

GUEST ESSAY Vive l'Horticulture de Conservation

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Abstract

Conservation horticulture is an emerging and increasingly important function for all botanic gardens, but it is an activity that can be difficult to explain and to promote. Part of that difficulty lies in its name, and a few alternatives are suggested in this Guest Essay – such as Care for the Rare, Raising Rarity, and Plant Rescue and Care Unit – all currently in use at Royal Botanic Gardens Victoria (RBGV) for more narrowly scoped but pioneering projects. In reimagining conservation horticulture at RBGV we want to draw on the public's intrinsic interest in and affinity with plants, rather than taking a defensive stand against what is often called 'plant blindness'. Raising Rarity 2.0 is likely to combine commercialisation of rare species, innovative blending of amenity and conservation horticulture, and even stronger partnerships with schools and local government. As I prepare to leave RBGV after 25 years in senior management of botanic gardens, I'm supporting a grassroots push from horticultural and research staff to add conservation horticulture (whatever we call it) to our already potent mix of nature, culture and science.

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Great expectations

In February 2013, I arrived back at RBGV as the new Director and Chief Executive having worked there for eight years in the 1990s as a botanist and Research Manager. I announced to the Melbourne press (Gadd, 2013), among others, that I wanted RBGV to be ‘an international cultural attraction while leading in science-based conservation’, adding, for good measure, my desire to also cater ‘for those who are simply passionate about plants – or, for that matter, fungi and algae’. This the editors summed up in the story’s headline: ‘The Royal Botanic Gardens’ new guardian believes in beauty before science, but only just’. I was happy with that as a fair reflection of my intent.

Now, after more than 25 years in the bucolic bureaucracy of botanic gardens – including heading up two Australian botanic gardens (in Melbourne and Sydney) and chipping in near the top of London’s Royal Botanic Gardens, Kew for a few years – I am about to step down from my current role. I’m immodest enough to declare here – and must confess I’m reading a very long and wonderful biography of Napoleon Bonaparte (Roberts, 2016), who was fond of exaggerating his achievements – that the decisive battle has been won. Most recently, our new winter event Lightscape attracted sell-out crowds of nearly a quarter of a million in its first year, supporting our selection as Australia’s Major Tourism Attraction in 2022 (along with being a three-time winner of the same award for our State of Victoria the year after). Science and horticulture have also prospered, apart and together, and in my view RBGV is now an unstoppable force for conservation.

I’m fond of saying botanic gardens are at their best when they combine nature, science and culture. What we have at Melbourne and

Cranbourne – RBGV’s two sites – is a potent mix of these three ingredients. The botanical landscapes are spectacular (Figs 1 & 2) and perhaps unsurpassed on a world scale (sorry, it’s the influence of Napoleon); the science we do is contemporary (extending to the latest genomics research) and targeted (reaching beyond flowering plants, deep into the kingdom Fungi and now Nucleariae); and the two sites form an unassailable cultural asset to the local community and tourists alike. For more hyperbole on how I see this as the culmination of both my own career in botanic gardens and the promise of RBGV, I refer you to my recent memoir, *Evergreen: the Botanical Life of a Plant Punk* (Entwisle, 2022).

In that book I touch only briefly on conservation horticulture, but I now see this as the next frontier for RBGV. Not, I rush to say, modelled on Napoleon’s ill-fated and unwelcomed advance into Russia (and other European nations). This ambition is better compared to his pursuit of Western Enlightenment ideals or perhaps his ability to inspire troops in his years as a younger general. This is a *cause célèbre*.

A rose by any other name *would* smell sweeter

‘Conservation horticulture’ (Affolter, 1997) is a victim of the same linguistic conundrum as ‘biodiversity’ – it says exactly what it is but in a rather obscure and overly technical way. Put simply, it is horticulture that we do to conserve plants. More precisely, Botanic Gardens Conservation International (BGCI) (2023a) defines it as the development and management of *ex situ* plant collections that:

- are genetically diverse and representative of wild populations;
- provide plant material for *in situ* conservation, including population



Fig. 1 Aerial view of Royal Botanic Gardens Melbourne with 'Guilfoyle's Volcano' in the foreground. Photo: Adrian Vittorio.



Fig. 2 The Red Sand Garden, Australian Garden, centrepiece of Royal Botanic Gardens Cranbourne. Photo: Tim Entwisle.

reinforcement and reintroduction programmes; and

- support conservation education and environmental sensitisation.

I gather 'environmental sensitisation' refers to our ability to perceive and process information about the environment, so 'environmental awareness' would do just as well. In any case, the territory marked out is quite broad, from doing things in order to actually save species at immediate risk of extinction, to holding insurance collections 'just in case', being able to study their genetics, taxonomy and behaviour under controlled conditions, and using plant collections to promote the importance of plant conservation.

Here at RBGV, we package up projects under the umbrella of conservation horticulture and give them what we consider to be more evocative and memorable names

– such as 'Care for the Rare' and 'Raising Rarity'. Care for the Rare is a collaboration with Botanic Gardens Australia and New Zealand (BGANZ) and a handful of the 40 or so regional botanic gardens in Victoria (BGANZ, 2020; Ross, 2021). In a pilot programme funded through philanthropy, we've selected and supplied locally rare plants to five botanic gardens for display and education (Figs 3 & 4). Sometimes that is a single at-risk local species, other times a selection of plants to create a thought-provoking and attractive garden display (Fig. 5). Funding permitting, we intend to expand this further to support all botanic gardens in our State to promote not only the merits of their local flora but the role their garden can play in its conservation.

Raising Rarity began in 2021 as a combined commercialisation and community outreach opportunity, to generate revenue for conservation work while establishing rare



Fig. 3 Royal Botanic Gardens Victoria horticultural staff preparing plant material to distribute to regional botanic gardens in Victoria through the Care for the Rare project. Photo: Kaishan Qu.

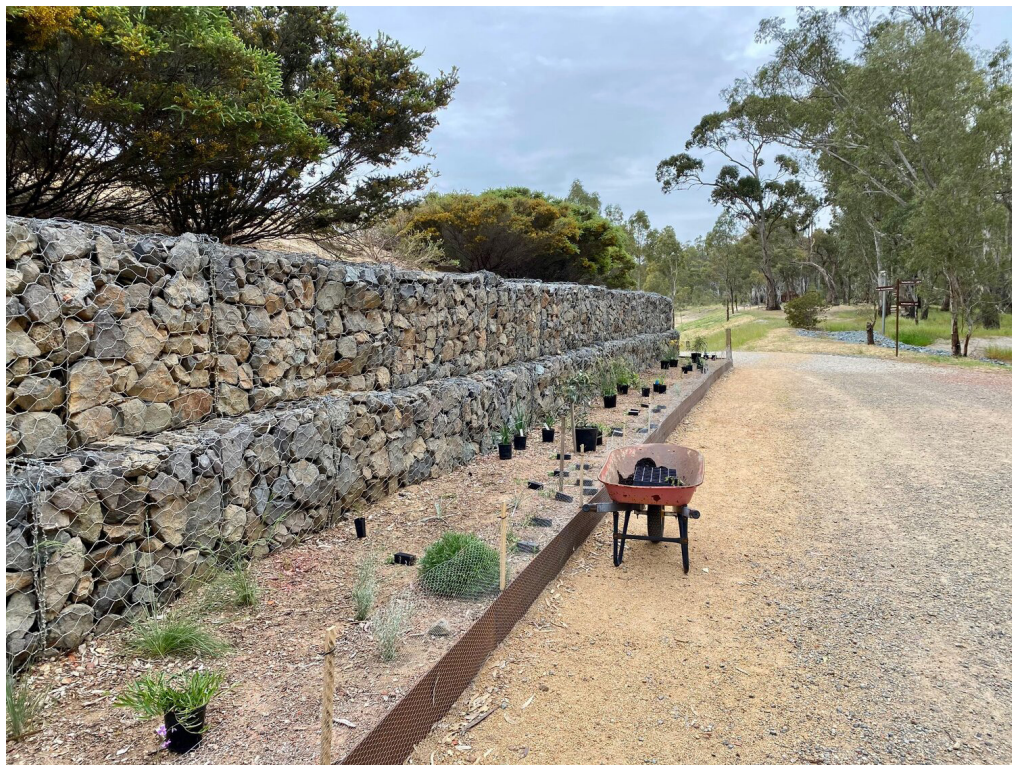


Fig. 4 Planting out the Care for the Rare Garden at Australian Botanic Gardens Shepparton, in northern Victoria. Photo: Melissa Stagg.



Fig. 5 The rare Australian violet, *Viola betonicifolia* subsp. *novaguineensis*, freshly planted into the Care for the Rare Garden at Australian Botanic Gardens Shepparton, in northern Victoria. Photo: Melissa Stagg.

plants in home gardens as a distributed *ex situ* collection (of plants from known source) and flagship for local plant conservation. The threats to Victorian species are many, from land clearing to climate change, from grazing by animals to competition with invasive plant species. These threats will be familiar to anyone caring for plants in the 21st century. We sought – and were awarded – funding from benevolent foundations and through crowdsourcing, enough to kickstart a small programme of propagation at our Cranbourne site. Ultimately, we want to sell plants and reinvest the revenue to help grow the programme.

Two years in, trials of twelve potentially reliable and pretty plants are in public view, within the Australian Garden at Royal Botanic Gardens Cranbourne (Fig. 6). When research scientist Meg Hirst and horticulturists Russell

Larke and Matt Henderson described the project for the industry magazine *Hort Journal Australia* (Hirst *et al.*, 2021) they explained that plants were to be assessed for ‘desired horticultural characteristics, including attractive and/or long-lived flowers, interesting foliage, unique forms (e.g., compact habit), pest and disease resistance, and adaptability to environmental conditions’, going on to say that ‘with an understanding that seed can be a limiting factor for many rare species, we are developing seed orcharding techniques and facilities to expand seed availability and retain genetic diversity, as well as investigate methods in asexual propagation from multiple populations’. Pretty plants, easy to grow and of value to conservation.

In recent months we have expanded the Raising Rarity concept to include other aspects of our conservation horticulture



Fig. 6 Raising Rarity research beds on public display in the Australian Garden, Royal Botanic Gardens Cranbourne. Photo: Tim Entwisle.

programme, such as seed collection and propagation research. Indeed, Raising Rarity is becoming a kind of shorthand for conservation horticulture at RBGV. While what you do may be more important than what you call it (a rose by any other name...) I think 'conservation horticulture' undersells and underwhelms. There are many other terms in use around the world, including the same one used for different programmes: Care for the Rare was first used by BGCI (2023b) for 'a flexible, growing resource for public gardens to use to highlight threatened species and conservation issues'. Different names will resonate differently around the world, and it makes sense to tailor the nomenclature to personal taste and to make the best local impact. I like 'Gardening for Nature', for example, but some of my colleagues think it doesn't have sufficient gravitas.

Another of my suggestions that hasn't taken off is 'Plant Rescue and Care Unit'. During the COVID pandemic, the term 'Intensive Care Unit' was familiar to all, being a critical part of the healthcare response. I could see a parallel in botanic gardens where in the summer of 2019–2020 we were responding to catastrophic bushfires, swooping in as soon as we could to collect seed and propagation material for our *ex situ* collections. Zoos Victoria were doing similar work on invertebrates and mammals devastated by the fires. Before these animals could return, their habitat – in all its diversity – had to be restored, and only then could we even think about the intrinsic value of the plants to that habitat. I began to refer to this work – along with the Victorian Conservation Seedbank, part of the Australian Seedbank Partnership – as our Plant Rescue and Care Unit. In that context, our 'plant ambulance' took scientists and horticulturists into the ravaged landscapes as soon as it was safe to

do so, bringing back samples to care for in the botanic garden. Normally we focused primarily on seed, but the scale of this destruction and the potential for more fires due to climate change meant we began to keep more living plant collections than we would have previously. We had to triage the situation, as in any good critical care unit. Although resource intensive, our response unit has become increasingly important, as evidenced by continuing government grant funding and philanthropic support (Grinter, 2021).

No matter what we call it – Care for the Rare, Raising Rarity, Plant Rescue and Care Unit or conservation horticulture – the horticulture we do to conserve plants should be visible in our botanic gardens and then promulgated through our communications and actions.

Promotion and provocation

While botanic gardens often bemoan the appeal of our feathered and furry animal friends to attract conservation attention and funding, plants do have some advantages. For starters, there is the opportunity for 'direct experience' or 'hands-on conservation' – you can't take home a living orang-utan or koala. Then there is the natural empathy we have for plants we eat (the vegetable garden), long-lived plants such as trees, and a wide range of garden plants. Nearly everyone loves flowers and although we hear a lot about 'plant blindness', or seeing the plant world simply as 'green wallpaper', most people already have a strong affinity with at least some plants. The challenge is to apply that same empathy to plants that are sometimes less attractive (to humans) or less well known. Which is not dissimilar to the problem faced by zoos anyway.

Our peak industry groups – such as BGCI and the International Association of Botanic

Gardens (IABG) internationally, and, locally for me, BGANZ – have plant conservation upfront in their missions and agenda. BGCI in particular was established, in 1987, to provide a stronger focus for botanic gardens in all aspects of plant conservation. It has been massively successful in that regard and justly proud of its ability to harness the resources of government and industry to help botanic gardens to save threatened plant species and their habitats worldwide. Conservation horticulture is called out as a key part of this work, and, as a member of BGCI's International Advisory Council for many years now, I have encouraged this focus, particularly in planning for the 7th Global Botanic Gardens Congress (see below).

IABG has a broader remit but currently less reach and impact than BGCI. Since 1954, it has advocated on behalf of botanic gardens, wherever they may be situated and whatever their scope. It covers all aspects of the botanic garden project – from science and collections, human culture and heritage, amenity and scientific horticulture, through to landscape design and maintenance. During my time as President (2017–), I've tried to complement rather than duplicate the work of BGCI, but I've been keen to support joint initiatives such as the Climate Change Alliance of Botanic Gardens (Symes & Hart, 2021), an international network of botanic gardens founded in Melbourne in 2018 and now boasting over 500 members. IABG has the potential to promote both amenity and conservation horticulture together, as two symbiotic halves of a precious discipline.

Just one example of how the link between amenity and conservation horticulture can work in practice, and how we can gently provoke a thoughtful response in a botanic garden, is the White Oak Project at our Melbourne site (Fig. 7). When a

150-year-old white oak (or possibly a hybrid, with a white oak as one parent) collapsed a few summers ago we decided to keep the stump intact and artfully arrange the fallen limbs to reflect the way the branches fell. Before they were returned, the wood pieces were made safe by local wood joiners, who also crafted flat sections for seats and artisan joins between broken pieces. We then interplanted with native grasses and local ephemerals, adding three new oak trees better suited to Melbourne's warming climate as determined by the Climate Assessment Tool (Climate Change Alliance of Botanic Gardens, 2023). These oaks were sourced from Mexico and the US (Texas and California), including a valley oak (*Quercus lobata*) propagated from an acorn gathered beneath a grove of remnant trees in Round Valley, in the Mendocino County of California. Visitors can now sit and talk, or eat, or read, while reflecting on the life of the white oak as well as its emerging replacements and the consequences of climate change. Adding yet another dimension to this opportunistic set piece, we think the new oaks are benefiting from the mycorrhizal fungi remaining in the stump and limbs. Conservation or amenity horticulture, or both?

We promote these ideas, and others, through BGANZ, particularly through the Victorian Chapter. In recent years we have led training workshops for horticulturists in both amenity and conservation horticulture, developed databases to gather and share information, and begun the Care for the Rare project mentioned earlier. BGANZ was a partner, along with BGCI and host RBGV, in the recent 7th Global Botanic Gardens Congress, held in Melbourne in September 2022, where conservation horticulture was a connecting and strongly resonating thread throughout. One of the highlights,



Fig. 7 White oak installation in Oak Lawn, Royal Botanic Gardens Melbourne. Photo: Tim Entwisle.

according to delegate feedback, was the strength of our local presentations – particularly the passion and expertise shown by our horticultural staff. They spoke about conservation projects that began on the weekend – when a few of them holidayed together in biodiversity-rich places in Victoria such as the Grampians/Gariwerd and East Gippsland – collecting small amounts of plant material but, more importantly, hatching plans for something much bigger. This evolved into work-sponsored collecting trips and a commitment to increasing the species diversity of our collections in the Australian Garden at Cranbourne – keeping that stunning landscape but embedding within it a better representation of plants from south-eastern Australia.

An important adjunct to this conversation focus, and another overarching theme at the Congress, was the pivotal role of First Nations knowledge and experience, particularly in our conversations and decisions about biodiversity. In Australia, the commercialisation or manipulation of plant resources should always be permitted by, and include agreed benefits to, Traditional Owners. More generally, restoration or supplementation of natural vegetation needs a sensitive synthesis of cultural and scientific knowledge, and the support of the entire community. That, however, is a topic for another essay.

Raising Rarity 2.0

Early this year, a collective of RBGV staff from various disciplines met to discuss an

expanded and ambitious version of Raising Rarity. Not just a plant commercialisation project with a little seed collecting and education on the side, but an integrated programme of community outreach, conservation action and – to help fund it and achieve some of the other goals – plant sales. Even without additional funding, and thanks to the passion and enthusiasm of mostly horticultural staff, the last eight years have seen over 1,000 species collected from 50 or so locations around Victoria, then propagated and introduced into the nursery or public display collections. About a third of these species are formally listed in Victoria or Australia as under threat of extinction. Imagine, we asked ourselves, what could be achieved through ramping this up to become truly organisation-wide, and one of our key strategic programmes at RBGV.

As a working title at least, we agreed that Raising Rarity could include anything that involved the propagation of rare plants to support their conservation. At its most fundamental, Raising Rarity might refer to any rare or threatened species held in the living collection, at least if that plant was labelled or used in a learning or extension programme. Typically, though, a Raising Rarity project would contribute directly to the long-term conservation of a species as well as promote the importance of plant conservation to a wider audience (that is, not just the already converted).

Fresh ideas sprouted. For example, buyers can register their purchases and garden location, and become part of an *ex situ* distributed collection. We will then gather climatic data to help us understand more about the tolerance of each species today and under future climate models. Schools can extend this further with detailed growth and survival data. Councils and other public

gardens (such as zoos) will be encouraged to replace plants ‘from elsewhere’ with a Victorian species – a species or variant that has the same attributes but might be less well known. Often, it’s about availability and confidence in the stock.

While Raising Rarity is still in its infancy as an overarching programme for RBGV, I’m confident that it or some other incarnation of conservation horticulture is here to stay. There is grassroots support from staff and it is clearly aligned with our vision (‘life is sustained and enriched by plants’) and mission (‘safeguarding plants for the wellbeing of people and the planet’). Conservation horticulture is, to use that bureaucratic obfuscation, ‘core business’ for a botanic garden, and would appear on every panel of my nature, culture and science triptych. Moreover, I’m convinced Raising Rarity will save plant species currently at risk.

Fin

Of course, there is always more to do. This is true across all botanic gardens. The landscapes are never pretty enough, the collections lack significant representatives of the world’s flora, there are too few scientists (particularly taxonomists) and species continue to become extinct on our watch. I could add a dozen more gaps to that list. But as I box up my botanical books and give valedictory talks around the State, I’m drawn back to the importance of horticulture as the engine room of the whole botanic garden endeavour – to celebrate and protect plants.

Without high-quality amenity *and* conservation horticulture, a botanic garden is at best a popular park with a research institution tacked on the side. Amenity horticulture alone can ignite an enthusiasm for plants, but only by adding conservation horticulture can we say we have given

everything we have to protecting our precious flora. As Napoleon told envoys from Piedmont in 1796, 'it may happen to me to lose battles, but no one shall ever see me lose minutes either by over-confidence or by sloth' (Roberts, 2016). We owe it to the world to try.

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