
AUSTRALIAN BOTANIC GARDENS: A RESOURCE FOR ENVIRONMENTAL EDUCATION

Summary

As education about the environment increases in significance, Australian botanic gardens are increasingly being viewed as valuable resources. The initiation of a network of botanic gardens educators has already resulted in the sharing of ideas and resources and, with the diverse nature of projects going on in botanic gardens in all parts of Australia, this network will be invaluable.

The network will also provide a means by which education officers can support each other to work towards increased resource allocation for environmental education at all Australian botanic gardens.

History

Botanic gardens were established in most large Australian cities during the second half of the 19th century. They were set out along similar lines to large European gardens with extensive lawns, deciduous trees and beds of annuals, shrubs and herbaceous perennials. Plantings were made from northern hemisphere stock.

This reflected the consciousness of the times which saw European gardens and plants as the ideal and the local native vegetation as unknown and foreign. In fact some gardens have only recently established areas of local native plants. Newer gardens such as the Australian National Botanic Gardens in Canberra, (opened in 1970) and Mt Annan Botanic Gardens in Western Sydney, (opened 1985) contain Australian native plants only, as do some of the smaller recent provincial gardens.

This trend demonstrates a growing understanding and appreciation of our native flora. We value our Australian plant heritage - it is so different from the soft, bright greens of Europe.

Education

In Australia today botanic gardens are experiencing a reduction in resources and, while education is a stated objective, educators often work alone with little support. They sometimes also have other

responsibilities such as supervising rangers, volunteers, and friends' organizations. Recently attempts have been made to set up a national network of botanic gardens educators for mutual support.

In a number of gardens the principal of "user pays" is being introduced. This may include the payment of entrance fees and charges made for materials and services provided by the education officer. This, combined with rising unemployment, is likely to see reduced numbers of students visiting gardens - particularly those from economically disadvantaged areas.

Professional development courses help to meet the needs of local students and teachers. They provide ideas for teachers on ways to integrate their classroom work into activities in the botanic gardens. In the long term such courses also free the education officer to prepare better quality written materials and to have more contact with groups from further afield.

Some gardens provide venues for schools to conduct staff meetings. At these meetings the education officer presents ideas for activities which can be integrated into the broader environmental education curriculum.

Environmental problems in Australia

Land degradation is a serious environmental problem in Australia. It may involve wind or water erosion, salinization and acidification. Such habitat destruction leads to loss of biological diversity and in some cases extinction of species. At least 100 plant species and 20 mammal species have become extinct since Europeans arrived in Australia. Awareness of the damage done to the fragile Australian environment in the first 200 years of European settlement has led to the formation of several agencies whose programmes aim to prevent further damage. These include the Save the Bush programme, Greening Australia, Landcare and local revegetation groups. With some 52% of our agricultural and pastoral lands in need of reclamation, it is now accepted that trees and shrubs are essential for healthy, productive land.

The Save the Bush programme is primarily concerned with the maintenance of biological diversity. Many species of Australian plants

and animals are not conserved within National Parks and Reserves - they exist in small rural and urban areas of remnant native vegetation - along railway lines, stock routes, roadside verges and in cemeteries and school grounds. The Save the Bush programme provides funding for local groups to investigate, protect and manage native vegetation.

Greening Australia is a national community organization dedicated to helping all Australians conserve and establish trees and associated vegetation. Greening Australia is administering the One Billion Trees Project announced by the Commonwealth Government in 1989. This project aims to have one billion trees planted by the year 2000 and in the process hopes to engender a tree and landcare ethic in the community.

They aim to ensure that the value of trees and vegetative cover is understood; growing and caring for trees becomes a way of life, and the practice of indiscriminate removal of vegetation becomes a thing of the past.

Botanic gardens and environmental education

Since environmental education is fast becoming a basic requirement at all levels in Australian school curricula, more and more educationalists are seeing botanic gardens as useful resources. Education of the young must be one of the long term answers to our environmental problems.

Botanic gardens can provide an ideal venue for encouraging positive attitudes about conservation and the environment. This will help to ensure that remaining native habitats, whether remnant or extensive, will be retained and many cleared areas will be revegetated.

At the Royal Tasmanian Botanical Gardens in Hobart, the education officer has developed a number of programmes which provide opportunities for personal action by school students and adults. Some of these activities are undertaken at the botanic gardens, some within schools and others in the wider community.

One project involves students in a series of activities which begins with a visit to the gardens, includes a field trip to collect seeds, then sessions on propagation techniques and finally the planting out of propagated material.

At the Royal Melbourne Botanic Gardens upper primary students can take part in Earth Education programmes - Earth Caretakers and Earth Secrets - with the Gardens' education officer.

These are environmental programmes which encourage students to understand, enjoy and live in harmony with the natural world. These programmes have been designed and developed by the Institute for Earth Education. Students learn basic ecological concepts and in the process develop a caring attitude to the environment. To ensure the success of this programme teachers are expected to attend in-service sessions which suggest pre-excursion and follow-up activities. These in-services sessions provide background information about current environmental problems, assistance with the development of a unit of study ideas for improving teaching skills as well as a list of resources.

Teaching about the importance of the eucalypt

The gum (or Eucalyptus) tree represents the Australian landscape more than any other plant. There are about 600 species and they grow over much of the continent, from alpine to arid areas. They show many interesting adaptations to Australian environments, notably their adaptation to bushfires. They are amongst the world's finest honey plants and their hardwood timber has many uses.

A series of activities can be undertaken in botanic gardens where a variety of eucalypt species are grown to help students to get to know these plants, as well as to understand their importance in many Australian ecosystems. Some activities are, for example, making rubbings of different bark patterns, crushing and smelling their leaves, holding leaves up to the light to see the tiny oil containing pores, making spatter prints of leaves, exploring the trees while blindfold, hugging them and gently feeling their textures, observing the animals which live on or visit the tree.

An important part of these activities is for participants to look upon gum trees as home and food for many animals. In spring several parrot families may be seen nesting in the hollows of just one tree. Small possums, such as sugar gliders, also nest in the hollows, so do owls and smaller animals, including reptiles and insects. The tree provides food

for many animals. For example, insects eat the leaves, bore into the wood and feed on the nectar and pollen. Large mammals such as koalas and gliders also eat the leaves. Some smaller animals seek nectar from their flowers, as do a large number of different birds. Thus a gum tree provides a perfect example of the interdependence of plants and animals. Drawing and creative writing can be an effective means to enable students to express their attitudes to and understanding of the environment. Lying on the ground beneath a gum tree can be an inspiration.

Plant propagation can be a useful extension of the eucalypt study activities. Teachers can learn propagation techniques at the botanic gardens, then conduct classes using the facilities of the gardens. Involvement of students in the entire process from collection and cleaning of seeds to the planting out and care of the young trees gives them a sense of owning the project. In some schools this is being extended to students designing and planting their school gardens.

Educators from a number of the major botanic gardens are actively involved in the planning of school gardens. In recent years the clear felling of old growth eucalypt forests for wood chip has become a controversial issue in Australia. Whilst the re-growth forests have a superficially attractive appearance they inevitably lack the diversity of flora and fauna of the old growth forests. For example, 80% of all marsupials in the forests of south eastern Australia require the hollows of old gum trees for their homes. So programmes that help students to learn about eucalypts are extremely relevant to current environmental issues.

Environmental education in botanic gardens can give new power to young people by giving them skills and ideas for strategies for doing something constructive for the environment. The gardens can provide the materials to propagate and the venue to see how a variety of plants grow. As well as that, they can provide the opportunity for people to learn about particular plants suitable for their areas. Children can have an investment in the project, making decisions as to which plants to grow. Schools are encouraged to plant local species so that the plants will have a greater chance of survival.

Use of Australian plants by Aboriginal people

This is an area of special interest to many. Trails enable people to learn about the uses Aboriginal people have made of plants. Aboriginal cultures and their relationships with the environment are being studied in many schools and students can extend this study at botanic gardens. Some gardens also have collections of Aboriginal tools and utensils, eg. woomeras (spear throwers), coolamons (wooden dishes), grinding stones, boomerangs (returning sticks), shields and didgeridoos (musical instruments). These materials help students understand the importance of plants to Aboriginal cultures.

Special facilities for people with disabilities in botanic gardens

All gardens encourage participation by people with disabilities and many have special trails, eg. for people with poor vision and people in wheelchairs. Two Australian botanic gardens, the Royal Tasmanian Botanical Gardens, Hobart and the Australian National Botanic Gardens in Canberra, have horticultural therapy centres. In 1982, the Banksia Centre opened at the Australian National Botanic Gardens.

The Banksia Centre

This Centre has a garden made up of alcoves of coloured, scented, textured and bird-attracting Australian plants. There is also an area of raised beds which allows access for disabled people so they can practice horticultural techniques, standing, sitting or kneeling.

Programmes at the Banksia Centre are designed to achieve broad educational, vocational, recreational and rehabilitation goals. They include a vocational training programme which offers places for about 10 physically and intellectually disabled students aged from 18 to 20 years. In 1990, they propagated 10,000 annuals (native paper daisies). These were grown from seed, much of it having been collected and cleaned from plants grown the previous season. The seedlings were potted on, cared for and planted out in prepared sections of the gardens using specially adapted tools. Appropriate signs tell visitors about the

programme and the input of the students. These young people spend 6 hours at the Gardens each week and the programme is set up to help them develop skills which may enable them to continue horticultural pursuits in their work or leisure. The flowers from these plants are cut and stored and along with the fruits (seed capsules and pods) of many other plants they are used in a wide variety of craft activities which are enjoyed by clients with disabilities as well as other student groups.

Another programme in which people with disabilities are involved is the propagation of local plant species for revegetation projects. Students visit sites on the hills and open spaces around the city to collect seed and inspect the plants. Then they clean the seed, sow it, pot up the seedlings and participate with local community groups in planting them out.

This year a pilot project will involve large scale propagation of native shrubs and herbs, some of which are quite difficult to grow. This enterprise aims to become self supporting, with the plants being sold through Greening Australia.

Other activities at the Banksia Centre assist the frail, the aged and people undergoing rehabilitation to help maintain their own home gardens.

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