

Botanic Gardens and Biodiversity



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Contributions of the Austrian Botanic Gardens to the implementation of the Global Strategy for Plant Conservation (GSPC)

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Abstract

Examples of GSPC-related activities of Austrian botanic gardens are presented. They illustrate the important role of botanic gardens in the implementation of GSPC-targets in Austria, as well as effects of the GSPC-involvement for the Austrian botanical gardens community, and the BG-commitment for an active role in supporting the new GSPC adopted in October, 2010.

Key words: GSPC, Austria, Botanical Gardens

Introduction

The Global Strategy for Plant Conservation (GSPC) was adopted at the 6th Conference of the Parties (CoP) of the CBD in The Hague (The Netherlands) in 2002. The strategy comprises 16 outcome oriented targets grouped under 5 goals to be reached by 2010. Its results were evaluated in October 2010 at CBD CoP 10 in Nagoya (Japan), and a second GSPC was agreed upon. Austrian botanic gardens and their representatives have been actively involved in the development of the GSPC internationally and in their implementation in Austria.

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GSPC-implementation in Austria

Following the adoption of the GSPC, the Austrian GSPC Focal Point at the Ministry of Agriculture, Forestry, Environment and Water Management organised a GSPC kick-off-meeting in 2003. The aim of this meeting was to make the GSPC known to potential stakeholders. The first author of this paper, in his functions as member of the Austrian CBD CoP 6 delegation and speaker for the Austrian botanic gardens, was asked to present and explain the GSPC goals, targets and objectives.

In 2004, the GSPC targets were incorporated into the new Austrian Biodiversity Strategy which was developed by the Austrian Biodiversity Commission including BG representatives.

Between 2004 and 2007, targets 8 (ex-situ conservation) and 10 (alien invasive species) were in the focus of the practical work of the Austrian botanic gardens.

In 2007 the need for a more coherent Austrian approach to reach the GSPC-targets became obvious. The BG, University of Vienna, was commissioned by the GSPC Focal Point to initiate a dialogue between all GSPC-involved stakeholders on individual and organisational levels by organising an Austrian GSPC-expert workshop. The workshop resulted in an overview of current GSPC-related activities in Austria, and in the identification of options, impediments and gaps in implementing the GSPC in Austria. It also presented a generally accepted “GSPC-roadmap to 2010” including proposals for actions addressing identified impediments and gaps.

Between 2008 and 2010, Austrian botanical gardens (amongst other stakeholders) carried out a number of GSPC-related projects in response to the proposals of the roadmap (see below). The whole process was coordinated by the BG, University of Vienna, and co-financed by the Austrian GSPC Focal Point. Two workshops (2008, 2009) evaluated and discussed the progress of these GSPC-activities and proposed adjustments for follow-up activities. Results of these activities were presented nationally and internationally (Kiehn 2009).

In a recent workshop (November 2010), the results of the GSPC-implementation in Austria were summarized. At the same time, the new GSPC adopted at CBD CoP 10 in Nagoya (Japan) was introduced and explained by the first author of this paper. The workshop agreed to

prepare a new roadmap to 2020, with an interim-evaluation in 2015, as also proposed by the new GSPC. This roadmap will be developed in the context of the new Austrian Biodiversity Strategy by a working group coordinated by the BG, University of Vienna.

Looking at the general implementation of the goals and targets of the GSPC in Austria, it needs to be stated that, of all GSPC goals, only goal 1 “Understanding and documenting plant diversity” and goal 4 “Promoting education and awareness about plant diversity” can be considered to have been satisfactorily achieved.

Goals 2 and 5 are areas where improvement is needed. In the case of the targets stated under Goal 2 “Conserving plant diversity”, Austria is rather far from implementing effectively coordinated in situ plant conservation. Specifically, Austria still falls significantly short of its stated aims of placing 10% of the surface area (target 4) and 50% of the most important areas for plant diversity (target 5) under some form of effective conservation protection. Work on Important Plant Areas is about to begin. In the Alps, environmental and species-at-risk assessments have not been adequate with respect to the expansion of ski areas at higher altitudes. These developments are increasingly reaching the alpine zone with its numerous endangered endemics and sensitive plant communities already threatened by global warming.

Goal 5, which refers to “Building capacity for the conservation of plant diversity”, has not been accorded with sufficient effort by the federal and provincial governments. With respect to this goal, more needs to be done to document the recent floristic changes in the environment, specifically habitat loss, climate change and invasive species. Current resources at the Botanical Gardens are insufficient to take on all of these tasks alone, and more investment is needed if Austria is to meet its GSPC goals.

Examples of Austrian botanical gardens contributions to GSPC-targets

While Austrian botanical gardens and their staff have worked on the implementation of all 16 GSPC targets, the BG-community has been more intensively involved in some targets. The following chapter gives examples for such activities during the last 8 years.

Target 1 (A widely accessible working list of known plant species, as a step towards a complete world flora):

Financially supported by the GSPC Focal Point, an online version of the “Exkursionsflora von Österreich, Liechtenstein und Südtirol” has been started in 2007 (Fischer et al. 2007). Taxonomic knowledge and expertise of several staff members of Austrian botanical gardens contributed to this project as well as to the publication of the third edition of the printed version of the “Exkursionsflora” in 2008 (Fischer et al. 2008). Besides these Austrian based checklist activities, researchers from the BG, University of Vienna, recently published a CITES-checklist for the largest orchid genus, *Bulbophyllum* (Sieder et al. 2009).

Target 3 (Development of models with protocols for plant conservation and sustainable use, based on research and practical experience) and

Target 8 (60% of threatened plant species in accessible ex-situ collections, preferably in the country of origin and 10% of them included in recovery and restoration programmes).

The Austrian Botanic Gardens Working Group (ABGW) has, since 2002, started programs for integrated ex-situ/in-situ conservation of Austrian endangered species.

In 2007, the ABGW carried out a survey of ex-situ collections of rare and endangered plant species of Austria. The project was co-financed by the Austrian GSPC Focal Point, based on the „Red List of endangered Pteridophyta und Spermatophyta of Austria” (Niklfeld 1999), and coordinated by the BG, University of Vienna.

According to this survey (Fuchshuber & Kiehn, unpubl.; Kiehn 2010) 779 of the 1798 species listed as endangered in Austria by Niklfeld (1999) are actually found in ex-situ collections in the Austrian BGs, 406 of them with documented origin. 382 of the 779 species are only present in one collection. 191 of the 520 species rated to be critically endangered in the “Red List” are found in ex-situ collections, 100 of them with data about their origin. As a result of this survey, the members of the ABGW will strengthen their efforts to include additional species into ex-situ collections, and to increase the number of collections with documented origins.

In order to complement the ex-situ living collections, seedbanks are considered to be a powerful tool. The BGs of the University of Applied

Life Sciences Vienna and of the University of Vienna participated in the EU-financed project ENSCONET, which aimed, i.a., at standardizing seed bank procedures and at linking seedbank activities within Europe with each other. For Austria, this project resulted in coordinated seed collection activities of several members of the ABGW using the standards set by the seed collecting manual of ENSCONET (ENSCONET 2009). In an Austrian-wide seedbanking project initiated in the context of ENSCONET, three local seed banks have been established at the BGs, of the Karl-Franzens-University Graz; the University of Applied Life Sciences Vienna, and the Carinthian Center of Botany Klagenfurt. Their aim is to conserve rare and endangered species of Austria as well as representative samples of more common species (see Bernhard et al. 2008, Gosch & Berg 2008, Kiehn et al. 2009). The integration of this project with seedbank activities on the European level (especially the ENSCRI-project proposal for the 7th EU framework program) allow, in addition, the prioritising of species for the collection program and secure a backup storage of seed material, if appropriate. To complement the seedbanking, germination tests, cultivation at botanical gardens and planting programs ex-situ have been started i.a., at the BGs of the University of Applied Life Sciences Vienna, the University of Innsbruck, the City of Linz, the Carinthian Center of Botany Klagenfurt, the Karl-Franzens-University of Graz, the University of Salzburg, and the University of Vienna). Their aim is to establish collections suitable for in-situ habitat restoration, i.e., for (re) planting the corresponding species at sites of their original occurrence. These activities can already be considered as a first step towards reaching target 8 of the new GSPC to 2020.

Target 10 (Management plans in place of at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems).

A neophytes-related information homepage: (<http://www.botanik.univie.ac.at/hbv/index.php?nav=83b>) was started on the ABGW network homepage in 2007 (Berg 2007), maintained and financed by the BG, University of Vienna, with support from the Austrian GSPC Focal Point in 2008 and 2009.

Guidelines for the BGs of German speaking countries related to invasive and potentially invasive neophytes were adopted by the Austrian BGs in 2008 (Kiehn et al. 2007; english version: Kiehn et al. 2008). Several representatives of Austrian BGs have participated in

the development of these guidelines. The eradication of *Toxicodendron radicans* (Poison Ivy) at the BG, University of Vienna, was one activity in the context of this action plan (As data for the species are still collected on the European level, please communicate any observations to the first author of this paper: michael.kiehn@univie.ac.at).

A series of publications on little documented, potentially invasive species observed in Botanic Gardens in Austria/Europated was started recently as collaborative project of several ABGW members (BGs of the University Salzburg, the Karl-Franzens-University Graz, the Carinthian Center of Botany Klagenfurt, and the University Vienna, The first publications meanwhile have appeared (Eberwein et al. 2010, Eberwein & Berg, 2010; a selection of such taxa is also subject of a current diploma thesis at the BG, University of Vienna (Lechner & Kiehn, 2010).

Target 16 (Networks for plants conservation activities established or strengthened at national, regional and international levels).

The Austrian Botanic Gardens, e.g., participated actively in the development of IPEN (International Plant Exchange Network; <http://www.bgci.org/resources/ipen>). This initiative provided, in recent years, CBD-conform standards for the exchange of living plant material for conservation and research as non-commercial transactions between Botanical Gardens (see, e.g., Van den Wollenberg et al. 2006). The IPEN project is of special relevance in the context of the actual “Access and Benefit Sharing” discussion and is mentioned, in several CBD-documents, as best practise example to address ABS-issues.

Literature:

- BERG C., 2007: Niederschrift zum Jahrestreffen der AG Österreichischer Botanischer Gärten am 16. November 2007 in Graz.
http://www.uni-graz.at/garten/Niederschrift_AGOBG_07.pdf (viewed Aug 15, 2010).
- BERNHARDT K.G., KIEHN M., KROPF M. 2008: Genbanken und ENSCONET in Österreich. – Osnabrücker Naturw. Mitt. 33/34: 71-80.
- EBERWEIN R.K., BERG C. 2010: Pflanzen mit invasivem Potential in Botanischen Gärten I: *Pinellia ternata* (Araceae). – Carinthia II 200/120: 81-86.

- EBERWEIN R.K., BERG C., LECHNER M., KIEHN M. 2010: Pflanzen mit invasivem Potential in Botanischen Gärten. Initiativen der ARGE Österreichischer Botanischer Gärten. – Carinthia II 200/120: 77-80.
- ENSCONET 2009: ENSCONET Seed Collecting Manual for Wild Species. Kew: Royal Botanic Gardens Kew. (available online: http://www.ensconet.eu/PDF/Collecting_protocol_English.pdf).
- FISCHER M.A., OSWALD K., ADLER W. 2008: Exkursionsflora für Österreich, Liechtenstein und Südtirol. 3rd edition.. Linz: Biologiezentrum der Oberösterreichischen Landesmuseen.
- FISHER M.A., WILLNER W., NIKLFELD H., GUTERMANN W. (eds.) 2007 (onwards): Online-Flora von Österreich. <http://flora.vinca.at> (viewed Aug. 15, 2010). (also available online at <http://www.flora-austria.at/>).
- GOSCH R., BERG C. 2008: Langzeitdiasporenbank steirischer Wildpflanzen am Botanischen Garten Graz. – Mitt. naturwissensch. Verein Steiermark 138, 23-28.
- KIEHN M. 2009: Contributions of Botanic Gardens to the GSPC implementation in Austria. Abstracts - EUROGARD V, Helsinki, Finland, <http://www.luomus.fi/eurogardv/abstracts.html>.
- KIEHN M. 2010: Botanic Gardens and the implementation of the Global Strategy for Plant Conservation in Austria. – Proceedings of the 4th Global Botanic Gardens Congress. Addressing global change: a new agenda for botanic gardens. 13-18 June 2010, Dublin, Ireland (in press).
- KIEHN M., BERNHARDT K.-G., BERG C. 2009: Seed banking endangered species of Austrian native flora: first steps towards a decentralised approach. - *Enscone* 5, 14-15.
- KIEHN M., LAUERER M., LOBIN W., SCHEPKER H., KLINGENSTEIN F. 2007: Grundsätze im Umgang mit invasiven und potentiell invasiven Pflanzenarten in Botanischen Gärten. – *Gärtn. Bot. Brief* 169: 39–41. (also available online at <http://www.biologis.de/vbg/pdf/neophyten2008.pdf>).
- KIEHN M., LAUERER M., LOBIN W., SCHEPKER H., KLINGENSTEIN F. 2008: Guidelines for handling invasive and potentially invasive plant species in botanical gardens. http://www.plantnetwork.org/aliens/code_of_conduct.aliens.austrian_german.pdf (viewed Aug. 15, 2010).

- LECHNER M., KIEHN M. 2010: Assessing invasive potential of plant species cultivated in botanic gardens in Central Europe. – Proceedings of the 4th Global Botanic Gardens Congress. Addressing global change: a new agenda for botanic gardens. 13-18 June 2010, Dublin, Ireland (in press).
- NIKLFIELD H. (ed.) 1999: Rote Listen gefährdeter Pflanzen Österreichs, 2nd edition. Grüne Reihe Bundesmin. Umwelt Jugend Familie 10. Wien: BMUJF.
- SIEDER A., RAINER H., KIEHN M. 2009: CITES Orchid Checklist. Volume 5. CITES checklist for *Bulbophyllum* and allied taxa (Orchidaceae). Kew: Royal Botanic Gardens Kew.
- VAN DEN WOLLENBERG B., LOBIN W., VON DEN DRIESCH M., KLINGENSTEIN F., DELMAS M., HELMINGER T., SCHUMACHER F., KIEHN M., WLDREN S., LAINE K., 2006: The International Plant Exchange Network (IPEN). p. 15 in Hanzelka P. (ed.): EuroGard IV. Botanic Gardens and the 2010 Challenge. Congress Proceedings. Prague – Pruhonice.