# Oh what a tangled wattle we weave

Once thought to be extinct, this wiry entangled shrub certainly lives up to its name—tangle wattle (*Acacia volubilis*)—with volubilis, meaning twining, in reference to the twisted, tangled and twining habit of the plant. Scientists are taking a closer look at the species that is only found in a small area in the Wheatbelt.

by Leonie Monks, Bree Phillips, Andrew Crawford, Josh Kestel and Rachel Binks

*Acacia volubilis*, commonly known as tangle wattle, is a small shrub that only grows in the Wheatbelt region of Western Australia. The species was first collected near Quairading before being named in 1877. However, the species was thought to have gone extinct in the subsequent decades, as the area in which it had been found was highly cleared for the rapidly developing agricultural industry.

Then in 1996, botanists Brendan Lepschi and Terena Lally found a handful of living plants of the tangle wattle north of Cunderdin. Following the rediscovery, several additional small populations of tangle wattle were found, mostly on narrow, weed-covered road verges, around the towns of Cunderdin and Quairading. The rediscovery was exciting, but the species was in a precarious state.

Tangle wattle grows to half a metre in height and is named for the tangled appearance of the branchlets. In fact, the scientific name 'volubilis' means twining, in reference to the tangled, twining habit of the species. The flowers cluster together to form small spherical balls (known as inflorescences) that are golden in colour, occur in June and July and are likely insect-pollinated. Seeds of tangle wattle grow in pods that are released, once ripe, in mid-summer.

## MANAGING THREATS

The species' rediscovery in 1996 stimulated further surveys to look for new populations of tangle wattle. Six years later, a total of 11 populations had been found, however many persisted on narrow road verges and consisted of a handful of individuals totalling just 89 plants.

Threats to the species' survival included clearing of road verges, weeds, herbicide, fertiliser drift from adjoining agricultural land and changed fire regimes. The small size of the populations was also a concern as small populations are less likely to attract pollinators, may have reduced seed set and seed may be more inbred (due to cross-pollination between related plants).

Together, these threats meant that tangle wattle was at high risk of extinction and led to it being listed as Critically Endangered. To help protect populations and support recovery, the Department of Biodiversity, Conservation and Attractions (DBCA) began trialling weed control measures, marking populations to help minimise accidental damage, continuing survey efforts to find new populations, collecting and storing seed at the WA Seed Centre located at DBCA in Kensington, and beginning a translocation program.

## TRANSLOCATING TANGLES

The translocation, which commenced in 2004, involved the germination of seed collected and stored earlier at the WA Seed Centre, as well as a small number of cutting-grown plants.

An area amongst an existing healthy but small population in remnant bushland was chosen as the site for planting the seedlings as it provided appropriate habitat and minimal threats. To boost the chances of survival, the seedlings were fenced to protect them from rabbits and kangaroos and were watered once a week for the first two summers following planting.

After the initial planting, further plantings were undertaken. However, the number of seedlings available were


"…tangle wattle was at high risk of extinction and led to it being listed as Critically Endangered."

*Previous page*
**Main** Flowers of the tangle wattle (*Acacia volubilis*).
*Photo – Andrew Crawford/DBCA*

*This page*
**Top** Collecting a genetic sample from a roadside tangle wattle plant.
*Photo – Rachel Binks/DBCA*

**Above** Tangle wattle shrubs have a twining, tangled appearance.
*Photo – Andrew Crawford/DBCA*

**Above** Close up of tangle wattle flowers.
*Photo – Andrew Crawford/DBCA*

**Above right** Tangle wattle is a small shrub that flowers in winter.
*Photo – Rachel Binks/DBCA*

constrained by the limited number of seed. By 2019, a total of 79 plants had successfully grown to maturity at the translocation site, with seedlings being more successful than cutting-grown plants. During this time, further survey work had also located an additional five populations. These new populations combined with translocation efforts meant that, just over 20 years after the handful of plants were rediscovered, the species was now known from approximately 260 plants across 17 populations.

## SEEDS FOR SURVIVAL

Despite these encouraging results from the efforts to conserve tangle wattle, more needed to be done to ensure the continuing survival of the species. Further translocations were required to increase the number of plants in some of the current populations and more populations were needed in secure locations. However, limited seed availability was a barrier.

It was decided that a seed production area (SPA), where plants are grown in a cultivated environment with optimised water and fertiliser regimes, was needed to increase the amount of seed for future translocations.

However, prior to establishing an SPA, additional information was required. It had been noted that some plants of tangle wattle appeared to be reproducing clonally via underground runners (known as rhizomes), which meant the number of genetically differentiated plants was unknown.

This knowledge gap, in addition to the extensive distance between some of the populations (up to 80 kilometres), meant a better understanding of the frequency of clonality, population structure, and remaining levels of genetic diversity was required to inform the establishment of an SPA.

## WHAT'S NEXT

In 2024, DBCA in collaboration with the Australian Seedbank Partnership, received Australian Government funding to support the recovery of tangle wattle as part of the Saving Native Species Program.

The first step was to undertake detailed monitoring in conjunction with the collection of samples for genetic analysis. The genetic analysis will help determine how many unique individuals of tangle wattle exist, what level of genetic diversity remains in wild populations, and how effectively genetic diversity was captured in the current translocation.

Answers to these questions will guide decisions about how to establish the SPA and future translocations, including which populations can be mixed together, and how to spatially arrange plants to boost cross-pollination and maximise genetic diversity.

Planning for the SPA is now underway and, once the results from the genetic study are known, the SPA can be set up with a science-based framework. It is hoped that diverse and abundant seed will be produced in the SPA that can be used to expand the number and size of translocations and ensure the long-term survival of this unique and beautiful tangle wattle.

***Leonie Monks*** is a Research Scientist with DBCA's Biodiversity and Conservation Science. She can be contacted at leonie.monks@dbca.wa.gov.au or (08) 9219 9094.

***Bree Phillips*** is a Flora Conservation Officer with DBCA's Parks and Wildlife Service in Northam. She can be contacted at bree.phillips@dbca.wa.gov.au or (08) 9881 1645.

***Andrew Crawford*** is a Research Scientist with DBCA's Biodiversity and Conservation Science. He can be contacted at andrew.crawford@dbca.wa.gov.au or (08) 9219 9063.

***Josh Kestel*** is a Research Scientist with DBCA's Biodiversity and Conservation Science. He can be contacted at josh.kestel@dbca.wa.gov.au

***Rachel Binks*** is a Senior Research Scientist (Plant Genetics) with DBCA's Biodiversity and Conservation Science. She can be contacted at rachel.binks@dbca.wa.gov.au or (08) 9334 0498.