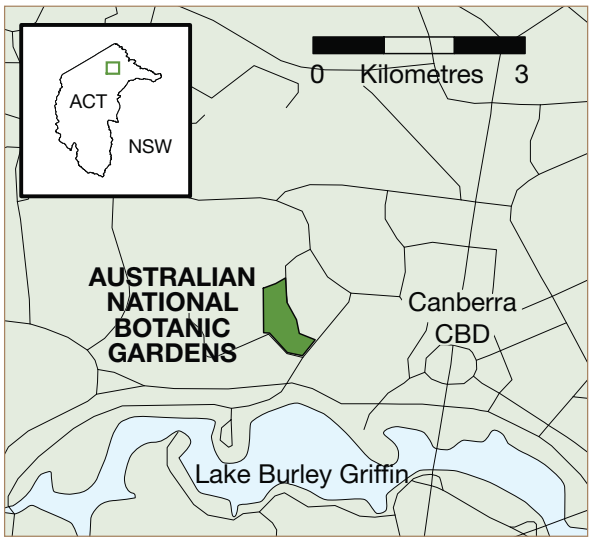
Australian National Botanic Gardens

anbg.gov.au



Special features

The Australian National Botanic Gardens (ANBG) is a major scientific, educational and recreational resource. It was one of the first botanic gardens in the world to adopt the study and display of a nation's native species as a principal goal. Approximately one-third of the known flowering plant species that occur in Australia and about half the known eucalypt species are represented in its living collection. The ANBG is a national showcase for the horticultural use of Australia's native plants. It is a partner in the Australian National Herbarium which is the world's most comprehensive collection of Australian plant specimens and which underpins the scientific identification of native plants.

The ANBG contributes to meeting Australia's obligations under international environment conventions to which Australia is a signatory. In particular, the Convention on Biological Diversity recognises the importance of botanic gardens in *ex situ* and *in situ* conservation, research, training, plant identification and monitoring, raising public awareness, providing access to genetic resources, and global cooperation in the sustainable use of plant biodiversity. The ANBG provides expert participation and contributes scientific data to the Global Biodiversity Information Facility and other international biodiversity projects.

Location	Latitude 35°16′ South, Longitude 149°06′ East
Area	85 hectares
Proclamation date	17 September 1991
IUCN category	Category IV
Biogeographic context	Displays plants from a diverse range of climatic and biogeographic regions – alpine to tropical, coastal to central desert
Management plan	Second management plan expired 9 January 2009. The third management plan (2009–2019) is currently being developed
Other significant management documents	Risk Assessment and Management Schedule; ANBG Masterplan (National Capital Authority); ANBG Fire Procedures 2008; Agreement for the Establishment and Operation of the Centre for Plant Biodiversity Research (CPBR) between the Director of National Parks and the Commonwealth Scientific and Industrial Research Organisation (CSIRO); CPBR Strategic Plan

Financial	Operating	$9.562 million
	Capital	$0.567 million
	Revenue	$0.825 million
Visitors	413,170 to site 104,195 to visitor centre	
Living plants	Planted in 2008–09: 5,590 Total number of taxa in the living collection: 6,170 Total number of registered plants in the living collection: 73,695	
Herbarium specimens	Specimen records added to database in 2008–09: 19,223 Specimen records in database: 815,841 Total number of specimens in collection: approximately 1.2 million	
Australian Plant Name Index	Names added to APNI database in 2008–09: 18,866 Total names in APNI database: 207,798	
Australian Plant Census	Names added to APC database in 2008–09: 8,439 Total names in APC database: 43,342	
Australian Plant Image Index	Images added in 2008–09: 4,592 Total number of images in collection: 57,298	
Permits	4 commercial activity permits; 32 wedding or wedding photography licences; 85 licences to publish 594 photographs from the collection; 15 research permits	

International conventions and agreements	
World Heritage Convention	Supports Australia's World Heritage sites through botanical research, scientific plant collections, plant identification, botanical information management, and horticultural and educational programs
Wetlands (Ramsar) Convention	Supports Australia's obligations under the Ramsar Convention through access to plant identification services and data on aquatic plants in the Australian National Herbarium, and by delivering information on Australia's aquatic plants through its website
Other agreements	Collaborates with international organisations including: • Botanic Gardens Conservation International • International Association of Plant Taxonomists • International Plant Propagators Society • International Union of Biological Sciences Taxonomic Databases Working Group • International Plant Name Index (Royal Botanic Gardens, Kew, and Harvard University) • Global Biodiversity Information Facility • International Organisation for Plant Information World Vascular Plant Checklist Project • Species 2000 • Millennium Seed Bank Project • American Public Gardens Association • Global Partnership for Plant Conservation

Environment Protection and Biodiversity Conservation Act 1999	
Heritage	On Commonwealth Heritage List

Management arrangements

The ANBG is managed by a Director appointed by the Director of National Parks. Since 1993 the ANBG has been involved in a joint research venture with CSIRO Plant Industry, the Centre for Plant Biodiversity Research which houses and manages the Australian National Herbarium. The herbarium retains voucher specimens for research and environmental studies and for plants at the ANBG.

Monitoring

ANBG staff stocktake the living collection and record information on plant locations, plant deaths and the overall health of the collection. This information is linked electronically to scientifically documented voucher specimens in the Australian National Herbarium. A team of botanists, including national and international collaborators, ensure that the correct botanical names are always applied to the ANBG's living specimens and used in public interpretation. New accessions help to document the occurrence and distribution of plants in Australia.

Kangaroo, wallaby and rabbit populations are monitored and managed to protect the living collection from damage. A venomous snake management plan has been implemented to monitor snake interactions with people.

Future challenges

Major challenges are:

- securing sufficient resources to achieve government and national priorities
- developing new strategic directions for the ANBG, with a new long-term vision, and completing the third management plan in accordance with the EPBC Act
- water management and securing an alternative water supply in light of the continuing drought and sharp increases in water costs in Canberra
- integrating climate change considerations into management and research. Climate change affects water management, horticultural practices, education and the scope of the living collections held in Canberra.
- calculating financial, social and environmental values for the living, herbarium and photograph collections. This will help to ensure the collections are adequately resourced
- developing a new operational and funding agreement between the Director of National Parks and CSIRO for the continuation of the Centre for Plant Biodiversity Research. The current agreement concludes on 31 December 2009
- securing accommodation for the Australian National Herbarium collections. This has become critical as the current arrangements with their lack of workable space are creating operational problems
- engaging the latest information technology to improve taxonomy and systematics research
- continuing the Australian Plant Census project and implementing the next phase of Australia's Virtual Herbarium.

Report on performance by key result areas

KRA1: Natural heritage management

Major issues

- Water management and associated infrastructure
- Ex situ conservation
- Conducting a review of the living collection to determine the current and possible future value and role of the collection
- Managing plant record information, including introducing GIS technology to living collection management

Actions

- Increase water use efficiency
- Position the ANBG as a leader in *ex situ* conservation including seed banking
- Commence a review of the scope and operations of the living collection
- Accelerate the living collection census
- Use GIS to accurately map the living collection

Performance results 2008–09

- Completed the design of major water infrastructure improvements. Construction of separate potable and non-potable water supplies will commence early in 2010
- Continued a program for *ex situ* conservation of alpine plants with an emphasis on germplasm storage under controlled and cryogenic conditions. Seven field trips to the Mount Kosciuszko area were undertaken. The ANBG now has 150 species stored in the alpine seed bank
- Contributed to a review of seed banking in Australia in cooperation with state and territory botanic gardens and the Kew Gardens Millennium Seed Bank Project, with the aim of developing a long-term national seed bank partnership
- Developed a framework for a comprehensive review of the ANBG living collection and its interaction with other ANBG collections
- Completed a living plant census which will inform the living collection review in 2009–10.

KRA4: Visitor management and reserve use

Major issues

- Visitor services including signage, interpretation and education programs
- Visitor safety
- Displaying the flora of Australia
- Education programs related to Australian flora and Indigenous stories

Actions

- Conduct visitor surveys
- Review communication and visitor services programs
- Develop a new climate change education program
- Progress development and installation of interpretive, information and directional signage
- Display the flora of Australia in a horticultural setting
- Review cultural interpretation and education programs about the Australian flora

Performance results 2008–09

- Surveyed visitor centre use and visitors' reasons for coming to the ANBG and upgraded the vehicle counting equipment
- Reviewed ANBG communication and visitor services programs
- Developed and implemented a new school education program on biodiversity and climate change
- Promoted the cultural values of Australian native plants through exhibitions in the visitor centre and elsewhere in the ANBG: 'Working on Country', 'Friends School Photographic Exhibition', 'Generate', 'Friends Botanical Art Group Exhibition', 'Pin Up Plants', 'Greening the Silver City', and 'Australian Plants Bonsai Exhibition'
- Hosted 11,060 students and 1,373 accompanying teachers/adults who took part in ANBG education programs: 5,957 students (54 per cent) from ACT schools and 5,103 students (46 per cent) from interstate schools as far away as Western Australia
- Fulfilled a successful calendar of public programs including NAIDOC Week celebrations, Science Week, Floriade events and the 'Snakes Alive' hands-on exhibition
- Continued to display about one-third of the plant species occurring naturally in Australia, in a managed horticultural setting. Water restrictions imposed during the drought continue to place the collection under stress
- Presented a floral display of Australian annuals and Sturt's desert pea *(Clianthus formosus)* as high-impact display plants during spring and summer. The project included interpretive signage and programs, and was a successful collaboration between horticulture, communication and visitor services staff and the Friends of the Australian National Botanic Gardens

- Distributed education resource material to schools and teachers including approximately 250 copies of the floral emblems of Australia poster and 100 copies of Bush Foods
- Reviewed ANBG education programs. The results will feed into the third management plan and the ANBG Education Strategy

KRA5: Stakeholders and partnerships

Major issues

- Supporting and participating in national and international botanical forums, including engagement with the Council of Heads of Australasian Herbaria, Council of Heads of Australian Botanic Gardens, Global Biodiversity Information Facility, Taxonomy Research and Information Network, Atlas of Living Australia, Encyclopedia of Life and Taxonomic Databases Working Group
- Servicing the department's and CSIRO's need for technical advice on Australian plants
- The need to develop memoranda of understanding and other instruments with government and non-government organisations associated with the ANBG
- Continuing a collaborative partnership with the Friends of the ANBG
- Supporting and engaging with the Australian Cultivar Registration Authority, the Australian Network for Plant Conservation and Greening Australia
- Ongoing support for the Centre for Plant Biodiversity Research

Actions

- Continue the ANBG's active leadership role as chair of the Council of Heads of Australian Botanic Gardens
- Continue strategic partnerships and cooperative data management with the Taxonomic Databases Working Group and the managers of the Global Biodiversity Information Facility, Taxonomy Research and Information Network, and Atlas of Living Australia
- Continue the Australian National Herbarium's engagement in the Council of Heads of Australasian Herbaria
- Undertake and promote the services that the ANBG and Centre for Plant Biodiversity Research can provide to the department and CSIRO in the form of technical and expert advice
- Formalise the strong relationship with non-government organisations located on site via memoranda of understanding
- Continue the partnership between the ANBG and the Friends of the ANBG
- Continue hosting on the ANBG website the Greening Australia Community Seed Bank, the Australian Cultivar Registration Authority and the Australian Network for Plant Conservation
- Continue the joint ANBG–CSIRO partnership in the Centre for Plant Biodiversity Research

Performance results 2008–09

- Took a leadership role within the Council of Heads of Australian Botanic Gardens in developing a national climate change adaptation strategy and action plan for botanic gardens which were endorsed by the Minister for the Environment, Heritage and the Arts and the state and territory environment ministers in November 2008
- The Australian National Herbarium continued to play a driving and coordinating role on behalf of the department for projects undertaken by the Council of Heads of Australasian Herbaria. These included developing plant profiles, and the Australian Plant Census
- The Centre for Plant Biodiversity Research continued its close association with the new Taxonomy Research and Information Network, housing the network's core staff and participating in projects such as systematic and diversity studies of weeds of national significance and biodiversity information management
- The ANBG and Centre for Plant Biodiversity Research entered into a partnership with the Australian Biological Resources Study and the Atlas of Living Australia to develop and manage a common taxonomic infrastructure for the Australian Faunal Directory, the Flora of Australia, the Australian Plant Census and the Australian Plant Name Index and to develop web services for the Atlas of Living Australia

- ANBG staff participated in a national workshop on collaborative biodiversity surveys and species documentation coordinated by the Australian Biological Resources Study. The results of these surveys will contribute to such projects as the Atlas of Living Australia
- Continued participation of ANBG staff in technical working groups under the Global Biodiversity Information Facility and Taxonomic Databases Working Group
- The Friends of the ANBG ran the annual students' photographic competition and the autumn and spring plant sales; published quarterly newsletters; provided volunteer guided walks each day and facilitators for Botanical Resource Centre twice a week; and supported the ANBG's annual summer concerts in January 2009
- The Australian Cultivar Registration Authority, based at the ANBG, documents the nomenclature of cultivated plants in the Australian Plant Name Index database. Funding was secured from private donors and the horticulture industry to enhance the index's cultivar data
- The Australian Network for Plant Conservation, based at the ANBG, continued to conduct workshops in plant conservation techniques throughout the country, held its second national forum and continued to produce its quarterly newsletter
- Continued the close collaboration between the ANBG seedstore and Greening Australia, including joint field collecting, seed storage and management. The ANBG also provides Greening Australia with ground space and irrigation for seedling production
- The Centre for Plant Biodiversity Research partnership in the new Australian Tropical Herbarium in Cairns was consolidated and the collections management is based on database services provided by the ANBG and the Centre for Plant Biodiversity Research

KRA6: Business management

Major issues

- Long-term sustainability for the ANBG's operation
- Budget management
- Staff management
- Risk management

Actions

- Commence development of the third management plan
- Ensure business continuity and service delivery
- Manage staff resources efficiently
- Continue ongoing risk assessment

Performance results 2008–09

- Undertook a major consultation process with communities around Australia on people's perceptions and expectations about the ANBG's role as a national institution. This information will feed into the third management plan
- Addressed the challenge posed by increases in the costs of water, electricity and maintenance which placed considerable strain on the ANBG as savings in other areas are required to cover basic maintenance and running costs
- Maintained and improved staff consultation, involvement and capacity building formally (through training, the occupational health and safety committee and staff planning days) and informally (through opportunities for higher duties and informal consultation)
- Completed repairs to buildings and nursery polyhouses damaged in the February 2007 hailstorm, with all insurance claims settled
- Developed a staff internal communication plan

KRA7: Biodiversity knowledge management

Major issues

- Nationally consistent Australian plant names
- Taxonomic botanical research
- Developing the horticultural knowledge base
- Integrating the living collection database and herbarium database
- Improving access to botanical information and photographs to assist in responding to climate change
- Engagement with national and international collaborative projects

Actions

- Maintain and curate the Australian National Herbarium collections and associated data links
- Make botanical data, information and expertise available to the national and international botanical communities and the public
- Develop and maintain the Australian Plant Name Index and the Australian Plant Census to define and list all the flowering plants in Australia
- Undertake taxonomic and systematic research, and publish and disseminate research findings
- Develop and maintain scientific databases of Australian plant information
- Integrate departmental plant and animal name databases to allow more consistent management and delivery of biological data
- Add to the extensive plant image collection and improve electronic access to the collection
- Promote and provide information about Australian native plants via the internet
- Position the ANBG as a leader disseminating information on climate change issues in botanic gardens
- Drive national collaborative biodiversity information management projects

Performance results 2008–09

- Databased 19,223 herbarium specimens with a total of 815,841 collection specimens now recorded
- Researchers completed scientific papers or publications resulting from research undertaken at the Australian National Herbarium. Areas of study include Australian Orchidaceae, Rutaceae, Myrtaceae, Malvaceae, Santalaceae and the bryophytes
- Brought Australian Plant Name Index compilation and data capture up to date
- Made significant progress on an agreed list of scientific names for Australia's flowering plants through management of the Australian Plant Name Index and the national collaborative Australian Plant Census project. The project is endorsed by Australian Government, state and territory herbaria
- The Centre for Plant Biodiversity Research successfully tendered to manage the weed images for the department's Weeds in Australia website. The agreement will result in additional staff in 2009–10 to add weed images to the Australian Plant Image Index, a new area of interest for the index which previously concentrated on native plants
- Collaborated with the Atlas of Living Australia and the Taxonomy Research and Information Network to develop specifications for species profiles for managing digital biodiversity data
- Continued research on the ecological function, structure and small-scale dynamics of grassland communities in south-eastern Australia, using grasslands in the West Wyalong district as model systems
- Updated the Australian Plant Image Index to make 4,592 additional images accessible on the internet
- Commenced redevelopment of the ANBG website to update content, modernise the site's appearance and improve site navigation
- The ANBG and Centre for Plant Biodiversity Research participated in national and international biodiversity information management and technical infrastructure projects including the Atlas of Living Australia, the Australian Faunal Directory, Taxonomy Research and Information Network, the Australian Plant Census, Australia's Virtual Herbarium, the Global Biodiversity Information Facility, the Encyclopedia of Life and the Taxonomic Databases Working Group

Alpine seed research project tackles climate change in the Australian Alps

Australian National Botanic Gardens staff collecting seeds in the Australian alpine region for research into the effects of climate change on temperate flora

The Australian Alps is one of the most plant-rich areas in Australia and its fragile ecology is among the most vulnerable to a changing climate.

The Australian National Botanic Gardens (ANBG) has recently entered into a three year research partnership to investigate how climate change will affect the reproductive ecology and demography of Australian alpine flora.

Little is currently known about how to actually grow most alpine plants from seeds. The new project involves not only collecting and storing alpine seeds but plant germination trials and ecological field studies on previously unstudied species.

Building on the past three years of seed collection and storage, the research will make a major contribution to understanding how Australia's alpine plants may be affected by climate change.

This research project is a collaboration of the ANBG, the Australian National University, the University of Queensland and the Friends of the Gardens, and has been funded under an Australian Research Council Grant.

The project also takes the ANBG one step closer to developing a national alpine seed bank as a conservation insurance policy to ensure Australia's alpine species are not lost.

As part of the project the ANBG will host a living collection of alpine plants to raise awareness about conservation of Australia's alpine biodiversity.

The Australian National Botanic Gardens is a national showcase for the horticultural use of Australia's native plants

Australia-wide consultation for the ANBG's next management plan brought out some definite views on the ANBG's role for the next ten years.

The national community expressed expectations that the work of the ANBG needs a strong scientific underpinning. There were views across the nation that the ANBG should be a leader in education and telling the Australian story that links people, plants, the Australian landscape and Australia's national identity.

The next ten years at the Australian National Botanic Gardens

Since its beginnings, the ANBG has led the way as one of Australia's first all-native botanic gardens, focusing on the horticulture and propagation of Australian plants. To remain a relevant national institution, the ANBG must now adapt to reflect the changing needs of Australian society and new challenges in managing Australia's biodiversity.

The ANBG consulted widely with the Australian community and experts in botanic gardens management, botany, business development, education, heritage, horticulture, management of national collecting institutions and tourism.

The initial 'have your say' consultation for the new management plan called for written submissions. The ANBG went a step further and led a series of discussions with community members across Australia. Interested people came together to talk about their perceptions and expectations of a national botanic garden and its living collection in representing Australia's biodiversity.

The management plan for the next ten years will be based on results from:

- national community consultation
- an extensive review of everyday operations in the living collection and horticulture, communication and visitor services, and science and information management
- a technical audit to identify achievements and areas of improvement from the previous management plan.

The next step is to examine and combine the conclusions from the consultation, review of operations and technical audit to create the new vision and management plan.

Taxonomy: an important tool in environmental weed management

Lantana is a Weed of National Significance. It is regarded as one of the worst weeds in Australia because of its invasiveness, potential for spread, and economic and environmental impacts

Environmental weeds are one of the greatest threats to native plants and animals.

A research program at the Centre for Plant Biodiversity Research is using taxonomic methods to unravel the genetic history of weeds and identify where they came from. The program is focusing first on the Weeds of National Significance, particularly weeds for which lack of taxonomic knowledge is hampering land managers' control efforts.

Plant scientists are combining tools from traditional taxonomy and from molecular systematics and ecology to determine the existence of distinct genetic races, the forces behind these variations, their geographic distribution and how they came to Australia. This knowledge will help with finding better targeted biocontrol agents for each weed species and will allow land managers to use traditional control methods more effectively.

Under the program, the Centre for Plant Biodiversity Research is working closely with biocontrol entomologist Michael Day of Queensland Primary Industries and Fisheries on lantana (*Lantana camara*), one of the Weeds of National Significance. The project is funded by the Australian Government's Commonwealth Environmental Research Facilities taxonomy research hub.

The precise origins of lantana are unclear due to a long history of horticultural breeding and a poorly resolved taxonomy. Genetic profiling under the project has shown that the source for the most invasive form of weedy lantana is likely to be a single widespread species with considerable variation.

The testing also indicated that lantana in Australia originated from Venezuela and the West Indies, suggesting that efforts to find a biocontrol agent should be refocused away from Mexico and towards those regions.

Other work has focused on flower colour. Scientists have found that flower colour is a poor marker for some genetic variants and instead varies within populations. Colours also vary throughout the Australian landscape and in their susceptibility to biocontrol agents. Colour is thus an important marker for predicting variation among lantana populations and how they interact with their environments.

This information will permit much more precise design of protocols for developing biocontrol agents.