

ARTICLE

Barbara Anderson's article in the previous issue compared her immediate impressions of South American and New Zealand rainforests. To follow on, we have the benefit of ex-patriate Chris Lusk's longer-term perspective.

Reading between the leaves: Chilean and New Zealand rainforest

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Take a look at one of 'biomes of the world' maps, and you'll see 'Temperate evergreen rainforest' shown for most of southern Chile. Same as what's shown for home. Then enrol in Kath Dickinson's 4th year ecology course and you'll probably feel like screenprinting a whole batch of "Reunite Gondwana" t-shirts in English, Spanish and proto-Polynesian. *Nothofagus*, *Podocarpus*, *Griselinia*, *Luzuriaga* and any number of other familiar names, growing on the faraway other side of the Pacific.

When you actually get to southern Chile on your next summer holidays, or on fieldwork, in many cases you won't need Plant Taxonomy 501 to recognise Chilean kith and kin of totara, beech, wineberry etc. What's more, you'll find a landscape that is reminiscent of home. Except, try to imagine Lake Wanaka with its solid Alpine backdrop, conflated with Taranaki's lonely igneous silhouette and rain-fed dairy pastures.

It's not only the landscape and the recognition of individual plants that remind a New Zealander of home. The forest has the same Gondwanan feel, at once familiar and ominous. That complexity and mystery that are missing from Europe's park-like deciduous glades, or from the coniferous monotony of the north.

Poet Pablo Neruda explored the secret corners of the Chilean rainforest and marvelled at its endless small surprises. You'll find his pages peopled by shiny beetles, giant mosses, aromatic leaves. Epiphytes perch in nooks and crannies, sending roots sprawling down trunks. Filmy ferns are everywhere. There are a few vines to swing on, although not as many as in northern New Zealand. The same evergreen hues predominate, not the spring-green of the northern temperate deciduous forests. White flowers are in the majority, although there are also plenty of red tubular ones, most of these pollinated by 'picaflores' (humming birds).

The forest roof is pierced by towering emergent trees with ragged crowns, not unlike podocarps in New Zealand. But you'll soon realize that these lords of the Chilean forest are not in fact podocarps, but usually *Nothofagus* or other broadleaved trees. There are a couple of really big conifers, although neither is widespread. One is the unmistakable monkey-puzzle tree (*Araucaria araucana*), probably Chile's best-known botanical ambassador. The other is the Methuselah-like 'alerce' (*Fitzroya cupressoides*), the second-longest-lived tree on earth, which looks and acts much like an outsize kaikawaka (*Libocedrus bidwillii*).

As in New Zealand, the birdlife in Chilean forests is usually discreet in appearance and habits. The exceptions are the local avian stars – the woodpeckers ('carpinteros') and the hummingbirds. The latter can appear soundlessly out of nowhere, to hover a few inches in front of your eyeballs. Why me? Then you remember that today you're wearing a large reddish 'flower' on your head or round your neck. And then there are native mammals in the Chilean forest. Foxes (*Pseudalopex* spp.) loiter around camping grounds and rubbish bins in national parks, sometimes sporting the latest fashion in radio-trackers. If you're lucky you might catch a glimpse of a pudu (*Pudu pudu*), reputedly the smallest deer in the world. You're very unlikely to see a puma (*Felis concolor*), although you probably will hear stories about the rustling exploits of these elusive felines.

So you already knew about the picaflores and the carpinteros, having seen the BBC's 'Flight of the Condor'. Standard New World fare, even if not exactly Gondwanan. But did anybody warn you about the hazards of stumbling into a **bamboo** thicket?! The tree horizon disappears, you begin to lose faith in your compass, there is a momentary flutter of panic. Southern Chilean forest is full of bamboos (genus *Chusquea*) that form impenetrable thickets in treefall gaps. Remember the Zen riddle about whether a tree falling in the forest makes a noise if there's nobody around to hear it? Well, as Chris Knox pointed out recently, those Zen bores should be sent to study Forest Ecology 101. Whenever a big tree falls in southern Chile, the bamboo moves in rapidly, extinguishing most other vegetable life in the gap. There it holds sway for at least 15 yrs, the tallest species (*C. coleou*) reaching heights of up to 8 metres. Until one summer, without warning, the whole local bamboo population flowers, seeds and dies en masse, an event which is at least as portentous as the toppling of the tree 15 to 25 yrs earlier. Rodent population numbers sky-rocket, gorged on the glut of bamboo seed. Almost unbelievably in these wet forests, fire becomes a real possibility, as the dead bamboo stems dry into ideal kindling under the next summer's sun. And light reaches the ground again in the treefall gap, giving the seedlings of the forest trees a chance to reclaim their inheritance from the usurper. But the respite is brief, as the next generation of bamboo seedlings is quickly underway. So the succession back to tall forest can take many decades.

It's not difficult to understand why Chileans often use rude words when they talk about, or directly address, the local bamboos. New Zealand ecologists and foresters don't have to deal with anything quite so obstructive to tree regeneration, vegetation sampling, or simply getting around in the forest. On other hand, the bamboos keep Chilean taxonomists gainfully employed, as there are about 20 species, some of which are devilishly hard to tell apart. Chilean industry has also found a use for what has often been considered a weed - the stems of some *Chusquea* species are used to make furniture.

Then you might start to miss the treeferns. Not a single species on the Chilean mainland, although there are a few on the Juan Fernandez islands out in the Pacific Ocean. The Chilean rainforest is rather poor in ferns in general, perhaps because the bamboos don't leave much room for them. There are also fewer shrubs than in New

Zealand, once again probably attributable to competition from those bamboos. Chileans have no need of a local equivalent of Hugh Wilson's guide to New Zealand's bewildering diversity of small-leaved shrubs.

Besides floristic differences, another thing that might surprise the visitor from New Zealand is the sight of familiar-looking plants acting a bit strangely. Like *Nothofagus* growing in the company of *Laurelia* - try finding that association in New Zealand. *Nothofagus* grows on a wider range of sites in Chile than in New Zealand, at least one of the nine South American species being present in virtually all forest types south of latitude 38°S. The success of *Nothofagus* in South America might stem from its "having the drop" on its local competitors. Whereas in New Zealand most emergent trees are podocarps, in Chile *Nothofagus* has moved into the top storey of the forest, and the few local podocarps are confined to the canopy. So the common elements of N.Z.'s Gondwanan heritage sometimes fit together differently in Chile.

If you look at the drama of forest succession, you'll find a clear divergence of NZ and Chile's hitherto parallel lines. *Nothofagus* is a ubiquitous coloniser of open spaces in southern Chile, slowly giving way to a range of shade-tolerant trees as succession advances. Whereas in New Zealand, stable self-replacing *Nothofagus* communities are the norm, as the genus tends to be relegated to sites that are not to the liking of shade-tolerant broadleaved trees. In Chile there is nothing comparable to the plethora of shrubs and small trees that precede tall forest on sites cleared by fire or farming back home. Nor is there an obvious parallel for the protracted curly successions in the central North Island podocarp forests that have long caused Kiwi foresters and ecologists to scratch their pates.

As it is for the landscape, so it is for the forest – many of the same elements, but combined differently. It's such a familiar setting, and you can you recognise half the players. But you'll see a new story unfold.



Bambusa guadua, one of the many bamboo species in South America