

News from the ASBP

Towards recovery of the Scaly-leaved Featherflower

ANDREW CRAWFORD*, LEONIE MONKS AND ALANNA CHANT

Department of Biodiversity, Conservation and Attractions

*Corresponding author: andrew.crawford@dbca.wa.gov.au

The Scaly-leaved Featherflower (*Verticordia spicata* subsp. *squamosa* A.S.George) has been rare for as long as it has been known. Since its discovery in the 1950s only nine populations of the species have been found over an area of approximately 160 km² in the Three Springs and Mingenew areas in the mid-west of Western Australia. This area has been extensively cleared in the past, with most of the known populations now occurring on narrow road verges, or in small patches of remnant vegetation on private property (Stack *et al.* 2004).

The number of mature plants known for the species has always been low. The total number of plants in the wild was at its highest in the mid-1990s but still the number of plants totalled less than 50 (Stack *et al.* 2004). This period, when the number of known plants was at its peak, coincided with the first seed collections of the species being made for conservation purposes by staff from the Department of Biodiversity, Conservation and Attractions' Threatened Flora Seed Centre.

The Threatened Flora Seed Centre is a seed conservation facility that was established in the early 1990s with the primary purpose of collecting and preserving seed of plant species of conservation significance in Western Australia. The aim of these seed collections is to ensure genetically representative samples of species are available for future recovery work such as translocation. To achieve this goal, best practice for seed collection and storage are followed (Offord and Meagher 2009).

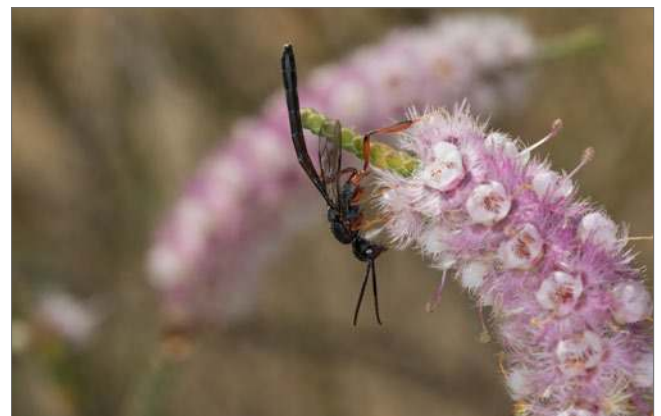
By the year 2000, an estimated 4500 seed had been collected from most of the known populations. Due to concerns about the long-term viability of the known populations, particularly the small road verge populations, plans were prepared for a translocation into a healthy patch of remnant vegetation on private property, within the known distribution of the species. Propagation of the species was known to be difficult and therefore it was decided using a combination of both cutting material and seedlings would be the best strategy to produce plants for translocation. A small number of plants were planted in 2001, followed up with further plantings in 2002, 2005 and 2009.

By 2017 only two of the known wild populations of the *Verticordia* still had living plants totalling six individuals. In the translocation, only around a quarter of the plants that had originally been planted were surviving (18 plants). Although low in number, these translocated plants had

become crucial for the ongoing recovery of the species due to the critically low numbers of wild plants at this time. Despite the translocated plants having flowered in the intervening years, no evidence of natural recruitment had been seen. Smoke has been found to stimulate germination of this species from the soil seed bank (Yates *et al.* 2000). As no fires occurred in the vicinity of the translocated and natural populations this lack of smoke to stimulate germination may be a possible explanation for the apparent absence of recruitment not only in the translocated population, but also the natural populations.

As part of the Australian Government's Threatened Species Strategy, the Scaly-leaved Featherflower, along with 29 other species were prioritised for action to improve their conservation trajectory by 2020 (Australian Government 2019). The actions planned to achieve this outcome for the Scaly-leaved Featherflower were the collection of propagation material (both seed and cuttings), translocation, and the protection of the remaining habitat on private property. This work began in 2017, when plans were developed to supplement the existing translocation, in addition to establishing a new translocation site and reintroducing plants to a population that had recently gone extinct. Additional seed collections from the remaining wild plants were also planned for the summer of 2017–18.

The value of having seed collections stored safely in an *ex situ* seed storage facility were highlighted with this project. Having existing seed collections enabled the generation of seedlings to be undertaken immediately.



The Scaly-leaved Featherflower (*Verticordia spicata* subsp. *squamosa*). Photo: Andrew Crawford



A translocated seedling of *Verticordia spicata* subsp. *squamosa*.
Photo: Alanna Chant

Additionally, the genetic diversity represented by these old collections is likely to be far greater than that represented by the current wild populations as the number of extant plants was now far less than when the collections were originally made. The germination of seed from collections made over a decade previously also provided the opportunity to compare the viability of the collections to what they had been when first collected. The good news is that whilst germination was low (ca. 50%) for some collections, this was comparable to what the germination had been when these collections were first tested.

Seed collections to improve the size of the *ex situ* collection and to replace seed used for the translocations were undertaken as part of the strategy in the summer of 2017/18. Unfortunately, 2017 proved to be a poor season for the flowering of the *Verticordia*, with little to no flowering of the remaining wild plants. A small number of plants in the translocated population had flowered and a decision was therefore made to collect seed from these plants. Bags were placed over the old flowers, which hold the seed containing fruit, to catch them when shed. These bags were retrieved in early 2018 and resulted in a seed collection of around 500 seed. This highlights one of the advantages of having *ex situ* seed collections that can be drawn upon to undertake translocations as there are no guarantees that seed will be able to be collected in a given season. It was also the case for this species that there would have been insufficient time to germinate and grow plants from the seed collected in 2018 for it to be ready for planting by winter of 2018.

Over eighty plants were planted into the translocations in the winter of 2018. Most of these plants were still surviving by the end of summer 2019. Plans are now underway to add additional plants to all of these translocations. As a result of these recovery actions, undertaken by the Department of Biodiversity, Conservation and Attractions and supported by funding from the Australian Government as part of the Threatened Species Strategy, and the Northern Agricultural Catchment Council, the future of this species is now looking brighter.

References

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Germinating seed of *Verticordia*

Verticordia have an indehiscent fruit contained within the old, faded flower. It is difficult to visually distinguish between old flowers that have a seed containing fruit and those that do not. The storage unit for seed collections is therefore the old flowers. To estimate how many seed are in a collection a sample of flowers is cut to determine the proportion containing seed. This process is combined with the germination test so that the viability of seed can be estimated. Germination testing begins with the old flowers being soaked in a smoke water solution and then the seeds are excised. These seed are placed into petri dishes on agar containing gibberellic acid (100 mg/l) and incubated at 15 °C. Once seed germinate, they are transferred to soil and grown into seedlings ready for translocation.



a. A seed of *Verticordia spicata* subsp. *squamosa* excised from the old flower; b. A germinating seed of *V. spicata* subsp. *squamosa*; c. A *V. spicata* subsp. *squamosa* seedling ready for translocation. Photos: a, b. Andrew Crawford; c. Leonie Monks.