

# GUEST ESSAY Conservation Horticulture is not a programme – it is THE programme

M. Patrick Griffith<sup>1</sup>

Dr M. Patrick Griffith has led Montgomery Botanical Center since 2005 – developing the team, focusing resources and setting priorities to meet the mission. Patrick has worked in leadership, living collections, herbaria, rare plant survey, floristics, lab research and land management, and for botanic gardens, universities, government and private interests. Patrick's research has been in plant diversity and conservation. Compelling palms and cycads have called Patrick to six continents and countless islands, but he has still not finished searching for them.



## Abstract

Conservation Horticulture (1) is an essential, central aspect of modern botanic garden culture and operations, (2) cannot be separated from botanic gardens and (3) produces positive outcomes in every other programme with which it intersects. Here, given the inseparable nature of each, a definition for Conservation Horticulture is provided along with an aligned definition of Botanic Garden. The concept of Conservation Horticulture is illustrated with examples.

## Conservation Horticulture is ascendant

This volume of *Sibbaldia* brings together a great collection of papers – the reader will quickly perceive the global scope contained herein, with articles from Australia, Asia, Europe, North America and the remote Pacific. Reading this volume reveals a focused theme: the ascent of Conservation Horticulture<sup>2</sup> as a discipline. As reflected in these pages, Conservation Horticulture

is certainly an international concern, and our botanic garden community has moved this work to an elevated presence in recent decades (for example, see Entwisle, 2023, in a previous volume of *Sibbaldia*). In this essay I will provide a definition for Conservation Horticulture, I will discuss how this discipline is uniquely rooted in and suited to botanic gardens in a way that can no longer be separated, and I will, respectfully, offer my own opinion and thoughts.

---

<sup>1</sup> Address: Montgomery Botanical Center, 11901 Old Cutler Road, Coral Gables, FL 33156, USA.  
Email: [patrick@montgomerybotanical.org](mailto:patrick@montgomerybotanical.org)

<sup>2</sup>The capitonym is used throughout this paper to denote the idealised form or transcendent idea, *sensu* Plato.

## A simple definition, but many outcomes

Conservation Horticulture leverages plant propagation and care to ensure that diversity is not lost. This definition simply combines the straightforward meanings of two nouns into a single phrase – but it is more than that. Conservation Horticulture is both a science and an art; but it goes beyond a practice and is better characterised as a pursuit, a mission, even an ideal and a vision. It requires unique skillsets, ample resources, specialised assets and highly specific living material, and it benefits greatly from every kind of knowledge and data that can be made available as well as every kind of outreach and promotion that it can leverage. The paper by Hughes (in press) in this volume of *Sibbaldia* details the many inputs, adjacencies and outcomes in this work, and Zale *et al.* (2025) show how Conservation Horticulture intersects with infrastructure planning, plant exploration, display programming and network development – this central practice should and does interact with every aspect of a modern botanic garden.

A recent example I cherish is the story of *Cocos nucifera* var. *palmyrensis* (giant Palmyra coconut) (Fig. 1). These uniquely wild coconuts – only known from Palmyra Atoll in the remotest central Pacific – are imperilled due to exotic invasive feral coconuts, but are now in protective cultivation at Montgomery Botanical Center in Florida (Griffith *et al.*, 2025). The processes of plant exploration, collections development, taxonomy, habitat restoration, population genomics and advocacy all intersect and contribute to the successful cultivation of these living treasures, which further ensures against their loss.

## Botanic gardens lead the field of Conservation Horticulture

Botanic gardens are uniquely suited to advance Conservation Horticulture. Just this year, we have already seen voluminous evidence from botanic garden experts: overviews of how collections advance conservation outcomes (Onophurhi & Ojeilua, 2025); specialised climate-change propagation trials that inform potential mitigations (Gonzalez *et al.*, 2025); and even the impact of wildlife on important conservation collections (Temesgen *et al.*, 2025), to provide just a few examples. Botanic gardens lead the field of Conservation Horticulture through uniquely plant-focused assets, resources, expertise, culture and collections which enable successful practice. Landsites, greenhouses, shadehouses, irrigation and all the other infrastructure of gardens provide critical life support assets for our plant practice; see Gray (2025) for an example of how critical these assets have always been. Leadership, visitor services and development operations work to provide consistent resources for our horticultural practice, enabling uninterrupted plant care over the long timeframes required. Expertise in propagation, plant care, data stewardship, research and curation is brought together in a unique array, which fosters and promotes a culture of ‘plant people’ focused on botanical diversity and health. And finally, at the centre of any bona fide botanic garden are the collections themselves – a deep legacy of the living material that is both the main resource for Conservation Horticulture and the main product – and which must also be continually enriched, developed and shared further to ensure effective conservation (Griffith *et al.*, 2017). Divide this recipe of fundamental ingredients into silos or locate



**Fig. 1** Conservation Horticulture fieldwork, Palmyra Atoll, 2024. Germinating fruit of *Cocos nucifera* var. *palmyrensis* (giant Palmyra coconut). Photo: K. McLaughlin.

them at different places – or just remove one of them entirely – and any organisation would have a hard time building a thriving programme in Conservation Horticulture.

Conversely, it could be said that the Conservation Horticulture field itself sprang forth from botanic gardens. Looking back upon the development of botanic gardens



over their long history, people at first just wanted to grow plants – for whatever reason – in an organised way. For a particularly delightful example see the pteridomania described in Gray (2025). Study and practice led to a science and craft of getting plants to thrive in cultivation, and in this issue Opgenorth *et al.* (2025) offer a synthesis of the current state of this art and directions to further improve it. Preserving these treasured collections eventually became a central focus, and awareness of the loss of diversity inside and outside gardens motivated practitioners to align their talents with conservation goals.

Fast-forward to today and specific, dedicated horticulture expertise at botanic gardens is now essential to maintain genetic diversity (Griffith *et al.*, 2020) and even prevent extinction (Diaz-Martin *et al.*, 2023). Fig. 2 shows one recent

example, Conservation Horticulture of *Sabal lougheediana* (Lougheed palm). This species consists of only 25 mature palms *in situ*, exclusively found on Bonaire in the Leeward Antilles (Griffith *et al.*, 2019b). As part of an integrated conservation effort, dedicated propagation and distribution of young palms help ensure against any sudden loss of diversity in the tiny wild population (Griffith *et al.*, 2021). The species was described as a result of collections development efforts stemming from a Conservation Horticulture strategy. This work resulted in official inclusion on the IUCN Red List (Griffith & Coolen, 2021), which prompted official government protection. These conservation actions are now guided by population genomic assay (Clugston *et al.*, 2024) which can help further tailor collections development strategies. In addition,



**Fig. 2** Conservation Horticulture of *Sabal lougheediana* (Lougheed palm). Photo: M.P. Griffith.

Conservation Horticulture can help preserve cultural traditions (Dunn, 2017), monitor environmental change (Yajima *et al.*, 2025) and build awareness of conservation issues (Yan & Wei 2025; Ong *et al.*, 2025).

This work is further enhanced by partnerships and networks (Griffith *et al.*, 2019a). One clear example is *Cycas micronesica* (Fadang), which is undergoing a conservation crisis in its native West Pacific range due to invasive insects (Fig. 3). The framework for a global Fadang metacollection exists thanks to collecting efforts in past decades. Current efforts examine how well this international

network of botanic garden collections can capture and maintain the genomic diversity of the pre-crisis population. Other great examples are featured in this volume of *Sibbaldia*, including with orchids (Zale *et al.*, 2025) and with the once nearly extinct Wollemi pine (*Wollemia nobilis*) (Offord & Zimmer, 2025). Nowadays the process of living collections development for Conservation Horticulture greatly enriches and expands the plant palette and places botanic gardens in an irreplaceable niche tasked with caring for diversity that has no better home and, indeed, often no other home.



**Fig. 3** Conservation Horticulture fieldwork for *Cycas micronesica* (Fadang), Rota Island, in the western Pacific, 2025. Finding mature seeds such as those shown here is a rare, major success, as seed production was not observed for at least a decade. Photo: M.P. Griffith.



## Can botanic gardens and Conservation Horticulture be separated?

Botanic gardens leverage the field of Conservation Horticulture to succeed, and Conservation Horticulture owes its existence to botanic gardens. So, on one hand, Conservation Horticulture is hard to separate from botanic gardens – the practice would be greatly diminished without the expertise, infrastructure, culture and collections of the botanic gardens it now flourishes among. But can gardens exist without Conservation Horticulture? I argue here that a botanic garden without Conservation Horticulture is also a diminished shadow of its potential.

Esteemed authors and organisations have long put forward definitions of botanic garden, or public garden, or arboretum. These definitions have evolved over the decades from organised living collections of plant diversity (Shaw, 1880 in Shaw, 1943), to now include education and conservation as central criteria (BGCI, 2025; APGA, 2025). Leaders have advanced a case for the future role of botanic gardens to be even more strongly focused on conservation (Blackmore, 2017, 2024). As detailed above, Conservation Horticulture depends on botanic gardens but is also a vital part of how gardens achieve their purpose. So, can we now possibly separate the two? Let's visualise each without the other with a brief illustrative vignette<sup>3</sup> for each:

### *A botanic garden without Conservation Horticulture*

The sweeping landsite and spacious new facilities welcome countless visitors to a full calendar of events. And donations are up: see, there's more clerks now, filled up

the old gatehouse and built a new bigger one and filled that office right after. The lawns pristine and sloping to stunning views laid out by the best landscape architects steamed in from New York, each plane tree set just so to catch the sunsets. Each year the newest flowers and foliage from Paris and London and Amsterdam. The library there is fine, well-upholstered, walnut everywhere, the founders' things all a museum now upstairs in the main house.

Slowly spinning the brass turnstile, a grandmother recounts a beloved tree she sat beneath in this very garden decades past. But not seen hereabouts anymore. One that gave her father food and unguents and shade. Every last one cut down, no one cared to grow another, she says.

Her grandchild stares blankly, impatiently, why can't I bring my dog or my baseball like I can at the park. It looks the same here, he says, there's just more rules here, nothing special about the place. No one ever spoke a thing about these plants, great-grandpa at least knew the names of trees and things.

### *Conservation Horticulture without a botanic garden*

She hitchhiked back to campus – these days grant money is just for molecules. A kind family shoehorned her in, haversack and all, next to three children in the station wagon second row. Crossing the quad along a footpath worn bare over the summer, the sun declining earlier today but no colors save gray on the horizon. Into the library, past the stacks and tables, she found a desk and opened one of the wrinkled parchment packets and pulled tiny seeds from the

<sup>3</sup>Vignettes are presented in colloquial form.

dry capsules with a pair of old forceps traded down from the former zoology building, polished smooth at the points from countless dissections by a thousand alumni well before her mother's birth: rabbits, eyes, kidneys, planarians.

A boy of perhaps seventeen passed this hidden spot wheeling a pile of unshelved texts, hey you're not supposed to bring food in here.

This is my thesis, she said. A rare flower. Only grows out where the new flood-dike is going in. Only a dozen left, maybe eleven. Let me show you a picture.

Well, you need to take that outside now.

Placing them back carefully she folded the small envelope shut and silently reckoned the months those seeds would take to grow their own fruits, new replicas, mirrors after the kind she had sought and gathered in that condemned place. Will my fellowship run out first? Things were harder since the departments merged. No one wants to hear about my deathcamas and there is no place to talk of it anyhow, no place to grow them save my windowsill. That garden up there won't have such a plant.

These tragedies show how reduced both the garden and its most central work would be if the two were ever divided – each so greatly diminished as to no longer be recognised for what they are now, and all thereby impoverished. They simply cannot be separated.

## A new definition of botanic garden

Thus, keeping these two essentials firmly attached, I offer here my own definition

of Botanic Garden:<sup>4</sup> 'a landscape where Conservation Horticulture supports education in, research on and appreciation of botanical diversity, through a collection of cherished plants'. A Botanic Garden is for Conservation Horticulture, and Conservation Horticulture is what makes a place a Botanic Garden. Any number of other vital, interesting, engaging programmes are certainly important or even critical to any particular garden, but each of these is more separable from the garden than Conservation Horticulture – Conservation Horticulture is the centre of our work; as a practice it cannot thrive elsewhere and removing it would reduce gardens into lesser establishments.

## Opinion

Here, please let me offer my own personal thoughts on the vitality of Conservation Horticulture. I am delighted to see how mainstream this focus now is. More gardens are deliberately working to align their efforts towards conservation, as in the wonderful example provided here by Zale *et al.* (2025).

I was recently privileged to participate in the Plant Conservation Leadership Summit hosted by Atlanta Botanical Garden with the Center for Plant Conservation, Botanic Gardens Conservation International – US and the American Public Gardens Association this past summer; not enough positive things can be said about the momentum and enthusiasm I witnessed there. We can't be stopped! What really stood out to me was how Conservation Horticulture is becoming broader, more inclusive and more widely acknowledged as a fundamental part of botanic garden work.

This mainstreaming of plant conservation happily aligns with my efforts over my own

---

<sup>4</sup>Hereafter capitalised to denote the idealised form.

career. But there was some resistance now and then! One example stuck with me for its audacity and its error: years back, early in my career, I gave a short presentation about efforts to help a plant species by growing it, and in fact this was at a botanic garden conference. Once my slides were done, a senior delegate took the floor to remark: 'You can't conserve a plant in a garden. It's not possible.' First of all, false. Second, this kind of gatekeeping advances nothing, makes no friends and belies a pessimism that needs to be left behind.

Instead, let's look for ways that every garden can move plant conservation forward with the resources, assets, team, programmes and collections it has available. This community leveraging is one of the principles behind our efforts to advance the metacollection concept for plant conservation (Griffith *et al.*, 2019a). Any plant in any garden – even a single individual plant – can contribute to a resilient, robust, networked effort in Conservation Horticulture. And we have the DNA evidence to prove it! See Griffith *et al.* (2015) and Schumacher *et al.* (2024), among many others.

Conservation Horticulture makes a positive difference in every single programme it touches. Make it central to a garden, and that garden, no matter how superlative, excellent and established it already is, will flourish above where it now stands in so many new ways (for example, Zale *et al.*, 2025). At this point, I think perhaps opinion may be too mild a word; my viewpoint goes past opinion and moves into declaration: Conservation Horticulture is not merely a programme – it is THE programme.

## Acknowledgements

I thank Kate Hughes for the very kind invitation to contribute this essay, two anonymous

reviewers for their helpful feedback, Anna Stevenson for a very constructive edit, and all my colleagues, mentors, friends, co-authors and collaborators for discussion and consideration of these ideas. I especially thank the team at Montgomery Botanical Center and the many, many amazing, irreplaceable experts around the world I have had the privilege of seeking seeds with afield.

## References

- AMERICAN PUBLIC GARDENS ASSOCIATION (2025).** APGA – American Public Gardens Association. Available online: [www.publicgardens.org](http://www.publicgardens.org) (accessed September 2025).
- BLACKMORE, S. (2017).** The future role of botanical gardens. *Tropical Plant Collections. Scientia Danica. Series B, Biologica*, 6: 285–297.
- BLACKMORE, S. (2024).** Botanic gardens are vital for delivering the Kunming-Montreal global biodiversity framework. *Biological Diversity*, 1(3–4): 120–123. doi: <https://doi.org/10.1002/bod2.12022>
- BOTANIC GARDENS CONSERVATION INTERNATIONAL (2025).** Botanic gardens and plant conservation. Available online: [www.bgci.org/about/botanic-gardens-and-plant-conservation](http://www.bgci.org/about/botanic-gardens-and-plant-conservation) (accessed September 2025).
- CLUGSTON, J.A., COOLEN, Q., HOUTEPEN, E., PROOSDIJ, A.S.V., GRINAGE, A.D. & GRIFFITH, M.P. (2024).** Genomic patterns of native palms from the Leeward Antilles confirm single-island endemism and guide conservation priorities. *Conservation Genetics*, 25(4): 985–997. doi: <https://doi.org/10.1007/s10592-024-01618-6>
- DIAZ-MARTIN, Z., FANT, J., HAVENS, K., CINEA, W., LIMA, J.M.T. & GRIFFITH, M.P. (2023).** Current management practices do not adequately safeguard endangered plant species in conservation collections. *Biological Conservation*, 280: 109955. doi: <https://doi.org/10.1016/j.biocon.2023.109955>
- DUNN, C.P. (2017).** Biological and cultural diversity in the context of botanic garden conservation strategies. *Plant Diversity*, 39(6): 396–401. doi: <https://doi.org/10.1016/j.pld.2017.10.003>



- ENTWISLE, T. (2022). Guest Essay: Vive l'horticulture de conservation. *Sibbaldia*, 22. doi: <https://doi.org/10.24823/Sibbaldia.2022.1997>
- GONZALEZ, P.D., TUCKER, D.A., NAGESWARA-RAO, M., GRIFFITH, M.P., BASKAR, M.S.B., ROSS, M. & KHODDAMZADEH, A.A. (2025). Enhancing cabbage palm resilience to saltwater stress through silicon applications. *HortScience*, 60(9): 1547–1554. doi: <https://doi.org/10.21273/HORTSCI18718-25>
- GRAY, D. (2025). Lost and found: the Benmore and other Clydeside fernery buildings constructed by James Boyd & Sons of Paisley. *Sibbaldia*, 24. doi: <https://doi.org/10.24823/Sibbaldia.2025.2083>
- GRIFFITH, M.P., BARBER, G., TUCKER LIMA, J., BARROS, M., CALONJE, C., NOBLICK, L.R., CALONJE, M., MAGELLAN, T., DOSMANN, M., THIBAULT, T. & GERLOWSKI, N. (2017). Plant collection “half-life:” can botanic gardens weather the climate? *Curator: The Museum Journal*, 60(4): 395–410. doi: <https://doi.org/10.1111/cura.12229>
- GRIFFITH, M.P., BECKMAN, E., CALLICRATE, T., CLARK, J., CLASE, T., DEANS, S., DOSMANN, M., FANT, J., GRATACOS, X., HAVENS, K., HOBAN, S., LOBDELL, M. ET AL. (2019a). Toward the metacollection: safeguarding plant diversity and coordinating conservation collections. Botanic Gardens Conservation International US (San Marino, USA). Available online: [www.bgci.org/resources/bgci-tools-and-resources/toward-the-metacollection-coordinating-conservation-collections-to-safeguard-plant-diversity](http://www.bgci.org/resources/bgci-tools-and-resources/toward-the-metacollection-coordinating-conservation-collections-to-safeguard-plant-diversity) (accessed September 2025).
- GRIFFITH, M.P., CALONJE, M., MEEROW, A.W., TUT, F., KRAMER, A.T., HIRD, A., MAGELLAN, T.M. & HUSBY, C.E. (2015). Can a botanic garden cycad collection capture the genetic diversity in a wild population? *International Journal of Plant Sciences*, 176(1): 1–10. doi: <https://doi.org/10.1086/678466>
- GRIFFITH, M.P., CLASE, T., TORIBIO, P., PIÑEYRO, Y.E., JIMENEZ, F., GRATACOS, X., SANCHEZ, V., MEEROW, A., MEYER, A., KRAMER, A. & FANT, J. (2020). Can a botanic garden metacollection better conserve wild plant diversity? A case study comparing pooled collections with an ideal sampling model. *International Journal of Plant Sciences*, 181(5): 485–496. doi: <https://doi.org/10.1086/707729>
- GRIFFITH, M.P. & COOLEN, Q.T. (2021). *Sabal lougheediana*. The IUCN Red List of Threatened Species 2021: e.T207984529A207984533.
- GRIFFITH, M.P., COOLEN, Q., BARROS, M. & NOBLICK, L.R. (2019b). *Sabal lougheediana* (Arecaceae), a critically endangered, endemic palm species from Bonaire. *Phytotaxa*, 420(2): 95–101. doi: <https://doi.org/10.11646/phytotaxa.420.2.1>
- GRIFFITH, M.P., MEYER, A. & GRINAGE, A. (2021). Global ex situ conservation of palms: living treasures for research and education. *Frontiers in Forests and Global Change*, 4: 711414. doi: <https://doi.org/10.3389/ffgc.2021.711414>
- GRIFFITH, M.P., STAUFFER, F., MCLAUGHLIN, K., GERRISH, J. & BALDINI, R. (2025). *Cocos nucifera* var. *palmyrensis*, a Unique Native Coconut from Palmyra Atoll. *Palms*, 69(2): 83–102.
- HUGHES, K. (in press). Student Project: an investigation into the components of successful conservation horticulture projects. *Sibbaldia*, 24.
- OFFORD, C.A. & ZIMMER, H.C. (2025). The contribution of horticulture to the conservation of critically endangered *Wollemia nobilis*. *Sibbaldia*, 24. doi: <https://doi.org/10.24823/Sibbaldia.2025.2086>
- ONG, B., YONG, K.T., MANICKAM, S., SAPNO, S.S., HASSYA, I. & MARICAN, N.F. (2025). Botanic garden profile: Rimba Ilmu (the ‘Forest of Knowledge’) at 50. *Sibbaldia*, 24. doi: <https://doi.org/10.24823/Sibbaldia.2025.2100>
- ONOPHURHI, G.A. & OJELUA, C.H. (2025). A decade of plant conservation and diversity: eco-taxonomic insights from the University of Benin Botanical Garden. *African Journal of Agricultural Science and Food Research*, 19(1): 281–309. doi: <https://doi.org/10.62154/ajasfr.2025.019.01028>
- OPGENORTH, M., DA CUNHA ÁVILA, J.V., BRYCE, S., RAE, D. & RØNSTED, N. (2025). A new framework for horticultural research in botanic gardens and arboreta of the United States. *Sibbaldia*, 24. doi: <https://doi.org/10.24823/Sibbaldia.2025.2094>
- SCHUMACHER, E.K., WU, Y., BYRNE, A., GRAY, S., LADD, L., GRIFFITH, M.P. & HOBAN, S. (2024). Examining previously neglected aspects of *ex situ* gene conservation in two IUCN Threatened plant species: rare alleles, redundancy, ecogeographic representativeness, and relatedness. *International*

*Journal of Plant Sciences*, 185(2): 198–209. doi: <https://doi.org/10.1086/728186>

**SHAW, H. (1943).** Guide to the Missouri Botanical Gardens, St. Louis. *Missouri Botanical Garden Bulletin*, 31: 135–145.

**TEMESGEN, Z., BIRU, Y., GIBRU, A. & HUNDIE, K. (2025).** Human–wildlife conflict and local community attitudes towards wildlife conservation in Konta Special District, southwest Ethiopia. *BioRisk*, 23: 63–77. doi: <https://doi.org/10.3897/biorisk.23.163073>

**YAJIMA, M., MURRAY, M., CHONDROGIANNIS, C., WALDREN, S. & MCELWAIN, J. (2025).** A framework for long-term environmental monitoring using living plant collections in botanic

gardens: a global review and case study from Trinity College Botanic Garden. *Plants, People, Planet*, 7(4): 954–968. doi: <https://doi.org/10.1002/ppp3.10628>

**YAN, S. & WEI, C. (2025).** The influence of cultural experience in botanic garden on plant conservation: a case from the peony garden in China. *Conservation Science and Practice*, 7(9): e70118. doi: <https://doi.org/10.1111/csp2.70118>

**ZALE, P., TURNER-SKOFF, J. & SANTOS, K. (2025).** The beauty of conservation – developing a science-based conservation horticulture programme at Longwood Gardens, Pennsylvania, USA. *Sibbaldia*, 24. doi: <https://doi.org/10.24823/Sibbaldia.2025.2074>