

Efforts in safeguarding China's botanical heritage: the implementation of the CSPC

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Abstract

With 31,362 species of vascular plants, China is home to about 12% of the Earth's known vascular flora. Remarkably swift changes at all levels including fast economic development are rapidly altering natural ecosystems and plant populations; today, the number of threatened species is estimated to amount some 15% of the total Chinese flora. Since China's ratification of the Convention on Biological Diversity in 1993, the country has undertaken tremendous steps to address biodiversity conservation, paying particular attention to safeguarding the country's vast botanical wealth. More recently, spearheaded by the Chinese Academy of Sciences (CAS), the State Forestry Administration (SFA), the Ministry of Environmental Protection (MEP) and BGCI, *China's Strategy for Plant Conservation (CSPC)* was officially launched in 2008. Working with Chinese botanical gardens and forest departments, BGCI has been assisting in the implementation of this national plant conservation strategy including an in-depth review of progress in 2012. A number of other country-wide plant conservation efforts have been initiated recently. SFA launched a '*Five Year Planning Program for the Protection of Plant Species with Extremely Small Populations*', in which 120 species have been identified for priority protection, with Yunnan being the first province for the pilot implementation of this program. In 2012, CAS, SFA and the Ministry of Housing and Urban-Rural Development (MHURD) issued '*Guidance on Enhancing Ex Situ Conservation for Botanical Garden Plant Resources*'. To facilitate the implementation of this scheme, SFA convened national training courses on '*Wild Plants Ex Situ Conservation*' for botanical gardens and forest departments personnel. The three agencies also established the Chinese Union of Botanical Gardens (CUBG) in 2013 to provide a national platform for conserving native plant species. This presentation will provide an overview of these initiatives and discuss progress made in implementation to date.

Key words

BGCI, Chinese Government, conservation, CSPC, efforts, plant species.

Background information

With 31,362 species of vascular plants in 3,328 genera and 312 families (FOC, 2013), China is home to about 12% of the Earth's known vascular flora. Under 50% of these species are endemic to China. Remarkably swift changes at all levels including fast economic development are rapidly altering natural ecosystems and plant populations; today, the number of threatened species is estimated to amount some 15% of the total Chinese flora since the early 1990s (Huang, 2011). The loss of plant diversity has drawn great attention of both at home and abroad. Since China's ratification of the Convention on Biological Diversity in 1993, the country has undertaken tremendous steps to address biodiversity conservation, paying particular attention to safeguarding the country's vast botanical wealth. Based on the model of the *Global Strategy for Plant Conservation (GSPC)* adopted by the Parties to the CBD in 2002, *China's Strategy for Plant Conservation (CSPC)* was launched in 2008 (China's Strategy for Plant Conservation Editorial Committee, 2008) which was spearheaded by the Chinese Academy of Sciences (CAS), the State Forestry Administration (SFA), the Ministry of Environmental Protection (MEP) and BGCI. Since its launch in 2008, The CSPC has served as a practical framework for action for many stakeholders of the Chinese conservation community specifically concerned with preserving China's botanical heritage for generations to come.

BGCI's efforts and achievements in the implementation of the CSPC

In 2007, BGCI established an office at the South China Botanical Garden of the CAS. The BGCI China Program fully supports the implementation of the CSPC and is recognized as having had a catalytic impact on plant conservation in China. The program has developed a focus on the conservation and restoration of globally threatened trees. Selection of species takes into account information derived from tree Red Listing activities and local consultation with botanic gardens and other partners. Working with Chinese botanical gardens and forestry departments, around 40 threatened plant species have been selected for conservation, integrating *ex-* and *in-situ* conservation in collaboration with local communities and authorities (*BGCI's current conservation projects in China*, 2015). In each case, as a result of the projects, the conservation status of the species has been significantly improved. The projects have proved to be catalytic, stimulating matching investment and conservation effort by major botanic gardens in China. A number of habitat conservation activities have been supported in China over the past five years, engaging with local communities and authorities to understand the underlying causes of plant diversity loss and develop sustainable solutions. Over the past five years, ecological restoration has been increasingly recognized as a global environmental priority. BGCI has responded to this challenge by supporting pilot restoration projects and the formation of the Ecological Restoration Alliance of botanic gardens (*Ecological Restoration*, 2015; BGCI acts as the coordinator of the Alliance. Pilot projects on the restoration of degraded tropical rainforest, subtropical forest, dryland ecosystems in China have been supported by BGCI; they all address the key issues of restoring habitats using native species, with a focus on securing the livelihoods of local communities as described in BGCI's *Review of Achievements: 2007-2012* (BGCI, 2013). BGCI has also supported capacity building and training in a range of botanical disciplines by supporting Chinese botanic gardens as major environmental centres for public outreach.

The Chinese government's efforts and achievements in the implementation of the CSPC

The Chinese government has paid great attention to plant conservation in China. To document vascular plants in China, China initiated the *Flora of China* (FOC) in 1988 which was completed in Sept. 2013. The FOC includes 25 volumes text and 24 volumes of illustration, describing 31,362 species of vascular plants in 3,328 genera and 312 families, approximately 12% of the world's flora. The preservation of China's species is of special significance. The FOC will contribute greatly to the conservation of Chinese plants.

The FOC also provides the information needed to facilitate the collaboration of international conservation organizations, especially those dealing with programs on forest restoration and the re-establishment of sustainable communities throughout the country, which have been so extensively devastated by human activities in the past 30 years (the significance of the Chinese flora is described in Harvard University, 2012). To document all known plants as well as recently discovered plants, in 2012 SFA began a large-scale national plant survey, which is a five-year project, called the '*Second survey for National Key Protected Wild Plant Resources*', coming after the '*First survey for National Key Protected Wild Plant Resources*' started in 1999. To ensure the quality and smooth progress of the survey, a survey leading group and an expert group were set up and a series of technical documents and protocols for surveying were developed and trainings on the survey technique were held. At present, the surveys have been carried out in each province of China.

Because of the limited resources available, conservation status assessment is vital for prioritizing plant species conservation. Compilation of the *Red List for China Higher Plants* was started in 2008 by MEP and CAS and published in 2013, using version 3.1 of the IUCN Red List categories (IUCN, 2001) and *Application of the IUCN Red List Criteria at Regional Levels, 2003, V3.0* (IUCN, 2003). The overall result of these assessment activities is shown in Table 1 (Ministry of Environmental Protection and CAS, 2013). This Red List can be used to identify the geographic

priority areas for biodiversity conservation and the target species for *ex situ* conservation in botanical gardens and in seed banks.

Besides the great efforts on the implementation of Targets 1 and 2 of the CSPC, a number of other country-wide plant conservation efforts on the implementation of Targets 7 and 8 have also been started recently and have made great progress. SFA launched a 'Five Year Planning Program for the Protection of Plant Species with Extremely Small Populations' (PSESP), in which 120 species have been identified for priority protection, with Yunnan being the first province for the pilot implementation of this program. The implementation involves establishing small protected areas or protected sites, *inter situ* (*near-situ*) conservation, propagation and *ex situ* conservation and finally restoring the original habitat by plant reintroductions.

With the rapid climate change, Chinese government has realized the increasing importance of *ex situ* conservation and has strengthened its partnership with botanical gardens. In 2012, CAS, SFA and the Ministry of Housing and Urban-Rural Development (MHURD) jointly issued 'Guidance on Enhancing Ex Situ Conservation for Botanical Garden Plant Resources', aiming to further standardize the planning, construction, management, conservation and development of botanical gardens; and to strengthen the *ex situ* conservation of plant resources. To facilitate the implementation of this scheme, SFA convened national training courses on 'Wild Plants Ex Situ Conservation' for botanical gardens and forestry department personnel. The three agencies also established the *Chinese Union of Botanical Gardens* (CUBG) in 2013 to provide a national platform for conserving native plant species. Since its inauguration in June 2013, CUBG has held a series of activities for staffs from Chinese botanical gardens, including environmental education training, horticulture training (Xishuangbanna Tropical Botanic Garden, 2015), and established network information systems for *ex situ* collection training.

Implementation review of the CSPC

The launch of *China's Strategy for Plant Conservation* (CSPC) in early 2008 was a major milestone in the development of guidance for safeguarding the flora of China for future generations. Reviewing the progress made in the implementation of the CSPC is essential to further enhance its impact and inform a future plan of action. Four years after its launch, BGCI and three agencies implemented the review of CSPC implementation progress in 2012. The review results are not only thought to provide guidance to conservation practitioners and policy makers in China on how to enhance coordination and consolidate different conservation approaches; they also aim to provide a basis for discussion to align CSPC with the amended objectives of the GSPC 2011-2020 and CBD's *Strategic Plan for Biodiversity 2011-2020*. The review results were published by BGCI (Gratzfeld, J. and Wen, X. Y., 2012).

Conclusions and recommendations

Tremendous contributions to plant conservation have been made over last few years, including the completion of the multi-volume Chinese Flora (national flora and local flora); a red list of Chinese higher plant species; an enhanced network of sites and people dedicated to *in situ* and *ex situ* conservation; numerous species recovery and ecosystem restoration projects have been initiated; many projects and initiatives to strengthen conservation capacity, education and public outreach; and several new information exchange platforms and networks have been created.

To conserve plants more effectively, we recommend that the linkages between *in* and *ex situ* conservation at species and ecosystems, as well as at institutional levels, need to be enhanced; (the coordination of all conservation actors needs to be enhanced); National coordination of *ex situ* collection policies and curatorial efforts to secure conservation and research value needs to be improved; The partnerships between scientists, conservationists and education specialists to promote a new generation of amateur botanists and naturalists need to be enhanced; and the

close linkages of CSPC stakeholders with policy and decision makers who influence and negotiate national and global conservation and development objectives need to be strengthened.

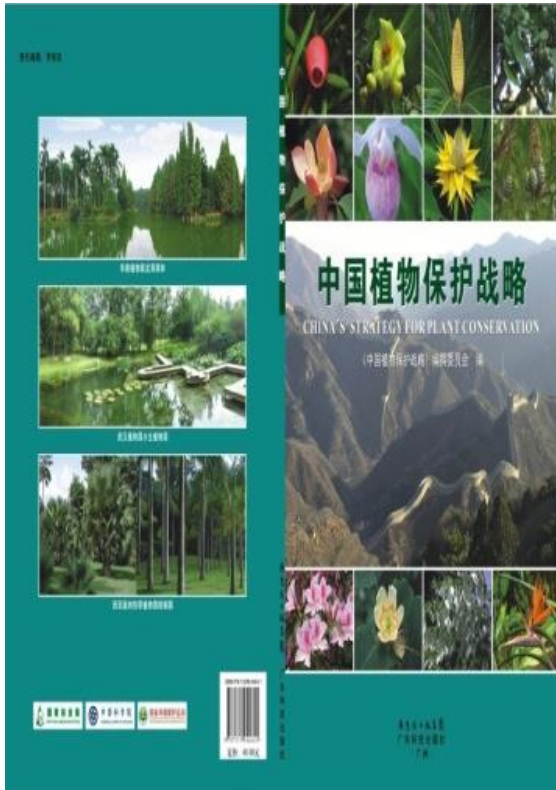


Figure 1 CSPC front page (2008)

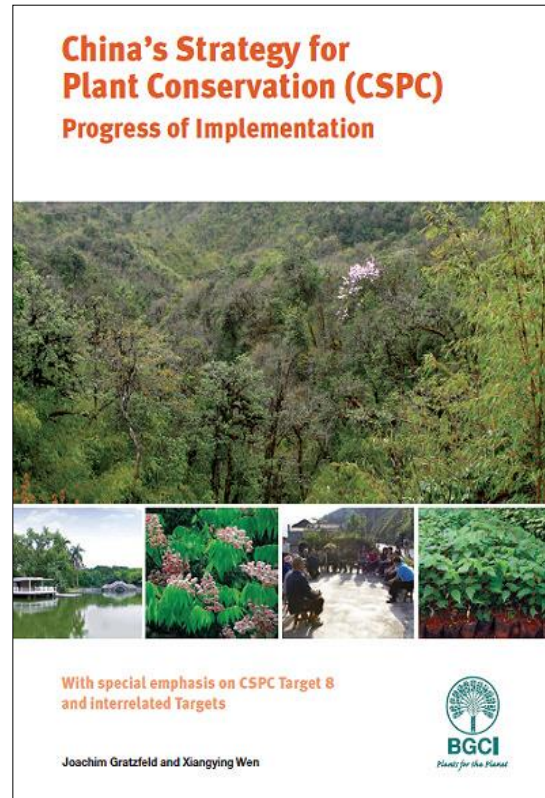


Figure 2: CSPC Implementation review result



Figure 3: *Ex situ* conservation of *Acer yangbiense*



Figure 4: On -site training of farmers



Figure 5: Flora of China



Figure 6: PSESP experience exchange meeting



Figure 7 Group photo of Wild Plants *Ex Situ* Conservation training



Figure 8 Inauguration of CUBG

Group Category	Bryophytes	Pteridophytes	Gymnosperms	Angiosperms	Total	%
EX	1	5	0	21	27	0.08
EW	0	1	0	9	10	0.03
RE	0	5	0	10	15	0.04
CR	12	28	28	515	583	3767 10.58
EN	44	57	39	1157	1297	
VU	61	66	60	1700	1887	
NT	94	67	12	2550	2723	7.65
LC	1761	1053	93	21389	24296	68.23
DD	584	1122	17	3049	4772	13.4
total	2557	2404	249	30400	35610	

Table 1: Results of the Assessment

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