

3 Ecology

3.1 Existing conditions

3.1.1 Historic ecosystems

Prior to human settlement, the northern area would have been covered in luxuriant forest with gigantic rata, rimu, totara and kahikatea. Tree ferns, nikau, flax and toi toi would have been common in the dense undergrowth. This undergrowth would have been interrupted only by the meandering Porirua Stream and its tributaries. Towards the coast the steep hills would have been covered in dense forest, thick with supplejack, and the whole area would have been ringing with bird song.

Records from early European settlers show that less than 170 years ago huge trees were still the norm and the forest was still teeming with bird life (including the now extinct huia). An early track was being cut through the thick forest of Porirua Valley and the Ngauranga Stream mouth was still an area rich with food for the local pa³.

The present day ecology of the northern area echoes the human history of the last 200 years of farming and development. It is characterised by remnant pockets of the original podocarp-broadleaved forest, with occasional fingers of regenerating forest reaching along scarps and down gullies. Most of the northern management area nestles in the basin of the Porirua catchment. The catchment runs north-south and extends from the Belmont ridge in the east to the Outer Green Belt (Ohariu Ridge) in the west. East of the Belmont ridge is heavily influenced by coastal conditions and its ecology is defined by the coastal forest of the harbour escarpment and the heavily fragmented streams and bush of the Ngauranga Catchment.

3.1.2 Present day indigenous forest

Most forest remnants are small (less than two hectares), with the exception of patches of forest in Belmont Regional Park (approximately 15ha), Redwood Bush (nearly 10ha and sited within the Outer Green Belt), and remnants within Woodburn Drive reserve (approximately 5ha). The inland remnants tend to be dominated by tawa with emergent rewarewa, occasional matai and totara, with canopy species such as kohekohe, hinau and mapou. Most remnants are buffered by mahoe dominated regenerating forest.

To the east of the management area, particularly along the harbour escarpment, the forest is strongly influenced by the exposed coastal environment. The forest tends to be lower than inland remnants, and is characterised by a very compact and often wind-sculpted canopy. Species such as nikau, putaputaweta and porokaiwhiri (pigeonwood) are more common. Karaka, a tree introduced from northern New Zealand, is also common in these areas.

³ Boffa Miskell 1998. *Wellington's Native Vegetation. A Brief Survey of Early Historical Records*. Report prepared for Wellington City Council.

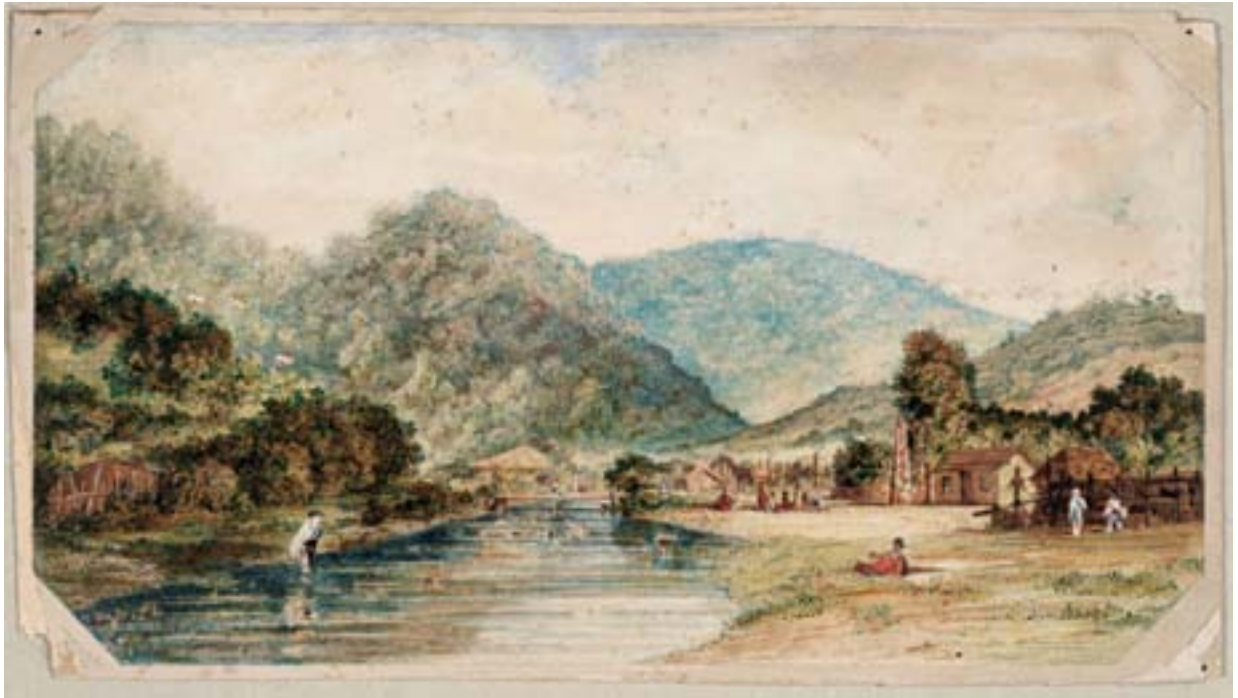
Physical parameters

Altitude: Sea level (on eastern side) to 40m above sea level (Tawa) to 373m above sea level (Magee Peak, Horokiwi)

Topography: Steep to undulating

Soil parent material: Mostly weathered to moderately weathered greywacke

Soil: all well drained to moderately well drained. Mostly Korokoro hill soils (shallow, less than 1m deep) supporting pre-European vegetation of rimu-rata/hinau/tawa or rimu-rata/tawa/kohekohe forest. Also some Makara Steepland soils (supporting same pre-European vegetation), Belmont hill soils (pre-European vegetation of rimu-rata/hinau/kamahi forest), Judgeford hill soils and Korokoro loam.



Ngauranga Gorge and Stream ca 1843. Watercolour by Samuel Charles Brees (Source: Alexander Turnbull Library, Wellington, NZ)



Forest on Porirua Road ca 1865. Photograph by William Thomas Locke Travers, 1819-1903 (Source: Alexander Turnbull Library, Wellington, NZ)

Regenerating forest areas are generally in transition from gorse to mahoe dominated forest, and typically occur in steep gullies or scarps of retired farmland and non-developable areas. There are also remnants of manuka/kanuka shrubland. Areas of regenerating forest are well represented in the northern reserves network (for example, Miles Crescent Reserve, Caribbean Avenue Reserve, Dungarven Road Reserve, Seton Nossiter Park). It is expected that, with ongoing pest control, regeneration of native species will continue in these areas, resulting in forest with elements of the original forest cover.

Little information exists on the fauna of the northern forest remnants. Council has been carrying out bird monitoring in Redwood Bush in Tawa. Although this reserve actually sits within the Outer Green Belt management area, its close association to other Tawa forest remnants make it likely that they experience similar relative abundances of species. Grey warbler, kereru, bellbird, kingfisher, tui, silvereye, fantail and tomtit have all been observed in this area within the last seven years⁴.

3.1.3 Streams



Porirua Stream, Oxford Street, Tawa

The Porirua catchment is an urban catchment, beginning in northern Johnsonville and draining to Porirua Harbour in the Porirua district. The main stream is Porirua Stream and major tributaries within Wellington district are Belmont Stream, Stebbings Stream and Takapu Stream.

Porirua Stream substrate is mostly gravels and cobbles. Riparian cover is sparse or non-existent throughout much of Porirua Stream, although some reserve areas do include a mix of exotic and indigenous trees that provide some shading for the stream as well as some (mostly exotic) herbaceous ground cover. Macroinvertebrate fauna is low in taxa richness, and taxa with low tolerances of pollution are rare or absent (eg mayflies, stoneflies, caddisflies). The aquatic fishery values are not regarded as high value, although two species of threatened fish, giant kokopu and longfin eel have been recorded. Other fish species recorded from Porirua Stream are shortfin eels, inanga, redfin and common bullies⁵.

Ngauranga catchment is similarly urban. The Ngauranga Stream is heavily modified and extensively piped with the presence of a

⁴ Pacific Eco-Logic Ltd (2007). Changes in native forest bird distribution and abundance in Wellington City Council reserves 2001-2007. Report prepared for Wellington City Council.

⁵ Kingett Mitchell Ltd (2005) Aquatic ecology and stream management groups for urban streams in the Wellington region. Report prepared for Wellington Regional Council.

quarry, freezing works, light industrial and commercial activity, and run-off from the adjacent motorway. Nevertheless, the stream has some areas of natural flow and bush regeneration⁶.

The Horokiwi catchment also occurs in the northern management area. This is a small catchment within the harbour escarpment. It is defined by the Horokiwi Stream and is heavily modified by the Horokiwi Quarry.

3.2 Issues and opportunities

3.2.1 Biodiversity protection

Biological diversity (biodiversity) includes all biological life, the genes they contain, the ecosystems in which they exist, and the systems and processes that connect them. Protecting biodiversity is important for the environment and economy as it supports ecological functions to ensure basic needs such as clean water and air. Biodiversity also forms part of the distinctive identity of an area and there are often associated cultural values.

Ensuring that a representative range of Wellington's biodiversity is protected is critical in the effective management of the city's biodiversity (see Wellington City Council Biodiversity Action Plan (2007)). The widespread nature of the reserves of the northern management area means that there is an opportunity for representing the full range of the northern area's existing indigenous biodiversity through the reserves network.

Ecological domains are useful planning units for considering the range of indigenous biodiversity at the scale of this management plan. Ecological domains (ecodomains) represent a cluster of repeating biogeoclimatic patterns which are manifest in its biological communities and patterns. Factors taken into account include fundamental ecological parameters of energy, nutrient, water, temperature extremes and physical substrate.

The following ecodevelopments occur in the northern management area (see Map 4:

Ecodevelopment 9a - inland hill country and basins: This is a large ecodevelopment of complex terrain, typically comprising broad, damp basins, moderate to steep hill country, and contorted gullies. This ecodevelopment has three key components; north/south aspect slopes, convoluted gullies and valleys with fast flowing streams, and frost-prone basins.

Ecodevelopment 8 - low hill country: This ecodevelopment represents a band of land experiencing year-round humidity and mild temperatures that lies between the extremes of a maritime influence (salty but frost-free) and the inland hill country (high rain, cloud cover and cool temperatures). Components include relatively straight flowing gullies, and slopes and ridges with mantled or deeply weathered surfaces.








⁶ Ibid.

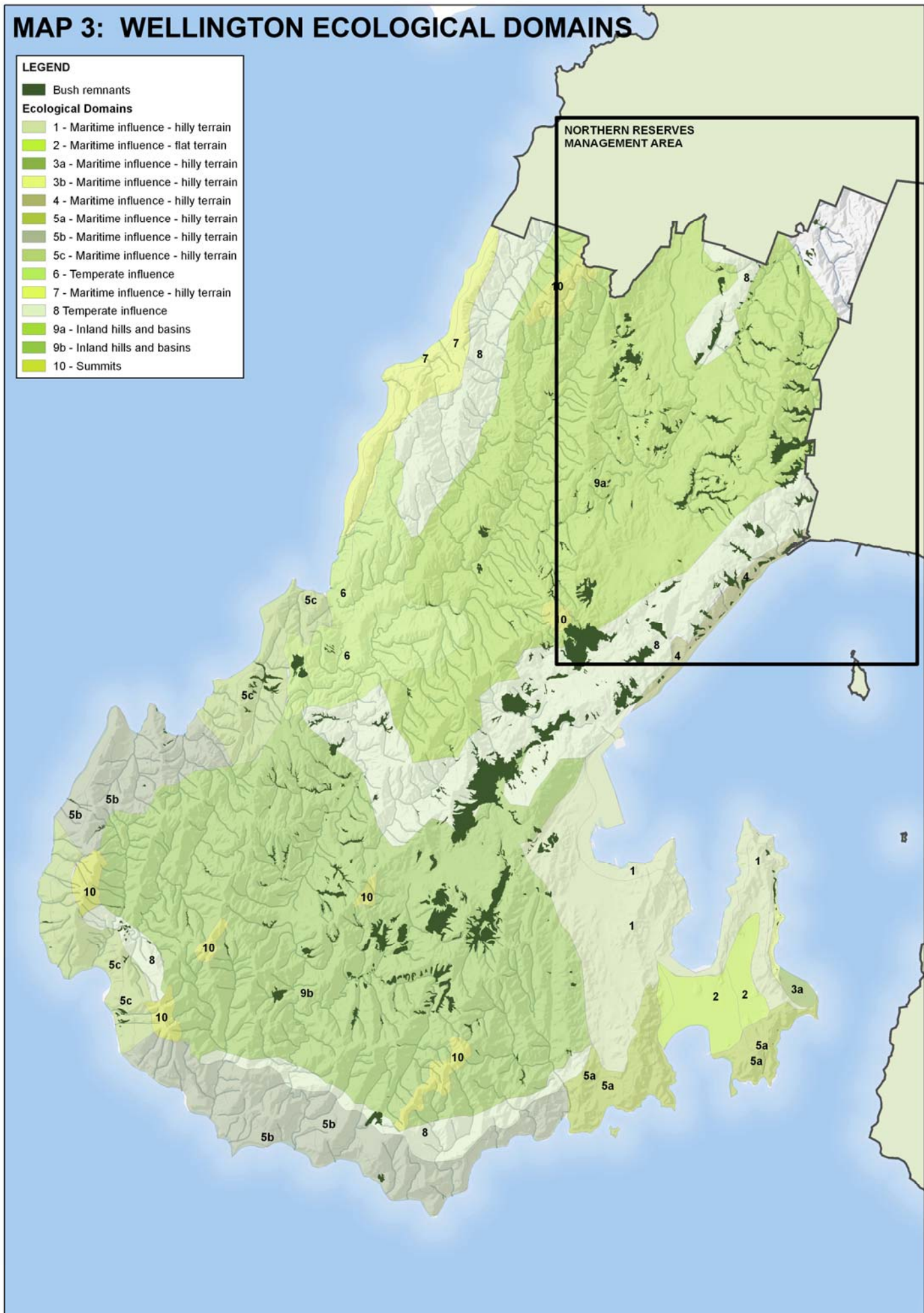
MAP 3: WELLINGTON ECOLOGICAL DOMAINS

LEGEND

 Bush remnants

Ecological Domains

-  1 - Maritime influence - hilly terrain
-  2 - Maritime influence - flat terrain
-  3a - Maritime influence - hilly terrain
-  3b - Maritime influence - hilly terrain
-  4 - Maritime influence - hilly terrain
-  5a - Maritime influence - hilly terrain
-  5b - Maritime influence - hilly terrain
-  5c - Maritime influence - hilly terrain
-  6 - Temperate influence
-  7 - Maritime influence - hilly terrain
-  8 Temperate influence
-  9a - Inland hills and basins
-  9b - Inland hills and basins
-  10 - Summits



Ecodomain 4 - Kaiwharawhara – Petone escarpment: This steep escarpment and narrow rock platform is defined by the fault line. Components include a salt zone with steep stable hillslopes and shallow gullies, and an upper slope zone, with steep, stable hillslopes and deeper gullies.

Based on the ecodomain analysis we expect differences in the forests of the northern area. Originally, inland hill country forests would all have had emergent rimu and rata with a canopy dominated by tawa, but there would have been subtle differences between forests occurring on the relatively sunny northern aspects, shadier southern aspects, frost-prone basins and gullies. Remnants of these differences remain today.

While no forest remains exactly as it was originally, a survey of the current reserves network shows current representation of the biodiversity of the northern ecodomains. Detailed results of this analysis are given in *Table 2*.

There is a relatively good representation of forests of north-facing inland hill country (e.g. Redwood Bush), and gullies and associated streams (e.g. Seton Nossitor Park). However, forests and streams of the frost-prone basins and southern-facing slopes are not well represented, although a number of reserves have the potential to be restored to a healthier state.

The vegetation of the low hill country, occurring between the extremes of the salty winds and the inland hill country is characterised by gullies, slopes and ridges. Gilberts Bush, Henly Estate Reserve, and Woodburn Drive Reserve are important examples of these ecosystem types. A significant gap in the current reserve network is the coastal forest and gullies of the harbour escarpment.

Table 2. Reserves that contain representative examples of the natural ecosystems of the northern ecological domains, and reserves with the potential to be representative examples.

Ecodomain number	Original ecosystems	Reserves representative of original ecosystem	Reserves potentially representative of original ecosystem⁷
9a – north aspect slopes	Rimu-rata/tawa-hinau-kohekohe/mapou-kohuhu	Redwood Bush (note this is covered by the Outer Green Belt Management Plan); Larsen Crescent Reserve; St Annes Reserve; Wilf Mexted Scenic Reserve;	Woodman Drive Extension, Oriel Avenue Reserve; Handly Grove Reserve

⁷ These reserves have been rated as having low to moderate ecological health. It is expected that over time these reserves have the potential to become representative example of the biodiversity of the northern area. In most cases intervention may be required eg pest control, restoration planting. In other cases the area is likely to revert naturally over time.

		Caribbean Ave; Belmont Reserve	
9a – south aspect slopes	Rimurata/tawa/rangiora, five finger-lemonwood-mahoe	-	Woodburn Drive Reserve; Totara Park
9a – convoluted gullies/valleys	Fast-flowing streams; forest dominated by moisture-demanding species (eg kahikatea, tree ferns)	Seton Nossiter Park and Belmont Gully; Woodridge Reserve	Pikitanga Close; Kentwood Drive Reserve; Ohariu Rd Reserve
9a – frost prone basins	Kahikatea-rata/hinaupukatea-pigeonwood; stream/riparian	-	Charles Duncan Reserve, Victory Crescent, Willowbank Reserve
8 – gullies	Straight flowing streams with eroded sediment; forest dominated by moisture-demanding species and nikau	Waihinahina Park, Gilberts Bush	-
8 – slopes and ridges	Rimurata/tawa-hinau-kohekohe with nikau	Gilberts Bush, Henly Estate Reserve,	Miles Crescent Reserve; Dungarven Road Reserves
4 – upper slopes	Wind-shorn coastal forest (eg ngaio-taupata-akiraho-tree hebe-broadleaf-mahoe-karamu-fivefinger)	-	Dungarven Rd Reserves; Tamworth Crescent Reserve
4 – salt zone	Coastal forest (as above), shrubland-flaxland	-	-

3.2.2 Ecological connectivity

Due to the relative isolation of the forest reserves in the northern area, ensuring the long-term health and resilience (or ecological integrity) of these reserves is a key challenge.

For forest areas, size, shape and connectivity are important for health and resilience. In general, an optimal forest patch will have a low edge to area ratio (eg circular or square, rather than linear or convoluted) and will be large enough to ensure an intact 'core' (where the core is an inner area not

influenced by edge effects such as increased light, wind and weeds). These elements can be addressed through restoration and revegetation priorities.

An optimal forest patch will also be close enough to other forests to sustain seed dispersal and seedling recruitment. Research and modelling in New Zealand indicates that if optimal forest patches ('sources') are interspersed by habitats receptive to seed germination ('sinks') then ecological functions such as podocarp recruitment can be sustained⁸. The northern management area is an opportunity to incorporate these principles of ecological connectivity into reserve design, management and acquisition.

Map 5 shows the current pattern of connectivity of indigenous forest reserves in the northern area. Buffers of one kilometre occur around forest remnants greater than one hectare that are protected within a reserve (shown by a black dot). These buffers are based on research integrating ecological and social needs⁹, where a 4-10 ha reserve every 5 km, and a 1 ha reserve every 1 km ensures seed dispersal as well as providing forested reserves within walking and cycling distance of the community. Ideally, clusters of big trees will also occur every 200m.



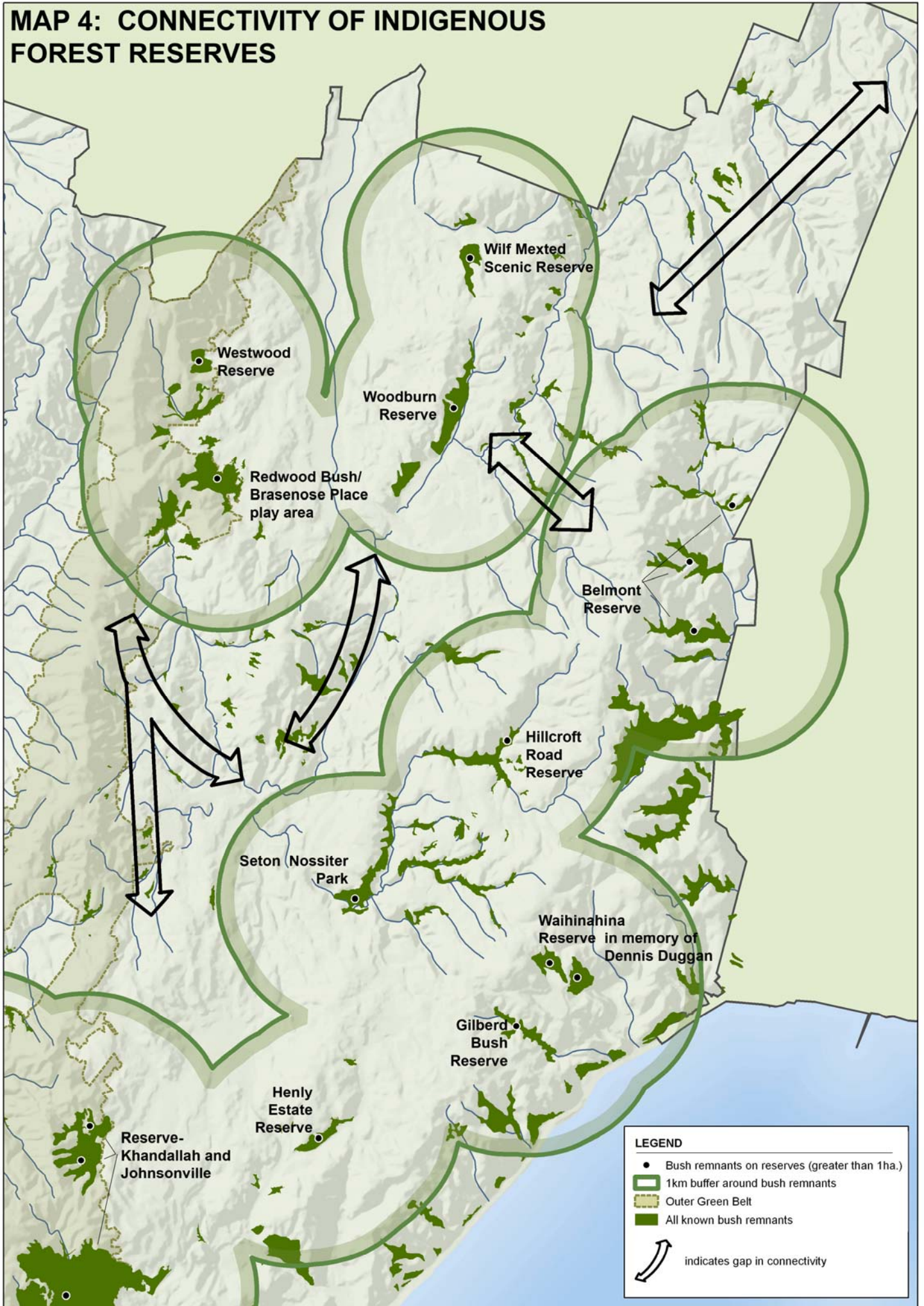
There are five reserves with forest of five hectares or more which are important influences in the northern area: Woodburn Reserve, Belmont Reserve, Redwood Bush/Brasenose Place, Khandallah and Johnsonville Reserve. The reserves with forest of one hectare or more are Wilf Mexted Scenic Reserve, Belmont Reserve, Hillcroft Road Reserve, Seton Nossiter Park, Waihinahina Reserve, Gilbert Bush Reserve, Henly Estate Reserve, Johnsonville/Khandallah Reserve.

Native forest at Wilf Mexted Reserve, Tawa

⁸ Meurk, C. & Hall, G. 2000. *Biogeography and ecology of urban landscapes*. In: Urban biodiversity and ecology as a basis for holistic planning and design: proceedings of a workshop held at Lincoln University 28-29 October 2000. eds G.H.Steward & M.E. Ignatieva. Christchurch: Wickliffe Press.

⁹ Ibid.

MAP 4: CONNECTIVITY OF INDIGENOUS FOREST RESERVES



Several gaps in ecological connectivity of the forest reserve network can be seen, namely the Tawa basin, Grenada North, Churton Park, Glenside and the harbour escarpment. Filling these gaps through restoration planting, pest control and reserve acquisition is an opportunity. There is further opportunity for ecological connectivity when considering forests on private land and for Wellington City Council to take an advocacy role in encouraging landowners to protect these.

The above principles do not include consideration of specific needs to maintain populations of species, and so the precautionary principle should be applied of preserving as much habitat as possible¹⁰. Map 5 should be considered as a minimum requirement for 'green' connectivity.

For streams, riparian habitat is as important as the in-stream habitat for ensuring ecological health. Native riparian cover is important for providing shade and food for aquatic life, which in turn, helps maintain water quality. Riparian cover can also help filter pollutants washed into streams by stormwater. The Porirua Stream is administered by Greater Wellington Regional Council and maintained by them as far as Glenside road bridge (by the garden centre), however there are a number of City Council reserves sitting alongside the stream that are within the scope of the current management plan. In addition, what happens on land affects stream health, and this plan is an opportunity to advocate for land use practices that protect streams, for example low impact urban design and development, and policies are designed to encourage this. Finally, protecting stream health is a key open space consideration in reserve acquisition.

3.2.3 Restoration

Restoration is an important tool in ensuring ecological health and resilience. Restoration may be to enhance an area (eg restoring podocarp species to a forest remnant), it may be to buffer an area (eg improving the shape or size of a forest remnant), or to create ecological connectivity (eg revegetation of a riparian area).

Priority setting for restoration should be in a city-wide context in accordance with the Biodiversity Action Plan (2007), but should also recognise specific opportunities for the northern reserves network. Opportunities for ecological enhancement planting will need to be assessed on a case-by-case basis and should be informed by ecological research. Buffer planting is a priority for reserves with primary forest remnants that are not already buffered by regenerating forest.

Ecological connectivity is an important issue for the northern area. Restoration work to fill gaps in the connectivity of forest reserves is important (as described in above section) and restoration of the riparian vegetation is an excellent opportunity to enhance the 'blue corridors' of the northern area.

¹⁰ Hanski, Ilkka. (1998). *Metapopulation dynamics*. Nature 396:41-49.

3.2.4 Pest control

Effectively managing pest plants and animals is also fundamental to the ecological health of the northern area. Pest plants, or weeds, are an issue throughout the northern management area and are a particular concern for small, isolated reserves.

Common weeds in the northern area are tradescantia, blackberry, hawthorn, Japanese honeysuckle, sycamore, and karo. Gorse and broom are also common, but



Churton Park Streamcare Group planting, Porirua Stream

these species can act as a nursery for the regeneration of native plants. Some weeds are not yet widespread in the northern area and there is the opportunity to keep them out of key reserves. One example is climbing asparagus which is already widespread within central Wellington but to date is unknown in the northern area. Darwin's barberry is another example. While this is scattered throughout the northern area, there is still the potential to keep vulnerable areas free from it. Surveillance and early intervention are critical for nipping these weeds in the bud.

Pest animals are also a problem, particularly possums, goats and mustelids. Possums are controlled in many parts of the northern area as part of the Wellington City Council and Greater Wellington Regional Council's shared possum control programme. Volunteers play a major role in this work with the Friends of Tawa Bush maintaining bait stations for Greater Wellington. This programme is thought to be contributing to increased numbers of native birds and improved forest regeneration and health. Goats have been an ongoing problem in many reserves, eating palatable plants (native and exotic) particularly around the Ngauranga Gorge and Horokiwi Reserve. They are thought to have been eradicated from the Ngauranga area, and

numbers are decreasing around Horokiwi. However, re-invasion is an ongoing issue. Mustelids (stoats, ferrets and weasels) are a particular threat to native birds (including eating eggs), lizards and insects (eg weta). Mustelid control requires intensive trap checking and is most successful where community groups are able to help.

The Wellington City Council Pest Management Plan (2005) identifies two kinds of pest control: species-led and site-led. Species-led programmes are particularly relevant in managing weeds and pest animals in the early stages of establishment when numbers are low and distribution is limited. Site-led programmes focus on areas of high biodiversity value and prioritise the control and management of pests that pose the greatest threats to these values. The Pest Management Implementation Plan prioritises sites for weed control and pest animal control on a city-wide basis. Priorities for pest control should also recognise specific opportunities for the northern reserves network as resources allow. Key opportunities are to manage pests in reserves that are representative examples of the biodiversity of the northern area, and to prioritise areas important for ecological connectivity.

Due to the huge number of pests, the greatest challenge both for the northern area and city-wide is to correctly prioritise control and use resources effectively.

3.2.5 Urban development

Urban development has a strong influence on the ecology of the northern management area. Urban development can have a detrimental impact on biodiversity values, for example filling-in streams and clearing vegetation. Development can also impact on the ecological health of existing reserves, for example stormwater run-off from development can increase sediment and pollutants in streams, and vegetation clearance reduces seed sources for forest recruitment and increases fragmentation. These issues are managed through the District Plan objectives and policies and resource consent process. However there is an opportunity to advocate for development styles which minimise ecological impacts through this plan and policies are provided to encourage this.

Looking after the biodiversity values of the northern area and providing links between these areas can also shape the extent and type of residential development and this is part of the vision described for the Northern Growth Management Framework (2003). Reserves contributions acquired through greenfields developments provide opportunities for the acquisition and management of many important ecological sites.

3.2.6 Biodiversity on private land

A principle of ecology is that everything is interrelated. The ecology of the northern reserves is heavily influenced by how indigenous biodiversity is managed on private land. For example, important food sources for birds may be specimen trees on private land, or a source of weeds could be from gardens. Advocating for the management and restoration of biodiversity on private land is an important opportunity for the ecological health of the whole area.

3.2.7 Community initiatives

Many of the current projects to restore and manage the biodiversity of the northern area are initiated and carried out by the community. This Plan will help the Council and community work together by providing a common vision to which the individual projects contribute. The importance of community work is recognised in the Wellington City Council Biodiversity Action Plan, and projects are being implemented to increase the overall level of community participation.

3.2.8 Managing change

The ecology of an area is a living process. As with all living things, it changes over time. This may be triggered by external events like fire, or it may be a natural successional change from scrub to forest. Land that is reverting from farmland or scrub to indigenous forest is a carbon sink and may meet criteria for receiving forest sink credits under the Government's Permanent Forest Sink Initiative (PFSI) scheme. Council will also seek opportunities to encourage and assist private land owners in the north to develop forest carbon sinks.

Gradual changes to biodiversity are difficult to plan for. In some instances, restoration may be needed, in other instances for example climate change, careful monitoring will be required to adapt management practices to ensure change is not threatening the ecological health and resilience of the northern area.

3.3 Objectives

- Ensure the protection of streams, forest remnants and other important ecosystems so that:
 - the reserve network comprises representative examples of the existing indigenous biodiversity of the northern area.
 - the biodiversity of the northern area is protected, enhanced and functions as a well connected system.
 - pest plants and animals are controlled efficiently and effectively.
 - changes and influences to the health of streams, forest remnants and other important ecosystems are monitored and acted upon appropriately.
 - landowners are motivated, inspired and educated to protect biodiversity on their own land.
- Restore and enhance streams, forest remnants and other important ecosystems so that:
 - continuous riparian cover alongside all streams that run through reserves (subject to 3.4.2).
 - restoration is carried out to improve ecological connectivity and to enhance existing ecosystems.
 - communities are motivated, inspired and educated to get involved in conserving biodiversity.

3.4 Policies

3.4.1 Protecting the biodiversity of the northern area

- The Council will protect all forest remnants and ecologically important areas on Council land in the northern area.
- The Council will protect all streams and natural water courses on Wellington City Council land in the northern area and work with adjacent local authorities to ensure a coordinated approach to stream management. This will include working with Greater Wellington to ensure consistent management of land held by them for waterway administration and flood control
- The Council will protect and restore the natural structure and flow of streams in reserve areas from modification.
- Where there is existing infrastructure, including stormwater management devices, within a Council reserve these will be managed and if necessary re-designed to minimise impacts on the natural environment.
- Any new infrastructure affecting a stream must firstly be assessed to see if it can be avoided; secondly it must be designed in such a way as to replicate the natural environment; thirdly the area must be restored to a natural state.
- Through this plan and other means the Council will seek the protection of all forest remnants, streams and other ecologically important areas on private land.
- The Council will support incentives for caring for biodiversity on private land in accordance with the Biodiversity Action Plan (2007).
- Where appropriate the Council will encourage the establishment of new permanent indigenous forest on previously unforested Council land to act as a carbon sink. The Council will utilise relevant carbon credit schemes, such as the Government's Permanent Forest Sink Initiative (PFSI).

3.4.2 Restoration

- Restoration work carried out by the Council will be prioritised around:
 - ensuring the ecological connectivity of reserve network
 - enhancing the size, shape, and species recruitment of existing reserves.
- There will be continual riparian cover on one or both sides of all streams flowing through Council reserve. Consideration will be given to retaining and enhancing stream views where appropriate.

- Where new riparian planting is required, the Council will use eco-sourced natives to create a riparian strip, no less than 5m wide where possible.
- Where existing vegetation occurs adjacent to streams in Council reserves, manage this to ensure the stream is shaded and that no pest plant species are present.
- Where there is a significant barrier to fish passage in a section of stream flowing through Council reserve, then fish passage shall be restored as resources allow.
- The Council will encourage and support local communities and interested groups to develop community catchment plans.
- Community interest groups involved in planting within the northern management area will be consulted on specific planting priorities and programmes.
- The Council recognises the important role individuals, community-based organisations, landowners and private businesses play in restoring the indigenous ecosystems of the northern management area and will support community initiatives with advice and, where possible, plants and other materials.
- All restoration work shall be carried out with eco-sourced plants.
- Support community revegetation, restoration and education programmes in accordance with the Biodiversity Action Plan (2007).

3.4.3 Pest management

- Plant and animal pest management will be carried out in accordance with the relevant policies and priorities set out in the Council's Pest Management Plan (2005).
- In addition to the priorities stated in the Pest Management Plan, plant and animal pest management will be prioritised as resources allow to:
 - areas representative of the biodiversity of the northern area
 - areas required to fill gaps in ecological connectivity
 - areas required to fill gaps in the representation of the biodiversity of the northern area
 - community priorities

3.4.4 Monitoring

- The Council shall ensure that the ecology of the north is represented in city-wide monitoring programmes, and that monitoring is carried out in accordance with the Biodiversity Action Plan (2007).
- The Council will monitor key reserves to ensure indigenous forest resilience and health.

- Support community monitoring programmes to increase understanding of the biodiversity of the northern area.

3.4.5 Fire

- To minimise the fire risk, open fires will be strictly prohibited on Wellington City Council land unless authorised by the Council.
- A buffering of fire resistant plants will be planted in high fire risk areas.