RESTORING THE WILD

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Sara Oldfield is Secretary General of Botanic Gardens Conservation International (BGCI), a post she has held since May 2005. In this role, Sara leads the strategic development of BGCI, a membership organisation that brings together around 600 botanic gardens. She is also responsible for the organisation's worldwide programmes that address the conservation of plant diversity, environmental education and biodiversity policy objectives.

Prior to joining BGCI, Sara worked for a range of conservation organisations. She was the Global Programmes Director at Fauna & Flora International (FFI) from 1998 to 2004 and was responsible for the management and development of global programmes including FFI's Global Trees Campaign. This programme, now run jointly with BGCI, aims to save globally threatened tree species and their habitats worldwide.

Sara is also Chair of the IUCN/SSC Global Tree Specialist Group, responsible for promoting and implementing projects to identify and protect global Red Listed tree species. She has published various books and reports on conservation, endangered species, rainforests and deserts. Her latest book is entitled *Botanic Gardens – Modern Day Arks*.

Environmental news is rarely positive. Habitats continue to be destroyed worldwide and species diversity continues to decline at an alarming rate. And yet species are being saved from extinction and botanic gardens are playing a key role in this task. Adding up the conservation actions of individual botanic gardens provides a good story and one that should be told more widely. And of course there is so much more that can be done. For several hundred years botanic gardens have been amassing a wealth of information, knowledge and plant material that can be utilised to repair the damaged earth. With new biodiversity targets agreed by the Convention on Biological Diversity (CBD) in October 2010, botanic gardens are preparing to address the restoration of species and habitats in an ambitious new initiative that builds on successes of the Global Strategy for Plant Conservation (GSPC).

The GSPC has served as a successful rallying call for botanic gardens. First agreed by governments in 2002, the now familiar Strategy has 16 ambitious targets. Botanic gardens around the world have played a role in implementing all the targets but have been particularly associated with Target 8, the target relating to the *ex situ* conservation and restoration of endangered species. The target called for 60 per cent of threatened plant species to be in *ex situ* collections by 2010. BGCI's PlantSearch database has been used to monitor progress towards Target 8 and has shown that the figure reached for European plants by 2010 was 42 per cent in *ex situ* collections and for North American threatened plants 35 per cent. Globally, at least 23 per cent of threatened plant species are recorded in *ex situ* collections, according to the PlantSearch database, and the true

figure is likely to be considerably higher when additional records are collected. This places a significant burden of responsibility on botanic gardens to look after threatened species in their collections and to use them wisely for conservation, restoration and educational purposes.

Using the baseline information collected for Target 8, the focus and challenges for the next ten years must be to increase the number of threatened plants in *ex situ* collections and to improve the quality of such collections (Sharrock *et al*., 2010). Incorporating threatened species into ecological restoration activities is an exciting prospect that botanic gardens are starting to plan for collectively. And the expectations are growing – even more ambitious targets have been agreed for the GSPC for 2020. Target 8 calls for "At least 75 per cent of threatened plant species in *ex situ* collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programmes". This is clearly a major challenge for botanic gardens but the global target is not impossible to reach.

One of the problems that remains in assessing progress towards the GSPC targets is that the baseline data on the global conservation status of plants in the wild is still sketchy. Relatively few plant species have been assessed with the current IUCN Red List categories and criteria (IUCN, 2011) and increasing the rate of assessing the conservation status of plant species remains a global priority. Evaluating conservation status is, of course, a vital component of conservation planning for both *in situ* and *ex situ* conservation. Contributing to plant conservation assessments is another important task for botanic gardens to consider.

Recently botanists from the Royal Botanic Garden Edinburgh (RBGE) have been working with BGCI and experts around the world on a conservation assessment of all taxa of *Rhododendron* in their natural habitats. The first comprehensive global list of threatened plant species, published by IUCN in 1998 (IUCN, 1998), included 63 *Rhododendron* taxa in a total list of 33,798 globally threatened plant taxa. This total figure for threatened plants was considered by the Red List compilers to represent the "tip of the iceberg". Gaps in taxonomic knowledge and in distribution information, and lack of on-the-ground fieldwork were cited as reasons for the list of threatened species being incomplete. These gaps have been partially addressed by the GSPC over the past ten years, but progress in global red listing has unfortunately slowed down at the same time as threats to wild plants have increased – not least as a result of climate change.

The recent *Red List of Rhododendrons* (Gibbs *et al.*, 2011) (see Fig. 1) indicates that out of a total of 1,157 rhododendrons assessed, 2 species are no longer found growing in their native habitats, and 316 are considered to be threatened with extinction. A further 66 taxa are likely to be threatened in the future if nothing is done to address the threats that they face. Rhododendrons not only provide stunning displays and inspiration in our temperate gardens, they are of great ecological importance in their natural habitats and provide essential resources such as fuelwood and medicines for local people. One of the very rarest species is the huge-flowered *Rhododendron magniflorum*, known only from two sites in Guizhou and now considered to be critically endangered mainly because of

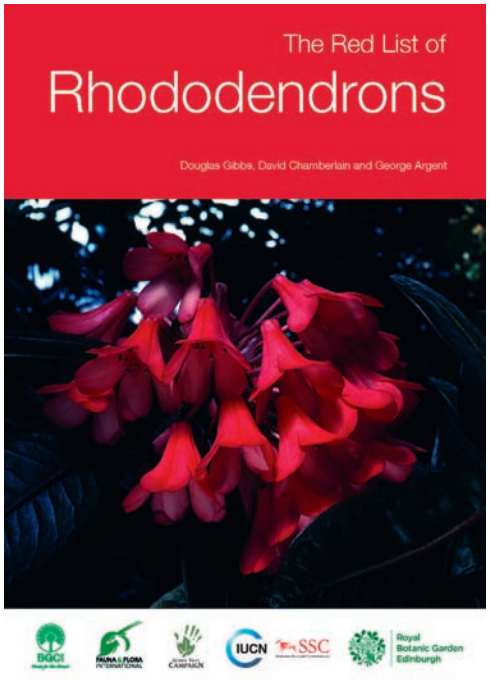

Fig. 1 The *Red List of Rhododendrons* publication (Gibbs *et al.*, 2011). Image: courtesy of D. Gibbs.

forest loss. This species is not yet recorded in cultivation in botanic gardens but BGCI will endeavour to ensure that the species is safe in *ex situ* conservation.

The information compiled for the Red List provides an excellent basis for a conservation action plan for threatened rhododendrons, building on the skills of botanic gardens such as RBGE with its world-renowned rhododendron collections. Partnerships between gardens concentrating on supporting action in the countries of rhododendron diversity remain essential. In April 2005, BGCI organised a workshop on the cultivation of rhododendrons at Cibodas Botanic Garden in Bogor, Indonesia. Training was provided by staff from RBGE in aspects of horticulture such as identification and taxonomy, techniques for field collection, propagation and data management. At the same time 14 species of rhododendron originally collected from Indonesia were repatriated to the Cibodas Botanic Garden from the *Rhododendron* section *Vireya* collection at RBGE.

This type of activity needs to be scaled up worldwide for so many threatened plant species. Plant care, whether in seed banks or living collections, and propagation of well-documented plant material of wild source origin are essential for reintroduction and ecological restoration. Establishing priorities and mechanisms for restoration on a landscape scale is now becoming a reality. In many parts of the world where forests and other types of vegetation have been destroyed or degraded the habitats that remain may not be adequate for the conservation of species that occur there – help is needed through

reintroductions and careful management. Unfortunately attempts at ecological restoration in general have often overlooked the need to use appropriate species in a given context and have neglected ecological functions, goods and services. Botanic gardens have the complementary skills and plant collections to enhance global ecological restoration efforts.

In 2008, representatives from botanic gardens around the world met at the Royal Botanic Gardens, Kew to assess their contributions to ecological restoration and how these activities could be expanded and further developed (Hardwick *et al*., 2011). As a follow-up to this, a second meeting was held at the New York Botanical Garden in March 2011 to consider a global initiative with ambitious long-term goals. The steering committee called for botanic gardens to form a new alliance to restore ecosystems worldwide and requested that BGCI play a coordinating role in its development. An ambitious programme is envisaged, with ecological restoration demonstrated in 100 places around the world. Important components of the programme will be to show that truly effective restoration must take into account the natural plant diversity of a particular habitat. It must also involve local people in the management and design of restoration and accept that all habitats are changing at an accelerated pace because of our impact on the biosphere.

Since the meeting in New York planning for the ecological restoration initiative is gaining momentum. BGCI has surveyed a wide range of botanic gardens around the world to find out what is already happening. The results are impressive: from prairie restoration in Chicago to rainforest restoration in Brazil, from wetlands in Canada to island floras in the Atlantic and Indian Ocean – habitats are being restored. Joining up all the actions, sharing skills and best practice and collectively accessing funding resources are among the next steps. Since the initiative was announced, additional gardens have expressed their willingness to get involved, working together for positive environmental change. As agreed in New York, the places we will target for restoration "include the full array of terrestrial ecosystems that are under threat and are no longer able to provide essential services and resources for sustaining human livelihoods and biodiversity".

It is possible to make good news happen for the environment. Botanic gardens can interpret positive environmental messages and show the potential for restoring natural ecosystems. Interest in ecological restoration is growing on a global scale along with the realisation that all the world's natural ecosystems are managed by active design or default. Botanic gardens bridge the gap between the natural and cultural worlds and, with adequate resources, are in a very strong position to help restore the wild.

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