

The flora of Aotearoa New Zealand: a study of Botanic Gardens and native habitats

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I travelled to New Zealand last November to finally realise a botanical study trip I had planned as a Kew Diploma student before the Covid lockdowns put it on the backburner. There, I met an ex-forester, a butcher and a young conservationist working to repair a landscape damaged by improper management. Burned, eroded and overharvested, the native bushland in the area had been decimated, and the wildlife, rivers, and people were vulnerable as a result. A patch of 1400 hectares had been designated as a reforestation site, which was my primary reason for going there. I wanted to see tree ferns and podocarps and witness an ecological rebound in action. I wanted to see how plants could be placed in key areas to hold soil that was eroding too quickly; could slow down the flow of water that was flooding the valley during heavy rains; could even filter agricultural runoff before it polluted the rivers. I saw all of this, and then I saw it through the team's eyes too. How they made sure to park so as not to squash a patch of *Drosera* as we looked on their newest replanting efforts. How they stopped by a *Clematis forseteri* so that we could catch the glint of the sun off the petals. How they fed us with 'bush lettuce' and 'supplejack' as we trekked through the forest on the trail of introduced mammals damaging the native trees. English, Te reo Māori and Botanical nomenclature flew around synonymously as we discussed botany, ecology, horticulture and conservation. It was there that I understood what a travel scholarship really means and what an opportunity it can give to someone studying in a craft. For they were also learning. So, when they showed my colleague and I a *Metrosideros robusta* (quite rare for that area of New Zealand) which had been damaged when the tree it had been climbing on snapped in half, we gave them our knowledge in return for all that they had shared with us. My colleague showed them how to take root cuttings, and I demonstrated how to take an air layer. They had already tried taking conventional semi-ripe cuttings and now they had two more techniques ready to use to help keep this plant and this landscape alive.

The dedication to conservation and scale of work being undertaken at the Waingake Transformation Programme described above was truly inspiring and this was a common theme with all the teams we met from Singapore Botanic Garden to Auckland Botanic Garden and finally at Otari Wiltons Bush, Wellington.

In the beginning of my journey, I met the curator of Singapore Botanic Garden, Ooi Zong Yu who introduced my colleague and I to his team to discuss horticultural practices, collection curation, and conservation action. Dr Jana Leong-Skornickova (Keeper of the Herbarium & Principal Researcher in Plant Taxonomy) and Sarah Lim (Collection Curator) gave us an informative tour of their area of specialism: the *Zingiberales*. We were shown species and genera that we had never heard of and were introduced to the subtle fragrances in *Orchidantha* flowers; notes of blue cheese and dog scat permeated the air. At a compact site like Singapore BG, it was easy to see the cross-disciplinary work of the teams in science and horticulture, working together to improve our current understanding of plant taxonomy, genetics, and cultivation.

Next, in Auckland BG, we met Barbara Wheeler and her team of many skilled horticulturists who provide not only the next generation of seedlings for national park restoration efforts but also educate the next generation of people to care for New Zealand's natural spaces. Doug Ward, Owen Newson, and Harpreet Singh of the Nursery team grow and bank seed for restoration projects in the wider Auckland area for a project called 're-veg'. Representatives of national parks and nature reserves can send seed from their sites to places like Auckland BG to be germinated and grown on to seedling stage to then be planted out when large enough to handle, ensuring a better chance of survival of those selected species. Additionally, we met Angela Anstis, one of the Collection Curators who oversees the Native Plant iD trail, Kitchen Garden, and Harakeke garden (Pā Harakeke). Harakeke is the Māori word for *Phormium tenax* (New Zealand flax) and 'Pa Harakeke' translates to 'flax plantation'. The approach of the Auckland BG team for this collection was refreshing to witness as the plants here are on one hand a living record of cultivars from across New Zealand and on the other, a resource for weavers from across Auckland to harvest from. Many Māori who live in the city have moved from other parts of the country where they would have grown up with and been taught to weave with particular cultivars from that region. These would have been selectively bred over centuries to achieve different desired woven textures and products. This bank of cultivars offers a connection for people far from their homes. Once inducted, weavers are free to collect from the plants in the collection and there is a covered workspace where people can gather to process and work the Harakeke into fibres for weaving. Angela also organises a gathering on Matariki (Māori New Year) where weavers, volunteers, horticultural staff/students, and local secondary school children get together to harvest most of the old Harakeke leaves and weed the garden in the process. The older generation teach the young and knowledge is kept alive.

It was clear that reaching out into the community is integral to everything Auckland BG stands for. There are numerous areas of the garden devoted to showcasing native plants whether to educate on conservation issues or to offer horticultural inspiration for a resident's garden. Likewise, in Gisborne we met with ecologists and conservationists who also work with local communities to support projects that immediately affect them. Cyclone Gabrielle struck most of New Zealand in 2023 and the area was devastated in the aftermath. To ecologists and many locals, it was clear that the denuded hillsides from years of clear-cut forestry and livestock grazing exacerbated the damage caused. There was serious flooding, property damage, and people lost access to drinking water for several weeks. Years of building on the steep coastline and on former duneland has also reduced the buffer against intense storm surges that could protect Gisborne from cyclone events in the future. This has initiated such projects as the Waingake Transformation Project introduced at the beginning of this report. Leon Tarsau and his colleagues Jimi, Haykim, and Ari manage 1400 ha for Gisborne District Council in collaboration with Maraetaha Incorporated and supported by Ngai Tāmanuhiri, the local iwi (Māori tribe). 1,100 ha is made up of pine plantation which will be selectively harvested for the next ten years and replanted with Manuka and Kanuka (*Leptospermum scoparium* and *Kunzea robusta* respectively) to begin the ecological restoration leading to climax podocarp-tree fern forest. The other 500 ha is native bushland which needs to be protected from excessive herbivory from introduced animals like possum and deer. The goal is to regenerate the environmental and cultural heritage of the area and ensure the protection of the water supply. Elsewhere with Gisborne District Council, we met the team at Gisborne Botanic Garden who have started growing plants for dune restoration schemes along the east coast which are largely planted

and maintained by volunteers in the communities who live close by them. The replanted areas have started to build back into dune systems much more successfully than the previous 'rock wall' initiative that saw to remake the dunes with boulders and permanent man-made structures. It has also been noted that the beaches are much more well cared for with less instances of littering and pollution since locals began taking care of their natural spaces.

Malcolm Rutherford, a local ecologist was instrumental in arranging for us to meet both the teams at Waignake and Gisborne Council. He also introduced us to Dame Anne Salmond who has developed Longbush Reserve and created Waikereru ecosanctuary which includes the 1769 Seed Archive garden where Malcolm works. The former is open to the public for recreation to connect the community to native bushland in an area that is intensively used for agriculture and forestry. The latter is used as an education space for local school children and a seed bank for some of the east coasts' rarest species. This was another example of successful community engagement as children are beginning to recognise their native flora and habitats, reforming a relationship with the land so in need of rehabilitation.

We finished off our trip in Wellington, meeting Megan Ireland and Tim Park of Otari Wilton's Bush, and Clare Shearman and Kate Roud of Wellington Botanic Gardens. Once again in a city, it was actually when we were out and about and speaking with local residents that we understood how important these two gardens are. People use them primarily as a recreation space to improve physical and mental wellbeing, to bring their children to play and to send their schoolchildren to learn about biology, botany and ecology on field trips. All these examples are essential aspects of a botanic garden, but it is the unsung and unassuming conservation work that leaves a lasting impression on many visitors. In a small box-room laboratory at Otari, we met Karin van der Walt, Conservation and Science Advisor at Wellington Botanic Gardens. Her research into cryopreservation of seed embryos and trialling germination techniques for native orchids was fascinating and impressive considering the small-scale set-up for such a large project. It was brilliant to see the connection between science and horticulture too as her colleague Phoebe was growing on the orchids from the lab and testing different protocols and media to achieve the best success rate which can be used for reintroducing plants into habitats. Otari and Wellington BG work on numerous projects protecting habitats around Wellington and the rest of New Zealand. While the full extent of their ventures is not always known, it was obvious when speaking with locals that they were well appreciated for the numerous services they provide.

The people and places I have visited in New Zealand and Singapore have inspired me to evaluate my own connection with the land and how I approach my work, especially in regard to engagement. I came into horticulture because I was fascinated with plants. From there, an appreciation for ecology and how plants interact with other organisms in an ecosystem grew. To protect all aspects of these ecosystems, however, it will take more than just the people that already love and appreciate it. Leon at the Waignake programme was a forester all his life, planting up most of the pine plantation he is now working to reforest into native bushland. His colleague Jimi is a butcher by trade and would be the first to admit that he didn't look twice at the plants at his feet before working at Waingake. He now points out where the best *Drosera* patches are. Haykim has no formal horticultural or botany training yet has learnt from his colleague Ari, his family, and ecologists like Malcolm and is building his knowledge each day to better know the forests he works to protect. Engaging with people that would otherwise have no

connection to nature is integral to protecting it. In Auckland, Gisborne, and Wellington, it was obvious that once ownership of plants and areas was opened to the people that live there, the community took care of what they saw as theirs. Work like this already happens through the great community and learning teams at Kew and after seeing the work of the horticulturists and conservationists during my travel scholarship, I now want to do my part in helping others love plants as I do.



Image: L-R: Jimi (Waingake team), Sam (summer intern), Leon (Waingake team), Nick, Jess, and Haykim (Waingake team) in the bushland of the Waingake Transformation Programme.



Image: Jess (left) and Nick (right) with Barbara Wheeler (centre), Curator Auckland Botanic Garden.



Images: L = Te Puna Raranga: the covered work/meeting shelter in the Harakeke garden, Auckland BG. R = a Harakeke (*Phormium tenax*) plant which has recently been harvested. The lower leaves of each shoot have been taken for weaving, and the central three leaves are left to grow.



Images: Dune restoration efforts in Gisborne. First plantings are of 'sand-fixers' like the threatened *Ficinia spiralis*. Once the dune begins to form, other herbaceous plants follow and over time organic matter deposits and enriches the sand producing ideal conditions for shrubs and trees like *Metrosideros excelsa*.

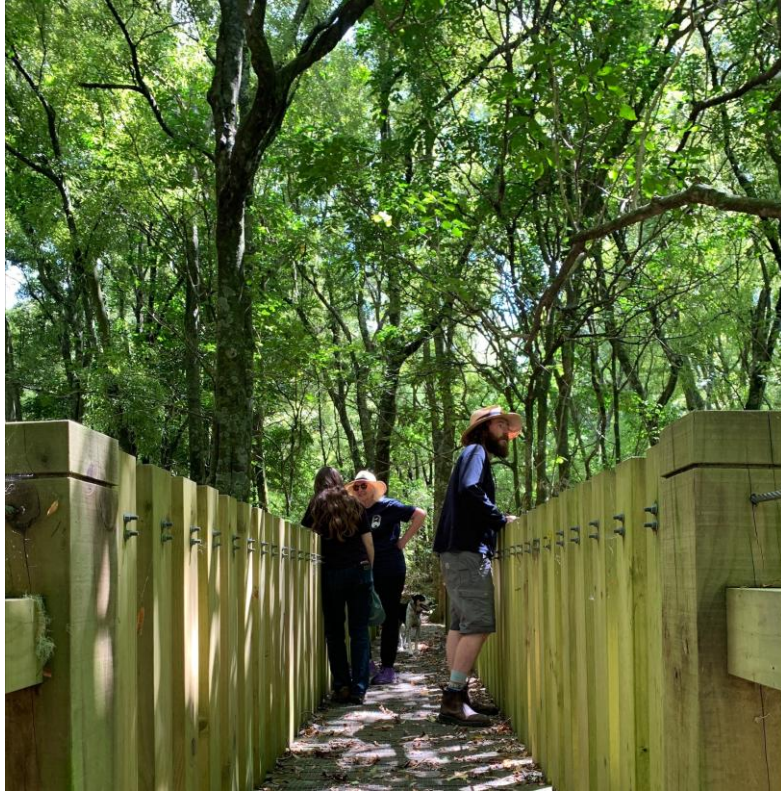


Image: with Dame Anne Salmond in Longbush Reserve



Images: L = The orchid germination fridge at Otari Wilton's Bush, Wellington. R = *Orchidantha stercorea* in the Nursery of Singapore Botanic Garden.

Breakdown of Final Costs

	Funding Contributions (£)			Personal Contributions (£)	
	RHS	Kew Guild	Merlin Trust	Jess	Nick
	2862	1000	2000	793.36	738.33
	5862				
Spending					
Flight		-3379.24			
Auckland accommodation		-369.05			
Car hire		-1326.14			
Singapore accommodation		-194.44			
Gisborne accommodation		-370.69			
Coromandel accommodation		-222.44		-11.48	
Tongariro accommodation				-298.84	
Wellington accommodation				-206.89	
NZeTA and IVL				-51.77	-51.77
Cash for NZ					-93.3
Uber to airport					-36.93
Food Singapore				-18.6	-130.96
Transport Singapore				-6.38	-6.38
Gardens by the Bay Singapore					-53.24
Food NZ				-146.07	-338.24
Fuel NZ				-86.15	-27.51
Tongariro refund				298.84	
Waikato accommodation				-111.81	
Taranaki accommodation				-154.21	

Itinerary

Date	Itinerary
05/11/25	Flew from London to Singapore.
06/11/25	Landed in Singapore.
07/11/25	Visited Singapore Botanic Garden and met Horticultural and Herbarium staff.
08/11/25	Visited Gardens by the Bay. Flew from Singapore to Auckland.
09/11/25	Landed in Auckland.
10/11/25	Met Barbara Wheeler, Curator Auckland Botanic Garden. Spent time with the nursery team at Auckland BG (Doug Ward, Owen Newson, and Harpreet Singh).
11/11/25	Spent the morning with the nursery team at Auckland BG. Met Bec Stanley, Garden Manager at Auckland BG. Barbara Wheeler took us to see regenerating forest and coastal vegetation in east Auckland.
12/11/25	Met Mere Brewer, Team Leader Plant Collections at Auckland BG, for a tour of the Gondwana Arboretum.
13/11/25	Barbara took us to the Domain Winter Gardens in the centre of Auckland to meet the Horticultural team there. In the afternoon, we went back to Auckland BG to meet Ella Rawcliffe, Botanical Records and Conservation Specialist. Travelled to West Auckland to botanise along the Mercer Bay loop track to see more coastal species.
14/11/25	Met Mark Fielder, Collection Curator Auckland BG (Palm Garden and Threatened Native Plants Garden). Met Angela Anstis, Collection Curator (Pa Harakeke Garden, Native Plants ID Trail Garden, and the Edibles Garden). Met Pippa Lucas, Collection Curator (Urban Trees Garden, Native Plant Ideas Garden, and South Africa collection). Thanked Barbara and said our Goodbyes. Drove to Thames, Coromandel Peninsula.
15/11/25	Botanised along the Cookson Kauri trail, Kauaeranga Valley, Thames.
16/11/25	Botanised along the Edward's Lookout track, Kauaeranga Valley, Thames.
17/11/25	Drove to Gisborne. Stopped en route at Opotiki to see a 2500-year-old Puriri (<i>Vitex Lucens</i>) which was once used as a Māori burial site. Met Malcolm Rutherford and Dame Anne Salmond at the 1769 Seed Archive in Gisborne for a tour of the Garden collection.
18/11/25	Met Malcolm at the 1769 Seed Archive to meet the two gardeners that work there one day a week. Met Dame Anne and Billie Lythberg from the University of Auckland then went for a walk around Longbush Reserve. Malcolm then took us to Sisterton Lagoon, a small patch of freshwater restoration run by a Trust and volunteers.
19/11/25	Met Leon Tarsau, Team Leader for the Waingake Transformation Programme, and Sam, summer intern at Gisborne District Council. Drove up with them to Waingake to meet Jimi and Haykim, also part of the Restoration Team. Spent the day with them learning about the work they do.
20/11/25	Spent the day with the Waingake team looking at pristine forest and regenerating bushland. Went on a bushwalk with Jimi and Haykim to observe predator control efforts.
21/11/25	Met Don Mclean, Regional Advisor of Biodiversity for Gisborne District Council, and Sam (intern) who took us to meet the team at Gisborne Botanic Garden. Met Trey, also of Gisborne Council, who showed us community-maintained dune restoration projects. Don took us to Gray's Bush to see swamp forest vegetation.
22/11/25	Drove to Atiamuri in the Taupo region, central north island.

23/11/25	Visited Orakei Korako to witness a Geothermal site and see the plants that grow in that habitat.
24/11/25	Drove to New Plymouth on the SW coast.
25/11/25	Botanised along the Mangorei track, Mt Taranaki
26/11/25	Drove to Wellington
27/11/25	Met Megan Ireland at Otari Wilton's bush for tour of collections. Met Karin van der Walt who showed us the conservation lab and research into cryopreservation of seed embryos and native orchid propagation. Megan took us to Wellington BG to meet Clare Shearman and Kate Roud to see the collections there. Finished the day at Percy Reserve to see cultivation of primarily alpine collections with Keith, Nursery Propagator.
28/11/25	Met Tim Park at Otari Wilton's bush for a tour of the Fernery and 38° Garden. Drove to Red Rocks on the south coast to see coastal vegetation.
29/11/25	Flew from Wellington to London (with stops in Sydney and Singapore).
30/11/25	Landed in London.

Note: Our itinerary differs to our original plan. We were supposed to go to Tongariro National Park and meet a Māori led Trust involved in conservation. There was a wildfire in the park a day before we landed which destroyed a vast area of habitat and affected the people there. We agreed with the Trust that the meeting would not go ahead. We decided to visit the Taupo region and Mt Taranaki instead to view similar habitats to what we would have seen in Tongariro.