

The Australian Cloud Forest Collection

Fact Sheet

The Australian Cloud Forest Collection is a new feature garden for the Dandenong Ranges Botanic Garden, designed to showcase and conserve endangered flora from Queensland's Wet Tropics World Heritage Area. A 175-metre loop allows you to explore this re-created landscape with a unique collection of plants. Reclaimed storm timbers have been used to create seating for you to pause and contemplate.

High altitude protection

The mountain top ecosystems in far North Queensland are globally unique. Many plant and animal species not found anywhere else on earth. Climate modelling predicts these areas could suffer drastic habitat loss in the future. These 'cloud forests' are expected to experience longer, hotter, drier and more frequent droughts.



Far North Queensland mountains under threat from warming

Andrea Proctor Landscapes designed this new feature garden, taking inspiration from the northern granite peaks. The garden aims to replicate a mountain-top rainforest design and provide specific microclimates for rare plants within the collection.

The garden includes wild-collected wet tropic mountain top plants which were propagated, grown and distributed amongst botanic gardens throughout Australia to help ensure their ongoing conservation.

Specially sourced plants include Australia's only two species of native Rhododendron, which can be seen growing as lithophytes (plants that grow in or on rocks) amongst the large boulders.

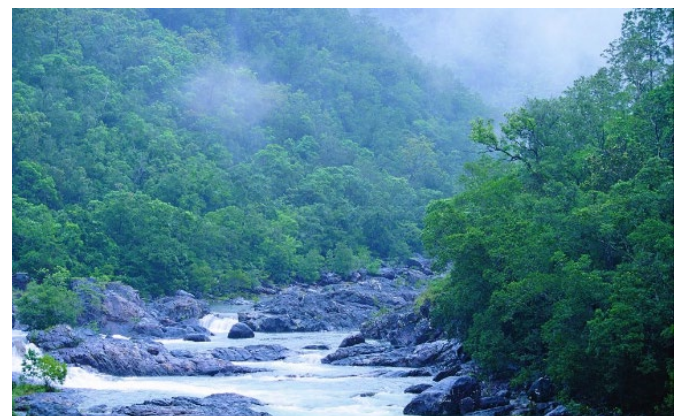
This kind of multi-strategy, ex-situ conservation reserve to 'backup' at-risk wild populations and support research, display and education, are critical in the fight to help protect climate-threatened plants.



Reclaimed storm timbers and huge boulders are part of this new garden design

Tropical world heritage area

The Wet Tropics of Queensland was declared a World Heritage Area (WHA) in 1988. It consists of approximately 8,940 km² of forest growing along the north-east portion of the Great Dividing Range.



Queensland rainforest gorge



Wet Tropics World Heritage area in Australia
Source: Wettropics.gov.au

To qualify as World Heritage, an area needs to be considered of Outstanding Universal Value, defined as 'cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity'.

For more information visit Wet Tropics Management Authority www.wettropics.gov.au.



Handover of plants from the Royal Botanic Gardens Victoria

Cloud stripping

Cloud stripping is a phenomenon that occurs in high-altitude rain forests (such as the cloud forests of far north Queensland) where clouds are often low enough to enshroud the tops of trees.

When the clouds come in contact with the trees water collects on the leaves and stems and becomes part of the throughfall, the water that drips to the forest floor and trickles down the trunks of the trees. It has been estimated to be as much as 30 % of the water reaching high altitude sites. The trees use a small amount of this water for their own survival, but most of the water reaches the streams and rivers.

Native rhododendrons

North Queensland's tropical mountain cloud forests are home to Australia's two native rhododendrons. Until 2022 it was thought only one species existed, however in that year it was recognised that differences in genetics and flower features were enough to recognise two separate species.

The first of these species discovered, *Rhododendron lochia*, was described by Ferdinand von Mueller in 1887, who gave it the specific epithet (label) *lochiae* in honour of Lady Loch, a patron of horticulture in Australia and wife of the Governor of Victoria. The spelling was later amended to *lochiae*. The name of the second species, *R. viriosum*, is derived from the Latin word for strong, or robust.

Both species have red flowers, however *R. lochia* (found on mountains south of Cairns), has a curved flower, whilst *R. viriosum* (found on the mountains north of Cairns), has a straight flower.



R. lochia in flower on Bell Peak (photo credit S Worboys)
www.inaturalist.org/observations/63658631



R. viriosum in flower on Mt Lewis (photo credit S Worboys)
<https://www.inaturalist.org/observations/40580302>

Sourcing the collection

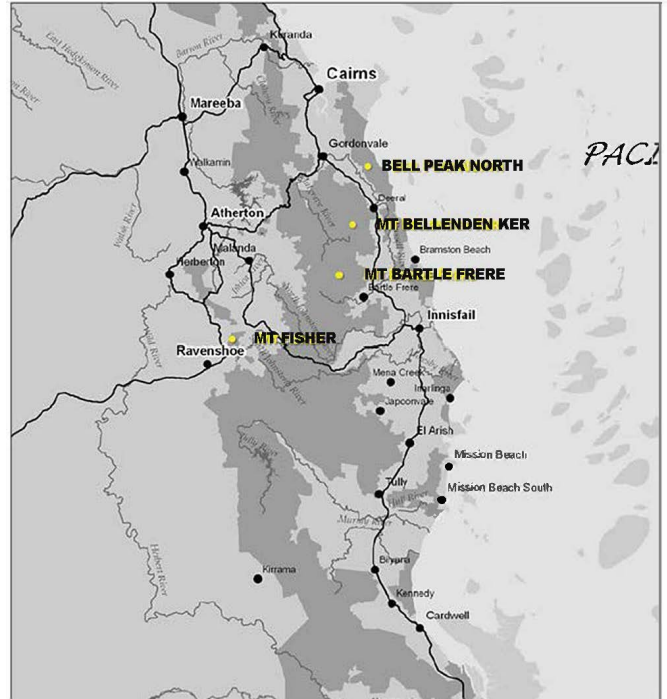
In the wild rhododendrons occur in several scattered populations on isolated high granite peaks. Here in the gardens plants sourced from all (but one) of the known populations, representing Australia's most comprehensive collection of native rhododendrons. This is preserving a significant amount of genetic diversity in the event that wild populations are lost to the effects of climate change.



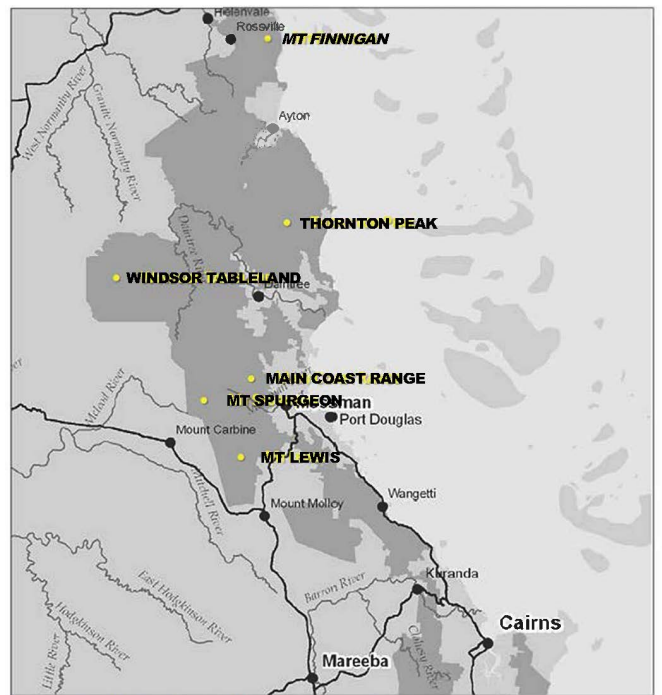
Field trips were undertaken to collect plant materials

The Australian Cloud Forest Collection focuses on plants from 10 mountain peaks within the world heritage area, all at an altitude over 1000m:

- Bells Peak
- Main Coast Range
- Mt Bartle Frere
- Mt Bellenden Ker
- Mt Finnigan
- Mt Fisher
- Mt Lewis
- Mt Spurgeon
- Mt Windsor
- Thornton Peak



Wet Tropics WHA south of Cairns, showing mountains targeted in the TroMPS project. These peaks (apart from Mt Fisher) provide habitat for *Rhododendron lochiaie*. (Base map: Wet Tropics Management Authority, 2008)



The Wet Tropics WHA north of Cairns, showing mountains targeted in the TroMPS project. These peaks provide habitat for *Rhododendron viriosum*. (Base map: Wet Tropics Management Authority, 2008)

Climate suitability

Despite being 3,000km south of their native range, the plants within this conservation garden will adapt to the local Dandenong Ranges climate. The key characteristic of these plants is that they don't grow at sea level in Queensland, rather at altitudes over 1000m "up in the clouds".



Plants ready for the cloud garden

The most noticeable difference between the mountains of the wet tropics and Olinda is rainfall volume. The Dandenong Ranges Botanic Garden is located within a cool temperate rainforest, receiving an average annual rainfall of approximately 1500mm (1000mm more than the Melbourne CBD).

By contrast the rain gauge at the summit of Bellenden Kerr in Queensland records an annual average rainfall of 8053mm, making it the wettest meteorological station in Australia. It also holds the record for the highest rainfall in a calendar year; 12,461mm (490.6in) recorded in 2000, and the highest monthly rainfall of 5,387mm (212.1in) recorded in January 1979.

The important similarity is that both locations are in temperate zones, not exposed to extreme temperatures or daily temperature variations. Olinda is generally cooler than the far north mountain peaks but is largely frost-free during winter. The humidity at Olinda is relatively high and uniform throughout the year.

Irrigation has also been installed throughout this garden, including fine mist sprayers, to help the plants survive.



Wild rhododendrons growing on mountain boulders

Project partners

This project was only possible through significant effort and partnership, funding from multiple sources and experts working together.

Delivered in partnership with the 'Tropical Mountain Plants Science' (TroMPS) project, this garden demonstrates a collaboration between:

- Australian Tropical Herbarium
- James Cook University
- Australian National Botanic Gardens
- Western Yalanji Traditional Owners
- Wet Tropics Management Authority
- Royal Botanic Gardens Sydney & Victoria
- Dandenong Ranges Botanic Garden (Parks Victoria)
- Brisbane Botanic Gardens
- Cairns Botanic Gardens
- The Australian Rhododendron Society

TroMPS aims to secure the future of Australia's climate-threatened tropical mountain top plants. This is achieved by building a multi-strategy, ex situ conservation reserve to 'backup' at-risk wild populations and support research, display and education.

For further information on TroMPS visit www.tromps.org.au or scan here:



Funding

The Australian Cloud Forest Collection has been funded by:

- Australian Rhododendron Society, Victoria Branch
- Victorian Government's 'Growing Victoria's Botanic Gardens' grant
- Ian Potter Foundation



Planting the garden was a big team effort

A gift for the future

Simon Begg was an Australian Rhododendron Society (ARS) member who saw the need for the proper scientific collection, study and conservation of our native Rhododendrons.

From 2010 Simon was instrumental in setting up and driving the project to collect and study Australian Rhododendrons and other mountain top species. This work later evolved into the Tropical Mountain Plant Science (TroMPS) project.

Sadly passing in 2018, Simon's estate included a large donation to the ARS, a gift which in turn became a substantial part of the funding required to build this unique cloud forest garden.



Official opening by MP Daniela De Martino (Member for Monbulk), 23 August 2024

For information on many more parks, gardens and other sites managed by Parks Victoria, visit www.parks.vic.gov.au.