BGCI – conserving trees

Sara Oldfield, Secretary General BGCI

Around the world there are over 2500 botanic gardens and arboreta falling within the definition "An institution holding documented collections of living plants for the purposes of scientific research, conservation, display and education". Collectively they hold an estimated 80,000 – 100,000 plant species which is roughly 25 percent of the world's total vascular flora depending of course on how we define species and which taxonomic system is followed. This plant material provides a major resource for research, conservation, education and enjoyment. Sharing skills and expertise amongst botanic gardens and arboreta enables the best use to be made of the plant diversity maintained by the institutions. The work of Botanic Gardens Conservation International (BGCI) provides one mechanism for this to happen, linking botanic gardens in a global network for plant conservation.

Approximately 8,000 tree species are recorded as threatened with extinction on a global scale. The threats to naturally rare species are increasing with climate change particularly for species confined to particular habitats such as coastal and montane areas. Botanic gardens and arboreta have a particularly urgent role to play in providing an insurance mechanism for the survival of threatened species in *ex situ* conservation collections. At the same time many botanic gardens manage natural areas for *in situ* plant conservation or contribute to the botanical survey and management of protected areas in partnership with other organisations. Ideally the best conservation solutions are integrated strategies using both *in situ* and *ex situ* techniques for endangered species. Developing conservation strategies for trees can be particularly challenging because of their longevity, the space requirements for maintaining genetically representative populations in cultivation and, for a significant number of species, the recalcitrant nature of their seeds.

One of the original objectives of BGCI when it was established in 1979 under the auspices of the IUCN Special Survival Commission as the Botanic Gardens Conservation Coordinating Body was to find out where globally threatened plant species were represented in *ex situ* collections. This role continues today. BGCI's on-line PlantSearch database records over 150,000 taxa maintained by botanic gardens around the world with a total of 11,468 plants being recorded as threatened in the IUCN Red List of threatened species. Of these, over 1700 are globally threatened tree species. Currently the most frequently recorded threatened tree species included in the PlantSearch database is the dawn redwood *Metasequoia glyptostroboides* which is Critically Endangered in its native China and known to be represented in over 100 botanic gardens. In this case, of course, the genetic representation is inevitably small given the nature of the original collection in the wild.

Other globally threatened tree species that are particularly well represented in botanic gardens and arboreta as recorded in BGCI's PlantSearch database are *Dracaena draco*, *Picea omorika*, *Araucaria heterophylla*, *Cupressus macrocarpa*,

Magnolia wilsonii, *Cupressus cashmeriana* and *Davidia involucrata* var. *vilmoriniana*.

The PlantSearch database provides the only comprehensive list of globally threatened plants in cultivation. Data input relies on the goodwill of botanic gardens that generally supply their information in electronic format. At present BGCI is working hard with the European Botanic Gardens Consortium to ensure that all European botanic gardens contribute their data on threatened plant species in collections. To be truly effective the PlantSearch database also relies on good information on the conservation status of plant species. Currently progress in capturing this information at an international level through updating the IUCN Red List is disappointing. BGCI is committed to working with IUCN to speed up the red listing process particularly for tree species and to provide a comprehensive European plant red list for all vascular plant species. This activity is needed if botanic gardens are to fulfill their potential in conserving globally threatened plant species. They need to know which species are priorities for conservation efforts.

One of the main purposes of the PlantSearch database is to monitor progress towards the achievement of Target 8 of the Global Strategy for Plant Conservation (GSPC). This Strategy was agreed in 2002 by over 180 countries who are signatories of the Convention on Biological Diversity. The Strategy has 16 ambitious targets to be met by 2010. Target 8 of the GSPC calls for 60 per cent of threatened plant species in accessible ex situ collections, preferably in the country of origin, and 10 per cent of them included in recovery and restoration programmes.

There is a good chance that 60 percent of threatened plant species will be maintained in accessible *ex situ* collections, preferably in the country of origin by 2010. China, which alone has 10 percent of the world's flora, has a well-organised network of botanic gardens closely affiliated with BGCI, that already has 60 percent of the China flora represented in various collections. The second part of target 8 will be more challenging and will require major efforts by botanic gardens working in partnership with other organizations.

The BGCI PlantSearch database has the potential to be a major tool for plant conservation planning and to be developed as the cornerstone for BGCI's future work on plant conservation and climate change. Current activities include the addition of fields to record propagation and restoration activities and in-depth analysis of the database to identify gaps and means to address these. Analysis is currently underway for medicinal plants working with the IUCN SSC Medicinal Plant Specialist Group and is planned for selected groups of trees including oaks and Magnoliaceae working with the IUCN SSC Global Tree Specialist Group for which BGCI hosts the Secretariat.

As well as maintaining databases to support conservation planning, BGCI supports the conservation of tree species in a variety of ways. Training and supporting environmental education are crucial roles and wherever possible providing direct support for on the ground conservation activities. Over the past five years, it has been possible to support over 40 conservation and education projects undertaken by botanic gardens as part of the Investing in

Nature Programme funded by HSBC. Examples of tree conservation projects supported include the work of Nairobi Botanic Gardens with local communities in the Taita Hills to restore and conserve the wild populations of *Millettia oblata*; work with the University and Botanic Garden in Cordoba, Argentina to conserve and restore native forests of Central Argentina with a complementary environmental education programme focusing on the ethnobotanical value of the forests; and *work* with WWF-India to develop a low cost nursery for the conservation of Rhododendrons in the Eastern Himalayas.

Another successful tree conservation project has helped to develop an arboretum for the endemic and endangered flora of the Nilgiri Biosphere Reserve in the Western Ghats, India. The Western Ghats is one of the global biodiversity hotpots. There are over 3,000 endemic plants in the fragmented forests which extend for 1,600 kilometers from India's southern tip to Gujarat in the north. Less than 15 percent of the Western Ghats is protected in national parks and other areas set aside for conservation. The pressure on natural resources is immense and the Nilgiri Biosphere Reserve managed with the cooperation and participation of local people is particularly important for the in situ conservation of rare and threatened trees. The arboretum is being developed by the Coimbatore Zoological Park and Conservation Centre. With support from BGCI over 70 woody species were collected for the arboretum and propagation techniques recorded for 22 species. Species established in the arboretum include the endemic and Endangered *Diospyros malabarica* which is a source of valuable natural dye and medicine from the fruits; *Gluta travancorica* an Endangered tree with edible fruits and *Euonymus serratifolius* a narrow endemic species which is thought to have ornamental potential. A small interpretation center has been developed at the arboretum as part of the project supported by BGCI.

In total BGCI has directly supported the conservation of at least 500 plant species through its small grants over the past five years. This may seem a small amount considering that it is generally agreed that up to 100,000 plant species are threatened with extinction but the pilot projects demonstrate what is possible and supplement the activities already underway by the 2500 botanic gardens and arboreta around the world. The potential to do more is great. Plant conservation is unlikely to ever receive the popular support given to the conservation of birds and mammals but will continue anyway using the technical skills and dedication of botanists, foresters and horticulturists around the world. Many are working behind the scenes of the landmark gardens and arboreta of Europe and the US and at the smaller local institutions in Asia, Africa and Latin America. Botanic gardens and arboreta can no doubt do more to showcase this work in their interpretation and public awareness programmes. BGCI aims to mobilise botanic gardens and work with partners such as Fauna & Flora International in the Global Trees Campaign to secure plant diversity for the well-being of people and the planet. A more tangible but still ambitious aim is to help to conserve 50 percent of endangered plant species by 2010.
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