

7. Wellington's biodiversity journey

7.1 Past

Wellington once had flora and fauna as diverse and abundant as any other coastal site in the lower North Island. It was once cloaked in lowland broadleaf-podocarp forest. Trees such as northern rata, with its bright red flowers, would have been a common sight, along with rimu, matai, kahikatea and totara. These would have been emerging through a solid canopy of tawa, kohekohe, kamahi, titoki, pukatea and kowhai. The forest interior would have been thick with climbers like kiekie and supplejack, and the forest floor carpeted with ferns^{1,2}. Early European settlers described a number of birds including saddleback, piopio, robin, kokako, stitchbird, banded rail, little spotted kiwi, weka, and huia. Local Māori brought kereru and kaka to the Thorndon village for barter and kakariki were prolific.

The main wetland areas were dominated by flax, rush, raupo and cabbage tree. Flowing into these were major Wellington stream systems, which had abundant eel, koaro, bullies, koura, various galaxiid species and summer swarms of mayflies and other freshwater insects.

Geckos and skinks were easily found in the forests and around the coast and native frogs lived in dark forested streambeds. In summer the forest would have been alive with insects. At night, the morepork (ruru) and laughing owl (whekau) came out to hunt and the calls of brown and little spotted kiwi echoed throughout the forests.

The rocky coastline was the winter haul-out for large groups of male fur seal. Weka cruised the beaches investigating seaweed and driftwood. Large numbers of little blue penguin would have emerged from the surf each night and the coastal ranges covered in sooty and fluttering shearwater burrows. The wind-buffed and salt-laden coastal escarpments facing the Cook Strait (Wellington's south coast), as well as the harbour escarpments, were covered with a mix of coastal forest, dense coastal scrub, flax and tussockland, and scree. The coastal forest was dominated by kohekohe, ngaio, northern rata, akiraho and kowhai, while the dense coastal scrub was characterised by tauhinu, mingimingi, matagouri, prostrate kowhai, pohuehue and speargrass. Tuatara scurried through these coastal forests feeding on large insects, small lizards and sea bird eggs. The coastal waters and harbour would have supported a great number and diversity of fish. The harbour was visited by whales, dolphins and porpoises.

Much biodiversity was destroyed when Wellington was cleared for human settlement and the trend of losing biodiversity as the city grew continued until recent times.

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1 Gabites, Isobel (1993). *Wellington's Living Cloak: A Guide to the Natural Plant Communities*. Wellington Botanical Society/Victoria University Press, Wellington.

2 Boffa Miskell (1998). *Wellington's Native Vegetation: A Brief Survey of Early Historical Records*. Prepared by Boffa Miskell Ltd for Wellington City Council.

Opposite: Trees such as this ancient rimu in Otari-Wilton's Bush would have once been a common sight throughout Wellington's lowland forest.

7.2 Present

Today we have 5% of our original lowland broadleaf-podocarp forest and 1% of our original coastal forest remaining. We are dealing with these fragmented sites supporting our remaining biodiversity, many of these within the heart of our city. Most of our wetlands have been lost and our streams piped and filled. However, there have been significant achievements in recent times. There has been extensive land protection since the early 1990's. The establishment of Zealandia (NZ's first fully-fenced urban sanctuary) in 1995 and ongoing predator control by the city and regional councils now means a number of iconic (and formerly rare or locally extinct) bird species are now commonly experienced by Wellingtonians. Taputeranga Marine Reserve, established in 2008, is the first marine reserve in the heart of a city. As a result of the 2007 Biodiversity Action Plan we have gained a good picture of where Wellington's ecologically significant sites are within Wellington and these have been mapped. We have 517 identified ecologically significant sites across the city (see Appendix 4), most of which are protected on public land. These sites can be seen in more detail on the Wellington City Council website.

We also have a lot more information on the location of our threatened species. We have moved from a position of needing to identify much of our significant biodiversity to actively managing it. Our restoration programmes have developed from a focus on operational requirements and amenity value to a focus on ecological needs. The Council's role in biodiversity protection and restoration has continued to strengthen, and other organisations respect our achievements.

We have moved from the identification of significant sites, to the identification and protection of the species within those sites and refining our techniques for restoration. We have acknowledged, and continue to acknowledge, the role that people play in Wellington's biodiversity journey.

Our bird monitoring programme has expanded and we have conducted the first study showing the

distribution of native lizards within the city. We have a diverse range of species in Wellington.

Wellington's indigenous biodiversity today is maintained by habitats that can be broadly grouped into ten different categories.

Habitat	Current cover (ha)
Lowland forest	932
Coastal forest	59
Scrub and shrublands	116
Coastal scrub	813
Coastal fringe	1.5
Offshore islands	3.4
Wetlands	3.5
Streams	260km
Urban area	4190
Harbour and coastal waters	8900

Each of these habitats supports a unique community of species and faces a different range of threats; although habitat loss and pest species are common threats across all habitats.

Forest

Lowland forest

Today, the original lowland broadleaf-podocarp forest that remains is mostly found in gullies and remote areas out of the reaches of development, fire and early logging. Some areas have also been preserved by early Wellingtonians. Otari-Wilton's Bush and the Wellington Botanic Garden native forest remnant are some of the best examples of these.

These remaining areas of ancient forest are now accompanied by regenerating forest dominated by the ever-present mahoe. These new forests are growing up through the gorse that colonised Wellington's retired farmland and are now a valued part of Wellington's open space³. They also have an important role in buffering the ancient forest from the effects of fragmentation.

³ Park, Geoff (1999). An Inventory of the Surviving Traces of the Primary Forest of Wellington City. Prepared for Wellington City Council.

The remnants of original forest are important seed sources for the regenerating areas. The regenerating areas are important for the health and eventual restoration of many forest species, including birds such as kaka, kakariki and bellbird, and even the long-tailed bat.

Many animals that would have once occurred in Wellington's forests are now extinct in the region, while others - such as Wellington's green gecko - are thought to be in critical decline. However tui, kereru and kaka have become a regular sight and sound in Wellington and, along with saddleback, kakariki and North Island robin are breeding outside the safety of a fence on the mainland for the first time in over 100 years. Tuatara have also been reintroduced to the sanctuary, as have giant weta, while some lizards have been identified as having translocation potential. Invertebrates such as the giant pill millipede and large land snails may also be released in the sanctuary one day.

Coastal forest

Some small remnants of original coastal forest can be found along the harbour escarpment, as well as some areas along the south coast. Spooky Gully within Te Kopahou Reserve is a good example of a south coast forest remnant, with its spectacular tree hebe forest interwoven with scramblers such as native jasmine and native clematis.

The coastal escarpment is an important habitat for many species that are now threatened, due mainly to habitat loss. One example is the speargrass weevil. The speargrass weevil and Hutton's speargrass weevil live on speargrass around the south coast. However, speargrass has been decreasing due to grazing, pig rooting and out competition by weeds, so the weevil's habitat is being lost. Another example is the geometrid moth, a striking orange, black and white moth. Again, the main threat to this species is habitat loss, in this case the decline of its host plant pinatoro.



Above: There are only a few *Muehlenbeckia astonii* left growing in the wilds of Wellington. It's important that we know where each plant is located. Photo: Anita Benbrook

Scrub and shrublands

Wellington has two main kinds of scrub and shrubland communities: grey scrub and manuka/kanuka shrubland. These ecosystems are a special part of Wellington's biodiversity, are important transitional communities in ecological succession, and are essential habitat for lizards, insects, and some birds.

Grey scrub

Grey scrub tends to occur in the relatively exposed environments of Wellington's south-west peninsula. Grey scrub is characterised by small-leaved divaricate shrubs (shrubs that have fine, right-angled branches with a woody, tangled appearance), and climbers such as pohuehue. It is called grey scrub because it appears grey from a distance. In Wellington's grey scrub, you will generally find small leaved coprosmas, pohuehue, coastal tree daisy, tauhinu, kowhai, manuka and bush lawyer. Te Kopahou has one area of dracophyllum, which is locally significant. Grey scrub is also habitat for the nationally vulnerable plant shrubby tororaro and regionally threatened matagouri.

Manuka/kanuka shrubland

Manuka/kanuka shrubland is generally found on disturbed, previously forested land and lightly grazed hill country. It has become relatively rare in Wellington as gorse has taken over its ecological niche. Wellington's remaining manuka/kanuka shrublands are important to protect to maintain a natural process of forest succession. Research has found that forest growing up through gorse has less diversity of species than forest that grows up through kanuka/manuka, and that some plant groups, such as podocarps, orchids, and small leaved shrubs, are less common in gorse than in manuka/kanuka shrubland⁴.

Coastal scrub

The scrub of the coastal scarp has fared a little better than the coastal forest but is still in serious decline⁵.

Matagouri is now endangered in the Wellington area, however pohuehue, mingimingi, tauhinu and taupata are still a relatively common sight along the coast, as are flax-clad cliffs.

Coastline

Coastal fringe

Wellington's coastal fringe is a dynamic mix of rocky foreshore, coastal turf communities, and coastal dunes.

Wellington's rocky foreshore defines the "wild coast" experience, but on closer inspection the rocky foreshore is actually an intricate mix of coastal turf communities (or herbfields), coastal shrubland, sedges, grasses, and rushes. A great example can be found at Hue-te-Taka (Moa Point).

The unifying feature of Wellington's coastal communities is that they are adapted to tolerate very salty and windy environments. The coastal turf communities are characterised by low-growing dense mats of herbs, often with very fleshy leaves that protect the plant from desiccation (for example NZ iceplant, shore bindweed, glasswort). Sedges, grasses and rushes growing in these areas are also specialists at withstanding salt and dehydration. Many also tolerate very low nutrient levels and shifting sands. You can also find coastal shrubs in some of these areas, including tauhinu, sand pimelea and sand coprosma.

Coastal dunes form where there is shelter from strong waves, a supply of sand, and onshore winds⁶. The side closest to the sea (foredune) is very dynamic, and sand-binding plants have an important role. The two main native sand-binders are pingao and spinifex; however, the introduced marram grass commonly seen. Other native species of coastal foredunes are sand tussock, sand coprosma, and sand daphne. An important site for coastal dunes in Wellington is from Owhiro Bay to Karori Stream. In the past, all five native foredune species have been recorded in this area, but in the last 10 years only sand tussock, spinifex and pingao have been found. This area

4 Sullivan, J.J.; Williams, P.A.; Timmins, S.A. (2007). *Secondary forest succession differs through naturalised gorse and native k anuka near Wellington and Nelson*. New Zealand Journal of Ecology 31.

5 Sawyer, J.W.D (2004). *Plant Conservation Strategy: Wellington Conservancy 2004-2010*. Department of Conservation, Wellington.

6 Milne, R. & Sawyer, J. (2002). *Coastal foredune vegetation in Wellington Conservancy*. Department of Conservation, Wellington.

is one of the only sites in the North Island where “Marlborough minimac” geckos occur. Common, brown, and copper skinks and common geckos have also been recorded here⁷.

The interface between the land and the sea is an important access area for many species. The coastal fringe provides habitat for many seabird species, but many of these bird species are now threatened. The banded dotterel is one example; this bird nests in soil, shingle or sand dunes using little, if any, nest material. This means that its breeding ground is easily disturbed by vehicles, people, and pets. Banded dotterel were found breeding on the South Coast in 2014. The little blue penguin is another example. The “little blue” is the smallest penguin in the world, and adults come ashore in Wellington between May and June to prepare nests, laying eggs from August to November. The landscape has been modified, and their habitat destroyed as a consequence. While many of them have adapted to nest under houses or reserves around the coast, many are killed by vehicles, pets, ferrets and stoats.

⁷ Melzer S & Bell, T. (2014). Lizard survey of Wellington City Council-administered parks & reserves: final report. Unpublished EcoGecko Consultants Ltd report prepared for the Wellington Council, June 2014.

Wellington’s wild coast also has a number of seal “haul-outs”; the most accessible site is at Red Rocks/ Sinclair Head. Between May and October, male fur seals rest up here between feeding.

Offshore islands

The only island that sits within Wellington District is Tapu Te Ranga in Island Bay. Tapu Te Ranga is typical of Wellington’s south coast environment and, as an island, potentially offers a safer place for nesting and roosting seabirds. Tapu Te Ranga is designated as a Conservation Site in the District Plan. It is characterised by flaxland, salt marsh and scrubland, and is home to two rare plants found nowhere else in Wellington: *Crassula moschata* and *Suaeda novae-zelandiae*.

Coastal waters

Wellington’s coastal waters are home to marine mammals such as the common dolphin and orca, and Wellington Harbour has unique marine features including a giant kelp forest and a population of rare sponge. The waters of Wellington’s south coast support a rich and varied mix of plants and animals, due partly to a complex topography and wide variety of habitats. The high biodiversity is also due to the collision of three major oceanic currents, the result



Above: Taputeranga Marine Reserve is located on Wellington’s south coast, providing easy access to study and interact with marine life, such as these blue moki. Photo: Stephen Journé, Friends of Taputeranga Marine Reserve

being a mix of warm Pacific and cold sub-Antarctic waters. The community of plants and animals found here is unique in New Zealand, with many species occurring at the northern and southern limits of their range. At least 100 different species of algae (seaweed) have been recorded on the south coast, and sea horses, many fish species, crayfish and paua can all still be found. Even Wellington's intertidal zone is filled with a rich number of seaweeds, shellfish and other invertebrates.

Nationwide, scientists estimate that as much as 80 percent of New Zealand's indigenous biodiversity may be found in the sea. Yet less than 1 percent has ever been surveyed. On average, seven new marine species are identified every fortnight.

The marine environment is also very important for many of our freshwater fish species. Almost half of them are diadromous, using both the streams and the sea to complete their life cycle. Our native eels are thought to breed in deep ocean trenches somewhere near Tonga. Their larvae return to New Zealand on the ocean currents and re-enter the stream systems. The adults never return as they die after spawning.

Wellington city is also the access point to Taputeranga Marine Reserve. Taputeranga Marine Reserve is home to over 180 species of fish and is particularly rich in invertebrates such as octopus, rock lobster, crabs and starfish. Only minutes away from downtown Wellington, it gives residents and visitors the opportunity to experience the highly biodiverse marine life of the Cook Strait.

Freshwater

Streams

Streams are one of the Wellington region's threatened ecosystems. The streams are also affected by what happens in their catchments, which is the area of land drained by that stream system. Wellington's streams can be described simply as rural streams and urban streams. Rural streams include lower Karori Stream, Makara Stream and Ohariu Stream - as well as some of the more remote streams, such as Oteranga Stream. Much of the country associated with these rural streams has a long history of farming and grazing, and these streams are often characterised by a lack of riparian vegetation. Some rural streams, such as Waiariki and Opau Streams, also flow through areas of fragmented or regenerating forest.



Above: Redfin bullies are still found in urban catchments such as in the Kaiwharawhara stream in Trelissick Park, where this male was seen. Photo: Alton Perrie

Urban streams include Owhiro Stream, Kaiwharawhara, Ngauranga and the Porirua Stream system, as well as the “lost streams” (now piped) of Te Aro, Houghton Bay, Miramar and the inner city. The Porirua Stream system, or catchment, is the largest in Wellington, running north from Johnsonville to exit at Porirua Harbour. There are also small local streams throughout Wellington which, although often fragmented, also have important biodiversity values and can provide habitat for landlocked populations of native fish such as banded kokopu. Urban streams have been, and continue to be, heavily modified and influenced by residential development and urban living.

Streams provide habitat and food for hundreds of plants and animals - from algae to eels. They also provide freshwater for people and animals to drink and places for people to play⁸. Although many of Wellington’s streams are small, and some are even dry at certain times of the year (ephemeral), their biological health is important both for the species they support and also for the harbour and sea they flow into.

Stream margins, or riparian areas, are an important part of stream biodiversity - providing riparian habitat as well as improving water quality and habitat by providing shelter for fish, lowering water temperature, removing sediment, filtering out some pollutants, preventing damage to stream banks, and increasing bird and insect life.

Nearly all of New Zealand’s freshwater fish species migrate between freshwater and the sea during their lives and this is an important part of their breeding cycle. This means that if streams are lost, or if there are barriers to fish passage, then fish will become extinct from that particular stream. Giant kokopu, long finned eel and short jawed kokopu are all nationally threatened fish that are known to live in Wellington.

8 Report from the Parliamentary Commissioner for the Environment, Water quality in New Zealand: Understanding the Science, March 2012.

Wetlands

Wetlands include swamps, bogs, shallow lakes and salt marshes - essentially, any area of land covered by water for some period of time⁹. Man-made ponds are not normally considered to be a wetland. Wetlands are important places for biodiversity - they support more bird species than any other ecosystem. Wetlands are also important places for water purification (trapping sediment and removing excess nutrients), for preventing flood damage, for healthy fisheries, and for recreation¹⁰.

Most of Wellington’s wetlands have been drained, filled and built on. Those that remain are mostly small swamps, usually characterised by raupo, carex and harakeke. These include a raupo wetland in Opau Valley, a carex wetland in Hawkins Hill and a wetland in Takarau Gorge. There is also a small estuary at the mouth of the Kaiwharawhara Stream and a recreated wetland at the head of the Kaiwharawhara catchment, within Zealandia.

Salt marsh estuary

Wellington’s only salt marsh estuary is located at Makara Beach. It is the only area in Wellington suitable for inanga spawning¹¹. Estuaries are incredibly rich biodiversity spots due to the combination of terrestrial and wetland plants, seashore life and wading birds. At Makara Beach Estuary there is a community of saltmarsh ribbonwood, as well as salt turf, sedges and rushes. It is an important area for white-faced heron, rare freshwater snails, and black flounder breeding.

Urban, Suburban and Rural Areas

Approximately 4190 hectares of Wellington are in a built urban environment, compared with 4207 hectares of Council-owned open “green” space. The

9 Greater Wellington (2003). Wetland Action Plan.

10 Russi D., ten Brink P., Farmer A., Badura T., Coates D., Förster J., Kumar R. and Davidson N. 2013. “The Economics of Ecosystems and Biodiversity for Water and Wetlands.” IEEP, London and Brussels; Ramsar Secretariat, Gland.

11 Taylor, M.J. & Kelly, G.R. (2001) Inanga spawning habitats in the Wellington Region, and their potential for restoration. NIWA, report prepared for Wellington Regional Council.

urban environment also includes 1200 kilometres of road reserve. About 65% of the total City is rural land.

It is possible for an amazing amount of biodiversity to be found in these environments. There are about as many wild native plants in New Zealand cities (350-550 species or 14- 22 percent of the flora) as in National Parks (440-660 spp. or 17-26 percent) (Given & Meurk 2000)¹². Some rural land is reverting back to native bush in parts of Makara and South Karori and contains areas of indigenous vegetation and habitat for indigenous fauna.

Much of Wellington's land environment¹³ that has been identified as acutely threatened¹⁴ sits within the built urban and rural areas. The majority of this land is privately owned. Planning that protects and restores the indigenous remnants within these areas is critical to the survival of many species, mitigating the effects typical of human occupation¹⁵.

Private gardens can greatly contribute to the overall biodiversity of the city through suitable plant choice and gardening practices. This not only provides a habitat for the plants themselves, but also creating an attractive environment for indigenous birds, lizards and insects.

People's interaction with the natural environment also plays a key role; it is within the urban area, including Wellington's central business district, that most people experience these interactions. An awareness of the value of biodiversity in our own

backyards can lead to an appreciation of the ecological importance of the wider landscape. In this context, social objectives can be as important as ecological outcomes¹⁶. People in Wellington are increasingly aware of our indigenous biodiversity, but often this isn't translated into action.

Introduced species

New Zealand is characterised by a mix of native and introduced species, which make up the country's total biodiversity. New Zealand has the highest number of introduced mammals of any country in the world and the second highest number of introduced birds. We also now have more introduced species of vascular plants in the wild than native ones, and this number is increasing all the time.

Many of the pressures on New Zealand's indigenous biodiversity are from plants and animals that were introduced with the arrival of humans. These species were introduced into Wellington from other parts of the country, as well as from overseas. However, these introduced species are neither all "good" nor all "bad".

Introduced species can threaten our indigenous biodiversity through processes such as out-competition, hybridisation, predation, and browsing. But they can also provide benefits depending on the situation in which they are found.

Introduced species can provide complementary food for a range of indigenous species. For example, the presence of bottlebrush from Australia provides a feeding source for tui. A forest stand, whether indigenous or exotic, provides an extra dimension of habitat (height) in comparison with grassland. This is reflected in the indigenous insect and bird populations that find cover in these habitats.

Our primary production is dependent on introduced biodiversity in agriculture, horticulture and forestry. The revenue from this introduced biodiversity also enables us to further protect our indigenous biodiversity.

12 Given, D.; Meurk, C. D. (2000). Biodiversity of the urban environment: the importance of indigenous species and the role urban environments can play in their preservation. *In*: Stewart, G. H.; Ignatieva, M. E. ed. Urban biodiversity and ecology as a basis for holistic planning and design. Proceedings of a workshop held at Lincoln University 28-29 October 2000. *Lincoln University International Centre for Nature Conservation No. 1*. Christchurch, Wickliffe Press. Pp. 22-33.

13 Leathwick, J; Morgan, F; Wilson, G; Rutledge, D; McLeod, M; Johnston, K. (2003). Land Environments of New Zealand: Technical Guide. Auckland: David Bateman Ltd.

14 Walker, S; Price, R; Rutledge, D. (2005). New Zealand's remaining indigenous cover: recent changes and biodiversity protection needs. Report no: LC0405/038 prepared for Department of Conservation, by Landcare Research.

15 Clarkson, B; Wehi, P; Brabyn, L. (2007). Bringing back nature into cities: Urban land environments, indigenous cover and urban restoration. CBER report No. 52. University of Waikato, Hamilton.

16 Kilvington, M; Allen, W. (2005). Social aspects of biodiversity in the urban environment. *In* Greening the City. Royal New Zealand Institute of Horticulture (Inc.).

Introduced species can be used to effectively convey conservation messages and used as examples for education purposes, such as at Wellington Zoo and the Wellington Botanic Garden. The messages of conservation and sustainability can be shared regardless of the provenance of the species involved. These places also run breeding and propagation programmes, safeguarding global genetic biodiversity in a controlled environment.

Wellingtonians value many introduced species for aesthetic, cultural, and heritage reasons. Introduced species can enable the community to identify with the city by providing evidence of its past in the existing environment. For example, the Wellington Botanic Garden has some of the oldest radiata pine in the country (dating back to the 1860s), which went on to become New Zealand's main timber tree. One area of significance to local iwi is a karaka grove between Red Rocks/Pariwhero and Sinclair Head/Te Rimurapa, which is associated with a pre-European Māori settlement site. Karaka is native to the north of the North Island, but has been introduced to Wellington.

Pohutukawa, another introduction to Wellington from the north of the North Island, is also of cultural significance and contributes to Wellington's sense of place.

The challenge is to find a balance between the benefits provided by introduced species and the threats they may present to local biodiversity. This balance is best determined on a case-by-case basis.

Surrounding districts

Wellington's biodiversity does not end at the edge of Wellington City's boundaries, neighbouring areas are very important. For example, many birds migrate to and from Kapiti Island in the north-west, the Tararuas to the north, and the Rimutakas to the east. Stream systems, such as that drained by the Porirua Stream, can incorporate multiple districts within their catchment area. Although this action plan focusses on Wellington City's biodiversity, we must be aware that it is not confined to legal boundaries and ensure that we work with our neighbours to ensure local biodiversity protection.



Above: The Wellington Botanic Garden is a place where many people begin to experience the natural world. The species within them form an important part of people's journey, whether exotic or native.

7.3 Future

In the future, as a result of adaptive management, partnerships, and ongoing investment, Wellington has achieved the biodiversity goals stated in 2015.

Our significant ecosystems are healthy and resilient to change. They are valued and no longer under threat from people's actions. They contain a complex array of habitats and a large diversity of indigenous plants and animals thrive within them.

Urban and backyard conservation is at the centre of everything we do. We support and initiate restoration programmes across people's backyards as well as within reserves. Wellingtonians willingly contribute to the ongoing restoration and protection of their natural environment. They know how important it is for them to spend time in natural areas and they eagerly do so, whether joining a community planting beside Owhiro stream, picnicking in Otari-Wilton's Bush, mountain biking in the Wellington Town Belt or snorkelling in Taputeranga Marine Reserve. There is national recognition of the role of urban parks in helping people to begin their natural journey, and the benefits to people encountering indigenous wildlife within our cities.

Restoration planting within reserves, large native street trees and people planting in their own backyards has created stepping stones between isolated remnants. This allows indigenous wildlife to disperse to surrounding areas, assisting in the ecological restoration of the city's wider habitats. All ecologically significant sites are protected and have large buffer zones, expanding and protecting them; and corridors where possible, linking areas through recently established community planting.

We have moved from focusing on planting for habitat creation to managing species in clever and innovative ways, working closely with our partners. We know exactly where our threatened species are and what they need within an urban context, and we are actively managing them to achieve their lasting protection. The species spilling out from sites such as Zealandia and Otari-Wilton's Bush inspire people to

take action in their own backyards to make our city safe for indigenous wildlife.

Less effort is required to control and eradicate pest species and we continue to refine our methodologies, working closely with the community. We have reduced our dependence on toxins and chemical pest control, instead using innovative trapping methods and biocontrol to deal with environmental pests. Biocontrol agents have eliminated the threats of weed species such as tradescantia and darwins barberry. Miramar Peninsula has been designated as New Zealand's first pest free urban area and the difference to our biodiversity is noticeable. This is another step towards eradicating significant pests from Wellington.

Catchments all have coordinated groups of volunteers working across them. They are well vegetated and all streams have wide riparian strips dense with native vegetation. Streams within reserves have been daylighted, creating further habitat for indigenous freshwater species and areas for nature play. Barriers to fish passage have been removed and artificial wetlands capture and treat stormwater.

We have a clear understanding of how the aquatic system within Wellington works and despite ongoing growth, we manage our stormwater in a way that doesn't create any adverse effects on our freshwater or marine environments. We advocate for the marine environment and our role in this is supported and recognised by our partners.

Wellington is a sought-after destination for international and domestic visitors because of its amazing combination of natural areas and thriving wildlife within a vibrant city. Healthy ecosystems and accessible natural areas are seen as an inseparable part of our economic growth.

When other cities are trying to restore biodiversity in an urban context, they use Wellington as a case study for how it can be done. We share the knowledge we have and use it to continually improve our own biodiversity management.





We need to involve our community in all that we do, and enable them to take action. This includes everything from planting and pest control to protecting our freshwater and marine environments.