

# Science Strategy

2022–2031



Royal  
Botanic  
Gardens  
Victoria

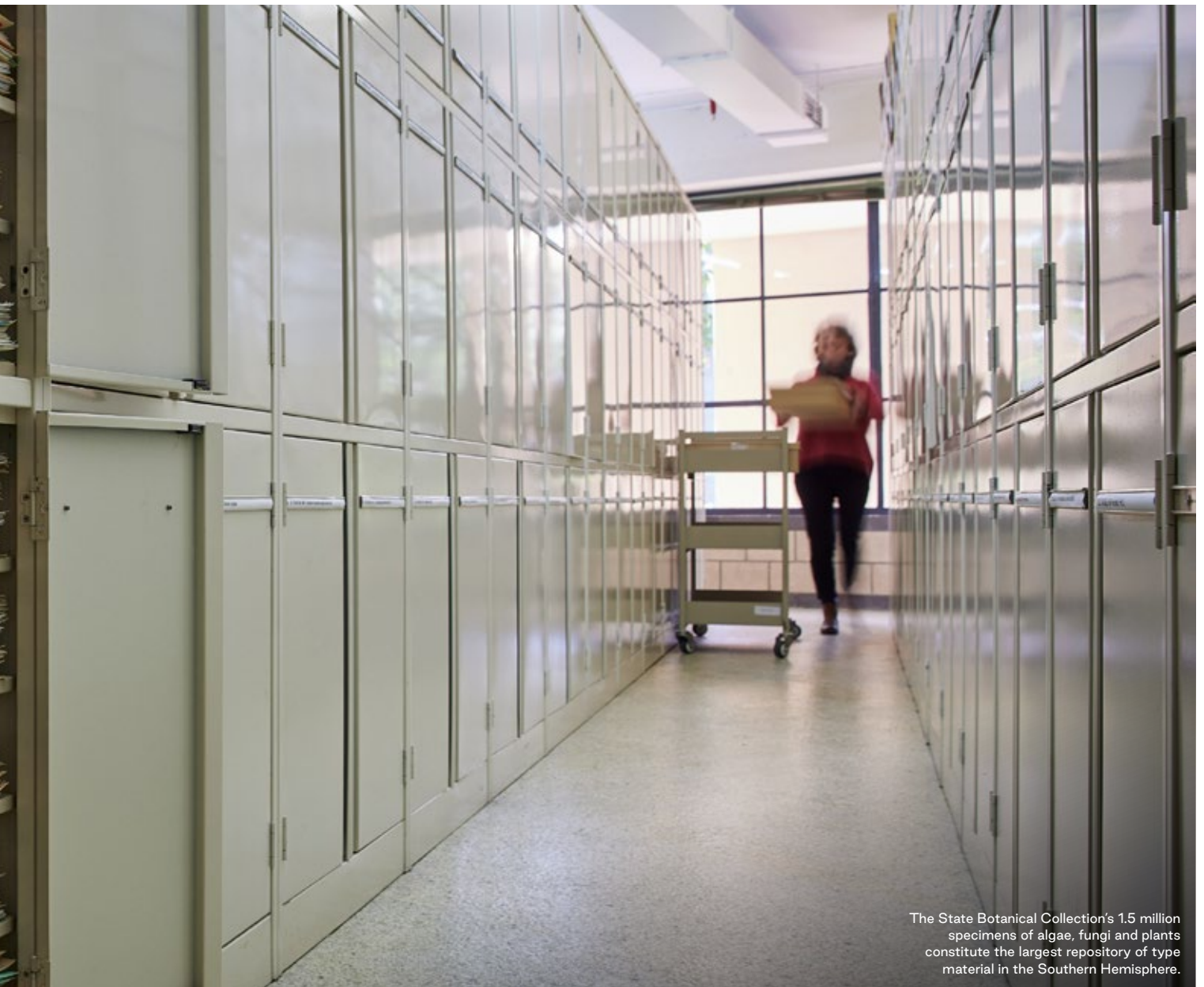






Front cover image: Royal Botanic Gardens Victoria botanists surveying for threatened plants following the catastrophic 2019–2020 bushfire season.

Back cover image: RBGV botanists and horticulturists salvaging seed and plant material along the Snowy River following the 2019–2020 bushfires.



The State Botanical Collection's 1.5 million specimens of algae, fungi and plants constitute the largest repository of type material in the Southern Hemisphere.

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Remnant vegetation on Baker Island stands as a symbol of resilience in the Melbourne Gardens landscape.

# Acknowledgement of Traditional Owners

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country, and their deep spiritual connection to it. We honour Elders past and present, whose knowledge and wisdom has ensured the continuation of cultures and traditional practices.

We are genuinely committed to partnering and meaningfully engaging with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.

Royal Botanic Gardens Victoria's two public gardens—one in Melbourne and one in Cranbourne—are situated on the ancestral lands of the Bunurong and Wurundjeri Woi Wurrung Aboriginal tribes of the Kulin Nations. We pay our respects to Elders past and present and recognise that sovereignty has never been ceded. We honour all the Aboriginal and Torres Strait Islander peoples and their countries on which much of our conservation, research and education work takes place.

Royal Botanic Gardens Victoria acknowledges that the Western tradition of botanical science relies heavily on the language of 'discovery' when describing advancements in our understanding of biodiversity. In doing so, it is not our intention to ignore or devalue other ways of knowing, but to describe an understanding within the confines of one particular worldview.

We acknowledge that the arrival of botanical science in Australia was part of a colonial practice that privileged Western knowledge over First Peoples' knowledge. Our collective environmental knowledge is diminished for it. The rich ecological knowledge of First Peoples—developed over millennia—has a vital role to play in the remediation of ecological challenges wrought by colonisation, and we commit to respecting and embracing the ecological knowledge of First Peoples under their guidance.



# Preface

## Our biodiversity is in crisis

The planet is experiencing its sixth mass extinction event since life began some 4 billion years ago. Current rates of biodiversity decline exceed those seen 252 million years ago during the Permian period, when over 70% of known terrestrial and 95% of marine species went extinct.

At that time, instability in Earth's feedback mechanisms saw a runaway greenhouse state that exacerbated environmental and ecosystem collapse. The current planetary emergency has many similarities to those of the Permian and requires an urgent and robust response if the planet is to remain habitable.

While the nature of the challenge is planetary in scale, the responses required to reverse the impacts of human activity and human-induced climate change on biodiversity need to happen at all scales. It is a challenge for Victoria as much as it is for Australia, or the rest of the world.

Victoria is the most cleared state in Australia, with over 50% of native vegetation lost since European settlement. Its remaining indigenous species live in a fragmented landscape, and we have limited knowledge of their basic requirements, ability to reproduce, and capacity to maintain genetic diversity, not to mention a poor understanding of where the majority of that genetic diversity resides.

With over 50% of threatened species occurring on private land, our system of reserves and national parks can never be fully adequate for the persistence of our remarkable biodiversity. Our scientific and conservation efforts must therefore consider algae, fungi and plants wherever they occur through a thorough understanding of their evolutionary history, diversity, biology and ecology.

## Our botanic gardens are a resource for the future

Royal Botanic Gardens Victoria (RBGV) comprises two public gardens developed in radically different styles. The Melbourne Gardens were designed in an English style, making liberal use of non-native plants in a formal, highly picturesque landscape, while the Cranbourne Gardens focus solely on Australian native plants in both naturalistic and modern landscape settings.

In some respects, our Melbourne Gardens represent a microcosm of the state of Victoria. Dating back to 1846, like much of the country they are representative of the impact of European settlement on the lands of the First Peoples. Prior to European settlement, these lands represented a rich resource that provided for peoples of the Kulin Nation. These lands were clothed in grassy woodlands on higher ground, and tall marshes and swamp scrub in low-lying areas bordering riparian woodland. Today, this altered environment with its English picturesque style garden contains few remnants of that original vegetation, but instead a highly curated collection for science, conservation, learning and amenity. It has much in common with other treasured cultural entities in the city, such as its museums, art galleries and sports arenas.

Cranbourne Gardens were acquired in 1970 to focus specifically on Australian flora. The site contains extensive areas of remnant natural plant communities including the diverse flora, fauna and fungi that once extended across south central Victoria. New living collections of Australian flora have been developed on a small fraction of the property, using former mining and grazing land.

Together, Melbourne and Cranbourne Gardens contain extraordinary collections of native and non-native species. These living collections form just a small part of the resources available to researchers who discover, document and understand biodiversity. Such knowledge underpins all biological science and plays a vital role in informing effective conservation actions.

The Melbourne Gardens are home to the National Herbarium of Victoria, which houses Victoria's State Botanical Collection, a working repository of over 1.5 million preserved specimens that date back to the 1600s and which form an important record of the history of biodiversity change on our planet. This globally significant collection contains over 32,000 known type specimens from Australia and across the globe, the largest such collection in the Southern Hemisphere.

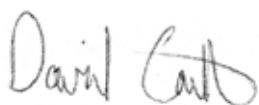
The State Botanical Collection holds scientifically significant collections from naturalists like Joseph Banks and Daniel Solander—gathered during the voyage of *HMS Endeavour* in 1770—as well as Robert Brown and Charles Darwin. It is also a rich repository of cultural knowledge, with many specimens containing traditional ecological, medicinal and food-plant knowledge that requires consultation with First Peoples to ensure that it is managed and accessed appropriately.

Supporting the herbarium collection, and forming part of the State Botanical Collection, is the finest botanical library in Australia—a resource rich in botanical art and literature dating back to the 16th century. Making these resources accessible and available will both enable research and expand public appreciation of the importance of algae, fungi and plants.

Today, utilising modern molecular techniques, RBGV scientists continue the work of discovering and documenting our rich biodiversity assets, and developing insights into their evolutionary relationships and biology. Our Victorian Conservation Seedbank collects, processes and stores seeds for the future, and creates knowledge about the germination requirements and stress tolerances of native plants, and their ability to respond to climate change. We have national expertise in a range of different plant groups, and particular expertise in fungi.

Although much of our collections and work are currently locked behind the doors of the National Herbarium building, the proposed Nature Science Precinct will not only safeguard the priceless State Botanical Collection—providing cutting-edge research facilities for our scientists—but enable and encourage increased outreach to a highly supportive public. Longer term, we plan to build a Conservation Centre at Cranbourne Gardens to safeguard our priceless native flora and provide vital conservation research facilities for scientists to help recover the threatened flora of south-eastern Australia.

RBGV is uniquely placed to discover and document Victorian plant, algal and fungal biodiversity, and well-positioned to contribute nationally and internationally to these efforts. Building and continuing to digitise our collections will allow them to be used to detect landscape changes through time, providing data to assess the impacts of climate change as well as the efficacy of conservation efforts. Conserving our algae, fungi and plants is crucial for the wellbeing of people and the planet.



**Prof. David Cantrill**  
Executive Director Science,  
Royal Botanic Gardens Victoria



**Prof. Tim Entwisle**  
Director and Chief Executive,  
Royal Botanic Gardens Victoria



The National Herbarium of Victoria houses the State Botanical Collection, a key element of our role in Science at Royal Botanic Gardens Victoria.



# Our organisation

The Royal Botanic Gardens Board Victoria, established by the *Royal Botanic Gardens Act 1991*, is responsible to the Minister for Energy, Environment and Climate Change of the state of Victoria for the overall direction and governance of our organisation. It delegates day-to-day responsibility for operations and administration to the Director and Chief Executive.

The State Botanical Collection is defined under the Royal Botanic Gardens Act 1991 as the botanical collections held in the National Herbarium of Victoria along with artistic material and documents held in the RBGV Library. The State Botanical Collection is provided secure, long-term protection under the Act. The role of Chief Botanist is set out in the Act as being responsible to the Director and Chief Executive for the management of the State Botanical Collection and of research programs relating to it and is carried out by the Executive Director Science.

Royal Botanic Gardens Victoria comprises five Divisions (Corporate Services, Cranbourne Gardens, Engagement and Impact, Melbourne Gardens, and Science) across Melbourne and Cranbourne Gardens, each with an Executive Director.

Since its foundation, RBGV has been involved in research on algae, fungi and plants. Today, it is a leading science research organisation specialised in biodiversity, conservation, genomics, and taxonomy.

RBGV Science programs are delivered by the three branches of the Science Division: Research, Collections (responsible for the preserved specimens held in the State Botanic Collection), and Biodiversity Services (overseeing the Library, public facing products such as VicFlora, identifications services, field collections, and the Victorian Conservation Seedbank). Horticultural staff at both Cranbourne Gardens and Melbourne Gardens work alongside Science staff on conservation programs involving the living collections.

RBGV's science and horticulture research directly supports both our community and Australia's conservation needs, most recently playing a critical role in Victoria's response to safeguarding rare flora impacted by bushfires and landscape change.

## Our mission

### Safeguarding plants for the wellbeing of people and the planet

Our mission underscores our commitment to evidence-based social, scientific, educational, cultural and economic benefit for Victoria. In this way, we are an influencer, communicator, collaborator and catalyst for behavioural change, both within the state and beyond, through our extensive international networks.

## Our vision

### Life is sustained and enriched by plants

This vision of a flourishing community and healthy planet, sustained and enriched by plants, is manifest through our iconic landscapes, horticultural excellence, scientific eminence and a compelling program of engagement.

Plants, along with fungi and algae, are fundamental to life on Earth. They provide the air we breathe, the food we eat, many of the medicines that heal us, and habitat and shelter for our planet's wildlife. They give our lives meaning and inspiration. We prosper and our planet benefits when we understand, appreciate and protect plants for their life-giving qualities. The actions we all take should be based on our knowledge and respect for plants.

## Our values

Royal Botanic Gardens Victoria espouses four key values across the organisation: we aim to be Brave, Remarkable, Open and Creative.

For our Science, in enacting this Strategy, we will apply these values day to day in the following ways:

### Brave

- We tackle key questions in biodiversity science
- We apply knowledge to critical questions concerning environmental change
- We lead the way in threatened species recovery

### Remarkable

- We aim for excellence in research and applications
- We work at large scale across collections, organisms and genomes
- We are champions for threatened flora

### Open

- We create information that is relevant and accessible
- We collaborate to achieve improved outcomes
- We communicate the relevance of our Science to community, government and researchers

### Creative

- We look for new solutions to problems
- We seek to value-add to collections and services by innovating
- We create programs that promote community involvement and interest in conservation

RBGV is committed to maintaining a workplace that is safe and welcoming to all. We recognise the value of diverse ideas and perspectives, and actively foster a culture of inclusivity. Our science will align with RBGV's *Diversity and Inclusion Access Plan*, our *Gender Equality Action Plan* and current and future *Reconciliation Action Plans*.



# Our corporate strategic priorities

Our strategic priorities as set out in our current *Corporate Plan 2021–2024*. *Safeguarding plants for the wellbeing of people and the planet* are:

## Engaged communities

- Invest more in our digital presence and strategy to reach new audiences
- Expand the range of nature and science-based programs
- Be inclusive and meet the needs of a wide and diverse community

## Vibrant Places

- Create opportunities to drive repeat visitation at both gardens in order to promote deeper community engagement and learning
- Invest in landscapes, built form and interpretation improvements to support increased visitation and positive visitor experience
- Expand our strategically aligned partnerships with tourism, health, cultural and for-purpose community organisations

## Conservation action

- Develop, refine and communicate our strategic responses to major biodiversity and conservation matters prioritising climate change adaptation, bushfire recovery, land use changes, invasive species and individual action
- Improve and promote our approach and outcomes in environmental sustainability across all areas of the organisation

## Sharing plant knowledge and discovery

- Improve how we translate our research and expertise within the broader community, making Gardens' research more engaging and influential in society
- Expand RBG's role as a centre of excellence for plant biodiversity and conservation research
- Adopt innovative approaches to increase visitor engagement with the natural world



RBGV's advanced research capabilities inform and support Australia's urgent conservation priorities.



# Our Science

Our Science combines the expertise of creative people with the power of our unique collections to generate and share essential knowledge about algae, fungi and plants for the conservation and sustainable use of Australia's biota

## Strategic goals

Our Science will focus on three strategic goals:

### **We create and share knowledge**

By generating and communicating insights into the diversity, ecology and evolution of algae, fungi and plants

### **We protect plants**

By safeguarding threatened algae, fungi and plants against extinction

### **We innovate and inspire**

By applying new ideas and techniques to address the climate and biodiversity crises faced by our natural world

## Themes

Within the three strategic goals there are three themes that align with our Science programs.

Details for each strategic goal are presented on the following pages, across the three themes.

- Discovering, documenting and understanding algae, fungi and plants
- Building and maintaining diverse collections
- Improving the impact and awareness of our Science



RBGV scientists work across a range of ecosystems to discover, document and understand plant, algal and fungal diversity.



# Goal 1: We create and share knowledge

By generating and communicating insights into the diversity, ecology and evolution of algae, fungi and plants



Our Victorian Conservation Seedbank staff use x-ray imaging to ensure that only high-quality seed is banked.

## Theme 1:

**Discovering, documenting and understanding**

We will lead foundational research on the diversity and relationships of Australasian algae, fungi and plants, generating new insights into evolutionary and ecological processes that advance our understanding of past, present and future capacity to adapt to a changing world

## Theme 2:

**Building and maintaining diverse collections**

We will build, protect and document preserved and living collections as a secure, comprehensive and accessible resource for scientific research and identification services, and as a tool for informing and inspiring the community to act for nature

## Theme 3:

**Improving the impact and awareness of our Science**

We will communicate to the public and key stakeholders the value and impact of our Science and the importance of the living and preserved collections for community wellbeing and planetary health

# Goal 2: We protect plants

By safeguarding threatened algae, fungi and plants against extinction



RBGV Science and Horticulture staff work together to maintain our conservation collections of rare and threatened plants.

## Theme 1:

**Discovering, documenting and understanding**

We will carry out research leading to measurable increases in the survival of threatened species in the natural environment and informing effective conservation of species in south-eastern Australia

## Theme 2:

**Building and maintaining diverse collections**

We will build genetically diverse collections of threatened species and living collections that support *in situ* and *ex situ* species conservation

## Theme 3:

**Improving the impact and awareness of our Science**

We will involve, engage and connect the public and key stakeholders in the plight, conservation and research of threatened species



# Goal 3: We innovate and inspire

By applying new ideas and techniques to address the climate and biodiversity crises faced by our natural world



## Theme 1:

**Discovering, documenting and understanding**

We will apply innovations in biodiversity science to answer key questions about species adaptation and resilience; accelerate species documentation; and develop novel identification and survey tools

## Theme 2:

**Building and maintaining diverse collections**

We will create integrated databases of images, DNA sequences and traits in train with completion of taxonomic documentation for Victorian vascular plants and for targeted groups of other algae, fungi and plants to provide reliable and accessible baseline knowledge through data-rich interfaces

## Theme 3:

**Improving the impact and awareness of our Science**

We will reveal the connections between people's lives and the environmental issues RBGV directly challenges to develop a better understanding within communities of their roles in conserving algae, fungi and plants for the future





Pioneering bryophytes (liverwort *Marchantia polymorpha* and moss *Funaria hygrometrica*) colonising bare ground after a bushfire.



# Science snapshots

The following snapshots demonstrate some of the ways we will enact our Science goals over the next decade.

The *Megacollection*—the combined holdings of the State Botanical Collection and RBGV's Living Collections—underpins all our research. There is significant *Traditional Ecological Knowledge* connected with the collections.

*Unlocking genomes* is a key strand of the innovation in our research.

*Turbotaxonomy* will accelerate species description and lead to *Floras and fungus for the future*.

The integration of *Conservation research* and *Conservation collection* will protect plants.

We engage people with science by *Showcasing the Collection* and *Highlighting our Science*.



The skilful curation of herbarium specimens is integral to maintaining the world-class State Botanical Collection.

## Megacollection

The National Herbarium of Victoria houses more than 1.5 million preserved specimens of algae, fungi and plants in the State Botanical Collection. These preserved collections are complemented by our Living Collections within both gardens, which, along with the Victorian Conservation Seedbank collections, cryopreserved fungal collections, and DNA collections, form a megacollection representing more than 90,000 species.

Each specimen in the State Botanical Collection documents the existence of an organism at a particular time and place. The Collection dates back to the 16th Century and includes specimens from all continents. Among them are more than 32,000 known type specimens—the reference materials to which all scientific names are anchored. The Collection forms a rich repository of the world's shared scientific and cultural history and underpins our contemporary research. Through regular collecting, we improve our understanding of the variation and distribution of species and gain insights into how algae, fungi and plants respond to environmental change.

The curation, databasing and imaging of specimens is transforming physical collections into freely available digital resources that link specimen, geographical and temporal data to create new investigative opportunities across taxonomy, conservation, ecology, bioprospecting, biosecurity and forensics. To date, 75% of our specimens are curated and more than 68% are databased, but only 2% are imaged at high resolution. We are building capacity to add further types of specimens, such as DNA and cryopreserved living cultures.

**Over the next decade we will seek further philanthropic and government support to accelerate the curation, databasing and imaging of the State Botanical Collection, fill geographic and taxonomic gaps through targeted collecting, and add value to the collection by adding new types of specimens, enabling participation in innovations in specimen-based research**





## Traditional Ecological Knowledge

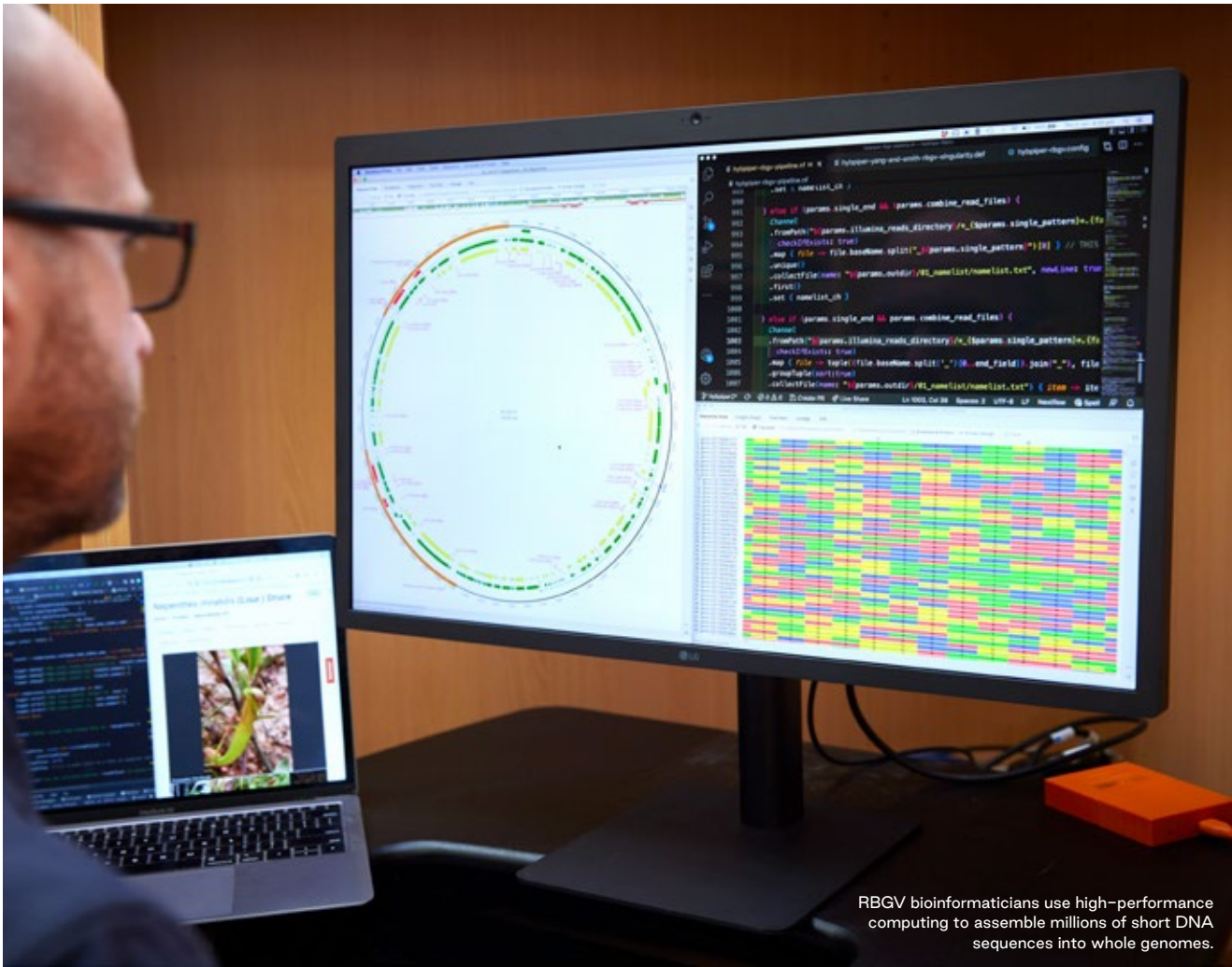
The State Botanical Collection houses thousands of specimens collected during 19th Century expeditions exploring Australia. We acknowledge that these expeditions relied heavily on the assistance of Aboriginal and Torres Strait Islander peoples who acted as guides and interpreters to European explorers, sometimes under duress. We commit to talking about the history of the State Botanical Collection in a way that acknowledges the often-hidden contributions of First Peoples.

Hundreds of specimens in the collection contain Australian Aboriginal and Torres Strait Islander language plant names and information on their uses, as well as plant names and uses from other Indigenous peoples around the world. Indigenous people have the right to decide how this information is collected, accessed and used.

As guardians of this information, we need to be mindful of principles of Indigenous Data Sovereignty and establish appropriate governance protocols to ensure that Indigenous cultural knowledge is treated with respect and managed in line with international best practice.

We commit to make all efforts to establish trusting, equitable and reciprocal relationships with Aboriginal and Torres Strait Islander communities whose cultural knowledge is represented in our collection, and to ensure that these partnerships reflect the aspirations and priorities of First Peoples.

**Over the next decade we will seek guidance from Aboriginal and Torres Strait Islander communities on how they would like their cultural knowledge in our collections to be documented and shared, with the aim of forging sustainable benefit-sharing partnerships.**



RBGV bioinformaticians use high-performance computing to assemble millions of short DNA sequences into whole genomes.

## Unlocking genomes

Every organism has a genome—the set of instructions encoded in its DNA that allow it to grow and develop. Initially, researchers focussed on single genes, but new technologies facilitate the affordable and accurate sequencing of entire genomes.

Whole-genome sequences can provide unprecedented insights into the evolution of algae, fungi and plants especially when integrated with data on morphological characters, ecological functions and geolocations derived from collections. Unlocking genomes can improve our understanding of genetic structure at the individual and population level, providing critical information for effectively managing threatened species.

RBGV has a leadership role in the Genomics for Australian Plants consortium, an ambitious project sequencing genomes across the tree of life for Australian flora.

**Over the next decade we will lead the sequencing of reference genomes for a significant set of Australia's algae, fungi and plants to underpin innovative biodiversity research**



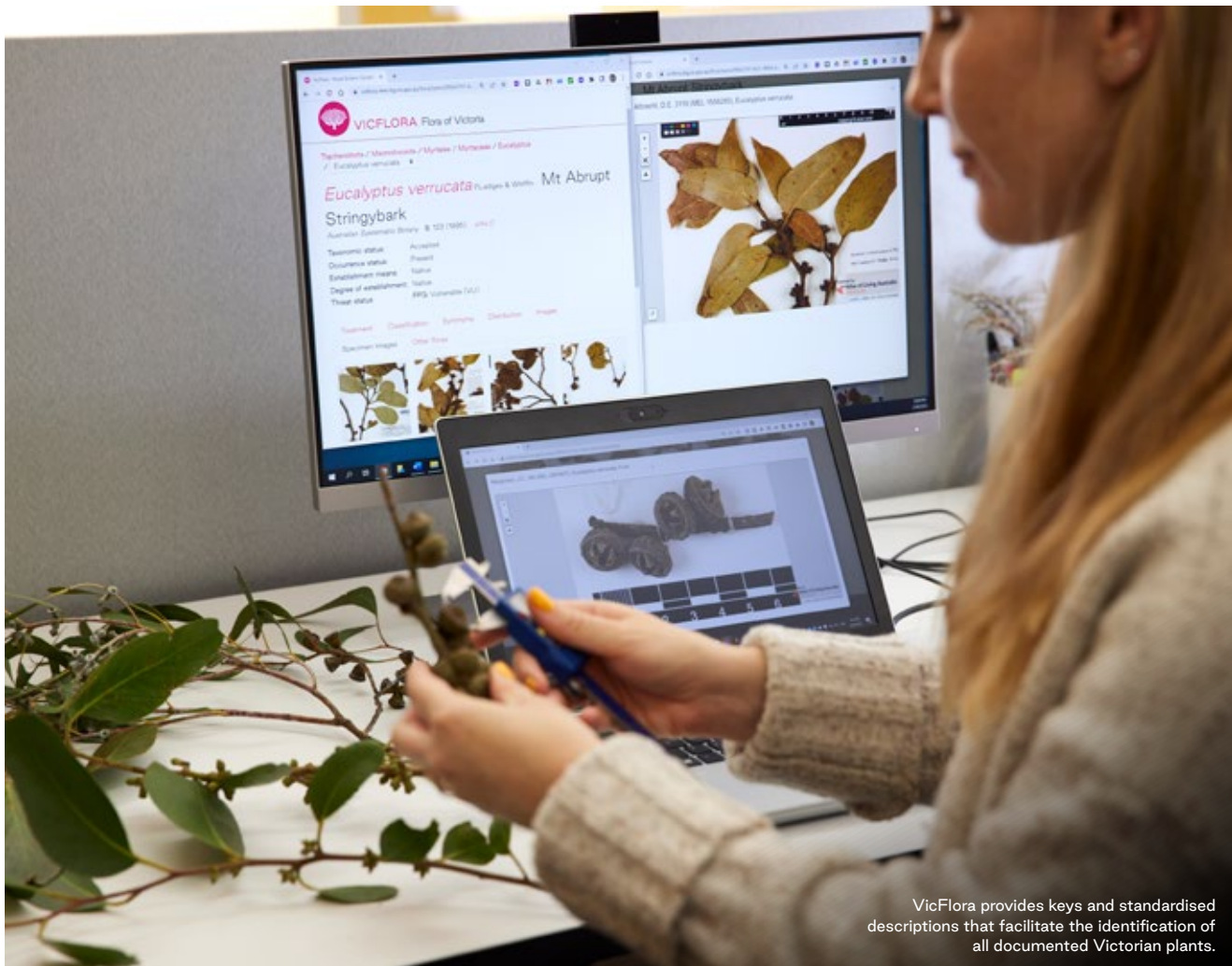


## Turbotaxonomy

Taxonomy is the science of naming and classifying organisms. There are some 4,891 formally named species of flowering plants in Victoria, including 1,541 that are exotic (weeds). After more than 200 years of research on Victoria's flora, the rate of discovery of novel flowering plants has slowed. Nevertheless, we are aware of several dozen plant species that are yet to be formally named, all represented by specimens in the State Botanical Collection. Others undoubtedly remain to be discovered.

For algae, fungi, and cryptic groups of plants—such as mosses—there are numerous species that await collection and documentation. Indeed, for fungi, there are tens of thousands of species yet to be named. Taxonomy Australia has recently shown that investment in species discovery and documentation yields significant economic multipliers, because species are the basic units of biology, fundamental to conservation, bioprospecting, biosecurity, and industrial applications.

**Over the next decade we will document and describe all known flowering plants in Victoria and implement collecting, documenting, sequencing and publishing pipelines to accelerate the rate of documentation and classification of other groups, especially fungi**



VicFlora provides keys and standardised descriptions that facilitate the identification of all documented Victorian plants.

## Floras and fungas for the future

A flora is a systematic compilation of information on the plants of an area. The freely accessible VicFlora platform is an online database that provides comprehensive descriptive information about the wild plants of Victoria in tandem with identification tools and occurrence records. At present, the VicFlora platform receives over 2 million page views per year and growing. It is used by researchers and naturalists alike for the identification of native and naturalised plants present in Victoria. It is also proving an indispensable reference for natural resource management, and a valuable teaching aid for secondary and tertiary students in the natural sciences.

Fungi are an essential component of the environment, facilitating the nutrition of the majority of the world's plant species and recycling organic material, but our knowledge of this kingdom is far behind that of flowering plants. This reduces capacity to make informed decisions regarding biosecurity, conservation, poisonings, and landscape and ecosystem resilience. It is therefore imperative that a concerted and targeted effort is made to create a funga—the fungal equivalent of a flora.

**Over the next decade, we will enrich the information content and accessibility of VicFlora, including images and updated keys for all flowering plants, and expand the VicFlora platform to include fungi.**





RBGV orchid conservation specialists hand-pollinate threatened orchids of known provenance to support our translocation work.

## Conservation research

The world's flora faces an extinction crisis, with 39% of plant species at risk of extinction. In Victoria, algae, fungi and plants are under particular threat from climate change, habitat destruction and degradation, as well as from invasive weeds and overgrazing by native and introduced animals. In many cases these threats have led to small and fragmented populations subject to inbreeding, resulting in reduced genetic diversity and a diminished capacity to adapt to environmental change. Affected species are often unable to maintain viable populations without our intervention.

Over 80% of plants form symbiotic relationships with mycorrhizal fungi to access nutrients from the soil, and most plants rely on pollinators to set seed. Therefore, to conserve threatened species in the wild and to successfully initiate recovery, we need to understand these complex relationships and the identity and distributions of these essential animal, fungal and bacterial associates to lead recovery efforts and mitigate the threats they face.

**Over the next decade we will increase our knowledge of the essential interactions, genetic diversity and threat mitigation required to sustain our threatened flora. We will use this information to increase the number of individuals and populations of threatened species in the wild.**



RBGV conservation collections hold hundreds of threatened plants as well as cultures of their associated mycorrhizal fungi.

## Conservation collections

Victoria has over 1,628 species of fungi and plants threatened with extinction, of which 319 species are recognised as threatened at a national level. RBGV plays an important role in *ex situ* conservation through the cultivation of rare and threatened plants in our living collections. Our living collections at Cranbourne Gardens represent 1,454 species of Australian native plants, including 217 rare and threatened species. At Melbourne Gardens, 193 of the more than 8,000 species in the living collections are rare and threatened. Our permanent living collections continue to expand and include a large and diverse *ex situ* nursery collection of over 180 species of terrestrial orchids, including 75 state and nationally threatened species utilised as the basis of recovery programs.

The Victorian Conservation Seedbank is a valuable resource for the conservation of our flora providing long term insurance for threatened species and their genetic diversity, forming the basis for species recovery programs and seed research. We currently have approximately 50 % of our threatened flora represented in the seed bank.

**Over the next decade we will increase the genetic diversity and representation of threatened flora in the Victorian Conservation Seedbank and nursery collection, with capacity to make nationally threatened Victorian species available in the quantities and quality required for recovery programs**





## Showcasing the Collection

The algae, fungi and plant specimens in the State Botanical Collection—gathered by many hands over many generations—are a testament to scientific enquiry, but also to curiosity and the intrinsic connection between people and their environment. They represent a story of cumulative human endeavour and cooperation that has immense power to engage a diverse range of people with the collections and our research on them.

We will showcase the State Botanical Collection to new audiences through the development of digital and physical exhibitions that leverage the aesthetic and cultural value of the specimens and artwork. Drawing on the rich stories behind the collection, we will connect people with our Science and inspire them to action. We will increase the reach and scale of engagement with the State Botanical Collection by actively seeking opportunities for academic enquiry and creative interpretation of the collection through collaborations with scientists, historians, artists and writers.

**Over the next decade we will connect a wider audience with the rich cultural and scientific value of the State Botanical Collection, motivating Victorians to act for nature**



RBGV scientists provide timely and authoritative advice to support the needs of the community.

## Highlighting our Science

RBGV Science plays a vital role in documenting and conserving algae, fungi and plants. We publish the results of our research in peer-reviewed scientific journals and professional publications, and we present our findings via seminars at conferences, talks at teaching institutions and public venues, as well as in print and electronic media.

We commit to increasing the visibility of our Science by providing targeted and tailored messages to key audiences and stakeholders. We will focus our communication on research projects with strong public engagement potential and create rich content that connects a broad audience with our Science. We will highlight the importance and impact of our research for understanding, conserving and enhancing the resilience of algae, fungi and plants.

**Over the next decade we will foster even greater awareness and understanding of the scope and value of RBGV Science among key stakeholders through placement of rich and engaging stories across a broad range of media channels, and through the development of our science storytellers**



# Strategic drivers

## State of Victoria – Biodiversity 2037

The Victorian Government’s *Biodiversity 2037* is a 20-year plan to ensure that Victoria’s biodiversity is healthy, valued and actively cared for.

*Biodiversity 2037* includes the following targets that RBGV Science goals will make significant contributions to:

### Victorians value nature

- All Victorians connecting with nature; and
- 5 million Victorians acting to protect the natural environment.

### Victoria’s natural environment is healthy

- No vulnerable or near threatened species will become endangered; and
- All endangered species will have an *ex situ* or reintroduction option for long-term conservation.

## Commonwealth of Australia – Threatened Species Strategy Action Plan

RBGV Science, working with our horticulture team, will make significant contributions to the following Australian Government *Threatened Species Strategy Action Plan* targets:

- Target 4: Secure 100% of nationally threatened species impacted by Myrtle Rust in insurance collections; and
- Target 8: Secure at least 80% of nationally threatened plant species in insurance collections.

## 2021 National Research Infrastructure Roadmap

The *2021 National Research Infrastructure Roadmap* sets out Australia’s research infrastructure capability and areas of importance for the next 10 years.

The *2021 Roadmap* notes, in relation to opportunities for system-wide enhancements in research infrastructure, that: “Physical collections are a vital resource for research and underpin activities that range from health and medical research to ecology and agriculture. Physical collections of specimens and taxonomy are also critical to support the identification of biosecurity risks and determine action, supporting Australia’s environmental and climate adaptation strategy”.

Recommendations in the *2021 Roadmap* that are pertinent to RBGV Science include:

- Recommendation 5: Drive a more integrated NRI ecosystem – including in relation to “management of datasets and collections”; and
- Recommendation 8: Prepare Australia to capitalise on future opportunities, especially in relation to the step change mentioned below.

Potential for step-change was identified in the following areas relevant to RBGV Science:

- 6.4. World-leading environmental and climate infrastructure to underpin Australia’s national adaptation strategy; and
- 6.5. A national approach to collections.

## Commonwealth of Australia – Science and Research Priorities

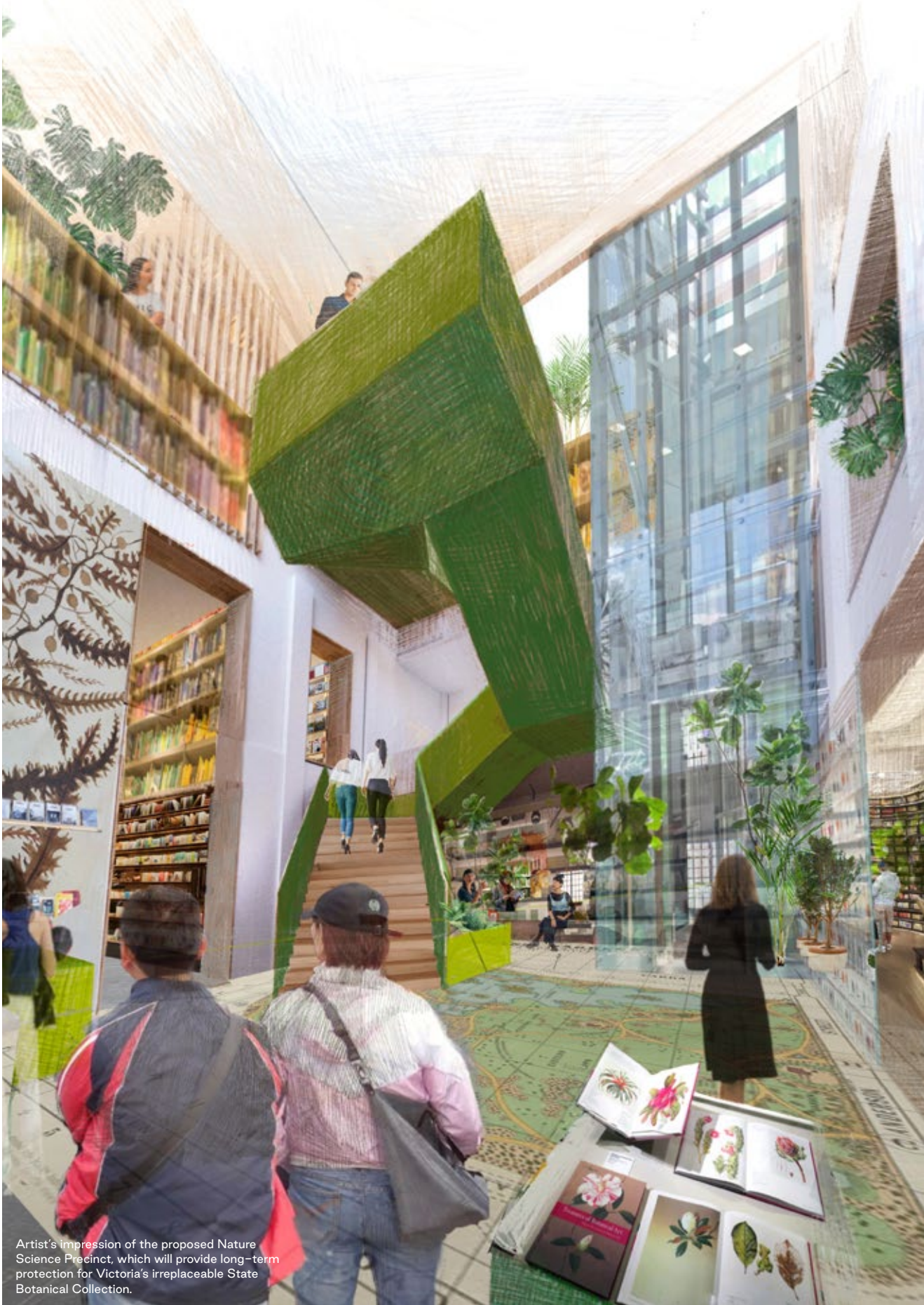
RBGV Science will contribute to the following national *Science and Research Priorities*:

- 1. Food (3. enhanced food production through: protection of food sources through enhanced biosecurity – a pertinent example being detection of new weeds);
- 2. Soil and Water (1. new and integrated national observing systems, technologies and modelling frameworks across the soil-atmosphere-water-marine systems – an example being use of metabarcoding to assay soil fungi); and
- 8. Environmental Change (1. improved accuracy and precision in predicting and measuring the impact of environmental changes caused by climate and local factors; and 3. options for responding and adapting to the impacts of environmental change on biological systems, urban and rural communities and industry).

## United Nations – Sustainable Development Goals

RBGV Science ties in with a number of the goals of the United Nations *Sustainable Development Goals*, particularly:

- 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation;
- 13. Take urgent action to combat climate change and its impacts; and
- 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.



Artist's impression of the proposed Nature Science Precinct, which will provide long-term protection for Victoria's irreplaceable State Botanical Collection.



# Housing our Science

To protect our priceless collections and support delivery of our Science goals we have a vision for a Nature Science Precinct at Melbourne Gardens and a Plant Conservation Centre at Cranbourne Gardens.

## Nature Science Precinct

RBGV has an ambitious vision for a Nature Science Precinct at Melbourne Gardens that will rehouse the State Botanical Collection in a secure, fit-for-purpose, state-of-the-art facility.

The Nature Science Precinct will provide cutting-edge research facilities for our scientists, facilitate access to our collections, and place RBGV Science on show.

The Nature Science Precinct will be a key enabler of the delivery of our key Science goals to create and share knowledge and to innovate and inspire – creating a vibrant place to connect people with plants for the benefit of the planet.

## Plant Conservation Centre

RBGV is the centre for threatened plant and fungus conservation in Victoria, encompassing ecological, horticultural and threatened species conservation research.

As foreshadowed in the Cranbourne Gardens Master Plan and more recent draft Strategic Place Plan, the Plant Conservation Centre at Cranbourne Gardens will provide the facilities needed to enable the protection of our plants and fungi, supporting their long-term preservation, and research into the conservation and cultivation of our threatened flora.

The Plant Conservation Centre will inspire and engage the public in the conservation of our threatened flora, take visitors behind the scenes at the Gardens, and provide opportunities for involvement in active conservation programs.

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NATIONAL HERBARIUM OF  
VICTORIA (MEL), AUSTRALIA

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MELBOURNE, AUSTRALIA



MEL 2511126

*Davallia solida* var. *pyxidata* (Cav.) Noot.

Det.: Ohlson, D.J., 14 Dec. 2021

Coll.: Ohlson, D.J. 1148 Date: 14 Dec. 2021  
Addit. Coll.: Stajic, V.; Chute, M.

**Australia:** Victoria

**Loc.:** North-east facing side of Mount Talbot, beside walking track to summit immediately after second set of metal steps implanted into the rock.  
37° 1' 41" S 142° 4' 33" E.

**Habitat:** Exposed sandstone rock face with deep sheltered cracks.

**Associated taxa:** *Goodenia ovata*.

**Descriptive notes:** Rhizome long-creeping and extensive in the deep sheltered cracks.

**Collecting notes:** Colony about 5 metres long. Also seen at 37° 01' 41" S 142° 04' 35.4" E.

**Misc. notes:** Voucher for Victorian Cryopreservation Bank.

**Dupl.:** WELT

FER06: *Davalliaceae* - FER, Ferns - Main collection (S. Australia)  
Printed from MELUSP, 21 Apr. 2022

Herbarium specimen of *Davallia solida* var. *pyxidata* whose spores are among many species now preserved in the Victorian Conservation Seedbank's new cryobanking facility.





Royal  
Botanic  
Gardens  
Victoria