

# Key Native Ecosystem Plan for Te Horo Forest Remnants

2016-2019



greater WELLINGTON  
REGIONAL COUNCIL  
Te Pane Matua Taiao







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## 1. Key Native Ecosystem programme

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

Greater Wellington Regional Council's (GWRC) Biodiversity Strategy<sup>1</sup> sets a framework that guides how GWRC protects and manages biodiversity in the Wellington region to work towards the vision below.

### GWRC's vision for biodiversity

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

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

### Goal One

Areas of high biodiversity value are protected or restored

The KNE programme is a non-regulatory voluntary programme that seeks to protect some of the best examples of original (pre-human) ecosystem types in the Wellington region by managing, reducing, or removing threats to their ecological values. Sites with the highest biodiversity values have been identified and prioritised for management. 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 the GWRC's Biodiversity department in collaboration with the landowners and other stakeholders. 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. Te Horo Forest Remnants Key Native Ecosystem

The Te Horo Forest Remnants KNE site (~24ha) is located 2km east of SH 1 at Ōtaki township in Kāpiti District. It comprises five forest remnants located on uplifted alluvial river terraces to the south of the Ōtaki River and is within the Manawatu Ecological District<sup>2</sup>. These remnants are predominately dominated by tōtara/mataī forest with interspersed patches of broadleaf/kohekohe/tawa forest. See Appendix 1, Map 1 for the KNE site location.

The five forest remnants are known as Tom’s or Ainslee’s Bush (7.5ha); Lumsden Bush (1.8ha); Davis’s Bush (1.8ha); Empson Bush (0.8ha) and Duggan’s Bush (12ha). The forest remnants are all sited no more than 1km from each other and are within a working dairy farm and lifestyle block landscape.

The remnants provide important habitat for native forest birds in particular, but also for the dispersal of native plants and other native animals. These forest remnants are an important part of the wider landscape as ecological ‘stepping stones’ within an otherwise agricultural landscape. This ‘stepping stone’ network includes other tōtara/mataī forests remnants on the Te Horo plain such as the Kiripiti Scenic Reserve, Cobbs Bush, and other KNE sites including the Ōtaki Coast and Haruātai-Pareomatangi wetlands.

## 3. Landowners, management partners and stakeholders

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

### 3.1. Landowners

All five forest remnants are privately owned. The majority landowner owns all of Tom’s Bush, Lumsden Bush, Davis’s Bush and Empson Bush. The remaining remnant, Duggan’s Bush, is collectively owned by five separate private landowners, including the majority landowner.

### 3.2. Management partners

The management partners of the Te Horo Forest Remnants KNE site are the private landowners, Queen Elizabeth II National Trust (QEII), Kāpiti Coast District Council (KCDC) and GWRC.

The landowners (supported by GWRC, KCDC and QEII) have undertaken and agreed to additional and substantial ecological weed control in many of the forest remnants. Furthermore, several remnants have been fenced off and protected from stock incursion for several years. This has allowed natural regeneration of the forest. In 2008 GWRC and QEII, in partnership with the landowner, fenced off the majority of Tom’s

Bush. Pest animal traps and bait stations set up across the KNE site in 2015/16 by GWRC are currently maintained by the private landowners.

Within GWRC, the management partners are the Biodiversity and Biosecurity departments. The Biodiversity department is the overarching lead department for GWRC on the coordination of biodiversity management activities and advice within the KNE site. The Biosecurity department coordinates and carries out pest control activities.

KCDC works with landowners providing grants (on application), rates remissions and advice on protective and restorative management. They also own the evergreen buckthorn road reserve weed buffer area (operational area G, refer to Appendix 1, map 2) in which ecological weed control is undertaken to prevent weed invasion into the KNE site.

### **3.3. Stakeholders**

The GWRC Flood Protection department manages the adjoining Ōtaki river lower terrace weed buffer (0.4ha, operational area F). The ecological weed control operations undertaken within it protects the adjoining Duggan's Bush.

NZTA are also stakeholders as a significant mitigation restoration project has been earmarked for land within the KNE site. The details and timing have not been finalised.

The Ōtaki Historical Society have an interest in main river terrace remnant (Duggan's Bush) as a network of stone walls built by relief workers in the depression era are still present. This site is in the process of being covenanted with QEII.



## 4. Ecological values

This section describes the various ecological components and attributes that make the KNE site important. These factors determine the site's value at a regional scale and how managing it contributes to the maintenance of regional biodiversity.

### 4.1. Ecological designations

Table 1, below, lists ecological designations at all or part of Te Horo Forest Remnants KNE site.

**Table 1: Designations at the Te Horo Forest Remnants KNE site**

Designation level	Type of designation
District	<p>Most of the KNE site has been identified by Kāpiti Coast District Council as Sites of Ecological Significance (SES):</p> <ul style="list-style-type: none"> <li>• <i>KO 28 Otaki River Bush A</i> (Duggan's Bush)</li> <li>• <i>KO 30 Gorge Road Bush A</i> (Davis's Bush)</li> <li>• <i>KO 36 Empsons</i> (Tom's or Ainslee Bush)</li> <li>• <i>KO 45 Gorge Road Bush B</i> (Lumsden Bush)</li> </ul> <p>Parts of the KNE site are listed in DOC's Manawatu Plains Ecological District Recommended Areas for protection (RAP):</p> <ul style="list-style-type: none"> <li>• <i>RAP 4 Ainslee Bush</i> (4.7ha) (Tom's Bush)</li> <li>• <i>RAP 5 Kirkwell Bush</i> (5.6ha) (Duggan's Bush)</li> </ul>
Other	<p>One of the properties is covenanted with QE II National Trust:</p> <ul style="list-style-type: none"> <li>• <i>Hobbs (1.14ha) - QEII Covenant 5-07-369</i> (part of Duggan's Bush)</li> </ul> <p>Four other areas are in process of being covenanted with QEII (Lumsden Bush, Davis's Bush, Tom's Bush and another part of Duggan's Bush)</p>

### 4.2. Ecological Significance

The Te Horo Forest Remnants KNE site is considered to be of regional importance because:

- It contains highly **representative** ecosystems that were once typical or commonplace in the region
- It contains ecological features that are **rare or distinctive** in the region
- Its **ecological context** is valuable at the landscape scale as it contain a variety of inter-connected habitats and, provides seasonal habitat for native bird species within the KNE site.

#### Representativeness

The entire Te Horo Forest Remnants KNE site is identified by the Land Environments New Zealand (LENZ) classification system as being in the highest threatened land environment category, Acutely Threatened.

The Singers and Rogers (2014)<sup>3</sup> classification of pre-human vegetation indicates the Te Horo Forest Remnants KNE site comprised two original ecosystem forest types with elements that are still present onsite today. These original ecosystem types are:

- Tōtara, matai, ribbonwood forest (WF2) located on recent alluvial terraces with free-draining stony and alluvial soils (Tom’s Bush, Duggan’s Bush and Davis’s Bush)
- Kohekohe/tawa forest (MF6) located on the older alluvial terraces (Lumsden Bush and Empson Bush).

The three pockets of tōtara, matai, and ribbonwood forest have been identified as being an extremely rare forest type (WF2 albeit in modified secondary form) with only an estimated 2.2% of its original extent left in the region<sup>4,5</sup>. There is also only 15% of kohekohe/tawa forest (MF6) left in the region.

### Rarity/distinctiveness

There is one nationally threatened plant species and one nationally threatened lizard species recorded from the site (See Appendix 2).

### Ecological context

The forest remnants are ecological ‘stepping stones’ for native birds across the Te Horo plains and between the Tararua foothills and other KNE sites (Otepua-Paruāuku, Haruātai-Pareomatangae and Ōtaki Coast) located within 5km of the Te Horo Forest Remnants KNE site. There are several smaller tōtara/matai remnants in the wider landscape that are part of the ‘stepping stone’ network. The KNE site also lies within the natural wildlife corridor linking Pukaha/Mount Bruce, the Project Kaka area within the Tararua ranges and Kāpiti Island.

## 4.3. Ecological features

### Habitats (vegetation)

The Te Horo Forest Remnants KNE site is dominated by secondary tōtara/matai forest modified by grazing. The other major forest type is kohekohe/titoki/tawa forest which is interspersed amongst the tōtara/matai forest. In areas more recently retired from grazing, regeneration of a wide range of species including divaricating *Coprosma* species and lemonwood (*Pittosporum eugenoides*) is occurring.

### Species

#### Birds

Waxeye (*Zosterops lateralis*), fantail (*Rhipidira fuliginosa*) grey warbler (*Gerygone igata*) tūi (*Prosthemadera novaeseelandiae*), kererū (*Hemiphaga novaeseelandiae*), paradise shelduck (*Tadorna variegata*), bellbird (*Anthornis melanura*), swamp harrier (*Circus approximans*), morepork (*Ninox novaeseelandiae*) and pūkeko (*Porphyrio melanotus*) have been observed within the KNE site by various landowners.

### **Plants**

Duggan's Bush contains the largest self sustaining natural population of akeake (*Dodonaea viscosa*) in the Kāpiti district<sup>6</sup>. Large hybridising populations of wharangi (*Melicope ternata*) and poataniwha (*Melicope simplex*) are occurring in several of the remnants. Uncommon in the Kāpiti lowlands, a single white maire (*Nestegis lanceolata*) is located on the edge of the Lumsden Bush.

### **Reptiles**

An ornate skink (*Oligosoma ornatum*) was recorded in Tom's Bush in 1995<sup>7</sup>.

## 5. Threats to ecological values at the KNE site

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

### 5.1. Key threats

The key threats are ecological weeds, pest animals and edge effects. Ecological weeds are widespread and abundant throughout the KNE site. These can displace indigenous vegetation and affect the structure and composition of ecosystems.

Pest animals such as mustelids (*Mustela* spp.), feral cats (*Felis catus*), and rats (*Rattus* spp.) are the biggest threats to forest birds and other native fauna whilst, possums (*Trichosurus vulpecula*) adversely impact native flora by over-browsing on native vegetation.

The fragmented and modified nature of the forest remnants means they are at greater risk from the impacts of edge effects. These impacts included increased light and wind into the interior of the forest remnants and pest invasion.

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

**Table 2: Summary table of all threats to ecological values present at the Te Horo Forest Remnants KNE site**

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
<b>Ecological weeds</b>		
EW-1	Climbing weeds such as banana passionfruit ( <i>Passiflora</i> spp.), old man's beard ( <i>Clematis vitalba</i> ) and climbing asparagus ( <i>Asparagus scandens</i> ) smother and displace native vegetation often causing canopy collapse, inhibit indigenous regeneration, and alter vegetation structure and composition (for full weed species list see Appendix 3, Table 8).	Entire KNE site
EW-2	Woody weed species such as evergreen buckthorn ( <i>Rhamnus alaternus</i> ), barberry ( <i>Berberis glauca</i> ) and non-local native plant karaka ( <i>Corynocarpus laevigatus</i> ) displace native vegetation, inhibit indigenous regeneration, and alter vegetation structure and composition (for full weed species list see Appendix 3, Table 8).	Entire KNE site

Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
EW-3	Ground covering ecological weeds such as tradescantia ( <i>Tradescantia fluminensis</i> ), ladder fern ( <i>Nephrolepis cordifolia</i> ) and agapanthus ( <i>Agapanthus praecox</i> ) smother and displace native vegetation, inhibit indigenous regeneration, and alter vegetation structure and composition (for full weed species list see Appendix 3, Table 8).	Entire KNE site
<b>Pest animals</b>		
PA-1	Hedgehogs ( <i>Erinaceus europaeus</i> ) prey on native invertebrates <sup>8</sup> , lizards <sup>9</sup> and the eggs <sup>10</sup> and chicks of ground-nesting birds <sup>11</sup> .	Entire KNE site
PA-2*	House mice ( <i>Mus musculus</i> ) browse native fruit, seeds and vegetation, and prey on invertebrates. They compete with native fauna for food and can reduce forest regeneration. They also prey on invertebrates, lizards and small eggs and nestlings <sup>12,13</sup> .	Entire KNE site
PA-3	Possums ( <i>Trichosurus vulpecula</i> ) browse palatable canopy vegetation until it can no longer recover <sup>14,15</sup> . This destroys the forest's structure, diversity and function. Possums may also prey on native birds <sup>16</sup> and invertebrates.	Entire KNE site
PA-4	Rats ( <i>Rattus</i> spp.) browse native fruit, seeds and vegetation. They compete with native fauna for food and can reduce forest regeneration. They also prey on invertebrates, lizards and native birds <sup>17,18</sup> .	Entire KNE site
PA-5	Mustelids (stoats <sup>19,20</sup> ( <i>Mustela erminea</i> ), ferrets <sup>21,22</sup> ( <i>M. furo</i> ) and weasels <sup>23,24</sup> ( <i>M. nivalis</i> )) prey on native birds, lizards and invertebrates, reducing their breeding success and potentially causing local extinctions.	Entire KNE site
PA-6*	Feral and domestic cats ( <i>Felis catus</i> ) prey on native birds <sup>25</sup> , lizards <sup>26</sup> and invertebrates <sup>27</sup> , reducing native fauna breeding success and potentially causing local extinctions <sup>28</sup> .	Entire KNE site
PA-7	Rabbits ( <i>Oryctolagus cuniculus</i> ) and hares ( <i>Lepus europaeus</i> ) are known to graze on palatable native vegetation and prevent natural regeneration in some environments <sup>29</sup> .	Entire KNE site
PA-8*	Wasps ( <i>Vespula</i> spp.) are known to adversely impact native invertebrates and birds through predation and competition for food resources <sup>30</sup> .	Entire KNE site
PA-9	Australian magpie ( <i>Gymnorhina tibicen</i> ) can be aggressive pests and are known to scare native birds away from home territories.	Entire KNE site
<b>Human activities</b>		
HA-1	Agricultural practices, particularly grazing livestock can result in pugging soils, grazing native vegetation inhibiting regeneration, wildlife disturbance and increasing nutrient content of soils and watercourses <sup>31</sup> .	Outside KNE boundaries



Threat code	Threat and impact on biodiversity in the KNE site	Operational area/location
<b>Other threats</b>		
OT-1	Edge effects affect forest remnants by changing environmental conditions (e.g. soil moisture or temperature levels), changing physical environment (e.g. different plant assemblages compared to the interior) and changing species interactions (e.g. increased predation by invasive species) <sup>32,33,34</sup> .	Entire KNE site
OT-2*	A <i>Phytophthora</i> or plant attacking fungal species has been identified within the KNE site. First noticed in 2010, this fungus has caused many individual trees to senesce and die. Matai are particularly afflicted.	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 4), 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 2).

## 6. Management objectives

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

The following objectives will guide the management activities at the Te Horo Forest Remnants KNE site.

- 1. To improve the structure\* and function† of native plant communities**
- 2. To improve the habitat for native birds**

\* The living and non-living physical features of an ecosystem. This includes the size, shape, complexity, condition and the diversity of species and habitats within the ecosystem.

† The biological processes that occur in an ecosystem. This includes seed dispersal, natural regeneration and the provision of food and habitat for animals.

## 7. Management activities

Management activities are targeted to work towards the objectives above (Section 6) by responding to the threats outlined in Section 5. The broad approach to management activities is described briefly below, and specific actions, with budget figures attached, are set out in the operational plan (Table 4).

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

### 7.1. Ecological weed control

The objective of weed control undertaken within the KNE site is to reduce the density of weeds so to maintain native plant dominance and integrity of native plant communities. This will also facilitate natural plant regeneration.

The GWRC Biosecurity department will undertake ecological weed control annually throughout the KNE site (unless otherwise stated) targeting species that have the highest ecological impact (See Appendix 3, Table 8 for a full list of identified ecological weed species within the KNE site and their relative ecological impact rating).

All climbing weed species, in particular banana passionfruit, blackberry, and old man's beard, will be controlled annually in operational areas A-E. In addition, high impact climbing weed species will be progressively controlled from the cliff terrace buffer area (operational area F) working progressively from the forest remnant edge towards the Ōtaki river (Appendix 1, Map 2).

Woody weeds such as barberry, evergreen buckthorn, gorse and willow species will be controlled annually across the KNE site. In addition, evergreen buckthorn will be targeted for control within the road reserve buffer area (operational area G). This will help prevent re-invasion of evergreen buckthorn into the KNE site. Woody weeds will be selectively controlled in the terrace cliff buffer area (operational area F), commencing from the forest remnant edge progressively towards the Ōtaki river.

The high to very high impact of ground covering weeds such as tradescantia will be controlled annually in operational areas A-E. Low to moderate impact ground covering weeds such as alpine strawberry (*Fragaria vesca*) and Jerusalem cherry (*Solanum capsicum*) will be controlled in operational areas A-E from 2017/18.

## 7.2. Pest animal control

Pest animal control is undertaken to protect the native bird populations present within the KNE site and to protect native vegetation from over browsing.

A network of Pelifeed poison-bait stations and DOC 250 kill-traps are operating in all the remnants of the KNE site aside from a smaller property within operational area D (see Appendix 1, Map 3). Where the network is installed landowners will maintain the traps and bait stations on their respective properties on a monthly basis. GWRC will assist the landowners by undertaking an annual service of the entire network.

Private landowners will control rabbits on their own properties where possible by shooting or burrow poisoning.

Should landowners wish to control magpies on their property, magpie traps are available for loan from the Biosecurity department on request.

## 7.3. Revegetation

The aim of revegetation is to assist the development of the structure and function of native vegetation and to reduce the impacts of edge effects. A larger intact forest core has stronger overall resilience and greater long term viability than smaller fragmented forests. Revegetation will also enrich the forest remnants by planting species that are now uncommon but, would formerly have been present.

Subject to successful grant applications, KCDC could provide the major landowner with native plant species for enrichment planting in operational areas A,B,D and E. Landowners would be responsible for planting and ongoing maintenance requirements.

Plants from the following table are recommended in any revegetation planting.

**Table 3: Revegetation plant list for use within the Te Horo Forest Remnants KNE site**

Scientific Name	Common Name
<i>Alectyron exelsa</i>	Titoki
<i>Beilschmeidia tawa</i>	Tawa
<i>Dodonaea viscosa</i>	Akeake
<i>Eleocarpus dentatus</i>	Hīnau
<i>Hedycarya arborea</i>	Pigeonwood
<i>Knightia excelsa</i>	Rewarewa
<i>Nestegis lanceolata</i>	White maire
<i>Plagianthus regius</i>	Ribbonwood
<i>Pseudopanax arboreus</i>	Five -finger

Scientific Name	Common Name
<i>Pseudopanax crassifolius</i>	Lancewood
<i>Prumnopitys taxifolia</i>	Mataī
<i>Streblus banksii</i>	Large leaved milk tree

#### 7.4. Legal protection and fencing

Legal protection of private land within the KNE site is desirable to ensure that its biodiversity values are safeguarded in perpetuity. GWRC supports the protection of private land under the QEII Covenant Support programme which provides financial support toward the costs of establishing covenants with the QEII National Trust.

A small portion of the Duggan’s Bush (1.4ha, known as Hobbs’ covenant) is covenanted with QEII. QEII are in the process of covenanting and fencing off four other forest remnants; Tom’s Bush, Lumsden Bush, Davis’s Bush and Empson Bush.

#### 7.5. Peka Peka to North Ōtaki expressway resource consent conditions

As part of resource consent conditions (G. 46) for the Peka Peka to Ōtaki expressway, NZTA are required to plant at least 1.5ha of edge and inter-planting of indigenous forest species (Ecosystem Type WF2)<sup>35</sup>. Following the completion of the planting, the consent holder (NZTA) shall ensure the full area (ie, entire forest remnant where planting has been undertaken) is fenced and legally protected.

The details and timings of this work has not been finalised at the time of writing, but it is GWRC’s understanding that NZTA propose to undertake planting in and around the forest remnants of the KNE site, and this may occur within the timescale of this KNE plan.

## 8. Operational plan

The operational plan shows the actions planned to achieve the stated objectives for Te Horo Forest Remnants KNE site and their timing and cost over the three-year period from 1 July 2016 to 30 June 2019. The budget for the 2017/18 and 2018/19 years are indicative only and subject to change. A map of operational areas can be found in Appendix 1 (see Map3).

**Table 4: Three-year operational plan for the Te Horo Forest Remnants KNE site**

Objective	Threat	Activity	Operational area	Delivery	Description/detail	Target	Timetable and resourcing		
							2016/17	2017/18	2018/19
1	EW-1, EW-2	Ecological weed control (Climbers and woody weeds)	F - Cliff terrace buffer	Biosecurity department	Cut and treat and spray target climbers. Basal spay or cut and treat woody weeds	Reduction in distribution and abundance of climbers and woody weeds	\$1,000	\$1,000	\$1,000
1	EW-1, EW-2, EW-3	Ecological weed control (Climbers/ woody weeds, groundcovers)	A-E & G - road reserve buffer	Biosecurity department	Cut and treat and spray target climbers. Basal spay or cut and treat woody weeds Spray groundcovers	Reduction in distribution and abundance of climbers, woody weeds and high impact groundcovers in Year 1. In year 2 include all other groundcovers	\$3,300	\$3,300	\$3,300
1,2	PA-1, PA-3, PA-4, PA-5	Pest animal control	A-E	Landowners	Bait station and trap maintenance. All traps checked monthly	Possums <1% RTC * Rats < 10% TTI**	N/A	N/A	N/A
1,2	PA-1, PA-3, PA-4, PA-5	Pest animal control	A-E	Biosecurity department	Bait station and trap annual service and periodic bait provision and delivery. All traps checked annually	Possums <1% RTC * Rats < 10% TTI**	\$700	\$500	\$500
1	OT-1	Revegetation	Entire KNE site	KCDC	Enrichment planting	Plants provided annually	\$500^	\$500^	\$500^



Objective	Threat	Activity	Operational area	Delivery	Description/detail	Target	Timetable and resourcing		
							2016/17	2017/18	2018/19
<b>Total</b>							<b>\$5,500</b>	<b>\$5,500</b>	<b>\$5,500</b>

^ subject to continued funding by KCDC through their contestable Heritage fund.

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

## 9. Funding contributions

### 9.1. Budget allocated by GWRC

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

**Table 5: GWRC allocated budget for the Te Horo Forest Remnants KNE site**

Management activity	Timetable and resourcing		
	2016/17	2017/18	2018/19
Ecological weed control	\$4,300	\$4,300	\$4,300
Pest animal control	\$700	\$700	\$700
<b>Total</b>	<b>\$5,000</b>	<b>\$5,000</b>	<b>\$5,000</b>

### 9.2. Budget allocated by KCDC

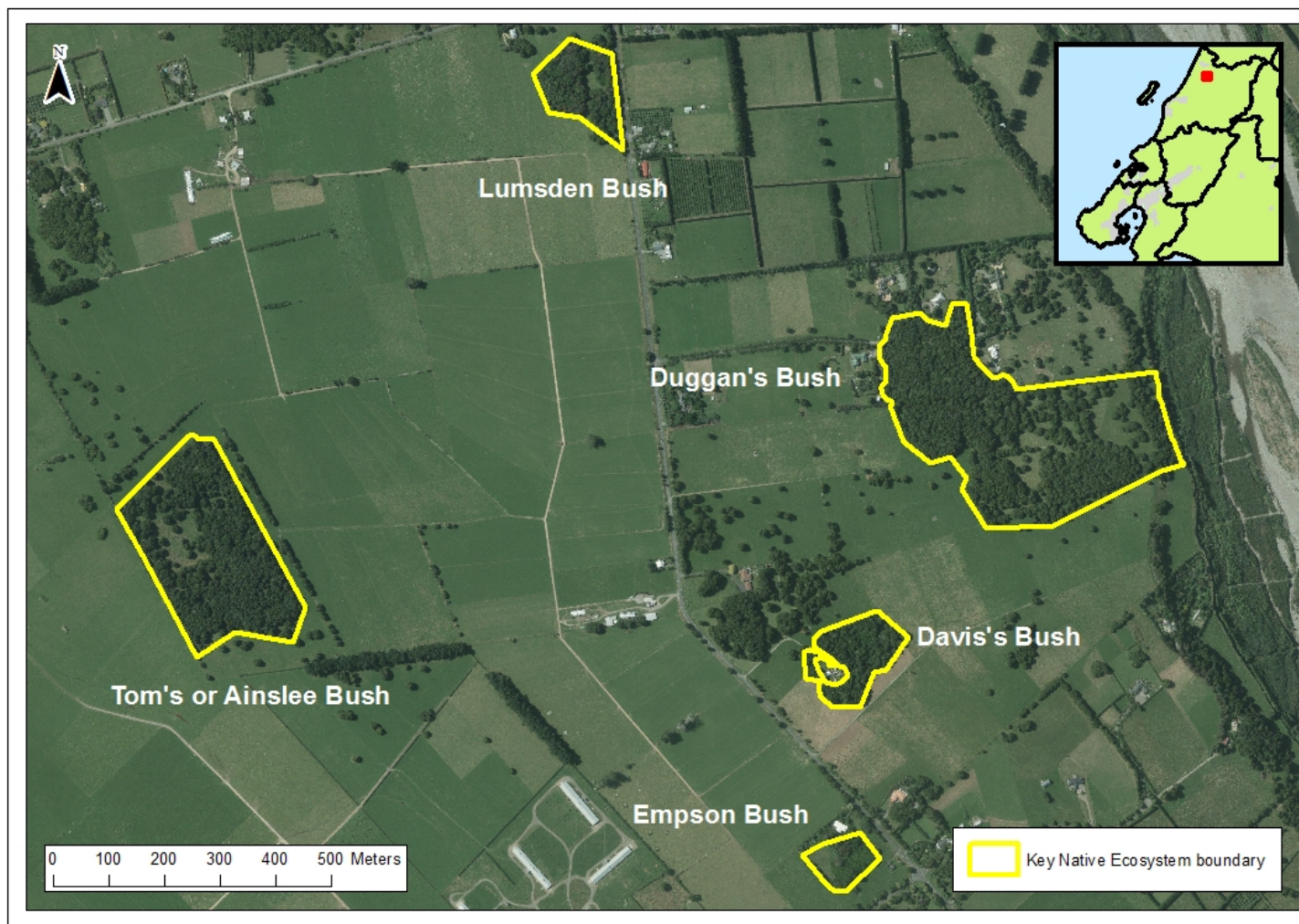
The budget is subject to confirmation through the ten year planning process.

**Table 6: Additional allocated budget for the Te Horo Forest Remnants KNE site from KCDC<sup>^</sup>**

Management activity	Timetable and resourcing		
	2016/17	2017/18	2018/19
Revegetation	\$500 <sup>^</sup>	\$500 <sup>^</sup>	\$500 <sup>^</sup>
<b>Total</b>	<b>\$500</b>	<b>\$500</b>	<b>\$500</b>

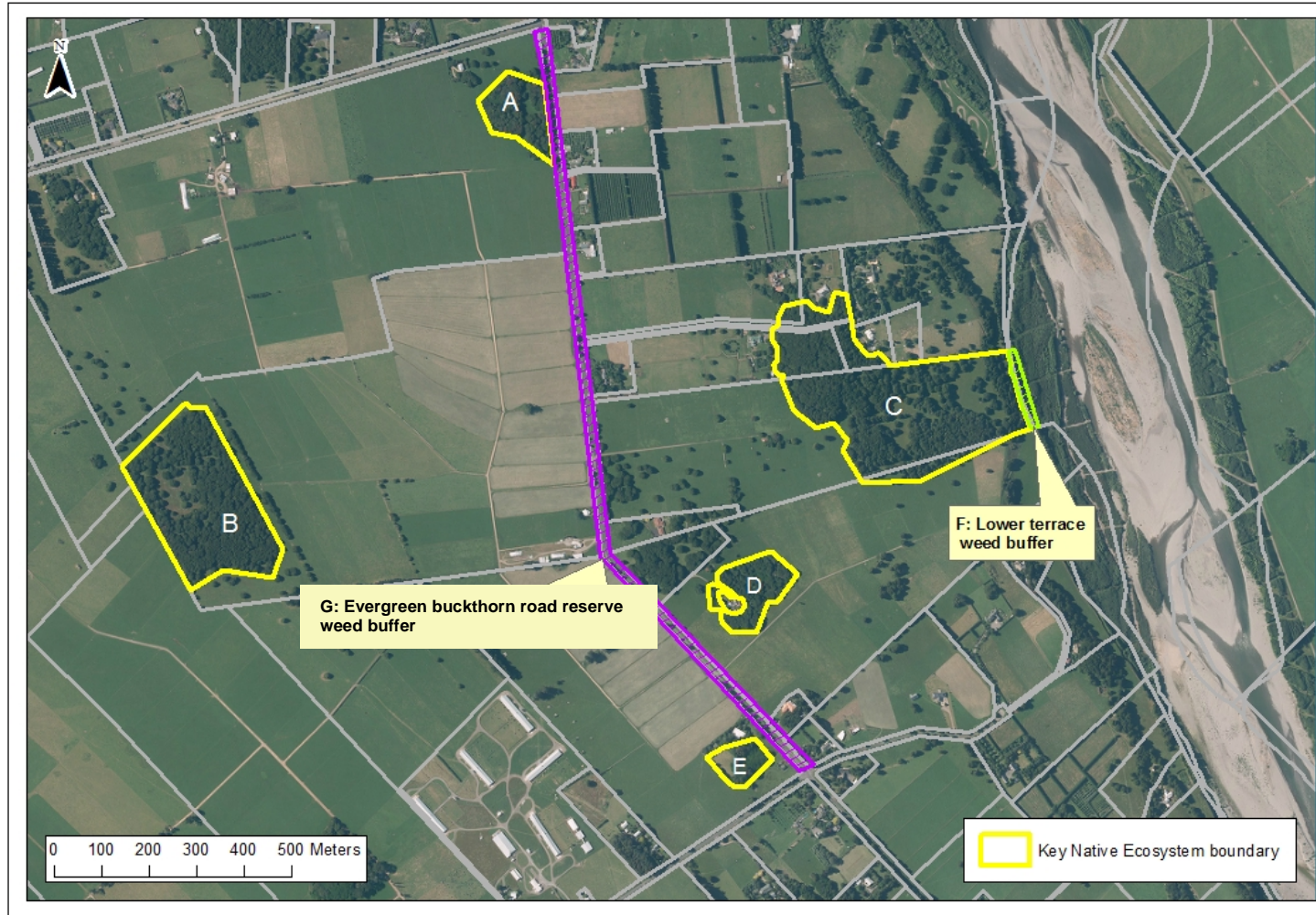
<sup>^</sup> subject to continued funding by KCDC through their contestable Heritage fund

## Appendix 1: Site maps

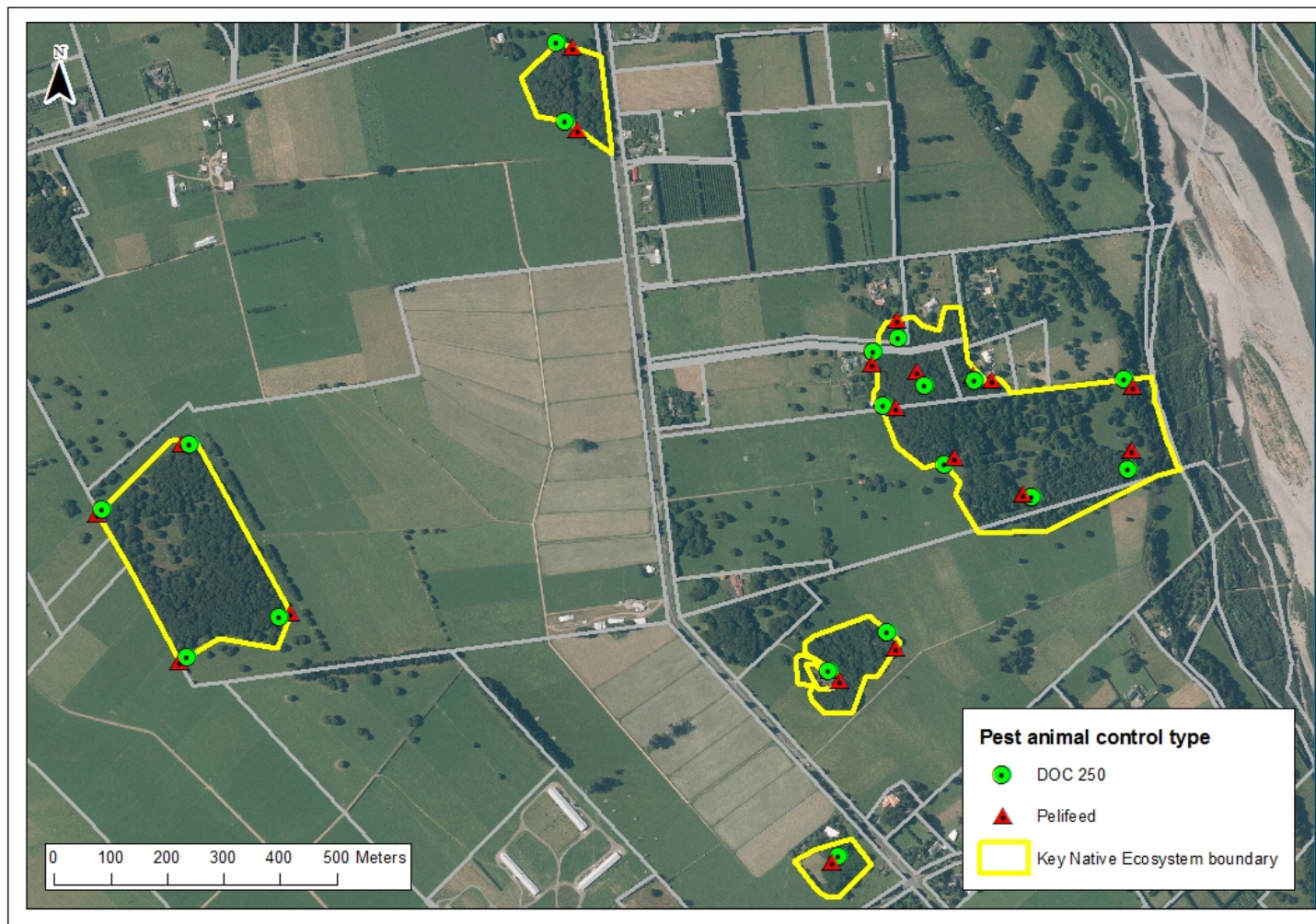


Map 1: The Te Horo Forest Remnants KNE site boundary





Map 2: Ecological weed control areas in Te Horo Forest Remnants KNE site



Map 3: Pest animal control in the Te Horo Forest Remnants KNE site



## Appendix 2: Nationally threatened species list

The New Zealand Threat Classification System lists species according to their threat of extinction. The status of each species group (plants, reptiles etc) is assessed over a three-year cycle<sup>36</sup>, with the exception of birds which are assessed on a five-year cycle<sup>37</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 and At Risk species that are resident in, or regular visitors to, the Te Horo forest remnants KNE site.

**Table 7: Threatened and At Risk species at the Te Horo Forest Remnants KNE site**

Scientific name	Common name	Threat status	Observation
<b>Plants(vascular)<sup>38</sup></b>			
<i>Streblus banksii</i>	Large-leaved milk tree	At Risk-elict	Wright 2000 <sup>39</sup>
<b>Reptiles<sup>40</sup></b>			
<i>Oligosoma ornatum</i>	Ornate skink	At Risk- gradual decline	Ravine 1995 <sup>41</sup>

### Appendix 3: Ecological weed species

The following table lists key ecological weed species that have been recorded in the Te Horo Forest Remnants KNE site.

**Table 8: Ecological weed species recorded in the Te Horo Forest Remnants KNE site**

Scientific Name	Common Name	Relative impact	Tier	Notes
<i>Agapanthus praecox</i>	Agapanthus	Low	Groundcover	Localised and abundant
<i>Asparagus scandens</i>	Climbing asparagus	High	Climber	Localised and abundant
<i>Berberis darwinii</i>	Darwin's barberry	Moderate	Woody weed	Localised and sparse
<i>Berberis glauca</i>	Barberry	Moderate	Woody weed	Few plants
<i>Chlorophytum comosum</i>	Spider plant	Low	Groundcover	Localised and sparse
<i>Clematis vitalba</i>	Old man's beard	Very high	Climber	Widespread and patchy
<i>Corynocarpus laevigatus*</i>	Karaka	High	Woody weed	Widespread and patchy
<i>Fragaria vesca</i>	Alpine strawberry	Moderate	Groundcover	Localised and abundant
<i>Hedera helix</i>	English ivy	High	Climber	Localised and sparse
<i>Jasminium officinale</i>	Jasmine	Moderate	Climber	Localised and abundant
<i>Lamium galeobdolon</i>	Artillery plant	Low	Groundcover	Localised and abundant
<i>Nephrolepis cordifolia</i>	Ladder fern	Moderate	Groundcover	Localised and abundant
<i>Passiflora</i> spp	Banana passionfruit	Very high	Climber	Widespread and patchy
<i>Plectranthus ciliatus</i>	Plectranthus	Low	Groundcover	Localised and abundant
<i>Pytholacca octandra</i>	Inkweed	Low	Groundcover	Scattered and patchy
<i>Rhamnus alaternus</i>	Buckthorn	Very high	Woody weed	Widespread and sparse
<i>Rubus fruticosus</i> agg.	Blackberry	Moderate	Climber	Localised and sparse
<i>Sambucus nigra</i>	Elderberry	Moderate	Woody weed	Few plants
<i>Solanum capsicum</i>	Jerusalem cherry	Low	Groundcover	Scattered and abundant

Scientific Name	Common Name	Relative impact	Tier	Notes
<i>Solanum jasminium</i>	Potato vine	Moderate	Climber	Localised and sparse
<i>Teline monspessulana</i>	Montpellier broom	Low	Woody weed	Localised and patchy
<i>Tradescantia fluminensis</i>	Tradescantia	High	Groundcover	Scattered and sparse
<i>Ulex europaeus</i>	Gorse	Moderate	Woody weed	Localised and sparse

\* Denotes a New Zealand native plant that is not local to the KNE site

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**Greater Wellington Regional Council:**

Wellington office  
PO Box 11646  
Manners Street  
Wellington 6142

T 04 384 5708  
F 04 385 6960

Upper Hutt office  
PO Box 40847  
Upper Hutt 5018

T 04 526 4133  
F 04 526 4171

Masterton office  
PO Box 41  
Masterton 5840

T 06 378 2484  
F 06 378 2146

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