



Safeguarding Australia's Flora
through a national network of native plant seed banks

A close-up photograph of a purple flower with water droplets on its petals, set against a dark background. The flower is the central focus of the lower half of the cover.

2016-17 ANNUAL REPORT

safeguarding Australia's flora



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Abbreviations

Australian National Botanic Gardens (ANBG)
 Brisbane Botanic Gardens (BBG)
 Botanic Gardens and State Herbarium of South Australia (BGSB)
 Botanic Gardens and Parks Authority (BGPA)
 George Brown Darwin Botanic Gardens (GBDBG)
 Royal Botanic Gardens and Domain Trust (RBGDT)
 Royal Botanic Gardens, Kew (RBG Kew)
 Royal Botanic Gardens Victoria (RBGV)
 Royal Tasmanian Botanical Gardens (RTBG)
 The Council of Heads of Australian Botanic Gardens Incorporated (CHABG Inc.)
 Threatened Flora Seed Centre (TFSC), Department of Biodiversity Conservation and Attractions (DBCA)

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Cover: *Boronia humifusa*
 (Photo: Andrew Crawford, DBCA)

This page: A diversity of annuals with white
Cephalopterum backdrop (Photo: Lesley
 Hammersley, BGPA)

LETTER FROM THE CHAIR

In a year of unprecedented global change, the Australian Seed Bank Partnership has seen its fair share, both in the natural environment and as an organisation. Our changing climate is putting pressure on native species. As habitats shrink and ecosystems shift in response to already altered conditions, it is increasingly challenging to secure viable collections of target species. Nevertheless, our skilled seed collectors continue to return from the field with encouraging collections of native seed for long-term conservation and research.



Organisationally, this year we said farewell to our long-term National Coordinator, Dr Lucy Sutherland. I thank Lucy for her many years of exemplary leadership. Also, because of her new role in South Australia, I welcome her as a member of CHABG. I also welcome our new National Coordinator, Damian Wrigley, who has hit the ground running, working closely with the Partners to secure support for future endeavours.

The Australian Seed Bank Partnership has done much to galvanise support for seed collecting and to build a strong, collaborative and enduring approach to seed conservation. In the past year, we have made great progress towards achieving our shared vision of a world where plants are appreciated for their important contribution to every facet of our society. With two years remaining in our current Business Plan and with the future of the Global Strategy for Plant Conservation still to be determined, a collaborative approach to plant conservation is critical now more than ever. We must all redouble our efforts to ensure plant conservation continues to be a strong focus of the Convention of Biological Diversity in the years to come.

An encouraging indication of the plant community's ability to maintain momentum was evident this year during the 6th Global Botanic Gardens Congress. This gathering of plant enthusiasts reaffirmed for me the importance of what we collectively strive to achieve, and how successfully we collaborate to secure meaningful outcomes for plant conservation. The congress was overflowing with inspiring stories—from individual botanic gardens to regional partnerships and global collaboration. A highlight for the Partnership was when the Australian PlantBank received the Global Seed Conservation Challenge Award for making the greatest progress in seed conservation. Many of these seeds were collected through Partnership-funded initiatives.

It was also encouraging to hear that other countries are developing collaborative seed banking partnerships based on the Australian experience. Examples like these serve to remind me of what a special and influential initiative the Partnership has become, not only throughout Australia but on the global stage.

In 2021, the Royal Botanic Gardens Victoria will host the 7th Global Botanic Gardens Congress, and the Partnership is well placed to showcase our many years of dedicated seed collecting in the Australian context. As we work towards this and other important milestones for our global community, I invite you to continue the journey with us—working together to ensure our shared seed conservation expertise continues to benefit Australia's native species and the international seed banking community.

Professor Tim Entwisle

Chair CHABG Inc.



LETTER FROM THE NATIONAL COORDINATOR

I joined the Australian Seed Bank Partnership in March 2017 and was immediately struck by the incredible variety of work we deliver. I have thoroughly enjoyed my first few months in the role, meeting each of the Partners and the many others that help us achieve better outcomes for Australia's flora. The many opportunities afforded to a national collaboration such as this are truly inspirational, and I look forward to working with you all over the coming years.



On behalf of the Partners, I would like to recognise Dr Lucy Sutherland for her dedication and exceptional leadership over much of the last decade. I congratulate Lucy on her appointment as Director of the Botanic Gardens and State Herbarium of South Australia and welcome her continued engagement with the Partnership through The Council of Heads of Australian Botanic Gardens Inc. (CHABG). I am very grateful to Jessica Pink and Elly Love for their stewardship following Lucy's departure.

This year the Partnership continued to focus on our core goals of collecting Australia's threatened species, and improving and sharing our knowledge of their conservation throughout Australia and overseas. Our list of banked species continues to grow; we banked over 300 species that are new to Australia's conservation seed banks. Our ability to respond to the needs of the seed-banking and restoration communities remains strong, and our input to industry standards and government policy at the national and international levels is an important activity.

We welcomed the opportunity to collect seed under The Threat Abatement Plan for disease in natural ecosystems caused by *Phytophthora cinnamomi*. This funding helped us to collect 27 taxa of threatened plant species throughout New South Wales, Victoria, South Australia and Western Australia. Our collectors targeted multiple populations to improve the genetic diversity of individual species held in our nation's seed banks. We are now well placed to deliver research into the ability of these species to withstand the impacts of introduced pathogens.

I rounded out the year by attending the 6th Global Botanic Gardens Congress, which was a great opportunity to raise global awareness of our seed banking success. Internationally the Partnership enjoys an enviable reputation, and delegates from around the world are eager to learn and collaborate on global conservation issues, such as the impact of *Austropuccinia psidii* (Myrtle rust) on native species.

What resonated with me most was how fortunate we are that the leading botanic gardens throughout Australia collaborate on a national approach to seed conservation. Their long-term investment in the Partnership continues to provide Australia with unique opportunities to engage with the restoration and research sectors, with governments and Indigenous communities, and with conservation organisations both here and overseas. I thank the Director of National Parks and CHABG for their generous financial assistance that ensured the Partnership could once again engage in this important global forum. I look forward to joining the Partners to showcase more of our achievements in Melbourne in 2021.

In 2017–18, the Partnership will continue to raise awareness and build support for plant conservation. More than ever, climate change is seeing a convergence of effort between conservation and Indigenous communities, and this will be a key interest for the Partnership. We will explore opportunities and work to build long-lasting and productive collaborations for initiatives such as Crop Wild Relatives.

We are also working to secure additional resources in 2017–2018 that will enable us to expand our collecting program and to further contribute to the Millennium Seed Bank Partnership's mission to bank 25 per cent of the world's plant species by 2020.

I hope you enjoy reading this year's report.

Damian Wrigley

National Coordinator

PROFILES OF OUR PEOPLE

James Wood, Tasmanian Seed Conservation Centre, Royal Tasmanian Botanic Gardens

I have worked in and around seed conservation for 27 years, working for the Royal Botanic Gardens, Kew in the UK before taking up my current post in Tasmania in 2005. My interest in natural history seems to run back as far as anyone can remember, but my interest in botany began in my mid-teens.



Seedbank manager James Wood checking for female Huon pine trees on the Pieman River. (Photo: RTBG)

During my degree, I took a placement year in the research lab of the Kew Gardens seed conservation program, looking at seed dormancy and storage behaviour. This stimulated my interest in seed biology, and after completing my degree I took a support position at the Kew Gardens Wakehurst nursery, growing plant material for the seed bank. During that time, I became interested in cultivating parasitic plants and, in the process of trying to collate the published data, I developed skills in database development.

After six years in the nursery, I took a position within the Kew Gardens Millennium Seed Bank in the UK and learnt the variety of practical skills needed to curate wild plant seed collections. My nine years with the Millennium Seed Bank was a wonderful time, dealing with a huge variety of species from all around the world. I became familiar with the enormous variation in seed and fruit morphology, and learnt the difficulties of trying to determine what is and is not a viable seed, and what is a practical end-point when cleaning collections.

I benefited greatly from my involvement in the germination testing of the Millennium Seed Bank collections. Alongside the challenges of making good collections in the field, successfully germinating wild plant species pose some of the biggest challenges in running a seed bank. Working with the Kew staff and handling very diverse material helped me come to grips with the science and practical realities of turning seeds into plants. During this period, I learnt to maintain and analyse germination data, and developed simple in-house applications to predict germination requirements for new collections.

In December 2005 I moved to Tasmania to take on the role of Seedbank Coordinator. Although primarily involved in the curation of collections, I also helped collect seed in the field and became more familiar with Tasmanian flora. Since 2011 my role has expanded to include planning and leading the seed bank collecting program for the Tasmanian Seed Conservation Centre, and I am now the Seedbank Manager.

Lorraine Cotter, Volunteer, Tasmanian Seed Conservation Centre

After my retirement and move to Tasmania, I thought I could add to my interest in botany by volunteering at the Royal Tasmanian Botanical Gardens (RTBG). I joined the team of Friends of the RTBG and jumped straight into the role of coordinator of the small group of herbarium volunteers cataloguing the plants growing in Tasmania. Gradually our role expanded to cleaning the seeds of endemic Tasmanian plants sent to us by the Department of Primary Industries, Parks, Water and the Environment. These were then packaged and forwarded to the Royal Botanic Gardens, Kew's Millennium Seed Bank in the UK.



Lorraine collecting *Telopea truncata* (Tasmanian Waratah) seed on the Navarre Plains, Central Plateau. (Photo: James Wood, RTBG)

The Tasmanian Seed Conservation Centre (TSCC) was established at the RTBG in 2005, and I was there from the very beginning, helping to process the growing collection of seeds. This involved cleaning, cut-testing, counting and 'banking' in the controlled conditions required for long-term viable storage of the collection.

My role at the TSCC has expanded to scoring the germination tests, to seed collecting trips all over Tasmania, and to any general jobs that need doing. TSCC manager, James Wood, encourages participation by volunteers in most areas of the seed bank operations, from collecting seed in the wild, to the germination tests, helping with seed orchards, and occasionally planting out young seedlings in the environment. The work is varied, stimulating and always interesting.



Shelley Witham, Nursery Horticulturist, Kings Park and Botanic Garden, WA

My interest in horticulture stemmed from a rural upbringing on a farm in Western Australia, a strong connection to the natural environment, and a mother who was an avid gardener. I initially worked as a Clinical Dietician, but, as my passion for Western Australian flora developed, I decided to change careers and applied for a three-year Horticultural Traineeship with the Kings Park and Botanic Garden.

On completing my traineeship, I successfully applied for a Nursery Horticulturist position at Kings Park. The role is inspiring due to the practical application of scientific research, the physical side of nursery work, and the visual aesthetics of the amazing range of native flora that I work with every day.

In 2016, I was assigned to relocate our entire seed collections from chest freezers to the new purpose-built seed bank facilities. This included conducting a full audit of the collector, provenance, name currency and seed weight; repackaging and relabeling; and then updating the horticultural database accordingly. I also had to re-dry the entire threatened flora collection and often undertook detective work, consulting old paper records, herbarium specimens, and various staff and collectors. I have a tendency to leave no stone (or seed) unturned!

Most of the work was done in the new drying room at a consistent 15 degrees and 15 per cent humidity, which was quite chilly but worth the effort, knowing that our data accuracy has improved and the collections are stored to international standards. It was a slow, methodical and detailed procedure, but it gave me great satisfaction to work with such a valuable conservation resource, setting up improved processes for future use of the seed bank, and making access to the collections and associated data more user-friendly. I have now returned to my nursery role, in which I continue to benefit from the revised organisation of the seed bank.



Shelley in the seed vault at Kings Park. (Photo: BGPA)

Andre Messina, Seedbank Coordinator, Victorian Conservation Seedbank, Royal Botanic Gardens Victoria

My first contact with the Victorian Conservation Seedbank was as a volunteer on a field trip in November 2005. I had just completed my honours studies in plant taxonomy in conjunction with the Royal Botanic Gardens Victoria (RBGV). I maintained an association with the Gardens, undertaking a summer studentship and then a PhD investigating the daisy genus *Olearia*.

My principal interest has been plant taxonomy, with a focus on the distribution and ecological requirements of species, and on identifying and conserving rare and threatened species. But most of all I enjoy getting into the bush. During my studies and other survey work, I have had many opportunities over the past ten years to see much of Victoria's plant life.

I completed my PhD in 2013, and the next year was offered a part-time job at RBGV as a Flora Writer. I was responsible for updating and creating species profiles for the new online Flora of Victoria – 'VicFlora' (<https://vicflora.rbg.vic.gov.au/>). Not long after my arrival at RBGV, our former Seedbank Coordinator, Jeff Jeanes, decided to hang up his seed-bag to pursue life in regional Victoria, and some nine years after my first taste of seed collection I was given the opportunity to take over his role.

Over the past three years I have enjoyed many seed collection trips throughout Victoria, chasing down some of our rarest species. One of my memorable 'holy grail' species was *Epilobium brunnescens* subsp. *beaugleholei*, known in Victoria from a single sheltered cliff-face, where it is constantly irrigated by the mist of an alpine waterfall. This species is now growing at RBGV as a 'seed-orchard' crop from which we hope to make a collection later this year.



Grey Mangrove *Avicennia marina* subsp. *australasica* and the location is Stony Point, Victoria. (Photo: Rachel Kelson)

Along with planning and undertaking collecting trips, my role involves cleaning, processing and storing seed collections. Much of this has been new to me, and in 2016 it was my good fortune to attend the seed conservation techniques training at the Royal Botanic Gardens, Kew's Millennium Seed Bank at Wakehurst in the UK, to further improve my knowledge and understanding of the seed bank process and seed science.

Conservation seed banking has been an unexpected turn in my career, but it has opened up a new door into the always intriguing science of botany.

Elinor Breman, Conservation Partnership Coordinator, Millennium Seed Bank, Royal Botanic Gardens, Kew

Growing up in London (albeit with a great garden), I was on the lookout for broader experiences away from the urban environment. This led me to take part in a number of expeditions that took me from the Rocky Mountains of Canada, through the jungles of Borneo, and into the wilds of Nepal. My fascination with plants had begun, and I was hooked.

My interest in conservation and landscape ecology led me to study plant sciences before heading off to Costa Rica to practise my new skills in the field at the La Selva Biological Reserve. After a Masters degree in forestry and land-use, I headed off once more—this time to Australia. An internship with the then Victorian State Forestry Department took me to Orbost and Ballarat, where I explored some of the amazing native forests in the region. During my time in Australia, I travelled extensively and backpacked my way around the country for six months, experiencing the extensive variety of this wonderful continent.

Having completed a PhD in paleoecology focused on long-term vegetation change in South Africa, I continued to work as an academic for a number of years. In 2013 I moved to the Royal Botanic Gardens, Kew and started work at the Millennium Seed Bank.

My first role included overseeing capacity development and technology transfer across the Millennium Seed Bank Partnership (MSBP), which at the time included 95 separate countries and territories. Since 2015 my role has enabled me to build partnerships and projects in Australia, Europe and the Middle

East. Working with the Australian Seed Bank Partnership is one of the highlights of this role. I have had the privilege of getting to know those working at the seed banks across Australia, and have been impressed with and infected by their enthusiasm and can-do attitude. I attend the annual steering committee meeting and try to visit three Partner seed banks a year—as well as fitting in fieldwork where possible!

For a number of years, the Millennium Seed Bank Partnership has been undertaking seed bank reviews against the MSBP Seed Conservation Standards. These reviews ensure that the seeds conserved by our international partners are of the highest possible quality, and it looks like Australia will be the first continent to be fully assessed. I continue to work closely with the Australian Seed Bank Partnership, and a new project conserving 'plants on the precipice' is on its way.

I continue to travel and to learn, and each day I am grateful to have a job that helps contribute towards the safe future of plants on our planet.



Elinor Breman in front of the rewilding the UK gardens at the Royal Botanic Gardens, Kew's Millennium Seed Bank. (Photo: Naomi Carvey, MSBP)



WHO WE ARE

The Australian Seed Bank Partnership is a national collaboration of nine conservation seed banks and two flora-focused organisations. The Partnership bridges the gap between policy-makers, researchers and the conservation and restoration sectors to help safeguard Australia's plant populations and communities.

Seed banking is the principal tool for the safe and efficient storage of wild plant genetic material. A sound understanding of seed harvest, storage and germination is crucial to combating the global decline of plant diversity. Together, these seed collections and the understanding of seed technology underpin our efforts to protect and restore natural ecosystems. Our Partners generously provide resources and knowledge that support the management of plant species and communities, and our collaborative efforts offer insurance against further loss.



Seed collectors at the Australian PlantBank made their first seed collections of *Prostanthera marifolia* (Seaforth Mintbush), a species that until recently was thought to be extinct. Collecting and conserving seed provides the Partnership with the opportunity to do research that can help to improve the success of conservation efforts.



Nicotiana burbigae flower Witjira National Park.
(Photo: Seed Conservation Centre, BGSB)



Anne Cochrane and Andrew Crawford give an early morning tour of the Threatened Flora Seed Centre in Perth before day two of our face-to-face meeting in April 2017. The Partners use these opportunities to compare facilities and to share their knowledge of tackling seed conservation using different technologies. The tours are an excellent forum to share candid feedback on specific equipment, often improving resourcing decisions in other seed banks throughout the country.

Our nationally cooperative initiatives focus on seed banking, research, knowledge sharing and capacity building. We follow internationally recognised protocols for collecting and storing the seed of Australian native plants. We record environmental data crucial to our role in plant conservation, and make it openly available through the Australian Seed Bank online. Our research is vital in establishing germination protocols and in building the knowledge that helps practitioners restore plant communities throughout Australia's diverse landscapes. Our Partners have discovered new species, identified previously unknown populations, and rediscovered species previously thought to be extinct. We share our knowledge and skills, collectively manage risk, and develop and use regional expertise to optimise the effective use of our resources.

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.

AUSTRALIAN SEED BANK PARTNERSHIP HIGHLIGHTS FOR 2016–17

Seeds in the international spotlight in Perth, Western Australia

For five days in October 2016, members of the Australian Seed Bank Partnership joined seed experts from around the world for a science workshop on seeds at Kings Park, Western Australia. In partnership with the CSIRO and the Australian National Botanic Gardens, Canberra, the Botanic Gardens and Parks Authority hosted 30 scientists and post-graduate students from Australia, Brazil, Canada, the Czech Republic, Indonesia, the UK and the USA.

Participants worked on creating the first-ever global standards to describe, measure, analyse and record information about seeds, with the aim that they be used in a global database. Compared with plants, for which global databases on traits already exist, relatively little is known about the complex traits and behaviour of seeds, despite their essential role in plant survival and conservation.

The workshop focused on defining the functional characters of seeds, such as the morphological, physiological, and biochemical features that influence how they behave in the environment—otherwise known as seed traits. When complete, the new standards will contribute to stronger international collaborations in seed science and will set directions for future research in seed and plant conservation.



Seed Science Workshop participants enjoying the mid-week field trip that traversed hotspots of biodiversity in the south-west of Western Australia, including Mt Lesueur National Park. (Photo: BGPA)



The Australian PlantBank made the greatest contribution to seed banking since the launch of the Awards in 2015, by collecting, storing and studying viable seeds for the conservation of the flora of New South Wales. (Photo: Damian Wrigley)

6th Global Botanic Gardens Congress in Geneva, Switzerland

In June 2017, at the 6th Global Botanic Gardens Congress in Switzerland, we shared our achievements in the conservation of Australia's threatened plants, thanks to our diverse and collaborative partnership. The congress also provided a valuable opportunity for the new National Coordinator to meet the multitude of global supporters for seed conservation.

During the closing ceremony, Botanic Gardens Conservation International presented the Australian PlantBank with a Global Seed Conservation Challenge Award. Of the 558 seed collections made by PlantBank since January 2015, the Partnership supported the collection of 108 species now banked at the Millennium Seed Bank, 39 of which are listed as threatened in New South Wales.



Improving seed bank diversity to combat emerging disease

The Threat Abatement Plan for disease in natural ecosystems caused by *Phytophthora cinnamomi* supported the Partnership to make 60 collections of 27 taxa of threatened species throughout New South Wales, South Australia, Victoria and Western Australia. The project enabled our collectors to secure seed from multiple populations, greatly increasing the genetic diversity of our collections of threatened species.



Maintaining the genetic diversity of all our collections is important, not just for those at immediate risk from introduced pathogens. Former ASBP National Coordinator Dr Lucy Sutherland (Director, Botanic Gardens of South Australia and State Herbarium) collects seed of a South Australian species of least concern, *Spyridium coalitum* on Kangaroo Island, SA. (Photo: Dan Duval, BGSH)

New seeds in the bank

This year the George Brown Darwin Botanic Gardens joined forces with the Australian National Botanic Gardens to collect the little-known, state-listed *Jacksonia divisa* from a remote southern part of Kakadu National Park. Subsequent germination testing at the George Brown Darwin Botanic Gardens seed bank in Darwin has resulted in the nursery propagating several seedlings that can now be used for educational displays in the gardens as well as for subsequent research.



Rachel Martin, Bessie Coleman and Ben Wirf collecting seeds of *Jacksonia divisa* in Kakadu National Park. (Photo: John Westaway, GBDBG)



Seedlings of *Jacksonia divisa* growing in the nursery at GBDBG, Northern Territory. (Photo: Ben Wirf GBDBG)

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 goal 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.

Seed banking for insurance

The Partnership has delivered a viable supply of seeds to conservation seed banks throughout Australia that will provide a national safety net for Australian plant species through *ex-situ* conservation. The first phase of the 1000 Species Project continues to benefit from concerted efforts across the Partnership, with over 300 species collected throughout the year. We complement our collecting efforts with targeted research to improve our understanding of species biology. We seek opportunities to collaborate and contribute to a shared understanding of seed conservation that can lead to better plant conservation—from local restoration initiatives through to international collaborations.



Many of the species we target are hard to spot and difficult to collect. Scouring the landscape for species such as this tiny *Juncus ratkowskianus* to contribute to our 1000 Species Project requires a keen eye and an excellent knowledge of our native Flora. (Photo: James Wood, RTBG)



Sharing knowledge – myrtle rust

In early 2017, myrtle rust was discovered on the north island of New Zealand, and our Partners have been sharing information and exploring opportunities for collaboration throughout the Pacific with the support of the Millennium Seed Bank Partnership. Our continued participation and knowledge sharing through the Myrtle Rust Environmental Impacts Working Group benefits our understanding of the threat to native species throughout Australia. This collaborative working group is looking to complement this knowledge base with resources that can mobilise efforts for collaborative seed collection and research targeting those species most susceptible to myrtle rust.

Securing resources to save more seeds

The Partnership worked closely with the Office of the Threatened Species Commissioner to develop three projects for inclusion in the Threatened Species Prospectus that was released in February this year. The Partnership is seeking support to collect seed from 75 of Australia's threatened eucalypts over three years through the Safeguarding Australia's Threatened Gum Trees project. We are also looking to secure investment from the business and philanthropic communities that will enable us to make collections from some of the 46 threatened species on Norfolk Island. Our third project under the Prospectus aims to collect the remaining 40 per cent of species in Alpine Sphagnum Bog and Fen communities not yet secured in *ex-situ* conservation.

Developing National Standards

We are continuing to work through our Partner organisations, Greening Australia and the Australian Network for Plant Conservation, to identify resources that will help develop national standards that support the work of our seed collectors and the broader conservation community. This ground work will underpin the standards with targeted research aimed at reducing the resource burden on restoration organisations that need to be confident in the viability of the seed they purchase.

We are also looking into how the Partnership can update and deliver more nationally consistent germplasm guidelines for the seed banking community.

The Partnership contributed beyond our national focus again this year, participating in an international seed science workshop in Perth (see page 9). Our participation contributed to developing the first-ever global standards to describe, measure, analyse and record information about seeds.



Dentella pulvinata Witjira collected from the Witjira National Park, South Australia. (Photo: Dan Duval, Seed Conservation Centre, BGS)

ACHIEVEMENTS AROUND AUSTRALIA TOWARDS OUR 1000 SPECIES TARGET

Western Australia's Spring Flowering Phenomenon

The spring flowering season of 2016 in the central desert, mulga and goldfields regions of Western Australia was nothing short of sensational, thanks to consistent rainfall throughout the area in the preceding autumn and winter periods. Our field collectors capitalised on the bumper season and made seed collections from taxa that rarely have seed available in such profusion.

Experienced collectors and plant observers recorded the 2016 season in Western Australia as being 'as good as it gets', with carpets of wildflowers creating a kaleidoscope of colour through the landscape stretching as far as the eye could see. Far from occurring as monocultures, a closer inspection unveiled a diversity of species, many that are rarely noticed even when flowering and seeding profusely.

Kings Park collectors made good collections of some uncommon annuals, some not collected in recent times. These included *Schoenia macivorii*, *Rhodanthe steriliscens*, *Rhodanthe rubella* and *Rhodanthe collina*, the latter considered threatened. All have been banked in conservation collections. Most have horticultural potential, particularly *Rhodanthe collina*, with its preference for shade and its delicate white blooms. The Kings Park Nursery is cultivating this species to develop a domesticated seed line for future displays in the Western Australian Botanic Garden that will highlight the importance of long-term conservation for the species.



Chthonocephalus viscosus, a tiny annual species from Western Australia, found growing in the stony soils and red sands of the Gascoyne and Murchison regions. (Photo: Luke Sweedman, BGPA)

Other collections of note were 23 species of *Eremophila* occurring in the heart of the arid northern goldfields and mulga country. Five of these species had not previously been banked at the Millennium Seed Bank. Funding provided through the Partnership's 1000 Species Project will enable good collections of these species to enhance Botanic Garden displays of this widespread arid zone genus in future years, and to contribute to our conservation collections for the future.



Collectors in Western Australia take advantage of the hot and dry conditions following the day's harvest. Drying seeds and maintaining lower levels of relative humidity will result in greater seed longevity, ensuring collections arrive at the seed bank in the best possible condition for viable long-term ex-situ conservation collections. (Photo: Luke Sweedman, BGPA)

Threatened Flora Seed Centre: discovering a new population of a threatened species

During a September 2016 field trip to the eastern wheatbelt of Western Australia, Natasha Moore and Jazmin Lindley, along with consultant botanist Jennifer Borger from the Department of Biodiversity, Conservation and Attractions (DBCA), made an immensely exciting discovery. For the first time in 20 years, botanists had identified a new population of *Lasiopetalum* sp. Mount Caroline (S.D. Hopper SDH 6381). The discovery of this new population is significant for the species, as only one other population is known to exist in the wild.

Staff at the department's Threatened Flora Seed Centre (TFSC) were alerted to the find and made immediate collection of the seed a high priority for *ex-situ* conservation.



To secure seed of the highest quality, seed capture bags were placed over immature fruit to catch mature seed when shed naturally from the plant. The bags yielded a small but valuable collection that is now stored for safekeeping at the TFSC in Western Australia and at the Royal Botanic Gardens, Kew's Millennium Seed Bank in the UK. A small number of seeds were used in germination trials to test the viability of the seed. These seedlings are now being grown by the Botanic Gardens and Parks Authority and will soon be incorporated into the living collection of plants on display at Kings Park.

This collection of seed has proved invaluable, not only for the insurance they provide against extinction of the species in the wild, but also as a reference for the department's botanists. Kelly Shepherd and Carol Wilkins described the seed as part of the formal description of the species, which was formally named *Lasiopetalum moulleian* (*Nuytsia* 28 (2017): 273–298), in recognition of the local Noongar name for the granite hills and surrounding area where the species occurs—Moullean.



The first collection of seed from the second known population of a Western Australian threatened species – *Lasiopetalum moulleian*. (Photo: Andrew Crawford, DBCA)

South Australia

The South Australian Seed Conservation Centre collected many new seeds throughout the 2016–17 season, spending much of our time in the Lake Eyre herbarium region—specifically near the Witjira National Park in the far north of the state. This inspiring area contains the Dalhousie Springs Complex that is listed in the *Environment Protection and Biodiversity Conservation Act 1999* as a threatened ecological community. It also features in the National Heritage List, and is home to rare plant species associated with the pools and alkaline mounds of the artesian spring complex and the gypseous slopes of the surrounding breakaways.

Several trips were made to the region, greatly assisted by six field volunteers. We are particularly grateful to the two ecologists who used their leave to be able to participate! On those trips, we managed to secure collections from 65 species, 48 of these being new to the South Australian Seed Conservation Centre. The year also included a total of 16 seed collections from state-listed threatened species, and more than two hundred plant specimens were collected for the South Australian State Herbarium to use in validating the seed collections and photographs. The most significant collections made from the Witjira National Park included *Goodenia anfracta* (Mound Springs Goodenia), *Sclerolaena fontinalis* (Mound Spring Bindyi), *Ptilotus aristatus* ssp. *aristatus* (Pink Pussy-tail), and *Nicotiana burbridgeae* (Dalhousie Springs tobacco bush), which is endemic to the national park.

Another interesting collection, recorded in a swamp on Mt Willoughby Station, south of Marla, was the semi-aquatic herb *Goodenia berringbinensis*, a species not previously recorded in South Australia. On a return trip to the Witjira National Park, we managed to collect over 200,000 seeds, all of which will be used for future conservation and research.

In addition to the collections made throughout the year, hundreds of photographs of plant species habit, their flowers, fruits and other characteristics have been uploaded to the 'Seeds of South Australia' webpage at <http://saseedbank.com.au>. The site already contains species information and images for 1041 species of the 1321 species that occur in the Lake Eyre herbarium region. We hope to have them all uploaded soon!



Ptilotus aristatus is a small herb with hairy, pinkish-purple flowers that can cause an allergic reaction in some people if handled incorrectly. This rare species was collected very carefully in the northern part of South Australia. (Photo: Dan Duval, BGSH)

Northern Territory

Over the last 12 months, staff from the Seed Bank at the George Brown Darwin Botanic Gardens traversed nearly the entire breadth of the Top End. We collected seed from Litchfield National Park and from Kakadu; we collected more still from Garig Gunak Barlu National Park north-east of Darwin, as well as from the Judbarra/Gregory National Park in the Victoria River District. One of our last trips involved scouring Wave Hill and Cattle Creek Stations in the northern Tanami Desert for more precious collections.

All up, we spent around 40 days in the field, the rugged terrain often dictating whether we used four-wheel drive vehicles, helicopters or light aircraft—all in the pursuit of new seed collections for the 1000 Species Project, the Global Trees Program and a few extra threatened species from Kakadu.

As recently as May, staff from GBDBG and the Northern Territory Herbarium took part in a Bush Blitz expedition over 12 days, where we collected seeds and plant specimens on the Department of Defence Bradshaw Field Training Area. This expansive Defence property is located between the Fitzmaurice and Victoria Rivers in the western Top End, and provided a unique opportunity to collect from a rarely studied area. This trip alone yielded more than 60 seed collections. Many of these had never been banked before, including the near-threatened *Boronia filicifolia*, *Rhynchosia filiformis*, and *Triumfetta sp. fleshy* (C.R.Michell 2169).

For the entire year we managed to collect over 100 species, around 70 of these being new additions to conservation seed banks both here and overseas.



Ben Wirf from the George Brown Darwin Botanic Gardens collecting seeds during the Bradshaw Bush Blitz in May 2017.



Queensland

The 2016–17 collecting year was off to a challenging start when the key target for the first major field trip—collecting on Queensland’s tallest peak, Mount Bartle Frere in the Wet Tropics—was abandoned after campsite flooding on the first night. Continued torrential rain and driving winds made for a gruelling climb back down the mountain the next morning. Despite the setback, the team managed to recover quite well, targeting alternative locations that produced some important collections. The team secured seed from the endangered aquatic *Aponogeton bullosus* and from *Melaleuca lophocoracorum*, a highly restricted and only recently described species from the Atherton Tablelands.

Following the first field trip, the team continued making important collections of rare, threatened and unusual species throughout the collecting year. Two notable collections were from a new species of grass in the genus *Aristida*, and a potentially new species of *Melaleuca* from areas to the west of Mackay. The vulnerable *Macropteranthes montana* was also collected in the northern savanna, and a small but very important collection was secured of the extremely rare and poorly understood *Senna* sp. (Davies Creek). This small shrub is known in only one location, which at the time of collection consisted of two mature individuals and about 50 seedlings that had somehow managed to escape a previous fire in the area. This is only the third time the species has been sampled botanically, the last collection having been made in the late 1990s.



Seeds for Life collector Simon Bush collecting the highly restricted and recently described *Melaleuca lophocoracorum* from the Atherton Tablelands. Collecting seed from range-restricted species provides opportunities for restoration and research in the hopes of preventing further declines in the population size and distribution of a species.

New South Wales

Royal Botanic Gardens and Domain Trust, Australian PlantBank

As the PlantBank seed vault collections steadily increase each year, we find that we are often searching for highly elusive species that take us to increasingly remote and interesting locations. Coupled with searching in remote locations, the vagaries of the Australian climate ensure that there is always an opportunistic element to plant hunting!

Superb autumn and winter rains across western New South Wales in 2016 saw the arid landscape come to life with a spring profusion of native annuals and other ephemeral plants. Described as a ‘one-in-twenty-year’ event, we knew this was an outstanding and rare opportunity to collect seed from these colourful plants for the PlantBank seed collection, but also for use in the spring displays at the Australian Botanic Garden, Mount Annan.

Amazing locations such as Ledknapper Nature Reserve north of Bourke, Paroo Darling National Park near White Cliffs, and Sturt National Park in the extreme north-western corner of the state did not disappoint. Along with ample opportunities to collect from the proliferation of wildflowers, we were lucky enough to collect several threatened species from the arid zone. Several inland tree seed collections were also made as part of the Global Trees Program, including *Corymbia dolichocarpa* (Long-fruited Bloodwood).

Other significant collections included our first quality seed collection of the endangered *Eriocaulon carsonii* (salt Pipewort), known from only one population in New South Wales, found on the unique artesian mound springs of Peery Lake in Paroo Darling National Park. We also discovered and collected from a new population of the state-listed *Kippistia sueadifolia* (Fleshy Minuria) that we found near Tibooburra. Ultimately, the seedbank and horticulture teams returned with more than 100 collections.

A seed collecting trip in such a rare and abundant season really ‘ticks all the boxes’, and brings together our key objectives of threatened plant seed conservation, and a diverse living collection display.



Gavin Phillips collecting paper daisy seed on desert sand dunes Sturt National Park. (Photo: RBGDT)

Commonwealth

The National Seed Bank at the Australian National Botanic Gardens (ANBG) maintained a focus of collecting species from Kakadu National Park. During two field trips in October 2016 and May 2017, we collected eighteen new tree species for the Garfield Weston Foundations' Global Trees Program. A highlight of the October trip was collecting jointly with Ben Wirf from George Brown Darwin Botanic Gardens. Our collecting ranged across Victoria River Downs, Gregory National Park and Kakadu National Park.

ANBG is the lead institution with the South East Bioregion Botanic Gardens partnership, working jointly to deliver a NSW Environmental Trust grant. The grant will allow us to secure listed threatened *Pomaderris* species from south-east New South Wales. During the 2016–17 collecting season, we made 107 individual maternal line collections from four *Pomaderris* species. These species are now secured in the seed bank and are available for the research component of the project.

The Friends of ANBG funded a threatened species project to ensure we had a representative genetic complement of a suite of species in the National Seed Bank. These species are represented in the ANBG as living collections but were

missing seed collections in the seed bank. Field work led by Dr Martin Henery with assistance from the Seedy Volunteer program collected 199 individual maternal line accessions from 16 species. The majority of these are new to seed banking.



Tom North, National Seed Bank Curator collecting in Kakadu National Park. (Photo: Joe McAuliffe, ANBG)



The Seedy Volunteers have helped us to continue our summer program of collecting from the Southern Tableland Grasslands and Alpine Sphagnum Bogs and Associated Fens, making 34 and 53 collections respectively. These new additions are contributing to the National Seed Bank's target of collecting the entire flora of the Australian Capital Territory by 2020.



ASBP collecting team collecting with Traditional Owners on Gregory National Park (Photo: Fanny Karouta-Manasse, ANBG)

Tasmania

Hits and misses: highlights from Tasmania's 2017 season

The 2016–17 season was unexpectedly busy. We decided not to set collecting targets, instead opting to revisit four target species that were missed last year, in the hope of securing viable collections. We also focused on tracking down populations of plants that had seldom been recorded and could possibly be collected next season. Two targets were particularly notable—*Isolepis tasmanica* and *Cardamine franklinensis*, a pair of small unimposing herbs that are seldom reported and are possibly often overlooked.

Isolepis tasmanica is an endemic sedge that has been recorded only 21 times. It was last reported in 1998. It has been on the radar as a possible target for a few years, but the lack of information and the difficulty in identifying *Isolepis* species have made it a difficult target. As luck would have it, cleaning of a *Schoenus* collection made in

the previous season revealed a contaminant—27 achenes of what was very likely to be *Isolepis tasmanica*. With a potential extant site identified, we revisited that site on the shores of Lake King William in the spring of 2016. Unfortunately, extremely heavy rainfall over winter put the site 30–50 cm underwater, so locating the plant was not possible.

The search then moved to an old record made near Lake Augusta, an area we have collected from several times before. Once again, the rise in water level made it difficult to search for this little sedge. However, the search led us to an area we had not previously surveyed and that in turn led to a couple of happy bonuses. Several threatened species were discovered during the survey, the most significant being *Stackhousia pulvinaris*. This species was previously known in Tasmania only from an area near Cradle Mountain. This discovery expands the species' range by over 60 km². Subsequent surveying with the threatened species unit has revealed a fairly healthy population and several spots in the Lake Augusta area where it is known to occur. As this species had not been successfully collected by the Tasmanian Seed Conservation Centre, we returned to the larger of the new populations and made a modest collection of 2300 seeds. Unfortunately, this year *Isolepis tasmanica* remained elusive.

The second surveying target was *Cardamine franklinensis*, a plant known from two records in Tasmania, only one of which contains specific date and location data. In November we scrambled up the Sandbanks Tier to the site reported in 1989, hoping to find a population still intact. That search and subsequent trips in the surrounding area proved inconclusive. We did find a few small *Cardamine* plants, but their identity was questionable. On New Year's Day, after several fruitless attempts, serendipity struck again. We stopped at a small reserve on the Lake Highway to look for *Leucopogon fraseri*, a much more common target that is seldom seen to fruit. Twenty minutes into our search we stumbled upon a little cluster of herbs that we immediately realised was *Cardamine franklinensis*. Further searching revealed around 40 plants in total. Now that we have a better idea of the species' appearance and habitat preference, we will do more surveys next season, and hopefully secure a viable seed collection.



RTBG horticultural botanist Natalie Tapson ascending the Sandbanks Tier in search of *Cardamine franklinensis*. (Photo: RTBG)

Victoria

This year has been one of ups (collecting in mountains) and downs (collecting in coastal saltmarsh) for the Victorian Conservation Seedbank. Three memorable treks went ever-higher into the mountains to source seed from *Lomatia fraseri* (Tree lomatia) for the Global Trees Program. At lower altitudes this species appears to suffer extraordinarily high levels of seed predation, but the cooler mountain air and shorter growing season appears to keep the munching blighters at bay. Remnant coastal saltmarsh, only 10 km from Melbourne's CBD, offered a handy site for collecting C4 saltbush, *Atriplex paludosa*. As the species is considered rare in Victoria, its close proximity to Melbourne rendered the nearby site serendipitous. This was just as well, as it proved to be a cantankerous fruiter, made more frustrating by some colonies within the larger population consisting of wholly male or wholly female plants. Between the mountains and coast, many other habitats have been sampled, with good spring rains providing fairly rich pickings.

What is a C4 species?

All plants fix and process carbon dioxide through photosynthesis using what is known as the C3 pathway. Some plants have developed an additional way of fixing carbon and are known as C4 plants. The C3 plants produce compounds with 3 carbon atoms and predominantly grow in cooler climates with lower light requirements but a greater need for moisture. The C4 plants produce compounds with 4 carbon atoms and tend to favour warmer areas, needing more light but less moisture to survive, such as the recently collected *Atriplex paludosa*.



Female flowers of the *Atriplex paludosa* (Marsh saltbush). (Photo: Neville Walsh, RBGV).



Gahnia subaequiglumis (Photo: Neville Walsh, RBGV)



Botanical highlights for us related to our botanical 'other lives', as we do more at the Victorian Conservation Seedbank than just collect seed! In February 2017, on a trip to the Errinundra Plateau in East Gippsland, we secured collections of the rare eastern Victorian/south-eastern New South Wales grass *Deyeuxia boormanii*. Neville Walsh was particularly enthused by this, having raised it to species rank in 2009 but without ever seeing it in the field. The collection was the first for the species for over 30 years. Nearby we found a new population (and a seed collection) of the attractive montane sedge, *Gahnia subaequiglumis*, considered vulnerable in Victoria and known otherwise from a single site. Previously the species had not been collected in Victoria since 1980.

Andre Messina's history (see Andre's profile on page 6) includes a detailed PhD study of the taxonomically difficult daisy bush complex around *Olearia phlogopappa* (Messina et al., 2013). A seed-collecting trek in Wilsons Promontory National Park enabled Andre to investigate a population of this species that had puzzled him since viewing a few herbarium collections at the National Herbarium of Victoria. Opinions varied between it being a new entity, a hybrid, or a highly disjunct population of a form believed restricted to south-eastern Tasmania. Fortunately the seed proved to be highly fertile and a uniform cohort of seedlings is dispelling the hybrid theory. As the seedlings mature to flowering, we will know if we have a new member of the complex waiting to be named, or an important, disjunct botanical link with south-eastern Tasmania.

Meg Hirst has been working one day a week at the Victorian Conservation Seedbank since 2012, devoting her other life to completing a PhD on the herbaceous daisy genus *Brachyscome*. Meg's PhD is focussing on a group of alpine species, trying to tease apart characteristics that cause some species to be rare and some to be common in this habitat. The project has significant implications for some of the rare species under a warming climate scenario. While the project zoomed in on the alpine group, Meg sampled widely across the genus, using seed collected by several of our Partner seed banks (thanks all!) and employing DNA sampling techniques to investigate phylogenetic relationships. Meg recently submitted her PhD but has already published two papers from this work, and a third is currently being edited. Well done Meg!



Brachyscome nivalis is found high up in the alpine regions of Australia and is commonly known as the Snow Daisy. Changes to the climate in Australia's alpine regions will place significant pressure on this species so seed collections are an important part of conserving the species for future use. (Photo: Neville Walsh, RBGV)

Like most of the Partnership's work, threatened species are our focus. However, it's great to be able to 'value-add' to both the seed collections and our other botanical lives here at the Royal Botanic Gardens Victoria.

We extend special thanks to our long-time volunteer Bob Hare, and our new recruit, Josephine Mitchell. They keep us on our toes, ensure our seeds are clean, dry and on agar, and lend a hand in the field when needed. We're ever grateful for their good humour and devotion to the sometimes less-than-glamorous side of seed banking.

Reference

Messina, A., Walsh, N.G., Hoebee, S.E. & Green, P.T. (2014). A revision of *Olearia* section *Asterotriche* (Asteraceae: Asterae). *Australian Systematic Botany* 27, 199–240.

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 projects in 2017–18.

Plants on the Precipice Program

Our Plants on the Precipice Program continues to be an area of focus for the Partnership. Climate change continues to put pressure on Australia's native species, and the alpine areas of Australia are not the only landscapes at risk of losing their endangered and endemic species. The Partnership is working with the Royal Botanic Gardens, Kew to mount an ambitious program of work that will see our seed collectors make significant new contributions to the Millennium Seed Bank as we get nearer to 2020.

Global Trees Programme

The Partnership will undertake a fourth year of collecting for the Garfield Weston Foundation's Global Trees Program with the Royal Botanic Gardens, Kew. We have 63 species remaining on our list to reach our target of 380 species for the program. Our collectors will be scouring the country to help achieve this. We will complement our tree seed collections by engaging in the Botanic Gardens Conservation International and IUCN/Species Survival Commission Global Trees Assessment to support the assessment of the world's trees by 2020.

Threatened and endemic species

In the coming year, the Partners are heading to the Wet Tropics and Desert Uplands (Qld), Shark Bay, the Pilbara and South-West (WA), Eyre Peninsula (SA), Litchfield National Park and Howard River catchment (NT), Cunninyeuk and Grose River (NSW) and the eastern Victorian ranges and subalpine woodlands (Vic). We will continue to bank seeds from species that are known to be endangered, endemic, or of economic potential.



The vulnerable *Macropteranthes montana* from the vine thickets and savanna of northern Queensland. Our Partners continue to collect threatened species providing much needed insurance populations of seed for research and future conservation of Australia's trees.



Dodonaea amplisemina is a small shrub found on the red-brown sandy-clay soils east of Geraldton, Western Australia. (Photo: Andrew Crawford, DBCA)



Seed supply standards

The Partnership is committed to pursuing opportunities for the Australian Network for Plant Conservation to bring together a consortium of conservation and restoration agencies to prepare national seed standards. National seed standards will provide guidance for practitioners and community groups to realign their seed collecting practices in a sustainable manner. This will reduce the pressure on natural populations and ecosystems that are being commonly targeted as seed sources. National seed standards will ensure that only high quality seed is used for restoration, improving the success of these projects and associated biodiversity outcomes. Having and applying seed standards will also improve the efficiency and cost-effectiveness of seed collection and use for restoration and research.

Crop Wild Relatives

The Partnership is working closely with our Associate organisation, the Australian Grains Genebank, to secure resources for the collection of crop wild relative species. We are already developing training that aims to build the capacity of Indigenous land managers in northern Australia to collect and process seed from these important species.



Ben Wirf, GBDBG and Tom North, ANBG stop on the Stuart Highway south of Katherine in the Northern Territory to confirm the afternoon's collections. The northern parts of Australia is home to many of the target Crop Wild Relative species, so you may see Ben and Tom on the side of the road again throughout 2018! (Photo: Fanny Karouta-Manasse, ANBG)

Crop wild relatives are wild plant species that are genetically related to common crop species. While humans have domesticated some 7000 species of plants over the last 10,000 years, only 12 of these account for 80 per cent of the foods we regularly consume.

Over the next year, the Partnership will explore opportunities with the Millennium Seed Bank Partnership and Crop Diversity Trust to support our Partners and Australia's diverse land managers to identify and collect these unique species for future research and conservation. We envisage this process will improve our understanding of traditional land management practices, and contribute significantly to the conversation about access and benefit sharing of genetic materials from Australia's native seed.

Australian Seed Bank online – Phase 2

Providing open access to accurate data is an ongoing commitment of the Partnership. We will continue to seek opportunities to improve the data we collect and share through the Australian Seed Bank online. Making our data available enhances opportunities for collaboration across the botanical, conservation and restoration communities. The Partnership and Atlas of Living Australia have developed an accessible online seed information resource so that seed collections data can be shared, retrieved and utilised.

The second phase of this project is still under development. The Partnership is looking at ways to improve how we present and increase the use of our data by engaging natural resource management and landcare groups, community groups, and local government staff.

HOW YOU CAN HELP

The Australian Seed Bank Partnership is taking decisive action to safeguard Australia's plants. Seed banking is a principal tool for the safe and efficient storage of wild plant genetic diversity, and provides a resource and knowledge base to support the management of plant species and communities.

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

Volunteer with one of our Partners

Collecting and banking native seed is a time-consuming enterprise and we couldn't do as much as we do without the help of our dedicated volunteers. If you would like to join us to collect in the field, sort seeds in the laboratory, or interrogate our collections data, then we would love to hear from you.

Volunteers can also help the Partnership to raise awareness and encourage public support for plant conservation by contributing to the Partnership's website and social media.

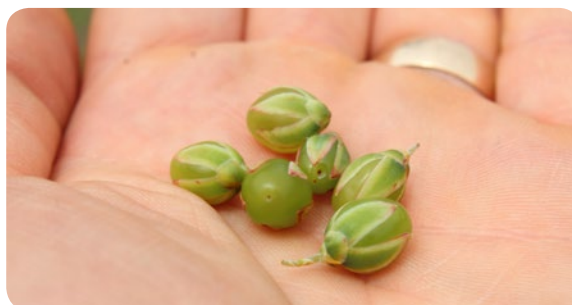
If you are interested in becoming a volunteer or would like to find out more about how you can help, please visit our website or contact us at coordinator@seedpartnership.org.au.



Some species, like the *Sclerolaena fontinalis*, set such small fruit that it takes a microscope to see them properly. (Photo: Seed Conservation Centre, BGSH)



Hastings River Grass (*Potamophila parviflora*) in typical fast-flowing river habitat in the Nymboida River near Grafton.



Styphelia perileuca fruit. (Photo: RBGDT)

Donations of any size are welcome, as every dollar provides support for the conservation of Australia's threatened plant species. The Partnership is able to work with you to design a package of support that suits your interests. Your donation will help ensure that future generations continue to benefit from the diversity of Australia's unique landscapes.

If you would like to donate to the Australian Seed Bank Partnership, contact our National Coordinator on +61 (0) 2 6250 9473 or email: coordinator@seedpartnership.org.au.

We are looking at ways to make donating to the Partnership even easier, so please visit our website for updates throughout the year.

Donations more than \$2 are tax-deductable.



ANNUAL FINANCIAL REPORT for the year ending 30 June 2017

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 programme. CHABG is an Association incorporated under the Australian Capital Territory Association 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 '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 programme activities.

Statement by the Management Committee for the year ended 30th June 2017

In the opinion of the Management Committee of CHABG Inc

the attached financial statements and notes thereto comply with Accounting Standards

the attached Income Statement is prepared so as to give a true and fair view of the Financial Performance of the association for the year ended 30th June 2017

the accompanying Balance Sheet is prepared so as to give a true and fair view of the Financial Position of the association as at 30th June 2017

there are reasonable grounds to believe that the CHABG Inc. will be able to pay its debts as and when they fall due and payable

that no officer of this association, or any firm of which an officer is a member, or any body corporate in which an officer has a substantial financial interest has received or is entitled to receive any benefit from a contract with this association, nor has any officer received any direct or indirect pecuniary benefit from this association.

SIGNED In accordance with a resolution of the Management Committee

This 21 day of September 2017
On behalf of the Management Committee

.....
Name:)
Position: Chair)
CHABG Inc)

.....
Name:)
Position:)
CHABG Secretary)

CHABG Inc

Annual Financial Statements

2016-2017

Independent Auditor's Report

for the year ended 30th June 2017

To the Members CHABG Inc

Scope

The financial report and management committee's responsibility

The Management Committee are responsible for the financial report, being a special purpose financial report, that gives a true and fair view of the financial position and performance of CHABG Inc, for the year ended 30th June 2017 and that it complies with Accounting Standards in Australia. This includes responsibility for the maintenance of adequate accounting records and internal controls that are designed to prevent and detect fraud and error, and for the accounting policies and accounting estimates inherent in the financial report.

The Management Committee have determined that the accounting policies used are consistent with the financial reporting requirements of the *CHABG Inc*, and are appropriate to meet the needs of the members.

The financial report comprises the balance sheet, income statement, accompanying notes to the financial statements, and the management committee's statement, for CHABG Inc.

Audit Approach

I conducted an independent audit of the financial report in order to express an opinion on it to the members of the association. The audit was conducted in accordance with Australian Auditing Standards in order to provide reasonable assurance as to whether the financial report is free of material misstatement. The nature of an audit is influenced by factors such as the use of professional judgment, selective testing, the inherent limitations of internal control, and the availability of persuasive rather than conclusive evidence.

Therefore, an audit cannot guarantee that all material misstatements have been detected.

I performed procedures to assess whether in all material respects the financial report presents fairly, in accordance with the *Associations Incorporation Act 1991*, including compliance with Accounting Standards in Australia, and other mandatory financial reporting requirements in Australia, a view which is consistent with our understanding of the association's financial position, and of its performance as represented by the results of its operations, changes in equity and cash flows.

I formed my audit opinion on the basis of these procedures, which included:

- > Examining, on a test basis, information to provide evidence supporting the amounts and disclosures in the financial report
- > Assessing the appropriateness of the accounting policies and disclosures used and the reasonableness of significant accounting estimates made by the committee.



While I considered the effectiveness of management's internal controls over financial reporting when determining the nature and extent of my procedures, my audit was not designed to provide assurance on internal controls. I performed procedures to assess whether the substance of business transactions was accurately reflected in the financial report.

These and my other procedures did not include consideration or judgment of the appropriateness or reasonableness of the business plans or strategies adopted by the management committee of the association.

Independence

I am independent of the association, and have met the independence requirements of Australian professional ethical pronouncements and the *Associations Incorporation Act 1985*. I have given to the management committee of the association a written auditor's independence declaration, a copy of which is included in the financial report. In addition to my audit of the financial report, I was engaged to undertake the services disclosed in the notes to the financial statements. The provision of these services has not impaired my independence.

Qualification

As is common for organisations of this type, it is not practicable for the management committee to maintain an effective system of internal control over its cash income prior to initial entry into the accounting records. Accordingly, my audit in relation to these items was limited to the amounts recorded in the books and records for the financial year and I therefore am unable to express an opinion whether proceeds of cash income obtained are complete.

Audit Opinion

In my opinion, except for the effects on the financial report of such adjustments, if any, as might have been required had the limitation on my audit procedures referred to in the qualification paragraph not existed, the financial report of CHABG Inc, is in accordance with:

- a) The *Associations Incorporation Act 1991*, including:
 - i. Giving a true and fair view of the financial position of CHABG Inc and of its performance for the year ended on 30 June 2017
 - ii. Complying with Accounting Standards in Australia and the *Associations Incorporations Act 1991*
- b) Other mandatory financial reporting requirements in Australia.

Signed this the 11 day of Sept 2017

Tony Trimboli
CPA Australia

**Auditor's Declaration of Independence
for the year ended 30th June 2017**

To the Management Committee of CHABG Inc.

I declare that, to the best of my knowledge and belief, there have been no contraventions of:

- (i) The auditor independence requirements of the *Associations Incorporation Act 1991* in relation to the audit
- (ii) Any applicable code of professional conduct in relation to the audit.

Signed this the 1st day of Sept 2017



Tony Trimboli
CPA Australia



CHABG Inc. Statement of Expenditure and Income

	2016-17	2015-16
Income		
Membership Contribution	11,000	15,000
Donation	250	6,722
Grant Funding - Royal Botanic Gardens Kew - Fieldwork Funds	90,920	-
Grant Funding - Royal Botanic Gardens Kew - Global Trees	241,847	-
Grant Funding - Royal Botanic Gardens Kew - C4 Grasses	30,197	-
Dept of Environment - Phytophthora Research	-	50,000
National Seed Science Forum Revenue	898	66,872
Interest	296	304
Total Income	375,408	138,898
Expenditure		
General Expenditure	5,091	8,087
National Seed Science Forum	-	39,524
Dept of Environment - Phytophthora Research	46,500	
Grant Funding - Royal Botanic Gardens Kew - Fieldwork Funds	116,395	96,830
C4 Grass Collectionns - Royal Botanic Gardens Kew Funds	34,000	24,000
Grant Funding - Royal Botanic Gardens Kew - Global Trees	224,915	193,583
Total Expenditure	426,901	362,024
Surplus/Deficit	(51,513)	(223,126)

CHABG Inc. Balance Sheet

	2016-17	2015-16
Current Assets		
Deposit account 224159	98,513	193,200
Deposit account 224167	116,606	74,323
Sundry Debtor		1,287
ATO - GST refundable	223	
Total Assets	215,342	268,810
Liabilities		
ATO - GST Payable		1,955
Net Assets	215,342	266,855

Equity	(266,855)	(489,981)
Surplus/Deficit for year	51,513	223,126
Retained earnings	(215,342)	(266,855)

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 2016–17 were:

- **Prof Tim Entwisle** – Director and Chief Executive, Royal Botanic Gardens Victoria (CHABG Chair November 2015–present) (RBGV)
- **Mr Dale Arvidsson** – Curator, Brisbane Botanic Gardens (BBG)
- **Ms Marcelle Broderick** – Acting Chief Executive Officer, Botanic Gardens and Parks Authority (BGPA)
- **Mr Gary Davies** – Director, Royal Tasmanian Botanical Gardens (RTBG)
- **Mr Bryan Harty** – Director, George Brown Darwin Botanic Gardens (GBDBG)
- **Dr Brett Summerell** – Director, Royal Botanic Gardens and Domain Trust (RBGDT)
- **Dr Lucy Sutherland** – Director, Botanic Gardens and State Herbarium, South Australia (BGSB)
- **Dr Judy West** – Executive Director, Australian National Botanic Gardens (ANBG)

We would like to recognise the contribution of **Mr Mark Fountain** – Deputy Director, Royal Tasmanian Botanical Gardens; **Ms Janice Goodwins** – former Acting Director, Botanic Gardens of South Australia; **Mr Mark Webb** – Chief Executive Officer, Botanic Gardens and Parks Authority; **Ms Lesley Hammersley** – Director, Horticulture and Conservation, Botanic Gardens and Parks Authority; and **Dr Peter Cuneo** – Manager, Seedbank & Restoration Research, Royal Botanic Gardens and Domain Trust.



Prof Tim Entwisle



Mr Dale Arvidsson



Ms Marcelle Broderick



Mr Gary Davies



Mr Bryan Harty



Dr Brett Summerell



Dr Lucy Sutherland



Dr Judy West



The Australian Seed Bank Partnership grew out of the Royal Botanic Gardens, Kew's Millennium Seed Bank Project that supported Australian institutions to help achieve the Project's goal of banking 10 per cent of the world's plant species by 2010. We continue to support Kew's endeavour to bank 25 per cent of the world's flora by 2020.

The Partnership program is carried out in collaboration with our partner organisations (see page 33). Other organisations (our Associates) assist with individual projects that contribute to the overall program (see page 32). The program is managed by a National Steering Committee and led by the National Coordinator provided by the Director of National Parks (through the Australian National Botanic Gardens).

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 organisations, through philanthropic and public donations and the generous time commitment from 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

Dr Lucy A. Sutherland (July–October)

Ms Jessica Pink (A/g National Coordinator, October–December)

Ms Elly Love (A/g National Coordinator, January–February)

Mr Damian Wrigley (March–June)

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.

Following the departure of Dr Lucy Sutherland in October 2016, the Partnership was pleased to welcome back former graduates from the Department of the Environment and Energy to continue the work of the Coordinator until a permanent replacement could be appointed.

National Steering Committee

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

Members of the National Steering Committee during 2016–17 were:

- **Dr Elinor Breman** – Program Coordinator, Millennium Seed Bank Partnership, Royal Botanic Gardens, Kew
- **Dr Anne Cochrane** – Committee Member, Australian Network for Plant Conservation at the Threatened Flora Seed Centre
- **Dr Peter Cuneo** – Manager, Seedbank and Restoration Research, Royal Botanic Gardens and Domain Trust
- **Dr Andrew Crawford** – Research Scientist, Threatened Flora Seed Centre
- **Mr Dan Duval** – Seed Research Officer, Botanic Gardens and State Herbarium, South Australia
- **Mr Graeme Errington** – Seedbank Curator, Royal Botanic Gardens and Domain Trust
- **Dr Jenny Guerin** – Seed Research Officer, Botanic Gardens and State Herbarium, South Australia
- **Mr Jason Halford** – Senior Botanic Officer and Seed Bank Manager, Brisbane Botanic Gardens, Mt Coot-tha
- **Dr Paul Gibson-Roy** – Lead Scientist Eastern Australia, Greening Australia
- **Dr David Merritt** – Senior Research Scientist, Western Australian Seed Technology Centre, Botanic Gardens and Parks Authority
- **Mr Tom North** – Seed Bank Curator, Australian National Botanic Gardens
- **Mr Luke Sweedman** – Curator, Western Australian Seed Technology Centre, Botanic Gardens and Parks Authority
- **Mr Neville Walsh** – Senior Conservation Botanist, Royal Botanic Gardens Victoria
- **Mr James Wood** – Seed Bank Manager, Royal Tasmanian Botanical Gardens.
- **Mr Ben Wirf** – Nursery / Seedbank Manager, George Brown Darwin Botanic Gardens



Goodenia anfracta Witjira National Park. (Photo: Seed Conservation Centre, BGSH)



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.

We look forward to working with our supporters and Associates in the coming years to achieve our vision of a future where Australia's native plant diversity is valued, understood and conserved for the benefit of all.

Supporters

- Royal Botanic Gardens, Kew
- Director of National Parks (Australian Government)
- Department of the Environment and Energy through the Threat Abatement Plan for disease in natural ecosystems caused by *Phytophthora cinnamomi*
- Garfield Weston Foundation
- Grantham Foundation
- Rae Allen

Associates

- Atlas of Living Australia
- Australian Government Department of the Environment and Energy
- 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
- Society for Ecological Restoration Australasia
- University of New England

Volunteers

- Anna Moreing

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 (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 Technology Centre

Botanic Gardens and Parks Authority (BGPA)

Threatened Flora Seed Centre

Department of Biodiversity, Conservation and Attractions, Western Australia (DBCA)





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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.