 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 the Pakuratahi KNE site.

1. To increase native plant dominance
2. To increase native plant regeneration
3. To increase abundance of threatened native plants (Kirk's daisy, greenhood orchid)
4. To increase populations of native birds
5. To increase populations of threatened native animals (rifleman, NZ pipit, NZ falcon)

**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 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. This is discussed in the broad management approach.

**Ecological weed control**

Three different approaches will be used to reduce the density and slow the spread of ecological weeds in the Pakuratahi KNE site.

1. The ecological weeds listed in Table 1 will be controlled at eleven different sites (see operational areas A-K in Appendix 1, Map 3). The intention is to eliminate these infestations within the term of this plan, or as soon as possible thereafter. Control has previously been carried out at these sites, over several years in most cases, but further work is required to ensure that the ecological weeds do not regenerate in these areas. All plants in identified infestations will be controlled annually before they set seed. This way the seed bank will be exhausted over time as existing seed germinates and resulting plants are controlled prior to seeding. The stand of *Pinus contorta* near the Puffer Saddle at the north of the KNE site (operational area L) will not be controlled during the period of this plan unless additional funding becomes available.
2. Wilding pines that are dispersed at low densities throughout a large part of the KNE site (operational area M, Appendix 1, Map 4) will be controlled. The preferred method of control is stem poisoning, as this avoids damage to surrounding native vegetation and allows native plants to regenerate and replace the poisoned trees as they slowly die and collapse.
3. All ecological weeds listed in Table 1, except gorse and broom, will be controlled throughout the KNE site if discovered by operational staff when carrying out other tasks or after being reported by the public.

**Pest animal control**

Possums will be controlled to keep the overall possum population density below 5% RTC (residual trap catch). Currently this is being achieved throughout most of the KNE site (see operational area N, Appendix 1, Map 4) through control operations carried out by TBfree New Zealand (TBfree NZ). This is part of the national strategy to eradicate bovine tuberculosis from New Zealand. Possums are the main vectors of bovine tuberculosis and in order to control the disease, TBfree NZ control possums in areas where the disease has been found in wildlife or cattle or deer herds. The Pakuratahi KNE site is one of these areas.

This possum control involves a combination of aerielly-sown 1080 (sodium fluoroacetate) and ground-based trapping and poisoning which are generally carried out at five-yearly intervals. The next control operation may take place in the winter of 2017, requiring planning to take place in 2016/17. TBFree NZ will determine exactly when another operation is necessary based on a number of factors including the results of possum population monitoring. This work will be wholly financed by TBFree NZ but is likely to require the input of a small amount of time by GWRC staff to assist with planning and communications.

TBFree NZ may eradicate bovine tuberculosis in this area in the future, at which time they are likely to cease possum control. This isn't expected to occur during the period of this plan, but when it does, the area will become part of the GWRC Regional Possum and Predator Control Programme. This will involve maintaining the possum population at low levels up to 5% RTC.

Possums will be controlled in operational area O (see Appendix 1, Map 5) on an ongoing basis through the use of kill traps. This small network of traps protects the rare podocarp-tawa forest located in the Tunnel Gully recreation area. This area is excluded from the TBFree NZ possum control to avoid the risk posed to dogs by the control methods used in those operations. Rat traps are deployed in the vicinity of the possum traps to reduce rat interference with the baits on the possum traps. These traps aren't expected to provide any significant decrease in the overall rat population in this area or the KNE site as a whole. Members of UHF&B will carry out this work with the support of the GWRC Parks and Biosecurity departments.

Monitoring of rat and mustelid (ferret, stoat and weasel) populations after possum control operations at other similar sites has shown that aerial 1080 operations also control these species to very low levels. However, this effect is short-lived, with populations returning to pre-control levels within eighteen months<sup>12</sup>. Native plants and animals may still benefit in the long term from these periods of reduced threat.

Feral goats and deer will be culled annually to reduce the populations of each to a level at which a professional hunter can destroy no more than one goat or deer per eight hours of hunting on foot, or five goats or deer per hour of hunting from a helicopter. This work will utilise a combination of ground-based and aerial hunting methods to target areas most frequented by the two species. Forty days of ground-based hunting and two hours of aerial hunting will be carried out. "Judas" goats attached with radio tracking collars may be used to find mobs of goats, which would then be culled, and helicopter transportation of hunters to and from remote locations will be used if required.

### **Community engagement**

An effort will be made to increase local community awareness of the site's biodiversity values and increase community involvement at Pakuratahi. This will be achieved by including biodiversity content in the GWRC Great Outdoors Summer Events programme and through the use of local media when opportunities arise.

### **Revegetation**

No revegetation is planned within the KNE site during the period of the plan. However, if revegetation is planned in the future for either biodiversity protection or amenity

development purposes, species will be chosen from the indigenous plant species list contained in the resource statement for the site<sup>13</sup>. Planting guidance may be taken from the unpublished report “Pakuratahi Forest, plants recommended for amenity and/or restoration<sup>14</sup>. Plant selection could favour threatened species or species uncommon within the site to increase numbers of these species. Examples of these are Kirk’s daisy, raukawa (*Raukawa edgerleyi*) and southern rata (*Metrosideros umbellata*). Additionally, species that are thought to have originally been present in the KNE site but have since been eliminated could also be used.

### Other activities

Biosecurity guidelines<sup>15</sup> will be used by all GWRC personnel when entering and working in the KNE site. Procedures involve checking for and removing seeds and plant fragments from vehicles, equipment and clothing before entering the site. Operators working in the adjacent plantation forests and needing to travel through the KNE site, such as silviculture crews, harvesters and trucking company personnel will also be requested to follow these guidelines.

A condensed and more specific version of the guidelines will be developed for hunters, trappers and researchers who hold permits for these activities. These guidelines will be issued with permits and also given to trappers when the opportunity arises.

GWRC operational staff will follow procedures designed to identify and avoid damage to biodiversity values such as plant and animal communities. This will limit risks to these values that could occur while planning and carrying out the construction and maintenance of assets, and when permitting the use of the KNE site by other users.

To reduce the risk of uncontrolled fires occurring in the KNE site, the present policy of no open fires will be continued. This policy is communicated to users through the park information brochure and the Parks Network Plan<sup>16</sup>. Wilderness camping is permitted with cooking on gas cookers only.

The collection of natural materials and research activities in the KNE site is managed by a permit system run by the Environmental Science department. However, illegal collection of native plants and animals occurs occasionally. This includes some species of native tree, which are valued for domestic uses such as fence building and for firewood, as well as some rare plants, lizards and invertebrates, which are sought after by collectors and traders. The Park Ranger will watch for this activity while carrying out other duties within the forest.

## 4. Operational plan

The operational plan shows the actions planned to achieve the stated objectives for the Pakuratahi KNE site, and their timing and cost over the three-year period from 1 July 2014 to 30 June 2017. 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. Maps of operational areas are included in Appendix 1 (see Maps 3, 4 and 5).

Table 2: Three-year operational plan for the Pakuratahi KNE site.

Objective	Threat	Activity	Operational area	Delivery	Description/detail	Target	Timetable and resourcing		
							2014/15	2015/16	2016/17
1,2,3	EW-1 EW-2 EW-3 EW-4	Ecological weed control	A, B, C, D, E, F, G, H	GWRC Biosecurity department	Control hakea, tradescantia, periwinkle, Japanese honeysuckle, pampas, old man's beard and buddleia at historic infestation sites	All plants controlled	\$6,500	\$6,500	\$6,500
1,2,3	EW-5	Ecological weed control	I	GWRC Biosecurity department	Control gorse and broom on the Climie ridgeline (North Climie to Climie No 2)	All plants controlled	\$1,500	\$1,500	\$1,500
1,2,3	EW-6	Ecological weed control	J	GWRC Biosecurity department	Control perennial nettle at the summit yards	All plants controlled	\$700*	\$700*	\$700*
1,2,3	EW-7	Ecological weed control	K	GWRC Biosecurity department	Check for surviving <i>Pinus contorta</i> and control all plants found	Site inspected and all plants controlled	Nil	\$1,000	Nil
1,2,3	EW-8	Ecological weed control	M	GWRC Biosecurity department	Control wilding pines	Reduction in distribution	\$4,000	\$3,000	\$4,000

Objective	Threat	Activity	Operational area	Delivery	Description/detail	Target	Timetable and resourcing		
							2014/15	2015/16	2016/17
1,2,3	EW-9	Ecological weed control	Entire KNE site	GWRC Biosecurity department	Control hakea, tradescantia, periwinkle, Japanese honeysuckle, pampas, old man's beard, buddleia, cotoneaster, hawthorn, holly and willow discovered through casual observations and reports	Reduction in distribution	\$1,000	\$1,000	\$1,000
1,2,3,4,5	PA-1	Pest animal control	N	TBfree NZ	Control possums using aerial 1080, bait stations and traps	Maintain possum population to below 5% RTC**	Funded by TBfreeNZ	Funded by TBfreeNZ	Funded by TBfreeNZ
1,2,3,4,5	PA-1	Pest animal control	O	UHF&B and GWRC Parks department	Control possums using kill traps located off Tane's Track	Maintain possum population to below 5% RTC**	\$100	\$100	\$100
1,2,3	PA-2 PA-3	Pest animal control	Entire KNE site	GWRC Biosecurity department	Control goats and deer, focussing on preferred habitats, using ground-based and aerial methods (40 days ground hunting and two hours helicopter hunting)	Maintain goat and deer populations to below 1 animal/hunter day or 5 animals/helicopter hunting hour	\$20,200	\$20,200	\$20,200
1,2,3	HA-1	Human activities	Entire KNE site	GWRC Parks, Biodiversity, Biosecurity & Environmental Science departments	Ensure ecological weed biosecurity guidelines are adhered to while carrying out all management activities	Guidelines available and adhered to in all cases	Nil	Nil	Nil
1,2,3,4,6,7	HA-2	Human activities	Plantation forestry margins	GWRC Biodiversity department	Request commercial forestry operators to follow ecological weed biosecurity guidelines	Guidelines supplied to commercial forestry operators	Nil	Nil	Nil



Objective	Threat	Activity	Operational area	Delivery	Description/detail	Target	Timetable and resourcing		
							2014/15	2015/16	2016/17
1,2,3,6,7	HA-3	Human activities	Entire KNE site	GWRC Biodiversity & Parks departments	Distribute ecological weed biosecurity guidelines to all permit holders through the existing permit systems, and to tramping groups when opportunities arise	Biosecurity guidelines disseminated to all permit holders, and to trampers when possible	Nil	Nil	Nil
1,2,3,4,5,6,7	HA-4	Human activities	Human activities	GWRC Parks department	Environmental impact assessment procedures are adhered to when carrying out construction and maintenance of assets, and allowing use by others	Procedures available and adhered to in all cases	Nil	Nil	Nil
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
1,2,3,4,5	HA-6	Human activities	Entire KNE site	GWRC Parks department	Continue to communicate policy of no open fires being allowed in the KNE site through the park brochure and signage	No human induced wild fires occur	Nil	Nil	Nil
1,2,3,5	HA-7	Human activities	Entire KNE site	GWRC Parks department	Park Ranger is alert to illegal plant and animal collecting activities during patrols	No illegal collection occurs	Nil	Nil	Nil
					<b>Total</b>	<b>Total</b>	<b>\$34,000</b>	<b>\$34,000</b>	<b>\$34,000</b>

\*Funded by GWRC Biosecurity department. This plant is a total control species under the Regional Pest Management Strategy.

\*\* RTC = Residual trap catch

## 5. Funding summary

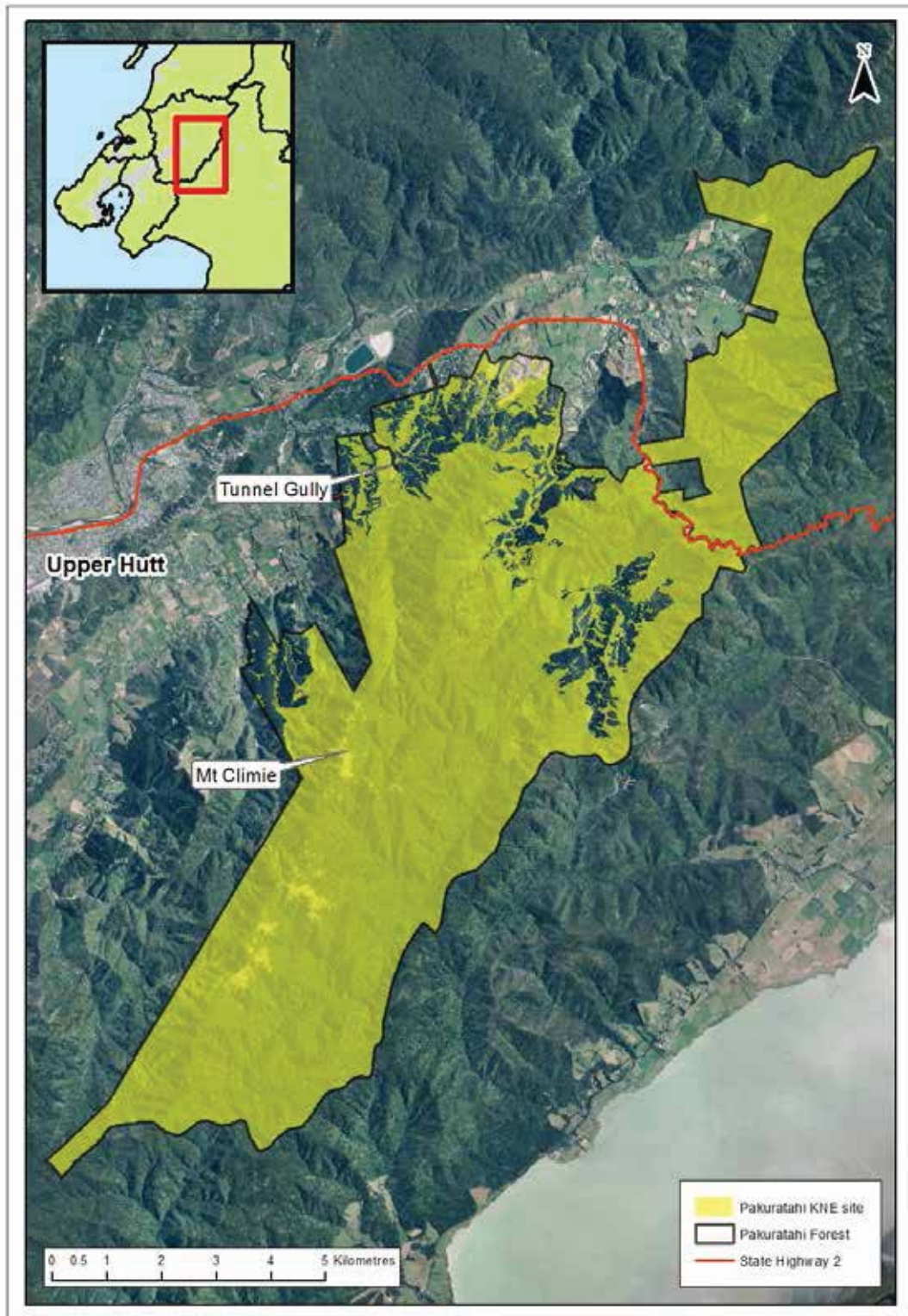
### GWRC budget

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.

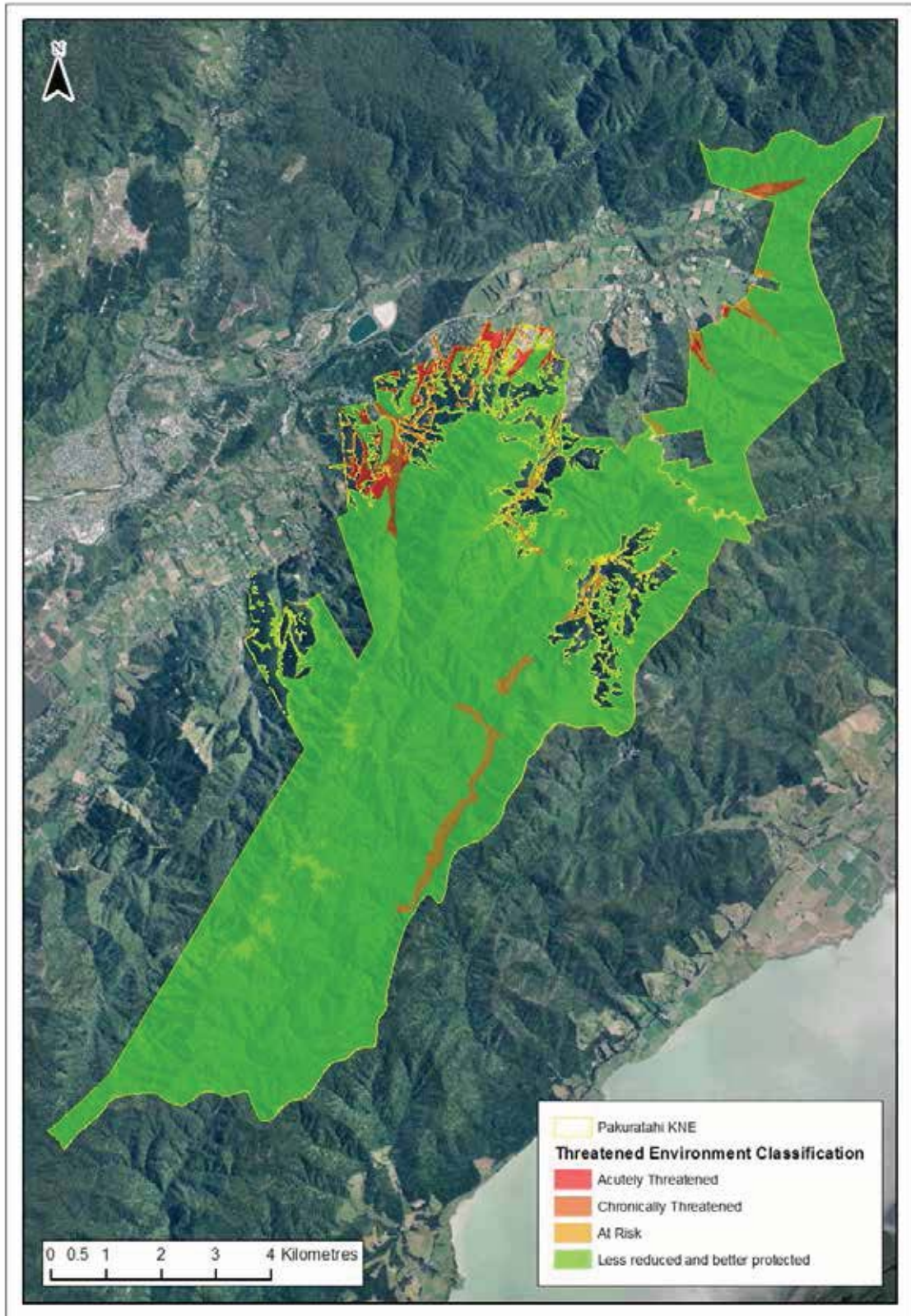
**Table 3: GWRC allocated budget for the Pakuratahi KNE site.**

Management activity	Timetable and resourcing		
	2014/15	2015/16	2016/17
Pest plant control	\$13,700	\$13,700	\$13,700
Pest animal control	\$20,300	\$20,300	\$20,300
<b>Total</b>	<b>\$34,000</b>	<b>\$34,000</b>	<b>\$34,000</b>

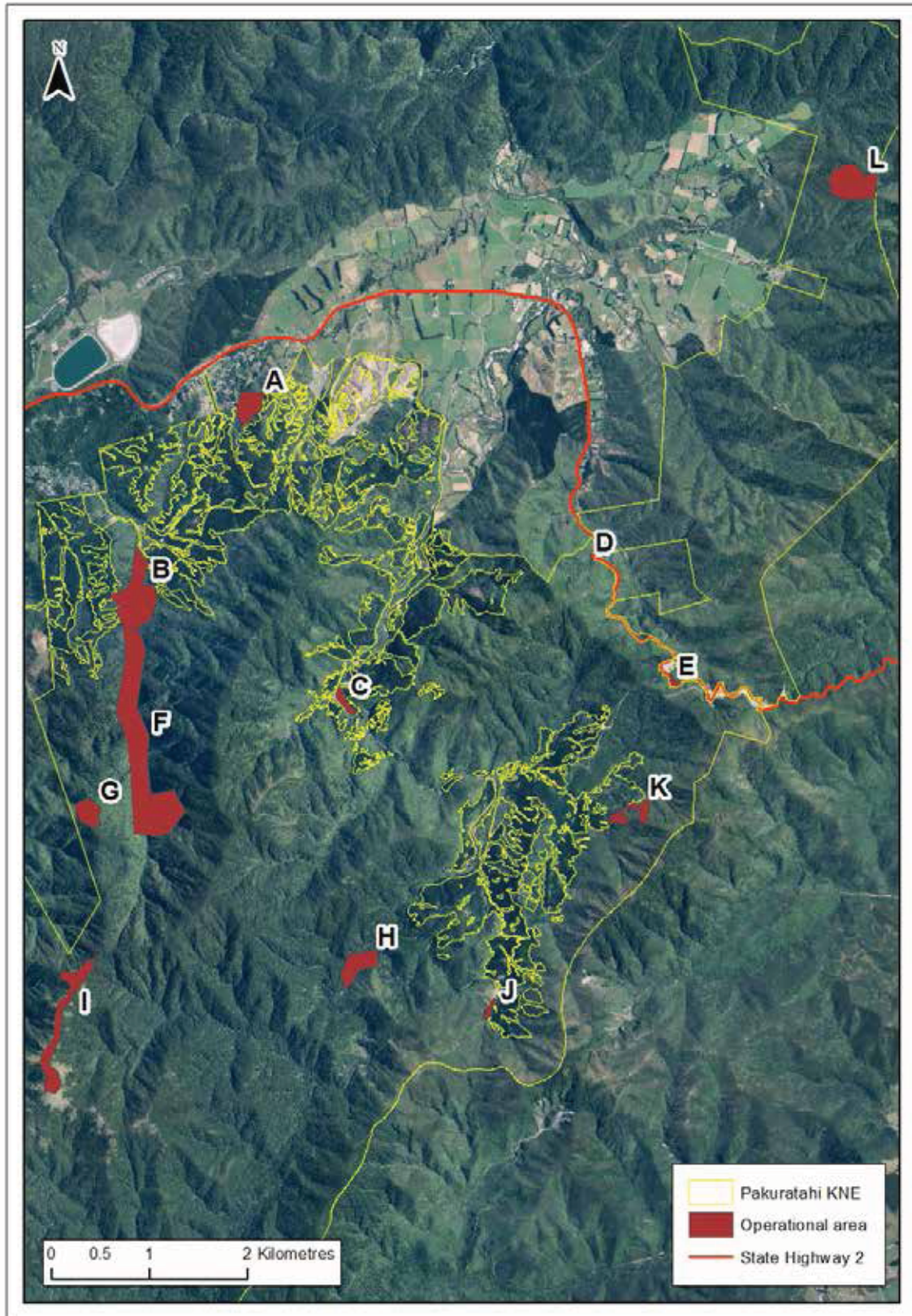
## Appendix 1: Site maps



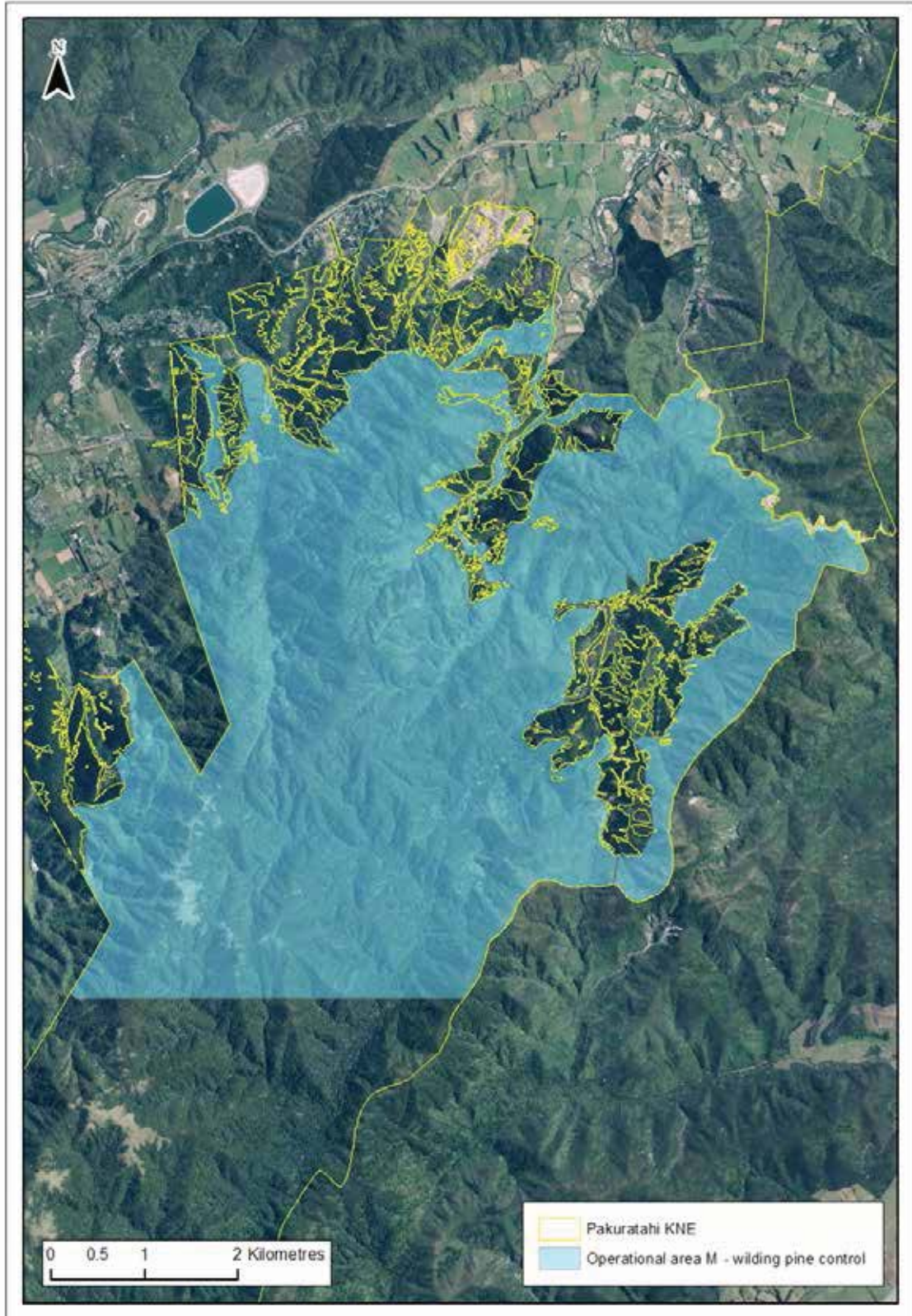
Map 1: Pakuratahi KNE site boundary. The Pakuratahi KNE site does not include areas of commercial exotic forest located within GWRC's Pakuratahi Forest management area.



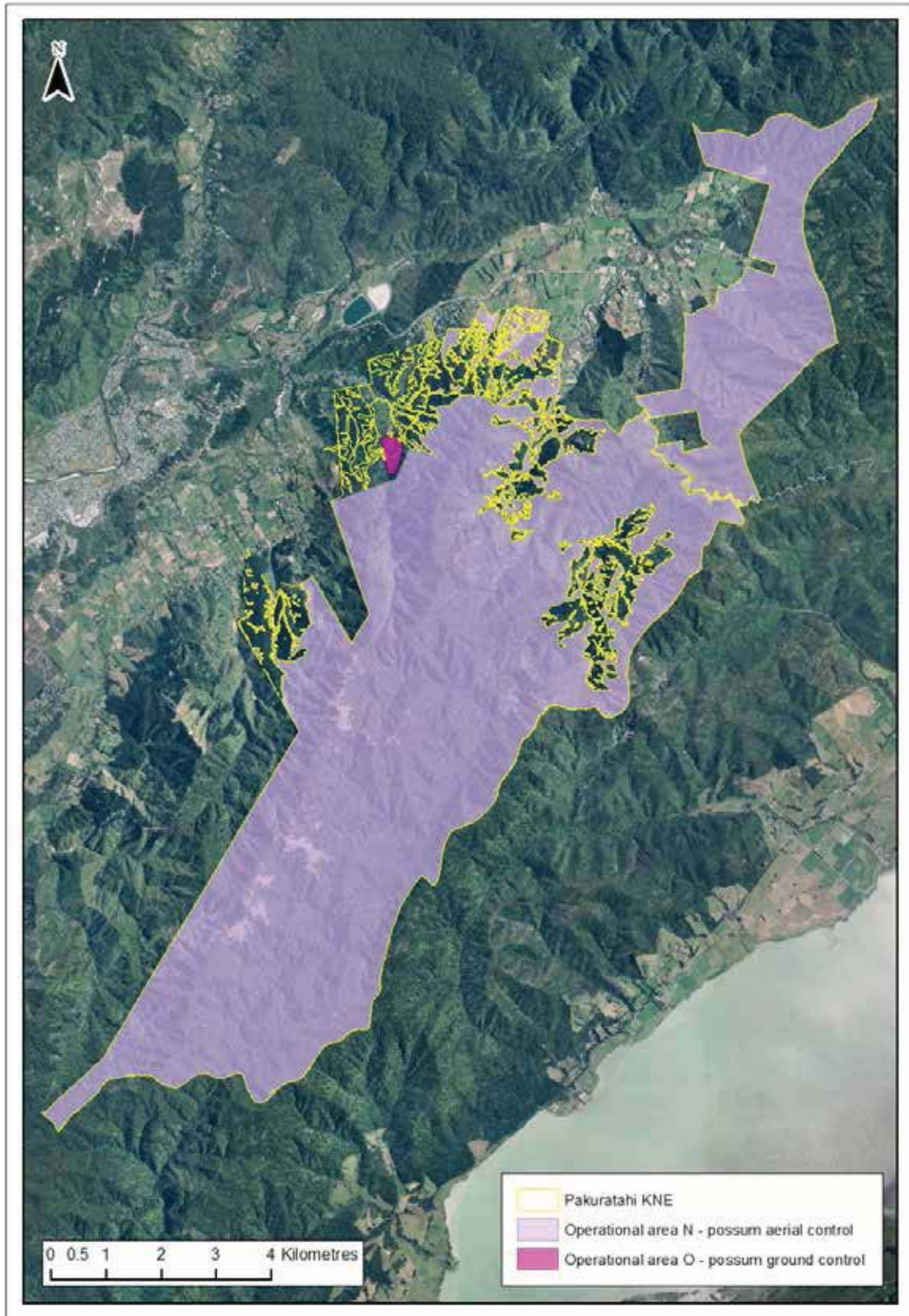
Map 2:Threatened Land Environment New Zealand classification map for the Pakuratahi KNE site.



Map 3: Operational areas A to L for ecological weed control in the Pakuratahi KNE site.



Map 4: Operational area M for wilding pine control in the Pakuratahi KNE site.



Map 5: Operational areas N and O for possum control in the Pakuratahi 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 (plants, reptiles, etc.) is assessed over a three-year cycle<sup>17</sup> with the exception of birds that are assessed on a five-year cycle<sup>18</sup>. 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 species that are known to live within the KNE site.

**Table 4: Threatened species at the Pakuratahi KNE site.**

Scientific name	Common name	Threat status	Source
<b>Plants (vascular)<sup>19</sup></b>			
<i>Brachyglottis kirkii</i> var. <i>kirkii</i>	Kirk's daisy	Declining	GWRC 2008 <sup>20</sup>
<i>Plumatochilus tasmanica</i>	Greenhood orchid	Nationally Vulnerable	GWRC 2008
<b>Birds<sup>21</sup></b>			
<i>Acanthisitta chloris</i>	Rifleman	Declining	<a href="http://ebird.org/content/new-zealand/">http://ebird.org/content/new-zealand/</a> (accessed 22/01/2014)
<i>Anthus novaeseelandiae</i>	New Zealand pipit	Declining	<a href="http://ebird.org/content/new-zealand/">http://ebird.org/content/new-zealand/</a> (accessed 22/01/2014)
<i>Falco novaeseelandiae</i>	New Zealand falcon	Nationally vulnerable	<a href="http://ebird.org/content/new-zealand/">http://ebird.org/content/new-zealand/</a> (accessed 22/01/2014)
<b>Reptiles<sup>22</sup></b>			
<i>Naultinus punctatus</i>	Wellington green gecko	Declining	GWRC Reptile distribution database
<b>Freshwater fish<sup>23</sup></b>			
<i>Anguilla dieffenbachii</i>	Longfin eel	Declining	GWRC NZ Freshwater Fish database
<i>Galaxias brevipinnis</i>	Kōaro	Declining	GWRC NZ Freshwater Fish database
<i>Galaxias divergens</i>	Dwarf galaxias	Declining	GWRC NZ Freshwater Fish database
<i>Gobiomorphus huttoni</i>	Redfin bully	Declining	GWRC NZ Freshwater Fish database



## References

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- <sup>1</sup> Greater Wellington Regional Council. 2010. Biodiversity Strategy 2011-21.
- <sup>2</sup> Greater Wellington Regional Council. 2010. Parks Network Plan.
- <sup>3</sup> Greater Wellington Regional Council. 2010. Parks Network Plan.
- <sup>4</sup> McEwen M. (compiler) 1987. Ecological Regions and Districts of New Zealand. *New Zealand Biological Resources Centre Publication No. 5*. Department of Conservation, Wellington.
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- <sup>6</sup> Singers NJD, Rogers GM. 2014. A classification of New Zealand's terrestrial ecosystems. Science for Conservation 325, Department of Conservation.
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- <sup>8</sup> Froude VA. 2004. Ecological Assessment of Selected Ridges in Pakuratahi Forest – Mount Climie Area, Report for Greater Wellington Regional Council
- <sup>9</sup> Greater Wellington Regional Council reptile distribution database.
- <sup>10</sup> Allibone R, David B, Hitchmough R, Jellyman D, Ling N, Ravenscroft P, Waters J. 2010. Conservation status of New Zealand freshwater fish, 2009. *New Zealand Journal of Marine and Freshwater Research* 44: 271-287.
- <sup>11</sup> Greater Wellington Regional Council. New Zealand Fresh Water Fish Database. Accessed May 2014.
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- <sup>15</sup> National Pest Control Agencies. 2013. Keep it Clean. Machinery hygiene guidelines & logbook to prevent the spread of pests and weeds.
- <sup>16</sup> Greater Wellington Regional Council. 2010. Parks Network Plan.
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- <sup>18</sup> Hugh Robertson, Department of Conservation, pers comm 2015.
- <sup>19</sup> Lange P, Rolfe J, Champion P, Courtney S, Heenan P, Barkla J, Cameron E, Norton D, Hitchmough R 2013. Conservation status of New Zealand indigenous vascular plants, 2012. *New Zealand Threat Classification Series* 3. 70p.
- <sup>20</sup> Greater Wellington Regional Council. 2008. Regional Forest Lands Resource Statement, Volume One – Physical Environment.
- <sup>21</sup> Robertson H, Dowding J, Elliot G, Hitchmough R, Miskelly C, O'Donnell C, Powlesland R, Sagar P, Scofield P, Taylor G. 2013. Conservation status of New Zealand birds, 2012. *New Zealand Threat Classification Series* 4. 22p.
- <sup>22</sup> Hitchmough R, Anderson P, Barr B, Monks J, Lettink M, Reardon J, Tocher M, Whitaker T. 2013. Conservation status of New Zealand reptiles, 2012. *New Zealand Threat Classification Series* 2. 16p.
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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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