

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

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In November, I set out on a three-week study trip to Aotearoa New Zealand with fellow RBG Kew Horticulturist Jess Francis to research and understand the floral ecology of the warm temperate to borderline subtropical sections of the North Island. We stopped in Singapore en route and met the curator of Singapore Botanic Garden, Ooi Zong Yu who introduced us to several experts to discuss horticultural practices. We also visited Gardens by the Bay to witness the displays in the Cloud Forest Biome and Flower Dome which showcased the engineering of a cooled glasshouse in a tropical climate.



Images: L = With a *Johannesteijsmannia altifrons* growing outdoors in Singapore Botanic Gardens. R = Cloud Forest and temperate climate species growing in a refrigerated glasshouse. Cloud Forest Biome, Gardens by the Bay, Singapore.

In New Zealand, we spent our first week at Auckland Botanic Garden (including a day at the Domain Winter Gardens) to meet horticulturists who specialise in native flora. Barbara Wheeler, the gardens' Curator, was instrumental in organising our time there and connected us with many skilled horticulturists. We met the Nursery team (Doug Ward, Owen Newson, and Harpreet Singh) who grow and bank seed for restoration projects in the wider Auckland area. This was a great opportunity to discuss and compare techniques, such as breaking seed dormancy, cleaning unorthodox seed coats, and seed sowing methods. We also learnt about 'eco-sourcing' whereby seeds collected from one region will return there as mature plants. This differs to some of the practices being used in our part of the world. Due to the changing climate, many horticulturists are looking at 'climate matching' which

involves collecting species that grow in areas currently experiencing conditions that the UK is predicted to have in 50 years' time. In New Zealand, there is a strong focus on maintaining the genotypes of plants growing in specific areas to keep the natural diversity across the country.



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

R = Chitting *Sophora chathamica* seeds with nail clippers in the nursery of Auckland BG.

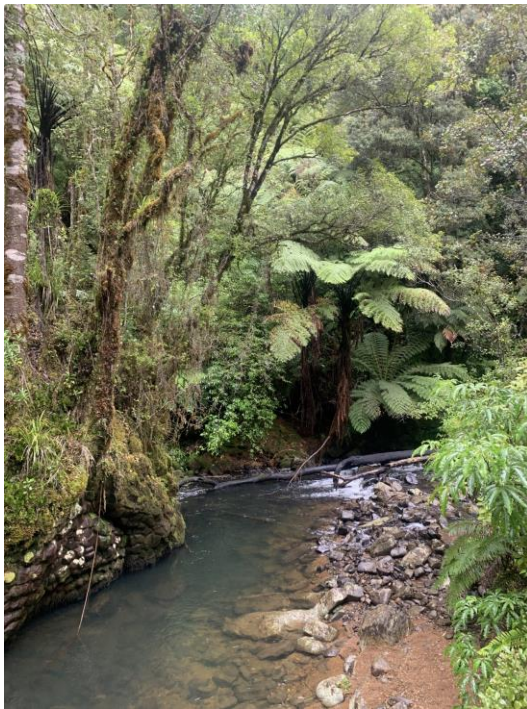
Additionally, we met Angela Anstis, Collection Curator, who was so passionate about her work, and we will never look at *Phormium tenax* (New Zealand flax) the same because of her. Harakeke is the Māori word for this plant and 'Pa Harakeke' translates to 'flax plantation' which is the name for the garden where the species and cultivars of *Phormium* are displayed in Auckland BG. Harakeke was and is the most important fibre for traditional Māori weaving. The method of harvest is to leave the central three shoots (the child/rito in the middle with its parents/awhi-rito either side of it) while the outer leaves (the grandparents and ancestors) can be taken for weaving. In the same way a healthy child needs to be raised by its parents, a healthy plant will grow with the central leaves retained. Weavers from across Auckland (once inducted) are free to collect from the plants in the collection (pictured right) which is so different to the usual Botanic Garden model where plants are 'on display' and not to be touched. This approach fosters learning, growth and sharing within the community.





The next stop was the Coromandel Peninsula for its remnants of pristine Kauri-Podocarp forests. Here, we saw the Cookson Kauri (*Agathis australis*), a tree with an 11 m circumference, which gave us an idea of the scale of the forest before logging (pictured left). We were able to observe how different species interact with each other and the environment that they create. Areas of disturbed soil by forest tracks, are quickly colonised by mosses, lycophytes and lichens. Amongst this carpet growing on the scratched bare earth, we spotted the tuberous *Drosera binata* which came as a surprise to us as we are used to the bog-loving species. Each part of the forest had a slightly different make up of plants which allowed us to better understand their cultivation requirements. *Phyllocladus trichomanoides*, for instance, was a species we encountered in the north of the island, preferring the warmth. We also saw it in greater numbers as we headed east, seemingly

preferring the drier conditions there. As a horticulturist, it is important to experience these locations for oneself to garner these nuances.



Images: L = Kauri-Podocarp Forest, Kauaeranga valley, Coromandel Peninsula. R = *Drosera binata* in a carpet of moss, Kauaeranga valley, Coromandel Peninsula.

We then made our way to Gisborne to meet with Malcolm Rutherford, an ecologist, who introduced us to Dame Anne Salmond. She has developed Longbush Reserve and created Waikereru ecosanctuary which includes the 1769 Seed Archive garden. 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 ensures the longevity of these plants and the habitats they grow in.



Images: L = mounds of rare coastal species such as the nationally threatened *Euphorbia glauca* at the 1769 Seed Archive. R = with Dame Anne Salmond in Longbush Reserve.

We spent the rest of the week with conservationists from Gisborne District Council, like the Waingake Transformation Programme team. They are made up of four members and manage 1200 ha in collaboration with Maraetaha Incorporated and supported by Ngai Tāmanuhiri, the local iwi (Māori tribe). The land contains remnants of native bushland that have not been logged as the sites were too steep. Other areas were logged and converted to farmland or plantations of *Pinus radiata*. Over the past four years, the site has been planted with Manuka and Kanuka (*Leptospermum scoparium* and *Kunzea robusta* respectively) which act as a nursery for other slower growing native species, sheltering them from the elements and protecting them from herbivory. The pockets of native bush are seed banks that the native dispersers can feed on and then spread to other parts of the reserve, helping the team in the restoration efforts. We also learnt about the scale of the pest control needed to maintain the seedling population and preserve older specimens. 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. At Kew, we are growing plants in an ex-situ situation for conservation purposes. Being able to see in-situ initiatives and the challenges they face has helped us to see the role of a botanic garden in assisting the people on the front-line protecting vital habitats.



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.

As we made our way south, we stopped in the Taupo region to see the last examples of tropical species in NZ in the geothermal heartland of the north island, and then on to the south-west to botanise the subalpine zone of Mt Taranaki's slopes.

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. We discussed native plants, the role of horticulture in conservation efforts, and how to deliver these important messages to people who visit our gardens.



Images: L = The subalpine scrub on the slopes of Mt. Taranaki. R = Testing the optimum time to collect seed from capsules of a native orchid species at different stages of maturation. Most successful germination in lab grown conditions came from the most immature capsules. Conservation lab at Otari Wilton's Bush, Wellington.

It would be amiss to not mention the scientists we met along the way, such as 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 inspiring. It was brilliant to see the connection between science and horticulture 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 habitat. At Singapore Botanic Gardens, we met Dr Jana Leong-Skornickova, Keeper of the Herbarium & Principal Researcher in Plant Taxonomy. She was so enthusiastic about her research and the plants of her specialism: the *Zingiberales*. Together with Sarah Lim who cultivates the living collection of gingers, they showed us species and genera that we had never heard of and introduced us to the subtle fragrances in *Orchidantha* flowers; notes of blue cheese and dog scat permeated the air.

These horticulturists, scientists, and ecologists have left a lasting impression on us, and we are grateful for the time they have given to pass on their knowledge. It is quite easy to stagnate with established methods, especially when relying solely on books. Horticulturists across the world are all doing the same thing but will be doing it in vastly different ways. It is important to meet people and communicate these different techniques to not only develop our own knowledge but to advance horticulture as a profession.



Image: Taketakerau, a Puriri (*Vitex lucens*) thought to be around 2,500 years old. A sacred site to Māori as the bones of important chiefs were laid to rest here for centuries. The bones have since been moved to another site. We visited this tree in Opotiki on our way from the Coromandel to Gisborne.

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.