

How many plants do we have in South Australia?

You might think this would be a simple question to answer. In a State like South Australia, with its strong tradition in natural history and scientific endeavour, wouldn't we would know all of our species of plants and animals?

We have accomplished some notable milestones in our floral knowledge. South Australia was the first State or Territory to have a flora (an inclusive description and identification tool for all plants, published by JM Black in 1922), and the Census of South Australia (an up-to-date list of the State's plants) is widely considered to be the best and most inclusive in Australia. The census currently puts the number of plant species in South Australia at around 5000.

However, the most recent edition of the flora, in the mid-1980s, described fewer than 4000 plants. That's over 1000 new species added in 20 years, an average of 50 new species a year. In the last year alone, 73 new species were recorded.

We have an approximate answer to the main question but why does the number change so rapidly? Well, several scientific disciplines, and DEH staff and volunteers who constantly push past boundaries, are responsible.

The first discipline is taxonomy, which aims to improve our imperfect knowledge of the natural boundaries between species.

Take a group of plants that appears identical to the naked eye, except for a few microscopic features. In reality, these few small differences may prevent interbreeding and maintain separate genetic units. As botanists get a clearer picture of the variation across species, they are able to identify the morphological discontinuities that delimit them. Botanical field trips conducted by the State Herbarium to remote locations in the state can often discover species that are new to science. This discrimination and identification effort accounts for 34 of the 73 new species, and is largely due to the dedication of staff and volunteers at the State Herbarium.

We should not rule out the possibility of discovery of batches of new species in the future. In the last decade, literally hundreds of troglobitic (cave dwelling), stygofaunal (living in underground limestone aquifers) and mound spring invertebrate species have been discovered, and are still turning up at a rapid rate.

But it's not always more, more, more. In recent times, four species have been struck off the SA plant list, because they were originally misidentified or they didn't warrant recognition as a separate species.

The second main area of activity for new species knowledge is field surveys by the Biological Survey of South Australia and the regional ecologists and threatened species officers across the State, who are making increased efforts to find species or surveying areas not previously visited by qualified botanists. Overall 39 species known from outside SA have been found by recent survey and field work within State boundaries. Three of these species (including an orchid, *Thelymitra cyanapicata*, and a *Viola* species) had been thought to have become extinct. Bringing species back from the dead is certainly a good news story.

However, the news isn't all good. This second category of plants hints at a worrying global trend, an increasing rate of species turnover in native plant communities. Of the 39 species previously known but recently found in SA, 15 (over 20%) are recorded as known weeds from elsewhere in Australia. It is also likely that a number of range expansions of both native and exotic species can be linked to recent trends in global warming. In other parts of the world, there is evidence that species are starting to shift their ranges to escape harsh environments in some parts of their historical distributions. Monitoring the changing distribution of the State's native species and new influxes of invasive species will require intensive efforts if we are to understand how and why species are changing in response to climatic and environmental shifts. It will allow us to develop planning and policy approaches to cope with the vagaries of this dynamic system.

Keeping on top of these changes has been a full-time job, and now they'll be consolidated in a new State flora. The new flora project is underway and will extensively update the State's floral taxonomic knowledge, and authoritatively answer the question, 'how many plants do we have in SA?' – at least for a short while.