AUSTRALIAN SEEDBANK PARTNERSHIP

Safeguarding Australia's Flora

through a national network of native plant seed banks

2019-20 ANNUAL REPORT

safeguarding Australia's flora

CONTENTS

Abbreviations

Alice Springs Desert Park (ASDP)
Australian Grains Genebank (AGG)
Australian National Botanic Gardens (ANBG)
Brisbane Botanic Gardens (BBG)
Botanic Gardens and State Herbarium (BGSH)
Botanic Gardens and Parks Authority (BGPA)
George Brown Darwin Botanic Gardens (GBDBG)
Royal Botanic Gardens and Domain Trust (RBGDT)
Royal Botanic Gardens, Kew (RB-G Kew)
Royal Botanic Gardens Victoria (RBG Vic)
Royal Tasmanian Botanical Gardens (RTBG)
The Council of Heads of Australian Botanic Gardens Incorporated (CHABG Inc.)
Western Australian Seed Centre (WASC), Department of Biodiversity Conservation and Attractions (DBCA)

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Prepared by: Damian Wrigley
Editor: Alan Cummine, GoodWords Consulting
Design: Siobhan Duffy

Cover: Recent advances in photographic software mean that our Partners are able to capture details that in some cases are not only invisible to the naked eye but also across multiple planes so that all physical traits of a seed can be captured. Capturing these traits are great for our recent stamp release, but more importantly they provide additional data for identifying seeds as well as understanding the functions of their unique morphological characteristics. (Photo: Australia Post, ANBG, BGSH and DBCA)

This page: The spectacular view of the enjoyed by our collectors when searching for *Sphenotoma drummondii* Toolbrunup, a species that prefers shallow soil over granite, quartzite, or schist. It can often be found growing on sheer cliff faces or underneath over-hangs in the Stirling Ranges in South-West WA. (Photo: Andrew Crawford, DBCA)

LETTER FROM THE CHAIR

Having worked in botanic gardens for many years, I am continually impressed by the dedication and professionalism I witness from our seed bank staff around Australia. Never more so than this year, which has thrown every conceivable challenge their way. Our Partners have had to contend with the impacts of bushfires and hailstorms, not just in the field but also directly in botanic gardens, seed banks and glass houses, and of course the global pandemic.

The Australian bushfires of 2019–2020 were unprecedented in their scale and severity. Having written about the devastating fires in Tasmania and Queensland in my letter last year, I am saddened to once again reflect on the monumental impacts felt across so many landscapes this past summer. Millions of hectares have burnt, impacting on thousands of taxa. But it is encouraging to see the work of so many individuals, botanic gardens, universities and governments collaborating to give priority to on-ground actions for species and communities that are distributed within or adjacent to the fire scars.

The scale and intensity of the fires have drawn widespread efforts from funders to support the recovery effort, but there is much to do and learn in order to ensure we are responding appropriately. We must continue to identify, conserve and study our native flora to ensure we have the capacity and capability to utilise our collections in the best way possible. Climate change will continue to create ideal conditions for catastrophic fires like the ones witnessed this year. Beyond fundamental changes to the global carbon economy, the best insurance we have for Australia's native flora is to commit to ongoing ex situ conservation and to building on cultural knowledge and on seed science to support these efforts.

As I reflect on the ten years that the Partnership has been in operation, I am impressed by the scale and complexity of work that we have managed to deliver. We have built a network of partners and associates that continue to collaborate on securing seeds from the Australian taxa. We have duplicated collections in other facilities within Australia and overseas, and used these to support translocations and the restoration of Australia's unique and diverse ecosystems. We have shared our knowledge through the delivery of critical seed science and contributions to peer-reviewed research. We have delivered or contributed to national and international conferences and workshops, and supported the development and ongoing review of best-practice plant germplasm guidelines, and restoration standards. And we continue to provide advice on the development of national and international policies, programs and agreements that support the conservation of the Australian flora.

With the global community delayed in their negotiations on a new Global Biodiversity Framework it is a timely reminder of how connected we truly are. The catastrophic events that have caused much destruction and disruption this year are linked directly to our unsustainable use of natural resources. It is imperative that we continue to support the conservation of our native species and the landscapes in which they exist. As the decade draws to a close and the next decade of global cooperation begins, we will continue to do our part, delivering robust seed science and ex situ conservation of Australia's unique native flora.

I would like to extend my gratitude to the teams of seed collectors, curators and scientists across the Partnership for their determination and commitment to deliver continuity of research and curation during an incredibly challenging year. In addition, I would like to recognise Neville Walsh for his monumental influence on the Australian botanical landscape throughout his remarkable career. Neville's contributions will support our efforts to both understand and conserve the Australian flora for many years to come.

Dale Arvidsson
Chair, Council of Heads of Australian Botanic Gardens Inc.

LETTER FROM THE NATIONAL COORDINATOR

What a monumental year it has been. The Partnership entered 2019–2020 with the goal of delivering the Australasian Seed Science Conference in April 2021 as the premier seed science event for the region. Our hosts, committees and supporters had committed substantial time and money to develop a conference program to be proud of. I thank them all for their hard work and dedication. The program was to be an impressive showcase of the incredible science taking place across the globe. The program had grown to include one international and five national keynote speakers, 67 individual conference papers, more than 20 posters, three workshops and four fascinating field trips throughout the Canberra region.

With COVID-19 presenting the world with a pandemic not seen for almost 100 years, we made the difficult decision to postpone the event less than three weeks before the opening ceremony. The Organising and Scientific Committees, the CHABG and the ANBG as hosts universally supported this decision so as not to put any of our conference delegates, partners or associates at risk of contracting COVID-19. We are continuing to work on the program and format for the postponed conference, and look forward to releasing more details early in 2021.

Before the international disruptions of 2020, the Australian bushfires of 2019–2020 were already devastating many parts of eastern and southern Australia. The extent and severity of these fires have seen entire ecosystems burnt, including rainforest areas unknown to have burnt in living memory. The impact of the fires was felt around the world, with significant interest from individuals, philanthropists, businesses and governments to support the recovery efforts. The pandemic did overshadow the response for a short while, but we have seen a renewed and sustained interest in dealing with the recovery, and have received significant support and engagement from a number of sectors.

I would like to express my gratitude to the Partners and Associates for their ongoing determination and resilience in the face of multiple challenges that put great strain on their efforts to undertake fieldwork and lab-testing of seed collections this year. Early in the year, the Partnership organised a series of meetings to share information and to support each other through the management of seed banks and research programs. Through these meetings we could share critical information about management approaches and potential risks, and support our shared efforts to continue research and collection maintenance across the network.

I cannot express how impressed I am at the people across our network. It is an absolute honour to represent the Partnership and the work the Partners deliver. We have a number of projects and initiatives underway and in preparation for the years ahead, and I am excited for the opportunities and possibilities they bring to our sector, especially for opportunities to grow the capacity and capabilities for long-term conservation of Australia's diverse native flora.

I would like to express my gratitude to Lisa Bazso, Jessica Nichols and Anna Moreing for their assistance this year. Their contributions to the Partnership have been extremely valuable. I would also like to wish Ben Wirf from the George Brown Darwin Botanic Gardens good luck as he takes some well-deserved leave, and welcome Scott Pullyblank from the Alice Springs Desert Park to the Partnership.

This last year of the decade of biodiversity has illustrated just how important our work continues to be. I encourage you all to branch out and experience our natural environment, to learn more about Australia's incredible native flora and to engage in the conversations and opportunities that support the conservation of our native flora so that it continues to be available for future generations.

Damian Wrigley
National Coordinator

PROFILES OF OUR PEOPLE

Jess Nichols, Graduate, Australian Seed Bank Partnership, Australian National Botanic Gardens

I came to work for the Australian Seed Bank Partnership Secretariat as part of the Department of the Environment and Energy 2019 Graduate Program and stayed for as long as I could. I had no previous experience in ex situ seed conservation, but had developed a passion for conservation while previously working as a chef in resorts in Kakadu National Park and the Kimberley region.

It was during my Bachelor of Science (Biodiversity and Conservation) at Flinders University of South Australia that I discovered a love of botany and undertook an Honours project investigating a possible link between the reproductive traits of introduced plant species and their invasive success. I did much of the research for this project at the State Herbarium of South Australia, where I continued as a volunteer for a short time after graduating. In the summer before the 2019 Graduate Program began, I worked as an assistant to a PhD candidate in the Weed Science Research Group in the School of Agriculture, Food and Wine at the University of Adelaide, which helped to foster my love of plant science.

My role with the Australian Seed Bank Partnership Secretariat was varied and challenging, and I learnt a great deal about ex situ seed science and the complexities of coordinating a national collaborative conservation program. I dedicated much of my time with the Secretariat to preparing an evaluation report on the governance and operations of the Partnership, which will support the development of a new Business/Strategic Plan to replace the existing 10-year plan, due to end in 2020. I also worked with the National Coordinator to manage a procurement of data and threatened species collections as part of the Threatened Species Commissioner's Year Five Reporting on the progress of the Government's Threatened Species Strategy.

During my time with the Secretariat, I witnessed the strength of the Partnership in their response to the 2019–20 bushfires and their adaptability in continuing important conservation work under the various coronavirus restrictions. I would like to thank the Council of Heads of Australian Botanic Gardens for the opportunities afforded to me through my time with the Partnership. The work being done by the Partnership is meaningful and hopeful, which is something we all need right now.

Lisa Bazso, Indigenous Intern (Winter 2019), Australian Seed Bank Partnership, Department of Agriculture, Water and the Environment

Ever since I was a young girl, I've felt a strong connection to animals and a responsibility to conserve the environment they live in. As I learned more about my Indigenous heritage growing up, my fascination with nature grew. I enrolled at the University of Sydney to study a Bachelor of Animal and Veterinary Bioscience. It was here I was first exposed to ecology, and the vital role plants play in the world. During university break, I participated in a conservation and restoration program at Ku-ring-gai-Chase National Park with the Green Army, and gained a further appreciation of plants.

Enjoying the fresh air along the National Pass trail in the Blue Mountains National Park, NSW. (Photo: Lisa Bazso)

When I saw the advertisement for an Indigenous winter internship through the Department of Agriculture, Water and the Environment, I made sure to put down my interest in the role. Despite my animal science background, my first preference was the project at the Australian National Botanic Gardens, working with the Australian Seed Bank Partnership (ASBP).. I am so glad I made this decision and got to meet such a passionate group of people, so dedicated to their role within the Partnership it can't help but be contagious.

Although my time with the ASBP was short, I felt heavily involved and well- supported. I completed an Indigenous participation plan for the Australasian Seed Science Conference, helped organise and deliver a fundraising workshop attended by dedicated staff from six capital city botanic gardens, and even got practical experience cleaning and sorting seeds for ex situ preservation.

During my role, I gained so much knowledge about seed banking and the importance of working together to safeguard Australia's flora. With the current climate crisis and various other factors contributing to the rapid decline of plants and their genetic diversity, the work done by the ASBP, volunteers, and fellow stakeholders is critical to protecting our natural heritage, and I can't wait to see their progress into the future.

Lisa spends her spare time volunteering at a local dingo sanctuary, pictured is Jarrah the alpine dingo, named after *Eucalyptus marginata*. (Photo: Lisa Bazso).

Aisyah Faruk, Conservation Partnership Coordinator, Millennium Seed Bank, Royal Botanic Gardens, Kew

Conservation has always been a passion for me growing up. Originating from Malaysia, I had the privilege of being surrounded by an amazing tropical system, which certainly sparked my obsession with the natural world, albeit not so much with plants but with reptiles and amphibians. Travelling to Australia to spend time with my cousins during my early years also helped cement my obsession with nature and herpetology. Despite numerous attempts from my mother pulling me into the botanical world, I ended up in the UK studying Zoology. That was the height of my rebellious phase!

I undertook a PhD with the Zoological Society of London to study the impact of the palm oil industry on amphibian diversity in Malaysia and Indonesia. I carried on in this theme, working with a social enterprise aiming at helping farmers and communities within the agricultural sector. My fascination with plants slowly began to take shape when I started living and working with these communities in Malaysia, Indonesia, and Cameroon. Each one showed a different perspective of the world and highlighted the sheer importance of plants, not only for their livelihoods, but also in their religion and culture. This spurred me on to expand into plant conservation.

In 2017 I had the opportunity to join the Millennium Seed Bank team at the Royal Botanic Gardens Kew. My first role was to coordinate projects and maintain partnerships across the Caucasus (Georgia, Armenia, and Azerbaijan) and the Arabian Peninsula regions. Although seed conservation, and indeed botany, was all very new to me, travelling, capacity building and maintaining partnerships were not.

I was blown away by the amazing work the Partnership has achieved, and the willingness (and patience) of Partners to impart their botanical knowledge and expertise.

At the end of January 2020, I took over from Dr Elinor Breman as Partnership Coordinator for Europe, Middle East, Australia, and the Pacific regions. Working with the Australian Seed Bank Partnership has truly been a very humbling experience. I am in awe at the utter dedication and enthusiasm of the teams. I am very much looking forward to meeting everyone face-to-face when we are all allowed to travel once more.

Through my various career paths and travels, the fragility of our natural world and the threats it faces are starker than ever. The work of the Australian Seed Bank Partnership is now so crucial to the future of plants, people, and the planet.

Denzel Murphet, Volunteer, South Australian Seed Conservation Centre, Botanic Gardens and State Herbarium, South Australia

I have been a field work volunteer with the South Australian Seed Conservation Centre for over a decade now and have probably been on a couple of hundred field trips over that time. I help with plant identification in the field, seed collecting, taking images for the web site and plant population surveys. I also often go out on my own or with other cohorts collecting seeds for the seed bank and taking photographs to fill the gaps in the SA plant web site. I have been interested in plants since the early 1980's and have conducted plant surveys in Parks, Reserves and private swamps across the Southern Lofty, Murray and South-east regions of South Australia. I also have an interest in birds and regularly contribute to bird surveys.

I always enjoy the opportunity to get out in the field with Dan and the team from the Seed Centre. We have travelled across most of the state and visited thousands of plant populations during the time I have been volunteering. We are planning the trips for the next season now and looks like plenty of day trips around the Mount Lofty Ranges, a trip or two to Kangaroo Island, Northern Yorke area and Eyre Peninsula.

Denzel searching for *Senecio gypsicola* to add to the South Australian collections.

Denzel searching for *Swainsona eremaea* in the remote parts of South Australia.

WHO WE ARE

The Australian Seed Bank Partnership is a national collaboration of nine conservation seed banks, two flora-focused organisations in Australia, and the Millennium Seed Bank in the UK. With support from our dedicated Partner and Associate organisations, the Partnership delivers fundamentally important *ex situ* seed conservation, as well as the critical seed science that underpins these efforts. We also ensure our experts across the country are contributing to the development of policies, programs, research and on-ground projects that seek to improve biodiversity outcomes for the Australian flora and fauna. Once again we have seen substantial interest in the work of seed banks from government, industry and the general public, as Australia responds to another catastrophic fire season in 2019–2020.

Ex situ seed banking is the principal tool for the safe and efficient storage of wild plant genetic material. This cost-effective method for maintaining genetically diverse and representative collections of the Australian flora requires a sound understanding of seed harvest, storage and germination. Our seed collections are held across a network of seed banks to enable a strategic approach to storage, conservation and research of Australia's incredibly diverse flora.

Our Partners generously provide resources and knowledge that support the management of plant species and communities, and our collaborative efforts offer an insurance policy against further loss. Australia's native flora faces an uncertain future due to many threats, including a rapidly changing climate, biological invasions, land clearing and severe weather events. The work of the Partnership will continue becoming more important.

We are very grateful to our many generous supporters across government, philanthropy and industry, as well as the individual donors that support our work. Much of our work is also supported by volunteers and students who work with our collectors, curators and scientists to ensure Australia's endangered, endemic and economically important species are provided with the best chance to survive in an uncertain future.

Lordhowea velleioides flowering in woodland on the northern slopes of The Needles, near the Gordon River Road in Tasmania. This regrowth was observed this year following fires in the 2018–2019 season where many parts of Tasmania sustained prolonged, high-severity fires. (Photo: RTBG)

Our Vision

A future where Australia's native plant diversity is valued, understood and conserved for the benefit of all.

Our Mission

A national effort to conserve Australia's native plant diversity through collaborative and sustainable seed collecting, banking, research and knowledge sharing.

We welcome opportunities to further build on our collaborate efforts across the conservation, restoration and botanic gardens networks. We continually strive to deliver on our shared objectives of seed banking and seed science, on sharing knowledge and building the capacity across the seed conservation community. The Partnership is committed to ensuring we deliver our ex situ conservation programs and projects to the highest standards, following internationally recognised protocols for collecting and storing the seed of Australian native plants, with all Partners assessed against the Millennium Seed Bank Partnership's Seed Conservation Standards.

Neville Walsh removing a large bag of seed from the seed store ready for restoration work in Victoria. (Photo: RBGV)

We contribute to national efforts to empower others to deliver their *ex situ* conservation endeavours to the highest standards. We do this by sharing our knowledge and expertise in various forums, as well as through the review and update of national guidelines and standards that aim to develop capacity and skills across the sector for plant germplasm conservation.

We continuously strive to improve the collection and curation of our data. We record environmental data crucial to our role in plant conservation and aim to make it openly available through the Australian Seed Bank online and through jurisdiction-specific websites. We are continuing to seek funding and opportunities to improve our data sharing to support the utilisation of seed collections for research and restoration.

Our seed science endeavours are critical for understanding seed biology and ecology, as well as for developing germination protocols and tackling dormancy or seed storage challenges. By building this knowledge base, we aim to help practitioners restore vital plant communities throughout Australia's diverse landscapes. Over many years and many more field trips, our Partners and Associates have secured seed from a wide variety of taxa across many unique and challenging landscapes. Our Partners hold seed from every state and territory, including our island territories in the Indian and Pacific Oceans. These important collections will continue to provide vital clues to the evolution and adaptability of native species as we continue to undertake further research and restoration projects around the country.

We welcome collaborations with individuals, organisations and governments within Australia and further afield to support the conservation of Australia's unique and diverse flora. It is our hope that, as we collectively share our knowledge and skills, we will be capable of overcoming many future challenges and threats and create a future where Australia's plant diversity is recognised for the ecosystem services it supports throughout the continent.

Pressed specimen of *Carex archeri* (tiny alpine sedge) collected from south of the Sandbanks Tier, Central Highlands, Tasmania. Every seed collection made by the Partnership is accompanied by an herbarium specimen. These are lodged at the seed bank's local herbaria and are used for identification purposes. The metadata associated with these herbarium specimens is then made available through the Australasian Virtual Herbarium, further improving known location information for each of the taxa collected. (Photo: RTBG)

AUSTRALIAN SEED BANK PARTNERSHIP HIGHLIGHTS FOR 2019–2020

Seed Banking Australia – Australia Post Stamp Release

In October 2019 we were thrilled to see a collaboration with Australia Post culminate in the public release of a selection of special-issue seed stamps and postcards titled '*Seed Banking Australia*'. This special release featured three stamps: Petrophile latericola from Western Australia; *Rytidosperma clelandii* from South Australia, and *Epacris petrophila* from the ACT, as featured on the cover of this year's annual report. This project with Australia Post provided the Partnership with the opportunity to raise public awareness of the complexity of native seeds and unique traits that help seed scientists and taxonomists differentiate between the huge diversity of taxa found throughout Australia.

Coincidentally, the release on 19 October coincided with the Future of Seeds Forum in Sydney, a forum that brought together seed experts and restoration practitioners. The stamps were put on display for delegates to view, and stamp packs were provided as gifts for speakers. And we think they make pretty great gifts too.

While the stamps themselves are no longer available for sale, you can read about the release on the Australia Post Website: https://australiapostcollectables.com.au/articles/stamps-that-sow-the-seeds-of-conservation.

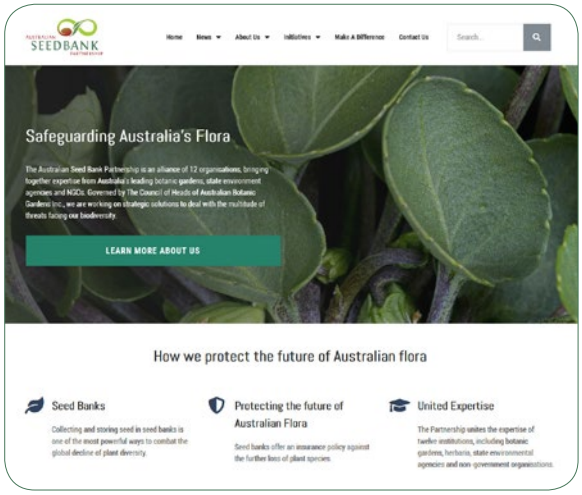
This First Day Cover

These maxi cards were released alongside the stamps, featuring both images of the seeds and the species both *in situ* and in the case of *Rhytidosperma clelandii*, the type specimen held at the South Australian Herbarium in Adelaide.

Release of our new Partnership website

Although it has been a long time coming, we are pleased that in February 2020 we released our new Partnership website. The new site provides a safe and secure platform where one can engage with our work and with the people that contribute significant time and effort to make the Partnership a success. The new site includes better accessibility for online and mobile devices, as well as functionality to submit enquiries and make tax-deductible donations to support our work. As the pandemic subsides throughout Australia, we will continue to upload more information to continue sharing case studies and information about the many exciting projects the Partnership is delivering in response to the 2019–2020 bushfires.

We invite you to visit our website and learn more about the work of the Partnership, including the organisations that undertake *ex situ* conservation, research and restoration of the Australian flora: https://www.seedpartnership.org.au/

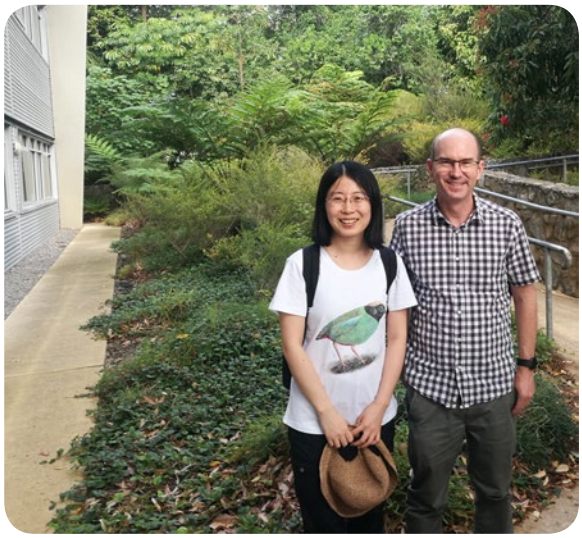


Our website provides people from all over the world the opportunity to engage with the work of the Partnership and contribute to the conversation on *ex situ* seed conservation.

International keynote speaker visits Partner Seed Banks

While the Australasian Seed Science Conference would have been a wonderful highlight for us to share with you this year, COVID-19 unfortunately necessitated that we postpone until the pandemic becomes less of an issue for both public health and national and international travel.

At the point when the conference was postponed, we had already managed to secure funding from Friends of the Australian National Botanic Gardens (Friends of the ANBG) to support travel and accommodation for an international keynote speaker, Dr Sichong Chen, from the Millennium Seed Bank at the Royal Botanic Gardens, Kew. Part of the funding provided by Friends of the ANBG was to enable Dr Chen to visit Partners around the country before attending the conference and workshops in Canberra in April.



Dr Sichong Chen, Early Career Research Fellow, Millennium Seed Bank, Royal Botanic Gardens, Kew meeting with Dr David Merritt, Senior Research Scientist at the Western Australian Seed Centre, Kings Park – 9 March 2020.

Dr Chen arrived in Perth very early in March, visiting the Western Australian Seed Centre at Kings Park and Kensington before continuing on to the Royal Botanic Gardens Victoria. During these visits, Dr Chen presented to botanic gardens staff and toured the facilities, taking the opportunity to explore potential research projects that

could be developed in collaboration with our Australian Partners. Unfortunately, Dr Chen's visit was cut short when the conference was postponed, although we were able to support Dr Chen's return to the Millennium Seed Bank before the closed borders came into effect in the UK late in March 2020.

Engaging researchers from overseas in the conference is made possible through generous support from donors and grants made by organisations such as the Friends of the ANBG. Support like this help to share cutting edge seed science with practitioners throughout the Partnership and beyond.

The Partnership is grateful to Dr Chen for all of her efforts to prepare for the conference as our invited international keynote speaker and for visiting Australia to share her work, and we acknowledge the efforts of our Partners to host Dr Chen at their facilities. The Partnership also extends our gratitude to Friends of the ANBG for their original support of the conference, and for their continued patience and understanding while we aided Dr Chen to return home safely. We look forward to welcoming Dr Chen to the postponed conference in 2021.

Return of seeds from Kew – South Australia

The 2019–2020 bushfires have presented many challenges for how we respond and manage bushfire recovery efforts across the country. The seed banks throughout our network are being called on by many organisations to assist recovery efforts with seeds from existing collections. One instance in particular has helped prove the value of *ex situ* seed conservation, as well as the duplication of seed in back-up facilities in other locations.

An endemic pea known as *Glycine latrobeana*, or clover glycine, was collected by the South Australian Seed Conservation Centre (SASCC) in 2007, with 1000 seeds duplicated at the Millennium Seed Bank in the UK. During the bushfires, 23,200 ha of the Adelaide Mount Lofty Ranges at Cudlee Creek were extensively burnt, significantly impacting the habitat of the EPBC-listed Vulnerable *Glycine latrobeana*.

Thanks to their earlier collecting in 2007, the team at the SASCC was able to respond immediately, recalling 250 seeds from the duplicate collection at the Millennium Seed Bank to be used for propagation and restoration within the fire scar at Cudlee Creek. Ongoing monitoring will help the team in South Australia to understand the recovery of the species as a result of this intervention.

The team in South Australia is also working on a number of other species within the immediate area. These include other rare plants such as the Australian Carraway (*Oreomyyrhis eriopoda*), Golden Cowslip orchid (*Diuris behri*), Slender Speedwell (*Veronica gracilis*) and Forest Mint (*Mentha diemenica*). The team has been working on these species with long-term SASCC volunteer, Kieran Brewer, who runs 'Billy Goat Hill', a private Conservation Reserve in the area. The SASCC is also working closely with the team at Adelaide Mount Lofty Ranges Natural Resource Management to help conserve the threatened species in the wider region.

Seedlings of *Glycine latrobeana* propagated from seeds repatriated from a duplicate collection at the Millennium Seed Bank in the UK. Germination trials for the species resulted in greater that 85% of the seed germinating, demonstrating that the duplication process and the storage methodologies used are proven to retaining the viability of the species long-term.

GOALS AND ACHIEVEMENTS

The Australian Seed Bank Partnership's national program to conserve Australia's native plant diversity has five goals. The Partnership's business plan identifies strategies, actions, priorities and outcomes under each of the goals that guide our work. These outcomes help us to maintain focus and ensure our work is relevant to our vision of 'a future where Australia's native plant diversity is valued, understood and conserved for the benefit of all'.

The five goals are:

1. Collecting and storing seed in secure seed banks as long-term insurance against loss of plant diversity.
2. Conducting research to improve both conservation and restoration outcomes from seed banking.
3. Developing national standards and improving capacity to enable conservation and restoration of biodiverse and resilient ecosystems.
4. Sharing knowledge and engaging the public, private and charity sectors, as well as community members, in the work of the Australian Seed Bank Partnership.
5. Securing and strategically managing our resources to strengthen and support the work of the Australian Seed Bank Partnership to achieve its vision.

Prioritising seed for collection after the bushfires

The bushfires had a monumental impact on our collecting efforts over the 2019–2020 season. Much of the landscape was either burning, at risk of burning, had already burnt, or was close enough to fires to be covered in a smoke haze that made it hazardous for collectors to be in the field. Not only was collecting off the cards for many areas, but long-term and new research plots and trial sites were either destroyed by fire or at serious risk of damage, potentially jeopardising many years of research and resourcing or disrupting newly established student projects.

During the brief window between the end of the fires and the beginning of the travel restrictions related to COVID-19, some partners were able to return to the field and assess the impacts within and adjacent to the fire scars, as well as the locations where research projects had previously been established.

The Partnership also took this time to work collaboratively on priority lists for seed collection in the following season, working closely with our state environment agencies and the Australian Government's Bushfire Expert Panel to determine how the work of the Partnership could best complement the local, regional and national prioritisation occurring across the southern and eastern states. We are confident that this work will underpin a couple of successful seasons ahead, noting our prioritisation of target species continues to evolve as more information is made available over the coming months.

News from the Australian Seed Bank Partnership

Seed banks respond to the bushfires with collecting, research and restoration

ANDREW CRAWFORD[1], PETER CUNEO[2], GAVIN PHILLIPS[2], DAN DUVAL[3], JENNY GUERIN[3], JAMES WOOD[4] AND DAMIAN WRIGLEY[5]*

[1]Western Australian Seed Centre, Department of Biodiversity, Conservation and Attractions, WA.
[2]The Australian PlantBank, The Australian Botanic Garden, Mt Annan, NSW.
[3]South Australian Seed Conservation, Botanic Gardens and State Herbarium, SA.
[4]Tasmanian Seed Conservation Centre, Royal Tasmanian Botanical Gardens, TAS.
[5]National Coordinator, Australian Seed Bank Partnership, ACT.
*Corresponding author: damian.wrigley@environment.gov.au

The ASBP published a paper this year in the Journal of the Australian Network for Plant Conservation about the seed collection response to recent bushfires. The paper can be found at https://search.informit.com.au/documentSummary;dn=279699550183292;res=IELHSS

Caption??

Seed research supporting the ex situ conservation of Australia's tropical mountaintop endemics – Tropical Mountaintop Plant Science Project (TroMPS)

Amelia Stevens (NSB), Gemma Hoyle (NSB), Ganesha Liyanage (PlantBank) and Karen Sommerville (PlantBank)

The tropical mountain tops of far north Queensland are at altitudes cool enough for clouds to form, creating isolated areas with frequent fog and mist. Here, unique species have evolved in what are known as tropical montane cloud forests (TMCFs). A recent study by Costion *et al.* (2015) has highlighted just how vulnerable these peaks are to the effects of climate change, and the urgent need for ex situ conservation action. Led by the Australian Tropical Herbarium and funded by the Ian Potter Foundation, the 'TroMPS' project is a collaboration between Botanic Gardens, conservation seed banks and plant research institutions, including the National Seed Bank (NSB) and Australian Plant Bank. The project aims to collect, store and propagate genetically diverse ex situ collections of TMCF plants and seeds, and to research the potential for these plants to survive and/or adapt to predicted changes in factors currently driving recruitment from seed – namely temperature, moisture availability and light quality.

The seed research component of the project has several aims – primarily to identify the seed storage requirements of the previously unbanked species, and to investigate the seed biology that underpins plant persistence in a changing climate and informs seed banking practices.

With very little in the literature about the seed biology of Australian tropical montane seed, or the environmental factors that drive seed characteristics (such as dormancy and germination), we have our work cut out for us. This project has inspired a thorough review of the TMCF seed-related literature in relation to storage and germination requirements. Once published, it is our hope this review will help put Australia's TMCF on the map and lead the way for future seed and conservation research in this space.

Experiments on seed storage behaviour at The Australian PlantBank are ongoing and have so far identified 15 species that are tolerant of desiccation (included 5 out of 5 species that are montane endemics) and 8 that are desiccation-sensitive. Most of the desiccation-tolerant species are also tolerant of initial storage at -20°C.

TroMPS Collecting Trip December 2019 – Collecting *Dracophyllum sayeri* on Mount Bellenden Kerr, Qld.

TroMPS Collecting Trip December 2019 – Graeme Errington, Karen Sommerville, Stuart Worboys, Amelia Stevens.

But thermal profiles obtained by differential scanning calorimetry suggest that a few of these may be short-lived in conventional storage and are likely to require cryopreservation. Seed dormancy has made it difficult to determine the storage behaviour of some species, so research has also been underway to determine dormancy-breaking requirements for those species. Appropriate techniques have so far been developed for two mountaintop endemics (*Tasmannia* sp Bellenden Ker and *Linospadix apetiolatus*) and three species with broader distributions (*Gahnia sieberiana*, *Linospadix palmerianus* and *Tasmannia insipida*).

PlantBank and NSB have collaborated to investigate the thermal tolerance of germination in the mountaintop-endemic *Dracophyllum sayeri*, with a temperature gradient plate experiment set up at PlantBank and analysed by NSB. The results of this first thermogradient study revealed that, at least for this species, temperature niche is broader than expected. While the predicted increase in temperature may not inhibit germination, there is a risk that warmer temperature may deplete the soil seed bank. If temperature is not a limiting factor for the persistence of species in the montane tropics, there may be other factors unique to the tropical mountaintops that are.

We have also identified light quality as a potentially unique and important factor driving seed germination in Australia's TMCFs. Light quality, specifically the ratio of red to far-red light (R:FR; 660:730 nm), has been shown to influence germination of many small-seeded tropical species, and cloud immersion has been shown to influence light quality and R:FR in a temperate mountain cloud forest. Despite this, there have been no studies looking at the effect of light quality on germination of TMCF seeds. Using natural sun as the light source and filters to manipulate light quality we are currently investigating the germination response to daylight, darkness and a gradient of R:FR ratios of *Dracophyllum sayeri* (Ericaceae), *Tasmannia* sp. Mt Bellenden Ker (Winteraceae), *Melastoma malabathricum* subsp. *malabathricum* (Melastomataceae) and *Abrophyllum ornans* (Rousseaceae). The study aims to determine the role that light quality plays in plant recruitment from seed in TMCFs, and how this might be impacted under predicted climate change.

In a largely unstudied ecosystem where *ex situ* conservation is critical in the face of climate change, there is an abundance of research to be done. Collaboration between the two seed banks is proving beneficial for all –sharing ideas, resources, and time to produce research supporting a collaborative conservation project.

Costion C.M., Simpson L., Pert P.L, Carlsen M.M, Kress W.J, Crayn D. (2015) Will tropical mountaintop plant species survive climate change? Identifying key knowledge gaps using species distribution modelling in Australia, Biological Conservation, 191:322-330.

Florabank and Germplasm Guidelines

The Partnership has continued to engage in the review and development of both the Florabank Guidelines and the Plant Germplasm Guidelines, both projects being led by the Australian Network for Plant Conservation (ANPC). Partner seed bank staff have provided significant time and expertise to review both of these significant guidelines that collectively provide best-practice technical instruction on how to design, undertake and maintain plant germplasm activities. These activities include establishing fit-for-purpose facilities, planning field work, processing, germinating and storing plant germplasm, and then utilising collections for research and restoration projects.

Both publications were due to have a strong presence at the Australasian Seed Science Conference in April 2020, and we hope to see them feature in the postponed event in September 2021. The Partnership congratulates the ANPC, in particular Dr Amelia Martin and Dr Lucy Commander, for successfully coordinating so many authors and reviewers to produce what will become two highly valued tools for the sector for many years. We are proud to be contributing to their development and look forward to the release of both publications in 2021.

Management of Seed and Gene Banks during COVID

Contrary to what might have been expected, the Partnership's long-term networking and collaboration have underpinned a productive period during the COVID-19 lockdowns. Our networks have enabled Australian botanic gardens and seed banks to capitalise on recent physical distancing requirements to refocus resources on digital tasks such as data curation, finalising research papers, and prioritising collecting targets for the coming seasons. It has been pleasing to see a benefit of our already physically distant collaborations – while in-facility teams have been affected by social distancing, our nation-wide collaborations have been able to continue, albeit with significantly improved IT infrastructure and software that enabled better video conferencing and information sharing.

An early priority for the Partnership was to maintain communications across our network to share information and experiences on the impacts of physical distancing and travel bans, including sharing knowledge to support the management of the various conservation and research programs under way around the country. The Partnership has actively shared and explored the various approaches to managing collections, fieldwork and research, with a focus on institution-level responses.

In April the Partnership convened two knowledge-sharing sessions so that Partners could engage with other facilities around the country to understand how those facilities are maintaining conservation and research programs. These discussions have also helped identify issues for collection maintenance not previously considered, including the need to rethink formerly practical approaches to building design, materials and management that can accommodate physical distancing and supply chain disruptions.

Seeds of *Acacia carneorum* (Purplewood Wattle) collected near Menindee. Most patches of this largely clonal species almost never produce fruit. (Photo: Gavin Phillips)

ACHIEVEMENTS AROUND AUSTRALIA TOWARDS OUR 1000 SPECIES TARGET

Queensland – Brisbane Botanic Gardens

Utilising collections in the botanic gardens and upgrading facilities for better collection management

2020 has presented many challenges for Brisbane Botanic Garden's (BBG) Queensland Conservation Seed Bank activities. COVID-19 has deeply impacted all our day-to-day lives, and BBG's Seeds for Life program is no exception. Our plans for reinvigorating our seedbank volunteer program and restarting collaborations that had fallen by the wayside were restricted by the Queensland government's strong approach to the pandemic, effectively delaying all these activities.

Brisbane City Council's approach to managing its diverse workforce during the pandemic directed that those who could work from home should do so. I (Ross Demuth) fell into this category as my role is largely split between coordinating our Seeds for Life program and managing the botanic gardens' living collection records. This allowed me to concentrate on the other aspects of my job: a total overhaul and remake of the aged living collections record system; the first audit of the living collection completed in many years, alongside which I began mapping the Botanic Gardens for the first time. As the situation returns to normal in Queensland, this now allows time to focus on the future plans for the seed bank activity in 2021.

We did achieve a couple of major wins for the year. During the restrictions, I was still able to undertake a large upgrade of the seed bank dry room area and complete the installation of the Building Management System (BMS), equipped with early warning capabilities and a simplified security system. The new BMS has proven to be a life saver. Anytime conditions deviate from normal, notifications are sent without the need for anyone to be physically present to notice anything wrong – a big upgrade for our processes and procedures. In more recent months, Project Phoenix has been the catalyst for a heightened level of collaboration with the Queensland Herbarium, with the hope this will continue.

With the horticultural staff remaining on site during the restrictions, we could continue to propagate species originally collected for various ASBP projects and introduce them into the living collection on site. *Melaleuca lophocoracorum* collected near Ravenshoe in Far North Queensland in 2016 has been a particular success in our Tropical Montane bed in the Queensland Conservation Collection. *Acacia attenuata*, collected in 2012 from the Tuan State Forest, with its unusually persistent bipinnate juvenile leaves, has also proven a point of interest for our educators to use with school groups.

As restrictions begin to ease and I transition back to working on site, we look forward to focusing on our seed banking activities once again.

Melaleuca lophocoracorum in the conservation garden at the Brisbane Botanic Gardens, Mount Coot-tha. These individuals we grown from seeds held in the seed bank at the gardens and are helping to educate visitors to the gardens about the importance of conserving our native flora. (Photo: Ross Demuth, BBG)

Commonwealth – National Seed Bank, Australian National Botanic Gardens

Working with Volunteers and Partners to collect and store seed

The National Seed Bank (NSB) at the Australian National Botanic Gardens (ANBG) faced several challenges over the course of 2019–2020. Drought and bushfires had a major impact on seed collection activities, limiting our ability to get out and collect, and affecting the quality of seed available. By the beginning of autumn 2020, COVID-19 restrictions brought the field trip season to an early close.

This year John McGrath Auto Group (JMAG) agreed to sponsor the Seedy Volunteer activities over a three-year period. The Seedy Volunteer program first commenced in the summer of 2011–2012 with the aim of providing volunteer help to NSB staff in collecting target species in the ACT and adjacent NSW regions. The JMAG sponsorship is aimed at promoting the work of the Seedy Volunteers and facilitating their activities over the summer seed collection season. JMAG is providing the Seedy Volunteers with new equipment, training and uniforms. It is also providing us with the resources for extended multi-day field trips to the Australian alpine areas.

In 2019–2020 the NSB Seedy Volunteers program collected 110 new accessions of 30 species from ACT and NSW, including two EPBC-listed species that progressed our targets for the ACT flora. The collection program shifted focus to target species that are known to be more reliable seed producers, such as those from the following families: Juncaceae, Cyperaceae and Poaceae.

We had a further 25 collections of 25 species from Far North Queensland, made under our partnership in the Ian Potter Foundation-funded project to secure the future of Australia's threatened tropical mountain top flora. Led by James Cook University, the project includes a number of other ASBP Partners in activities of seed banking, *ex situ* propagation, and research.

In all, the NSB participated in 11 conservation research collaborations spanning multiple threatened species and threatened ecological communities. These collaborations produced three reports, five scientific papers and two conference presentations, and made possible multiple other publications currently in preparation.

NSB is currently co-supervising two PhD students, who commenced in 2018. Joshua Hodges, joint Charles Sturt University and Australian National University PhD candidate studying the seed biology and ecology of grassy

National Seed Bank staff and volunteers at their annual forum, ANBG (Photo: Richard Snashall, Reelspin)

woodland understorey plants, and Leah Dann, University of Queensland PhD candidate, researching the seed biology and conservation of Norfolk Island endemic flora.

Over the past twelve months the NSB has continued its research focus on endangered temperate grassy ecosystems, completing a study of 34 species from 49 accessions, with the age of the collections covering 26 years from 1981 to 2017. Results suggest that current NSB collecting and storage protocols promote and maintain viability of seeds over time.

During the year the NSB conducted a total of 163 germination trials of 105 seed accessions from 92 species from three Commonwealth Terrestrial Reserves and from our areas of research focus – temperate grasslands, alpine, arid, tropical mountain tops, and threatened species. Results from these trials will be used to inform and further investigate issues relating to collection, germination, propagation and banking that are impeding use of the collected seed..

ANBG Threatened Species Officer, Mary Lovett, ANBG-JMAG Seedy Vol and Amelia Stevens, NSB Research Technician collecting alpine species Kosciuszko National Park, March 2020 (Image: Tom North, ANBG)

The NSB provided seeds from 28 accessions of 28 species to four external parties.

Tours for groups or visiting scientists were hosted for 79 individuals from botanic gardens, academic institutions and the general public.

NSB's seed data were supplied to the national Australian Seed Bank Online database (hosted by Atlas of Living Australia), and the international Millennium Seed Bank Partnership Data Warehouse managed by the Royal Botanic Gardens, Kew. NSB supplied a dataset for the national research database *Austraits* that will provide plant (including seed) trait information for Australia. NSB's was one of the largest contributed datasets and includes 9,011 individual data points from 2,038 species.

We welcomed two new staff to the NSB team – Amelia Stevens, Research Technician, and Dr Gemma Hoyle, Project Officer (Threatened tropical mountain top flora & Australian Capital Territory threatened orchids). Their contribution to the work of the NSB is already making a huge difference and is greatly appreciated.

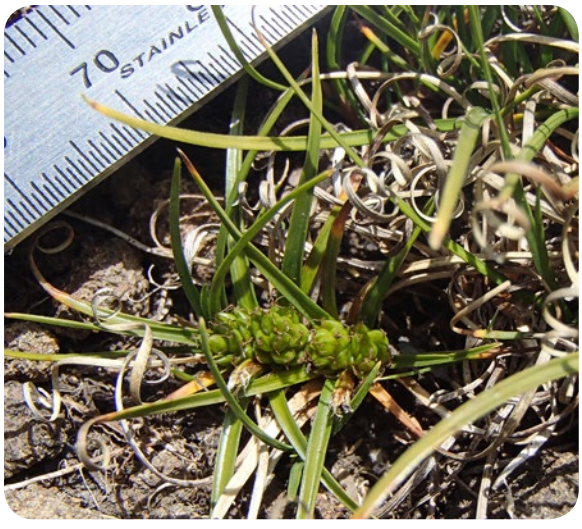
Tasmania – Tasmanian Seed Conservation Centre, Royal Tasmanian Botanical Gardens

A good start to the year but a pandemic almost foils collecting plans for a masting mountain conifer

The 2019–2020 collecting season for the seed bank was an unusual one, due in no small part to the Coronavirus pandemic. During surveying in November 2019, we realised we were heading into a masting year for our montane conifers. The seed bank quickly developed a plan to sample more of our montane conifers across the state to build on what had been achieved during the last masting event in 2015. With the support and feedback from the Tasmanian Parks & Wildlife Service (TASPWS), the program that was going to involve Sustainable Timber Tasmania, the Royal Botanic Gardens, Edinburgh, and the Tasmanian Walking Company. We also had a public Facebook group reporting back on sightings from across the state (a novel approach that proved very effective) and we had a public fundraiser to support the costs. The program was building up very well to address failures of the 2015 conifer project. In that year we hadn't accounted for the clonal nature of conifer stands, an understanding that has come from recent research work. Unfortunately the lockdown struck just as the cones began to mature and we were only able to make a single collecting trip, a two-man, 5-day-trip

sampling of pencil pine from 46 stands of trees, scattered around the Pelion Gap area of Cradle Mountain-Lake St Clair National Park.

Despite the pandemic spooking the major program for the year, some other interesting collections were made. In January 2020, *Myosurus australis* was collected from private land, after its discovery just a few months earlier. This population represents the third record for the species in Tasmania. Also collected this season was *Carex* 'Algonkian Rivulet', a sedge that was previously only known from a single specimen collected deep inside the Franklin-Gordon Wild Rivers National Park back 1979. The seed bank discovered this plant by germinating and growing-on a small amount of contaminant seed in a collection of *Carex breviculmis* made back in 2017. When the nursery plants flowered in November 2019, the identity became clear and a search of the 2017 collection site was done in late December. This search revealed a very contained population of 100 plants, then a second smaller population of 30 plants two days later about 1.5 km away. The seed bank returned to the first population in March of 2020 and harvested 1,400 seeds. Seed orchards for both the *Myosurus* and the *Carex* have been initiated to build up seed numbers.



Carex 'Algonkian Rivulet' identifiable by its near sessile inflorescences and coiling dead leaves, but very easily overlooked. The status of this plant is currently unclear. It appears to be very restricted within the new site and brief searches elsewhere have so far come up blank.

South Australia – South Australian Seed Conservation Centre, Botanic Gardens and State Herbarium of South Australia

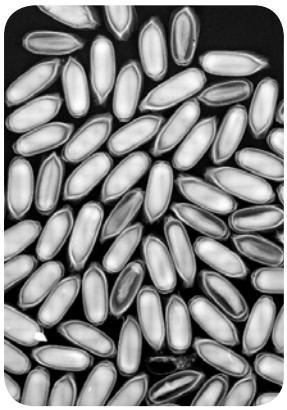
Working with local partners to upgrade facilities, conserve seed and restore habitat

The Mount Lofty Ranges was the main target region for last season's collection program, as per the requirements of current project commitments. A total of 111 collections from 53 taxa were made and included 33 endemic to SA, 42 threatened in SA, and 23 nationally listed taxa. These collections have been tested for viability and screened for germination baseline data, and are now secured in the seed bank. This brings the total to approximately 83 % of South Australia's threatened flora now represented in long-term storage. Five new chest freezers were recently procured to house the seed collections. The new freezers will be more reliable and efficient than the upright, glass-doored freezers they have replaced. We are very grateful to the Friends of the Botanic Gardens for donating the new freezers.

Last year the research program was focused on developing techniques for propagating orchids for translocation. The tasks included isolation and storage of several strains of mycorrhizal fungi to use in germination. We tested different media for seedling growth and methods for hardening-off seedlings before deflasking. A total of 12 orchid species were propagated for restoration and translocation programs, and resulted in thousands of plants now growing in the glass house. Thanks to collaboration with Dr Noushka Reieter, who has assisted the program and generously shared her years of experience. We also thank our project partners within Adelaide and Mount Lofty Ranges NRM for their program support. Trial 'in-pot' methods had positive results for one species, and this will be further investigated in the coming year. Germination of *Gahnia*, *Lobelia*, *Acrotriche* and *Choretrum* species were also continued this year, investigating fire and seasonal responses. Two forms of *Euphrasia osbornii* ssp. *collina* were tested for germination and growth in the nursery in the

presence of different host species. This research will help to develop methods of returning seedlings to the wild for future restoration projects.

This year included propagation for translocation and restoration of 64 plant species, including 40 species that are threatened within South Australia. These plants have been grown and planted in collaboration with other project partners, including: Ecological Horizons for planting at Secret Rocks; Sam Chesson (DEW) for the Gawler Buffer Project; Sean Kennedy (SA Water) for the restoration of SA Reservoirs; and Threatened Flora Ecologist Jerry Smith (Landscapes SA) for translocations of orchids and other threatened plants; as well as Luke Price and Randall Johnson for restoration at Deep Creek, Newland Head and Stipiturus Conservation Parks.



The SASCC has been collecting *Adenanthos terminalis* for several years with limited luck. However, a recent collection from hundreds of individual plants at Deep Creek and Newland Head Conservation Parks have resulted in more than 600 seeds. Thanks to support from Randall Johnson the team were able to germinate the seed and grow seedlings on in the gardens' nursery in Adelaide for reintroduction *in situ*. (Photos: SASCC)

New South Wales – The Australian PlantBank saving more of our threatened species

Like many of our seedbank partners across Australia, the NSW team found the 2019–20 year particularly challenging, and one of the most difficult ever encountered. After years of drought, the devastating 'black summer' bushfires impacted on 5.5 million hectares of bushland during 2019–20, and occurred during the peak summer seed-collecting season. Much of the planned seed collecting activities had to be abandoned due to safety concerns and extensive national park closures. As the situation improved during late summer–autumn (with good rainfall in many regions), extensive lockdowns and regional travel restrictions linked to the COVID-19 pandemic further affected our ability to complete targeted seed collections.

Despite the bushfires and COVID-19 restrictions, the team based at the Australian PlantBank was able to maintain a strong focus on threatened species seed conservation, with funding support from the NSW Government Saving our Species (SoS) program. In this second implementation year for the SoS ex situ seed program, a total of 191 new seed collections representing 68 threatened species were made. These bring the cumulative totals for the first two years of SoS to 490 seed collections made, processed and stored, representing 130 species listed as threatened in NSW.

Collection highlights include promising signs of resilience and regeneration after the bushfires, such as:

- Collection of critically endangered terrestrial orchids *Prasophyllum bagoense* and *P. keltonii* from the Bago Plateau,accessed whilst still an active fireground in order to salvage seed from plants that had been hand-pollinated and bagged before the summer fires to get the first ever seed collections of these species.
- Collection of critically endangered terrestrial orchids *Genoplesium plumosum* from a newly discovered site in Morton NP and first-ever seed collections of Genoplesium superbum from previously known sites also in Morton NP, which had been completely burnt in January 2020.
- First-ever seed collection of the fire ephemeral *Muehlenbeckia* sp. Mt Norman (previously *M. costata*) from Bald Rock NP.

- Multi-provenance genotype seed sampling of *Eucalyptus alligatrix* subsp. *alligatrix*, *Eucalyptus camphora* subsp. *relicta*, *Thelymitra adorata*, *Corunastylis* sp. Charmhaven and *Bossiaea fragrans* to support research and future translocation actions.
- Several seed pods from a newly described underground orchid (*Rhizanthella* sp. Barrington Tops) were received from SoS staff, and a small amount of seed has been sown to isolate mycorrhizal fungi.

Importantly, SoS has also funded a wide range of plant conservation programs across the RBG, and provided a catalyst for fully integrated conservation actions for priority species. These actions include seedbanking, orchid research, conservation genetics, plant disease mapping and protocols, plant production and conservation translocations.

Other local region conservation projects completed this year include our work on the propagation and translocation of threatened native plant populations affected by the development of the Western Sydney International (Nancy-Bird Walton) Airport at Badgerys Creek. This project has focussed on three listed threatened species: *Pultenaea parviflora* (a shrub), *Marsdenia viridiflora* subsp. *viridiflora* (a climber) and *Pimelea spicata* (a low shrub). Importantly, the project has featured an integration of the Garden's horticultural and scientific skills, resulting in seed collections, germination and propagation experiments, establishment of nursery stock, and genetic analysis.

Genoplesium superbum orchid found in Morton National park after fire in January 2020. (Photo: Gavin Phillips)

Western Australian Seed Centre, Kensington

One of the highlights of the year for the Western Australian Seed Centre, Kensington was the collection of seed of the Critically Endangered Many Flowered Commersonia (*Commersonia apella*). This species is known from the Pemberton, Walpole and Denmark areas of Western Australia. The species was first collected in 1919, but surveys for the species between 2003 and 2007 only managed to locate a solitary plant, which died in subsequent years. Then in 2011 another population of the species was found, over 500 km east of previously known populations of the species, becoming the only extant population known.

Fast forward to the spring of 2019, when DBCA Flora Conservation Officer Matthew Rumenos was working in Karri forest in the Pemberton area. There he made an exciting discovery – *Commersonia apella*. The last time the species had been collected in the area was almost 100 years before, so he alerted staff at the Western Australian Seed Centre who made plans to collect seed that summer.

Bags were placed over fruit in December 2019 to ensure that mature seed was collected when it was shed from the plants. This seed was retrieved in February 2020 and returned to the Western Australian Seed Centre where it was cleaned and quantified and has now been stored for safe keeping.

The last year also saw a number of the Western Australian Seed Centre's older seed collections, some made over 30 years ago, being tested to check their viability. Over fifty collections were tested, representing 28 species. The good news for seed conservation is that the viability of the majority of the collections was still above a critical threshold known as the regeneration standard, which is 85% of the initial viability of the collection. A small number of collections (6) had declined in viability, but for many there were other collections stored for a comparable period that were fine. This highlights that generalisations about the longevity of a species are not possible. For a number of the collections tested, the seedlings produced are being grown-on for use in translocations, helping to safeguard the future survival of these species.

Commersonia apella is listed as critically endangered in Western Australia, having known to once inhabit multiple sites beyond its current distribution in the South-West. The species produces tiny seeds that are smaller than a match head, making the curation and utilization of this species a very delicate process. (Photo: Andrew Crawford, DBCA)

Western Australia, Western Australian Seed Centre, Kings Park

Kings Park and Botanic Garden embarked on a short collecting season after the final Millenium Seed Bank-funded trips concluded, making some significant seed collections. Germination trials of many species previously collected were conducted and brought into cultivation for the first time at Kings Park. A total of 26 days were spent in the field collecting in the south west of the state, resulting in 84 seed collections.

Highlights from the season

Seeds were collected from the endemic species, *Dasypogon hookeri* (Pineapple bush) from near Cowaramup Bay in the Margaret River region, the first viable seeds we have collected for this species. Seed has been extremely rare to find on plants in the past and has never been successfully germinated at Kings Park. A collection in late December yielded 930 viable seeds, some of which are being grown in the Kings Park nursery.

Another important find was a collection of the orchid *Thelymitra graminea*. Of the many Western Australian orchids, only one collection of this species had been previously stored in Kings Park, with little provenance information. This collection resulted in tens of thousands of seeds now stored in cryopreservation facilities in the Seed Centre at Kings Park.

Finally, collecting species for display is a key function of our collecting program and some new species were collected close to home. One of these is the beautiful and highly ornamental *Patersonia umbrosa* var *xanthina* or yellow flags, which had eluded our seed collection program. But this season, with time to spend locally, we collected good seed for conservation and for display.

Seed from *Thelymitra graminea* cannot be stored using traditional methods so cryopreservation is used to ensure collections remain viable for the long term. Cryopreservation involves storing germplasm at temperatures of minus 130–196 degrees Celsius. This method ensures metabolic processes are suspended and genetic drift is minimised. (Photo: Lesley Hammersley, BGPA)

Northern Territory

Seed banking activities at the George Brown Darwin Botanic Gardens this year included a focus on consolidation and upgrade of the seed banking storage facility, final project reporting, updating the seed bank database, and data sharing.

Seed Bank manager, Ben Wirf, was on extended leave from December 2019, which meant alternative options were being explored to undertake any field work activities during his absence. These options included looking to the field work capabilities of the Alice Springs Desert Park to achieve project specific outcomes.

Unfortunately, the COVID-19 pandemic further restricted the opportunities for fieldwork, particularly in areas where access restrictions were in place due to the potential health impacts on Indigenous community members.

Seed bank activities in the first part of 2020 were minimal other than monitoring and maintaining the collection.

Melaleuca triumphalis is only found in Gregory National Park, growing on sandstone cliffs by the Victoria River. This species will grow to 2.5 metres and can often be found at the base of temporary waterfalls. (Photos: Ben Wirf, GBDBG)

Victoria – Victorian Conservation Seedbank

Bushfires bring funding for seed conservation

Marred by the extensive and tragic bushfires of last summer, this past year commenced with a number of fortuitous seed collections from areas now burnt. During and following the fires, our focus swiftly shifted to the collection of species and vegetation types in unburnt areas that have had much of their broader range burnt in these or other relatively recent fires. In total, 52 seed collections were made throughout the year.

Atriplex holocarpa is found throughout arid areas and is also known as the pop saltbush due to the popping noise the carpals make when squashed underfoot. (Photo: Andre Messina)

One of the outcomes of the fires has been the availability of additional funding to carry out targeted collection work. As these funds eventuate, it is hoped that critical collections can be made during the next two seasons of threatened taxa not yet adequately banked or for which no material is held at all. Funding has also permitted the acquisition of key analytical and propagation equipment to support seed-orientated research and develop strategies for more successful translocation of recalcitrant species.

After a rather stressful summer, the year finished on a high note with a short but fruitful trip into semi-arid parts of far North West Victoria. Good autumn rains saw exceptional (at least in recent times) flowering and fruiting of riverine chenopod shrublands and associated mallee woodlands. Over the course of three days, 17 seed collections were made, with most representing species previously not banked in Victoria.

Brachyscome dichromosomatica var. *alba* is found in the far North-West of Victoria, inhabiting chenopod shrubland. Not much is known about this variety so collections like those held at the Victorian Conservation Seed Bank, along with their accompanying herbarium specimens provide vital information about the taxa's distribution and morphological traits. (Photo: Andre Messina)

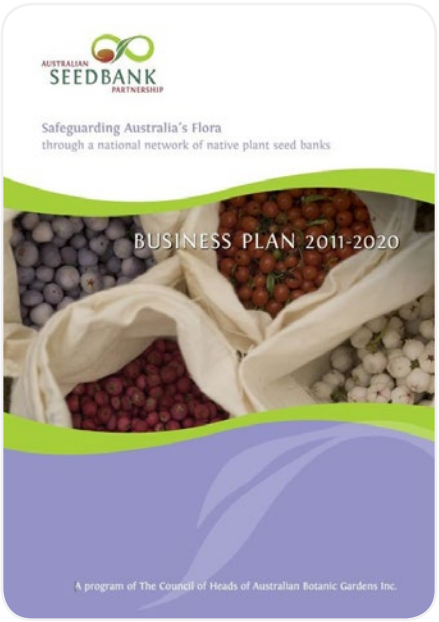
FUTURE DIRECTIONS

The Australian Seed Bank Partnership is working towards **a future where Australia's native plant diversity is valued, understood and conserved for the benefit of all**. As part of our ambitious program of work, we will focus on the following activities in 2020–2021.

Next Business / Strategic Plan

The Partnership is coming to the end of its current Business Plan (2011–2020) and the Partners are turning our minds to the next decade of ex situ seed conservation in Australia and how we can contribute to better outcomes for plant conservation both here and overseas. We will also continue to contribute directly to the international negotiations and delivery of the Global Biodiversity Framework under the United Nations Convention on Biological Diversity, and, if adopted, a new set of targets under the Global Strategy for Plant Conservation. Nationally we will also be supporting the Threatened Species Commissioner to deliver a new Threatened Species Strategy, as well as to implement various state and territory biodiversity conservation and threatened species interventions as required.

Like most projects this year, the revision of the strategy has been delayed due to the bushfires and global pandemic. However, we will be releasing our new plan at the Australasian Seed Science Conference in September 2021.



Bushfire Projects

While the bushfires have created a devastating impact across the country, they have also presented new opportunities for the Partnership to engage in new projects and sector-wide collaborations for conservation. The Partnership has spent many months developing projects with five receiving funding for the coming seasons. We have received funds from the Australian Government, UK Government, Royal Botanic Gardens Kew, and Greening Australia's Project Phoenix. These projects, along with others currently in the design phase will enable the partners to continue collecting, germinating, propagating and storing seed for research and restoration in bushfire-affected areas.

Epicormic growth on a fire affected Eucalyptus in the Blue Mountains National Park. (Photo: Bradley Desmond)

Australasian Seed Science Conference 2021

Like many throughout the world this year, we were disappointed to postpone our signature event for the year. We were only three weeks away from welcoming delegates to the Australian National Botanic Gardens in Canberra. Delegates from more than 25 countries and from every Australian state and territory had registered to attend five incredible days of plenaries, workshops, field trips and social events. The program was set to deliver presentations on more than 80 papers, as well as numerous posters from individuals and groups on a multitude of topics.

While we missed this important opportunity to connect with colleagues from around the world and hear the latest advances in seed science, we look forward to delivering a conference in September 2021 that will continue to support the seed science collaborations and networks that underpin so many advances in seed science.

We are continuing to monitor the impact of the pandemic as we prepare to hold the conference in 2021. More information about the program will be made available over the coming months: https://seedscience2021.com.au.

AUSTRALASIAN Seed Science Conference

Reviewing our collections to inform future collections strategies

The Partnership will take the opportunity in 2021 to review the germplasm collections held in seed banks to better understand the breadth and diversity of collections in our network of facilities. This information will help illustrate the work that the Partners have managed to achieve throughout the country and its external territories while also providing the opportunity to identify gaps in the representation of the Australian flora in our shared collections.

Our aim is that this analysis will assist the Partnership to develop strategic priorities for the future than can better inform species targets and assist governments, industry and philanthropists to better target their investments in *ex situ* seed conservation, research and restoration to maximise conservation and biodiversity outcomes.

A prolific flower spike of *Xanthorrhea glauca* found in Bungonia National Park. (Photo: Bradley Desmond, ASBP)

HOW YOU CAN HELP

The work of the Australian Seed Bank Partnership relies on support from many people and organisations to achieve our goals. Each of our Partner seed banks around Australia receive invaluable in-kind support from volunteers to collect, process and store native seeds as part of their long-term *ex situ* conservation programs. Furthermore, our Partners rely on funding from government, philanthropy and grants to enable them to undertake both conservation operations and scientific studies.

It is critically important that we continue to build on Australia's ex situ seed collections of native species to secure a future where they continue to thrive *in situ*. Achieving this relies on our Partners sharing the knowledge we create and using this to underpin practical on-ground restoration and research projects that enable long-term plant conservation outcomes.

Botanic Gardens networks globally have supported plant conservation outcomes through seed banks and living collections for many years, and our work is proving critical in the response to major destructive events like the 2019–2020 Australian bushfires. These organisations have built the capability to contribute to local, regional and national efforts to conserve our threatened species and we do this largely through our networks and collaborations. These efforts and collaborations take time and resources and we are seeking your help to support us in these endeavours.

With your help, we can continue to grow our national effort to conserve Australia's native plant diversity by collaborative and sustainable seed collecting, banking and research, and by sharing our knowledge about Australian plants across the equally diverse plant conservation community. With your help, we can make a difference.

Viola fuscoviolacea was collected in wet sclerophyll woodland on the northern slopes of The Needles, just off the Gordon River Road in Tasmania. Otherwise known as the Dusky Violet, *V. fuscoviolacea* is a perennial shrub found throughout Tasmania as well as the eastern states of Australia. (Photo: RTBG)

Your donations will make a difference

The work of seed banks relies on world-class scientific analysis and research to ensure the strategies, protocols and methods we use have the best probability of delivering effective and efficient *ex situ* seed storage and utilisation of our collections.

Collecting and banking native seed is an incredibly rewarding experience. However, a lot of work goes into ensuring we're banking the right seeds in the best possible conditions. Our collectors devote significant time to identify target species and plan collecting trips to coincide with seed-set across a diversity of species. They also spend several weeks a year in the field making collections. In addition to the time in the field, many weeks are dedicated to cleaning, drying and cataloguing seeds and herbarium specimens. Germination trials are also conducted for every species we collect, to ensure seeds are actually viable and therefore worth storing in the bank.

Every cent of your donation will support the work of the Partnership. Our governing body, The Council of Heads of Australian Botanic Gardens, has established a Public Fund Committee to oversee the management of donations the Partnership receives. The Public Fund Committee is responsible for ensuring these donations are used to support the conservation of Australia's native flora through seed collecting, germination, storage and the utilisation of our collections for conservation, research and restoration.

Donating to the Australian Seed Bank Partnership is simple. Our new website supports secure electronic donations through PayPal, providing the option for one-off or recurring donations to support our work. Payments can also be made using a debit or credit card.

The Partnership welcomes donations of any size and can work with you to design a package of support that suits your interests.

If you would like to discuss your donation and the activities they you would like to support we invite you to contact the National Coordinator on +61 (0) 2 6250 9473 or via email at coordinator@seedpartnership.org.au.

Donations of $2 or more are tax-deductible.

Your donation will help ensure that future generations continue to benefit from the diversity of Australia's unique landscapes.

With climate change predicted to result in warmer average temperatures, extended droughts and more severe extreme weather events, many of our native flora and fauna will find it difficult to persist in their traditional habitats. It is imperative that we continue to secure representative collections of our native flora as an insurance against species loss. (Photo: GBDBG)

ANNUAL FINANCIAL REPORT for the year ending 30 June 2020

The Australian Seed Bank Partnership is a trading name of The Council of Heads of Australian Botanic Gardens Incorporated (CHABG), as well as its primary conservation program. CHABG is an association incorporated under the Australian Capital Territory *Associations Incorporation Act 1991*, an Act administered by the Office of Regulatory Services in the ACT. CHABG, a charitable institution endorsed by the Australian Taxation Office, is also endorsed as a deductible gift recipient under Subdivision 30-BA of the *Income Tax Assessment Act 1997* for the operation of the 'Council of Heads of Australian Botanic Gardens Public Fund'.

The financial report contained within this annual report also includes financial statements for CHABG's other program activities.

The Council of Heads of Australian Botanic Gardens Incorporated

Financial Statements

For the Year Ended 30 June 2020

Contents

For the Year Ended 30 June 2020

The Council of Heads of Australian Botanic Gardens Incorporated

Committee's Report

For the Year ended 30 June 2020

The committee members submit the financial report of the Association for the financial year ended 30 June 2020.

Committee members

The names of committee members throughout the year and at the date of this report are:

Prof. Tim Entwisle
Mr Dale Arvidsson
Mr Alan Barrett
Mr Gary Davies
Mr Bryan Harty
Dr Brett Summerell
Dr Lucy Sutherland
Dr Judy West

Principal activities

The Council of Heads of Australian Botanic Gardens and the Australian Seed Bank Partnership have been involved in several fora responding to the impacts of the bushfires. In doing so, we have contributed data, information and expertise to governments at the local, state and national levels, including the Australian Government's Bushfire Expert Panel. As a result of long-term collaborations with Botanic Gardens nationally and overseas, the Partnership has been successful in negotiating and securing over $1m of financial support from the Australian and British governments to support ex situ seed conservation, germination research, rapid flora assessments and the reintroduction of seedlings in situ.

Significant changes

No significant change in the nature of these activities occurred during the year.

Impacts of coronavirus (COVID-19) and Bushfires

The combination of bushfires and COVID 19 has had a significant impact on the operations and outputs of seed banks throughout Australia. Due to these unforeseen impacts, the January to June period of 2020 has been dedicated to responding to COVID 19 and planning for the coming collecting seasons in 2020/2021 and 2021/2022. As restrictions on travel are lifted and as the areas within the fire scars recover, it is hoped that the Partners will be able to revisit their collecting programs across the country.

Operating result

The Profit of the Association for the financial year amounted to $5,698

Signed in accordance with a resolution of the Members of the Committee:

Chair: 

Treasurer:  .

Dated 16 September, 2021

Statement of Comprehensive Income

For the Year Ended 30 June 2020

	Note	2020 $	2019 $
INCOME			
Bank Interest		258	361
CHABG Members Contribution		10,000	3,182
Donations – ASBP		155	-
Image Fees		6,700	-
TOTAL INCOME		**17,113**	**3,543**
EXPENDITURE			
General Expenditure		-	13,593
Data Curation		-	10,150
Accounting and Bookkeeping Fees		273	-
Advertising and Marketing		519	-
Contribution to Partners (for conference)		6,700	-
Bank Fees		32	-
PayPal Fees		28	-
Annual Report Costs		1,091	-
Internet		899	-
Association Insurance		1,873	-
Grant Funding-Royal Botanic Gardens Kew – Fieldwork Funds		-	2,608
C4 Grass Collections – Royal Botanic Gardens Kew Funds		-	20,964
Grant Funding – Royal Botanic Gardens Kew – Global Trees		-	157,203
Grant Funding – Royal Botanic Gardens Kew – Wild Crop Relatives		-	11,488
TOTAL EXPENDITURE		**11,415**	**216,006**
Current year Profit (Loss)/ before income tax		5,698	(212,463)
Income tax expense		-	-
Net current year Profit (Loss) after income tax		5,698	(212,463)
RETAINED SURPLUS AT THE BEGINNING OF THE FINANCIAL YEAR		**246,670**	**459,133**
PRIOR PERIOD ADJUSTMENT		**(49,899)**	**-**
RETAINED SURPLUS AT THE END OF THE FINANCIAL YEAR		**202,469**	**246,670**

Statement of Financial Position

As at 30 June 2020

	Note	2020 $	2019 $
ASSETS			
CURRENT ASSETS			
Cash and cash equivalents		292,202	285,353
Prepayments		41,289	500
ATO GST Refundable		-	3,580
TOTAL CURRENT ASSETS		**333,491**	**289,433**
TOTAL ASSETS		**333,491**	**289,433**
LIABILITIES			
CURRENT LIABILITIES			
GST Payable		7,338	-
Sundry Creditors and Accruals		3,950	42,763
Project Funds Received in Advance		119,734	-
TOTAL CURRENT LIABILITIES		**131,022**	**42,763**
TOTAL LIABILITIES		**131,022**	**42,763**
NET ASSETS		**202,469**	**246,760**
MEMBERS' FUNDS			
Retained Surplus		**202,469**	**246,760**
TOTAL MEMBERS FUNDS		**202,469**	**246,760**

The Council of Heads of Australian Botanic Gardens Incorporated

Notes to the financial statements
For the Year Ended 30 June 2020

1 Statement of Significant Accounting Policies

This financial report is a special purpose financial report that has been prepared in order to satisfy the financial reporting requirements of the Associations Incorporations Act 1991 (ACT) and the Australian Charities and Not-for- profits Commission Act 2012. The committee has determined that the Association is not a reporting entity.
The financial report has been prepared on an accruals basis and is based on historic costs and does not take into account changing money values or, except where specifically stated, current valuations of non-current assets.
The following material accounting policies, which are consistent with the previous period unless otherwise stated, have been adopted in the preparation of this financial report.

(a) Income Tax

The Association is exempt from income tax under Division 50 of the income Tax Assessment Act 1997.

(b) Property Plant and Equipment (PPE)

Leasehold improvements and office equipment are carried at cost less, where applicable, any accumulated depreciation.

The Depreciable amount of all PPE is depreciated over the useful lives of the assets to the association commencing from the time the asset is held ready for use.

Leasehold improvements are amortised over the shorter of either the unexpired period of the lease or the estimated useful lives of the improvements.

(c) Impairment of Assets

At the end of each reporting period, the committee reviews the carrying amounts of its tangible and intangible assets to determine whether there is any indication that those assets have been impaired. If such an indication exists, an impairment test is carried out on the asset by comparing the recoverable amount of the asset, being the higher of the asset's fair value less costs to sell and value in use, to the asset's carrying amount. Any excess of the assets carrying amount over its recoverable amount is recognised in the income and expenditure statement.

(d) Employee Benefits

Provision is made for the association's liability for employee benefits arising from services rendered by employees to the end of the reporting period. Employee benefits have been measured at the amounts expected to be paid when the liability is settled.

(e) Provisions

Provisions are recognised when the association has a legal or constructive obligation, as a result of past events, for which it is probable that an outflow of economic benefits will result and that outflow can be reasonably measured. Provisions are measured at the best estimate of the amounts required to settle the obligation at the end of the reporting period.

The Council of Heads of Australian Botanic Gardens Incorporated

Notes to the financial statements
For the Year Ended 30 June 2020

(f) Cash and Cash Equivalents

Cash and cash equivalents include cash on hand, deposits held at call with banks, and other short-term highly liquid investments with original maturities of three months or less.

(g) Revenue and Other Income

Revenue is measured at the fair value of the consideration received after taking into account any trade discounts and volume rebates allowed. For this purpose, deferred consideration is not discounted to present values when recognising revenue.

It is not practicable to establish accounting controls over cash receipts from all sources beyond the recording of amounts entered in the books and records. Therefore income is only taken up when received and entered in the books and records

Interest revenue is recognised using the effective interest rate method, which for floating rate financial assets is the rate inherent in the instrument. Dividend revenue is recognised when the right to receive a dividend has been established.

Grant income is recognised as revenue in the year to which the associated expenditure relates. Accordingly, grants received in the current year for expenditure in future years are treated as grants in advance. Unexpended specific grant income at 30 June each year is carried forward to be matched against future income in accordance with Australian Accounting Standards.
All revenue is stated net of the amount of goods and services tax (GST).

(h) Goods and Services Tax (GST)

Revenues, expenses and assets are recognised net of the amount of GST, except where the amount of GST incurred is not recoverable from the Australia Taxation Office. In these circumstances the GST is recognised as part of the cost of acquisition of the asset or as part of an item of the expense. Receivables and payables in the Balance Sheet are shown inclusive of GST.

(i) Accounts Receivable and Other Debtors

Accounts receivable and other debtors include amounts due from members as well as amounts receivable from donors. Receivables expected to be collected within 12 months of the end of the reporting period are classified as current assets. All other receivables are classified as non-current assets.

(j) Trade and Other Payables

Trade and other payables represent the liability outstanding at the end of the reporting period for goods and services received by the association during the reporting period, which remain unpaid. The balance is recognised as a current liability with the amounts normally paid within 30 days of recognition of the liability.

The Council of Heads of Australian Botanic Gardens Incorporated

Notes to the financial statements

For the Year Ended 30 June 2020

Note 2

Events After the Reporting Period

The Committee is not aware of any significant events since the end of the reporting period with the exception of the possible effect of the Novel Coronavirus (COVID-19) pandemic and bushfires and the related impact on the Association's future results of operations, cash flows and financial condition which cannot be reasonably estimated at this stage.

The Council of Heads of Australian Botanic Gardens Incorporated

Statement by Members of the Committee

The committee has determined that the Association is not a reporting entity and that this special purpose financial report should be prepared in accordance with the accounting policies outlined in Note 1 to the financial statements.

In the opinion of the committee of the Association-

1. The financial report, including notes are in accordance with the *Associations Incorporation* (*ACT) 1991*, and the *Australian Charities and Not-for profits Commission Act 2012*, and
   a) Comply with the Accounting Standards as detailed in Note 1 to the financial statements; and
   b) Give a true and fair view of the Associations financial position as at 30 June 2020 and of its performance for the year ended on that date.

2. In the Committees' opinion there are reasonable grounds to believe that the Association will be able to pay its debts as and when they become due and payable.

This declaration is made in accordance with a resolution of the Committee.

Chair

Treasurer . Beth Summerell

Dated this day 16th of September 2021

Canberra ACT

Bandle McAneney & Co.
Chartered Accountants

Suite 2d, 1st Floor
18 Napier Close
DEAKIN ACT 2600
PO Box 52, DEAKIN WEST ACT 2600
AUSTRALIA

Ph: (02) 6282 3341
Fax: (02) 6282 3342
Email: banmca@interline.com.au
ABN: 87 955 412 345

THE COUNCIL OF HEADS OF AUSTRALIAN BOTANIC GARDENS INCORPORATED

YEAR ENDED 30 June 2020

AUDITOR'S INDEPENDENCE DECLARATION

As auditor of the financial report of The Council of Heads of Australian Botanic Gardens Incorporated for the year ended 30 June 2020, I declare that, to the best of my knowledge and belief that there have been no contraventions of:

I. The auditor independence requirements of the *Australian Charities and Not-for-profits Commission act 2012* in relation to the audit; and

II. Any applicable code of professional conduct in relation to the audit.

Bandle McAneney & Co

Anthony J Bandle FCA
Partner

Place: Canberra

Date: 16 September 2021

Liability limited by a scheme approved under Professional Standards Legislation

Bandle McAneney & Co.
Chartered Accountants

Suite 2d, 1st Floor
18 Napier Close
DEAKIN ACT 2600
PO Box 52, DEAKIN WEST ACT 2600
AUSTRALIA

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Fax: (02) 6282 3342
Email: banmca@interline.com.au
ABN: 87 955 412 345

Independent Audit Report to the members of The Council of Heads of Australian Botanic Gardens Incorporated

Opinion
We have audited the financial report of The Council of Heads of Australian Botanic Gardens Incorporated ("the Entity") which comprises the Statement of Financial Position as at 30 June 2020, the Statement of Comprehensive Income for the year ended on that date, a summary of significant accounting policies, other explanatory notes and the Committees' Report.

In our opinion, the accompanying financial report of the Association is in accordance with Division 60 of the *Australian Charities and Not-for-profits Act 2012*, including:

a) giving a true and fair view of the Association's financial position as at 30 June 2020 and of its financial performance for the year then ended; and
b) complying with Australian Accounting Standards and Division 60 of the *Australian Charities and Not-for-profits Commission Regulation 2013.*

Basis for Opinion
We conducted our audit in accordance with Australian Auditing Standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Report* section of our report. We are independent of the Entity in accordance with the auditor independence requirements of the Accounting Professional and Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants* ("the Code") that are relevant to our audit of the financial report in Australia. We have also fulfilled our other ethical responsibilities in accordance with the Code.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Emphasis of Matter – Basis of Accounting
We draw attention to Note 1 to the financial report which describes the basis of accounting. The financial report has been prepared to assist the Entity meet the requirements of Note 1. As a result, the financial report may not be suitable for another purpose. Our opinion is not modified in respect of this matter.

Committee's Responsibilities for the Financial Report.
The Committee is responsible for the preparation and fair presentation of the special purpose financial report in accordance with the accounting policies described in Note 1 of the financial statements and for such internal control as the Committee determines is necessary to enable the preparation of the financial report that is free from material misstatement, whether due to fraud or error.
In preparing the special purpose financial report, the Committee is responsible for assessing the Entity's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Committee either intend to liquidate the Entity or to cease operations, or have no realistic alternative but to do so.

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Auditor's Responsibilities for the Audit of the Financial Report

Our objectives are to obtain reasonable assurance about whether the financial report as a whole is free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Australian Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of this financial report.

As part of an audit in accordance with the Australian Auditing Standards, we exercise professional judgement and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial report, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Entity's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the management.
- Conclude on the appropriateness of the management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Entity's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial report or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Entity to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial report, including the disclosures, and whether the financial report represents the underlying transactions and events in a manner that achieves fair presentation.

We communicate with the Committee regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identity during our audit.

Bandle McAneney & Co

Anthony J Bandle FCA
Partner

Canberra:

Dated this 16th day of September 2021

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GOVERNANCE OF THE AUSTRALIAN SEED BANK PARTNERSHIP

The Management Committee of The Council of Heads of Australian Botanic Gardens Incorporated (CHABG Inc.) draws on the expertise of senior executives from Australia's capital city botanic gardens, who guide the strategic direction of the Partnership's work to ensure it addresses national plant conservation priorities and contributes to international conservation targets.

Members of the Management Committee of the Council in 2019–20 were:

Mr Dale Arvidsson – Curator, Brisbane Botanic Gardens (CHABG Chair)

Mr Alan Barrett – Chief Executive Officer, Botanic Gardens and Parks Authority (Kings Park) (CHABG Secretary)

Mr Gary Davies – Director, Royal Tasmanian Botanical Gardens

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

Mr Bryan Harty – Director, George Brown Darwin Botanic Gardens

Dr Brett Summerell – Director Research & Chief Botanist, Royal Botanic Gardens and Domain Trust (CHABG Treasurer)

Dr Lucy Sutherland – Director, Botanic Gardens and State Herbarium, South Australia

Dr Judy West – Executive Director, Australian National Botanic Gardens.

Dale Arvidsson

Alan Barrett

Gary Davies

Tim Entwisle

Bryan Harty

Brett Summerell

Lucy Sutherland

Judy West

The Australian Seed Bank Partnership grew out of the Australian Conservation and Research Network (AusCAR) with support from the Royal Botanic Gardens, Kew's Millennium Seed Bank Project. The MSBP supported Australian institutions to achieve the Project's goal of banking 10 per cent of the world's plant species by 2010, and we have continued to support the Millennium Seed Bank Partnership to bank 25 per cent of the world's flora by 2020.

The Partnership program is carried out in collaboration with our partner organisations, who commit significant resources to the ongoing management of seed banks and maintenance of plant germplasm collections. Other organisations (our Associates) assist with individual projects that contribute to the overall program. The program is managed by a National Steering Committee and led by the National Coordinator.

Festuca muelleri, or Alpine Fescue is part of the Poaceae family and was collected at Lankey Plain in the Victorian Alps. The genus is made up of many species with widespread global distribution. (Photo: Darryl Whitaker)

The Australian Seed Bank Partnership is supported by financial and in-kind contributions (e.g. scientific expertise, project management, fieldwork, information management, promotion and marketing) from partner and associate organisations, through philanthropic and public donations and the generous time commitment of many dedicated volunteers. Our business plan outlines our national program, which includes specific strategies, actions and timelines for achieving our vision: http://seedpartnership.org.au/about/reports.

National Coordinator Australian Seed Bank Partnership

Mr Damian Wrigley

The role of the National Coordinator is to provide strategic leadership and program management to oversee the implementation of the Partnership's business plan, policy and operations. The Coordinator works with the members of the Partnership to secure the necessary funds for operations and programs that will realise the business plan for the Partnership. This position is supported by the Director of National Parks and is hosted at the Australian National Botanic Gardens.

Boronia capitate capitata is known as the cluster boronia for the way this particular Rutaceae displays clusters of flowers at the end of its branches (Photo: Andrew Crawford, DBCA)

National Steering Committee

The National Steering Committee brings together a team of leading experts from the members of the Partnership, who help guide the delivery of practical plant conservation outcomes. These experts range from seed scientists, botanists, taxonomists and ecologists to horticulturalists and plant conservation ambassadors.

Neville Walsh pressing herbarium specimens in the field to dry prior to returning them to the seed bank for further processing. Specimens mush be pressed fresh and carefully placed in the plant press to ensure as many features are able to be displayed when the specimen is eventually mounted on a specimen sheet in an herbarium. (Photo: Darryl Whitaker).

Members of the National Steering Committee during 2019–20 were:

Dr Elinor Breman – Program Coordinator, Millennium Seed Bank Partnership, Royal Botanic Gardens, Kew, UK

Dr Aisyah Faruk – Oceania Coordinator, Millennium Seed Bank Partnership, Royal Botanic Gardens, Kew, UK

Ms Samantha Craigie – Senior Ecologist, Greening Australia

Dr Andrew Crawford – Committee Member, Australian Network for Plant Conservation; Seed Bank Manager, Western Australian Seed Centre, Kensington, Department of Biodiversity, Conservation and Attractions, Western Australia

Dr Peter Cuneo – Manager, Seedbank and Restoration Research, PlantBank, Royal Botanic Gardens and Domain Trust, New South Wales

Mr Ross Demuth – Botanic and Technical Coordinator, Brisbane Botanic Gardens, Mt Coot-tha, Queensland

Mr Dan Duval – Seed Research Officer, South Australian Seed Conservation Centre, Botanic Gardens and State Herbarium, South Australia

Commonly known as the Christmas Morrison, *Verticordia nitens* provides a prolific display of richly scented, orange blossoms from October through to the end of Summer. (Photo: DBCA)

Mr Graeme Errington – Seedbank Curator, PlantBank, Royal Botanic Gardens and Domain Trust, New South Wales

Dr Jenny Guerin – Seed Research Officer, South Australian Seed Conservation Centre, Botanic Gardens and State Herbarium, South Australia

Dr David Merritt – Senior Research Scientist, Western Australian Seed Centre, Kings Park, Botanic Gardens and Parks Authority, Western Australia

Dr Andre Messina – Botanist, Royal Botanic Gardens Victoria, Victoria

Mr Tom North – Seed Bank Curator, Australian National Botanic Gardens, Australian Capital Territory

Mr Luke Sweedman – Curator, Western Australian Seed Centre, Kings Park, Western Australia

Mr Neville Walsh – Senior Conservation Botanist, Royal Botanic Gardens Victoria, Victoria

Mr Ben Wirf – Nursery / Seedbank Manager, George Brown Darwin Botanic Gardens, Northern Territory

Mr James Wood – Seed Bank Manager, Royal Tasmanian Botanical Gardens, Tasmania.

Melaleuca triumphalis is only found in Gregory National Park, on the sandstone cliffs along the Victoria River. The flowers appear in September and change from green to yellow as they age. (Photo: Ben Wirf, GBDBG)

THANK YOU—SUPPORTERS AND ASSOCIATES

The Australian Seed Bank Partnership would like to thank all our supporters and Associates. Your resources and in-kind support have made significant contributions to our mission to conserve Australia's native plant diversity over many years.

As the decade draws to a close, we look forward to working with our supporters and Associates and to continuing these collaborations well into the future. The combined efforts of the Partnership staff, volunteers and supporters is paramount to seeing us achieve our vision of a future where Australia's native plant diversity is valued, understood and conserved for the benefit of all.

Guichenotia seorsiflora is one of 16 endemic species in this Western Australian genus. (Photo: DBCA)

Supporters

- Millennium Seed Bank Partnership, Royal Botanic Gardens, Kew
- Director of National Parks (Australian Government)
- Garfield Weston Foundation
- The Crop Trust

Associates

- Atlas of Living Australia
- Australian Government Department of Agriculture, Water and the Environment
- Australian Grains Genebank
- Botanic Gardens of Australia and New Zealand Inc.
- Centre for Australian National Biodiversity Research
- CSIRO
- Global Crop Diversity Trust
- Grains Research and Development Corporation
- Kakadu National Park
- Society for Ecological Restoration Australasia
- University of New England

Volunteers, Graduates and Interns

- Anna Moreing
- Jessica Nichols
- Lisa Bazso

PARTNER ORGANISATIONS OF THE AUSTRALIAN SEED BANK PARTNERSHIP

Australian Network for Plant Conservation Inc. (ANPC)

Australian PlantBank The Royal Botanic Gardens and Domain Trust (RBGDT)

Brisbane Botanic Gardens Conservation Seed Bank Brisbane City Council (BBG)

George Brown Darwin Botanic Gardens Parks and Wildlife Commission of the Northern Territory (GBDBG)

Greening Australia (GA)

Millennium Seed Bank Partnership Royal Botanic Gardens, Kew (RBG Kew)

National Seed Bank Australian National Botanic Gardens, Parks Australia (ANBG)

South Australian Seed Conservation Centre Botanic Gardens and State Herbarium, South Australia (BGSH)

Tasmanian Seed Conservation Centre Royal Tasmanian Botanical Gardens (RTBG)

The Victorian Conservation Seedbank Royal Botanic Gardens Victoria (RBGV)

The Western Australia Seed Centre Kings Park, Botanic Gardens and Parks Authority (BGPA)

The Western Australian Seed Centre Kensington, Department of Biodiversity, Conservation and Attractions, Western Australia (DBCA)

Rytidosperma clelandii – Cleland's Wallaby-Grass is highly localised, growing in the wetter parts of South Australia's Mount Lofty Ranges and Adelaide Hills. This grass seed is purple with three distinct rows of hairs and a twisted coppery bent awn.

Epacris petrophila – Snow Heath is dominant in alpine and subalpine feldmark, heath and bogs in the Australian alpine region. The seed of this species possesses a net-like surface structure and is oval in shape. At less than 1/50th of a gram and one millimetre long, the physical traits of *Epacris petrophila* seed are only visible under magnification.

Petrophile latericola – This endangered species occurs naturally in Western Australia's south-west, producing a radiating fruit that releases hard, individual capsules which provide protection until conditions are suitable for germination. The seed disperses over short distances thanks to a row of fine hairs that line the seed coat.

Australian Seed Bank Partnership
c/o Australian National Botanic Gardens
GPO Box 1777
Canberra ACT 2601
Australia

ABN: 58153442365

Contact: Damian Wrigley
t: +61 (0) 2 6250 9473
e: coordinator@seedpartnership.org.au

www.seedpartnership.org.au/

CHABG Inc. (trading as the Australian Seed Bank Partnership) is dedicated to supporting the protection, conservation and enhancement of Australian plants and their ecosystems. CHABG Inc. relies on support for the Australian Seed Bank Partnership Program and its other programs to achieve its vision of a future where native plant diversity is valued, understood and conserved for the benefit of all. Please help us to conserve Australia's unique flora and plant communities today and for the future. CHABG Inc. is a charitable institution, with deductible gift recipient status (item 1), and operates the Council of Heads of Australian Botanic Gardens Public Fund.