Safeguarding Foote's grevillea

Grevillea is the third largest genus in the Australian flora, and perhaps the most popular horticulturally. One unusual member of this popular group, *Grevillea calliantha*, was only discovered in 1991 but the number of plants that remain in the wild has already declined by 80 per cent. Collaboration between scientists, landholders, natural resource managers and the State Government is safeguarding this unique species into the future.

by Leonie Monks, Andrew Crawford, Kane Watson, Christine Smith, Lauren Strumpher and Steve Buitenhuis

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Main Foote's grevillea (*Grevillea calliantha*).
Photo – Sallyanne Cousans

Above Setting seed, site inspection.
Photo – Kane Watson

Foote's grevillea (*Grevillea calliantha*) was first brought to the attention of the botanical world in 1991, when plant collector, Nick Foote, working in the Cataby area (around 170 kilometres north of Perth), noticed an unusual grevillea, covered in striking, dark maroon-coloured flowers. It wasn't until 1991 that the species was formally named. The botanists who described and named the species, Peter Olde and Neil Marriott, were inspired by the prolific and spectacular flowering of the species, naming it *calliantha*, meaning 'beautiful flowers'.

Foote's grevillea is a compact shrub, which grows to around one metre tall and two-to-three metres wide, with grey to yellow-green coloured leaves. Flowering occurs between September and February, with large quantities of nectar produced that encourage visitation by honeyeaters. The species grows in soils of grey to yellow-brown sand over laterite and occurs in areas of low heath with scattered coastal blackbutt (*Eucalyptus todtiana*) and marri (*Corymbia calophylla*) on slopes and low hills.

In the early 1990s, following the formal naming of Foote's grevillea, extensive searches were made to find new locations of the species. However plants were only found in a small area near Cataby. Only six populations of this species were found with a combined total of just under 150 plants. Foote's grevillea was listed in Western Australia as rare when it was named, but since then concern has grown for its long-term future with the species now listed nationally as Critically Endangered.

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In the four decades since it was discovered, the number of plants remaining in the wild has declined by more than 80 per cent to just over 25 plants due to threats from grazing by rabbits, changed fire regimes, competition with weeds, chemical spray drift, *Phytophthora* dieback disease and maintenance of the road verges in which many plants grow.

CONSERVING FOOTE'S GREVILLEA

To safeguard the long-term future of Foote's grevillea against these threats, conservation efforts over the past four decades have focussed on protecting the wild populations, collecting and conserving seed, and using the seed to establish new populations in locations that don't have the same threats as the wild populations (called translocation sites).

The seed collection program began in 1998 when seeds were collected from multiple plants at four different occurrences of the species. The seeds were then dried, before being frozen

How do Grevillea seeds disperse?

Grevilleas have two main forms of seed dispersal. Some have seed with a wing that enables the seed to be caught by the wind when shed from the seed pod and blown away. Others have an elaiosome, a fatty structure at the end or along the side of the seed, which attracts ants. The ants carry the seed away, usually to their nests, to eat the elaiosome, leaving the seed intact.

Below Ants on a *Grevillea batrachioides* seed.
Photo – Andrew Crawford/DBCA

and stored in the seed vaults of the Department of Biodiversity, Conservation and Attraction's (DBCA) Western Australian Seed Centre-Kensington (WASC-K). Over the subsequent 24 years, an additional 31 seed collections were made from all the populations of Foote's grevillea, including populations for which there are now no living plants. Despite this considerable seed collection effort, the number of seeds in secure storage is still low with just over 1440 seeds collected.

The stored seed has been used to establish two new translocated populations and to restock one wild population where plants had recently died out (also known as a restocking translocation). The seed stored in the WASC-K vaults was carefully thawed, then germinated under controlled conditions in the laboratory before being transferred to the nursery at Kings Park to be grown until the seedlings were robust enough for planting at the translocation sites.

When germinated for translocation, some of the seed collections had been in storage for more than twenty years. The fact that the viability of the collections was still high and as good as it had been when the seed was first collected, shows that seed banking is working for this most threatened of species. From 1998, these seedlings and some cuttings were planted at the three translocation sites. Almost 500 plants were recorded across the translocation sites by 2018, demonstrating how valuable this work had been in ensuring the species did not go extinct in the wild. However, further work is still required.

Top left Fernanda Veraldo preparing cuttings.
Photo – Andrew Crawford/DBCA

Above left Foote's grevillea seed collection.
Photo – Leonie Monks/DBCA

Above *Grevillea calliantha* flower.
Photo – Andrew Crawford/DBCA

COLLABORATIVE CONSERVATION

In 2020, the Northern Agricultural Catchments Council Natural Resource Management (NACC NRM) received funding from the Australian Government's National Landcare Program to support recovery efforts for Foote's grevillea. Over the past two years, this funding has helped NACC NRM and DBCA, together with landowners from the Cataby area, to increase the effort to help save this stunning plant. These partners bring unique skills and different perspectives to the conservation actions, that when combined enhance the recovery efforts for this very threatened plant.

What the project means to the Regional NRM partner

NACC NRM recognises that as the pressures facing our environment continue to grow, support for collaborative projects provides a clear path to shared outcomes. NACC NRM's purpose is to guide and support the Northern Agricultural Region community to value, and actively protect our region's natural capital, consistent with the aspirations and goals of the regional NRM strategy (NARvis). Partnership for the improved conservation of Foote's grevillea clearly aligns with the NARvis goal of maintained or improved conservation status of threatened plants, of which Foote's grevillea is listed as one of the thirty plants in the Australian Government's Threatened Species Strategy. Being able to partner with DBCA and landowners to build on previous efforts delivers a positive conservation outcome.

Kane Watson *is an Environmental Scientist with NACC NRM, with a focus on sustainability and working with community to achieve collaborative projects and education.*

What the project means to the local landowner

The work being done here is important and the interaction and education of landholders encourages us to engage with the process of protecting endangered species. We are currently constructing a bush corridor, part-funded by NACC NRM, to link up vital bush areas on our farm. The support around controlling the rabbits has made a huge difference to us going forward and being more committed to getting on top of this major issue. Education and awareness are critical, and this has trickled down to the next generation coming into our farming operation.

Christine Smith *and her family are landowners in the Cataby area, utilising regenerative agricultural practices on their farm.*

DBCA Turquoise Coast district's involvement

Turquoise Coast District staff are actively involved in the conservation of Foote's grevillea, as well as many other threatened species. Populations are monitored, roadside markers maintained, and discussions are had with property owners and local governments to identify and manage threats to the species. Officers and conservation employees are involved in translocation site planning, irrigation, fencing and planting in support of the conservation efforts. Ongoing tasks for local staff include seed collection, weed control and the maintenance of water tanks and irrigation set ups. District staff across several work areas value the opportunity to be involved in these programs, as it gives a good understanding of threatened species recovery actions, and local involvement in the conservation of these species is vital to ensure successful outcomes.

Lauren Strumpher *is a District Operations Officer for DBCA's Turquoise Coast district and* ***Steve Buitenhuis*** *is a Nature Conservation Coordinator for DBCA's Turquoise Coast district. He oversees the management of flora and fauna in the district.*

Opposite page
Main Orange-red flowers of Foote's grevillea hang below the bonsai-like weeping foliage.
Photo – Benson Todd/DBCA
Inset far left *Grevillea calliantha* seed.
Photo – Andrew Crawford/DBCA
Inset left Foote's grevillea seedlings growing in the nursery.
Photo – Simone Dudley/DBCA

This page
Top right Lauren planting *Grevillea calliantha*.
Inset top *Grevillea calliantha* seedlings in nursery.
Inset above Foote's grevillea planted in the seed orchard.
Photos – Leonie Monks/DBCA
Right Ant on the flower of Foote's grevillea.
Photo – Benson Todd/DBCA
Background right *Grevillea calliantha* flower.
Photo – Andrew Crawford/DBCA

DBCA Science contribution: seed collection and translocation

The funding secured by NACC NRM has supported further seed collection and translocation work for Foote's grevillea. There are currently only three populations of Foote's grevillea where seed can be collected, and these were targeted for seed collection over the past two summers. To ensure only mature seed was collected, breathable cloth bags were placed over fruit to catch seeds when it was shed from the plant. The number of seed collected from each plant was limited to a small proportion of what was available, so as not to adversely affect long term survival of the populations. During the two seasons, over 350 seeds were collected, some of which were used to grow plants for translocation. In the first year of the project over 260 seedlings and cuttings were planted at one of the wild populations where plant numbers had been dwindling. Adding more plants has boosted the likelihood that the population will once again thrive.

In a new direction to the conservation efforts, this year the project partners have worked together to establish a seed orchard near Jurien Bay. Seed orchards are plantings planned and maintained to increase seed production, so that seed does not need to be continually harvested from wild plants. The seed orchard for Foote's grevillea was planted with over 325 seedlings and cuttings, is fenced to protect the plants from grazing and will be watered to maximise plant survival and seed production. The seed will be used to expand our efforts to conserve this beautiful plant and ensure it continues to survive and thrive in the wild.

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