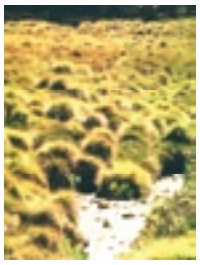


The Convention on Biological Diversity

Plant Conservation Report

A Review of Progress in Implementing
the Global Strategy of Plant Conservation (GSPC)

BGCI
Plants for the Planet

Convention on
Biological Diversity

Contents

FOREWORD

Plants are universally recognized as a vital part of the world's biological diversity and an essential resource for the planet. Many thousands of wild plants have great economic and cultural importance, providing food, medicine, fuel, clothing and shelter for humans around the world. Plants also play a key role in maintaining the Earth's environmental balance and ecosystem stability. They also provide habitats for the world's animal and insect life.

Many plant species are threatened by habitat transformation, over-exploitation, invasive alien species, pollution and climate change, and are now in danger of extinction. The disappearance of such vital and large amounts of biodiversity presents one of the greatest challenges for the world community: to halt the destruction of plant diversity that is essential to meet the present and future needs of humankind.

In 2002, the Conference of the Parties of the Convention on Biological Diversity, through decision VI/9, adopted the Global Strategy for Plant Conservation (GSPC): a strategy that aims to halt the current and continuing loss of plant diversity, and to contribute to poverty alleviation and sustainable development.

The development of the Strategy has benefited from a number of consultations and submissions of views from Parties, and from supporting resolutions and related initiatives. The recent in-depth review of the Strategy generated valuable information for communicating progress, challenges, opportunities and gaps, and has yielded new examples and case studies on the implementation of the various targets of the GSPC. This information has been synthesized into the present report.

As you may know, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) of the Convention on Biological Diversity recommended that this report should provide inputs to the third edition of the Global Biodiversity Outlook. However, while for some targets (1, 2, 7, 8 and 10) the quantitative information on their global progress is presented, indicators are still under development or additional data still being collected. As such, it is anticipated that for these latter targets, this information will be available by 2010.

However, I am confident that the Plant Conservation Report, developed in collaboration with the Global Partnership for Plant Conservation and other relevant organizations and stakeholders, will serve as a valuable communication and awareness-raising tool for the further implementation of the Strategy.

I wish to thank all those involved in the preparation of this report, as well as everyone who submitted materials, case studies, experiences and comments.

Dr. Ahmed Djoghlaf
Executive Secretary
Convention on Biological Diversity

FROM THE GLOBAL PARTNERSHIP FOR PLANT CONSERVATION

It is a pleasure for me to welcome this important report documenting the progress that has been made worldwide towards the achievement of the Global Strategy for Plant Conservation (GSPC). The adoption of the Strategy in 2002 by the Convention on Biological Diversity was a major achievement for biodiversity conservation worldwide. It provided much needed and urgent recognition not only of the importance of plants for humanity but also of the critical threats faced by tens of thousands of plant species throughout the world. The unique importance of plants as essential renewable natural resources and as the basis for most terrestrial ecosystems demanded that such a strategy was required to help halt the loss of plant diversity and raise new awareness of the threats faced by plants.

The Strategy was also an extremely innovative advance for the Convention as it incorporated for the first time a series of targets for biodiversity conservation, aimed at achieving measurable plant conservation outcomes by 2010. The catalytic role of the Strategy in stimulating new programmes and initiatives at all levels has been significant, linking a wide range of organizations and institutions in its support. It is clear that much new plant conservation action has been encouraged and supported by the GSPC to date, including the generation of substantial new resources for biodiversity conservation that would not otherwise have become available without the Strategy.

This report shows that substantial progress has been made towards reaching some of the GSPC targets, although for others it has been limited and their ultimate achievement will require renewed effort by the international community The establishment of a Global Partnership for Plant Conservation (GPPC) in 2004, as a voluntary initiative to bring together international, regional and national organizations to contribute to the implementation of the GSPC has been widely welcomed and this report testifies to the important contributions of the Partnership and its members.

This report provides a useful and welcome synopsis of progress to date. Thus far, a good beginning has been made in tackling the huge task of safeguarding plant diversity worldwide, but it is only a beginning. The urgency of this work is without question; if we do not succeed in conserving tens of thousands of wild plants, of importance for food, fibres, medicines, fuel and multiple other purposes, there will be far fewer natural resources to support future generations. It is also urgent that work should begin in ensuring that the work of the Strategy continues beyond 2010, to help maintain the momentum and genuine enthusiasm for the Strategy that has been a hallmark of its first six years, as well as to ensure that the focused approach to urgent plant conservation action continues in the decade up to 2020.

The Global Partnership for Plant Conservation has been privileged to support the preparation of this report. As the Chairman, I am pleased to offer my congratulations to those members who have been involved in the preparation of this report and encourage all those able to contribute to plant conservation to redouble their efforts over the coming years.

Peter Wyse Jackson
Chairman
Global Partnership for Plant Conservation (GPPC)
Dublin, Ireland

ACKNOWLEDGEMENTS

The Executive Secretary was requested by the twelfth Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice of the Convention on Biological Diversity to develop, for the ninth meeting of the Conference of the Parties, in collaboration with the Global Partnership for Plant Conservation (GPPC), the World Conservation Monitoring Centre of the United Nations Environment Programme (UNEP-WCMC) and relevant organizations, and taking into account contributions from Parties, other Governments and relevant stakeholders, a "Plant Conservation Report" that could provide input to the third edition of the Global Biodiversity Outlook. The report would also serve as a communication and awareness-raising tool on the implementation of the Strategy.

The Executive Secretary, with support from the Government of Ireland and the Global Partnership for Plant Conservation, working closely with UNEP-WCMC and Botanic Gardens Conservation International (BGCI), organized a meeting of a voluntary drafting group held in the National Botanic Gardens, Dublin, from 28 to 30 November 2007. The voluntary group consisted of members of the Secretariat of the Convention on Biological Diversity; the GPPC Chair; BGCI; IUCN; PlantLife International; UNEP-WCMC; the South African National Biodiversity Institute (SANBI); Royal Botanic Garden Edinburgh (UK); and three GSPC focal points (Canada, Ireland, United Kingdom). The meeting agreed on content and possible case studies and developed the outline for this report. Further, a call was made by the Chair of the GPPC for volunteers to draft the elements and outlines for the various targets, agree on time-lines and oversee the production of the report.

The draft elements of the report were circulated in December 2007 for further input, following which the initial draft was generated. Three versions of the report were reviewed between January and March 2008. A draft was then made available on the CBD website for peer review between 1 and 15 April 2008. Comments to this draft were received from Parties, including Canada, China, Germany, Ireland, Mexico, South Africa and the United Kingdom, as well as international agencies and partners, including the members of the GPPC, BGCI, Plantlife International, Royal Botanic Gardens Kew, Species 2000, the Food and Agriculture Organization of the United Nations and UNEP-WCMC.

We would like to acknowledge the input of the drafting team: GSPC focal points David Galbraith (Canada), Matthew Jebb (Ireland) and Chris Cheffings (UK); members of the GPPC Peter Wyse Jackson (National Botanic Gardens, Ireland), Christopher Willis (SANBI, South Africa), Claire Brown (UNEP-WCMC), Sara Oldfield and Suzanne Sharrock (BGCI), Steve Blackmore (Royal Botanic Garden Edinburgh, UK), Alan Paton (Royal Botanic Gardens Kew, UK), Geoffrey Howard (IUCN),Liz Radford and Alan Hamilton (Plantlife International).

Additional input and comments were provided by Domitilla Raimondo and Ian Oliver (SANBI, South Africa), Kingsley Dixon (Kings Park and Botanic Gardens, Perth, Australia), Linda Collette (FAO), Jane Smart and Julie Griffin (IUCN), Frank Bisby (Species 2000), Eimear Nic Lughadha, Natasha Ali and China Williams (Royal Botanic Gardens Kew) and finally the CBD Secretariat staff.

We wish to acknowledge all the individual and corporate contributions that have enriched this report and therefore express our gratitude.

Stella Simiyu
SCBD/BGCI GSPC Programme Officer

KEY MESSAGES FROM THE PLANT CONSERVATION REPORT

1. Plants are a vital component of biodiversity and healthy ecosystems. They provide a range of ecosystem services, from production of oxygen and removal of atmospheric carbon dioxide emissions, creation and stabilization of soil, protection of watersheds and provision of natural resources including food, fibre, fuel, shelter and medicine.

2. Two thirds of the world's plant species are in danger of extinction with pressure from the growing human population, habitat modification and deforestation, over-exploitation, spread of invasive alien species, pollution and the growing impacts of climate change.

3. The Global Strategy for Plant Conservation (GSPC) whose goal is to halt the current and continuing loss of plant diversity; has provided a solid foundation for real and significant progress in plant conservation throughout the world. The implementation of the GSPC has demonstrated the importance of diverse networks, collaborations and the crucial role played by strong cross-sectoral partnerships within the context of the Convention on Biological Diversity.

4. In addition, the Strategy provides a useful entry point for Parties to address issues related to poverty alleviation and foster the achievement of the Millennium Development Goals at national level and global level while ensuring that communities continue to derive benefits from plant diversity, a need so clearly highlighted by the recent findings of the Millennium Ecosystem Assessment.

5. While in some instances a national approach to implementation of the Strategy has been by default the most pragmatic option, in other instances, a regional approach has provided a more rational approach through development of regional targets, based on national and/or regional priorities, capacities and capabilities. In both options, the need to reach beyond the botanical and conservation communities to integrate the Strategy into agricultural, forestry and other land management policies, as well as poverty reduction initiatives and development strategies, has been emphasized.

6. While substantial progress has been reported for eight of the sixteen targets, limited progress has been made so far in the achievement of others, notably on Target 2 (completion of preliminary conservation assessments), Target 4 (ecological regions conserved), Target 6 (conservation of biodiversity in production lands), Target 12 (sustainable use of plant-based products) and Target 15 (capacity and training for plant conservation). Accelerated and increased investment in Target 15 is critical for the overall achievement of all the targets by 2010.

7. The emerging trends of climate change pose an even more serious threat to the conservation and sustainable use of plant diversity and may compromise gains made this far, if not urgently addressed. A rise in global temperature will increase the extinction rate of plant species. There is therefore a real need to look beyond 2010, building on the framework of, and achievements made during, the implementation of the current strategy.

INTRODUCTION

THE ESSENTIAL ROLE OF PLANT DIVERSITY

Plants are universally recognized as a vital component of biodiversity and global sustainability. For example, plants provide food (around 7,000[1] species are used for food[2]), fibre, fuel, shelter, medicine. Healthy ecosystems based on plant diversity provide the conditions and processes that sustain life and are essential to the well-being and livelihoods of all humankind. Ecosystem services provided by plants include:

- The production of oxygen and assimilation/ sequestration of carbon dioxide (CO_2) in both terrestrial and marine systems that currently removes about 50% of anthropogenic CO_2 emission;
- The creation, stabilization and protection of soil, essential for most of the Earth's productive agricultural systems and the major carbon pool in the terrestrial biosphere; and
- The creation and protection of watersheds, slowing run-off rate of precipitation and promoting water infiltration and purification.

Plants also form the basis of the trophic pyramid in all terrestrial and most marine ecosystems on which we and all other animal species inevitably depend. In addition, plants provide a vast multitude of natural resources for humanity, especially in the developing world. They provide the basis for all of our food, most medicines and many other materials essential for our daily lives.

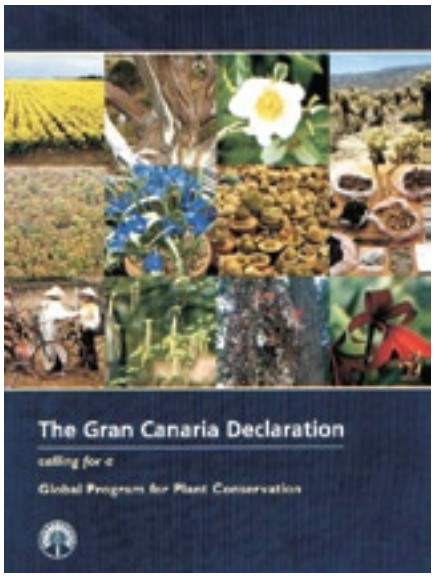
The overall status and trends of plant diversity

An accurate picture of the status of plants and the trends that are impacting on them is difficult to determine. Indeed, we do not yet know the exact number of plant species in the world (estimated currently at 370,000 known species). However, it is predicted that as many as two-thirds of the world's plant species are in danger of extinction in nature during the course of the 21st century (Gran Canaria Declaration - 2000)[3].

Extinction and declines in plant diversity is due to a range of factors including population growth, high rates of habitat modification and deforestation, over-exploitation, the spread of invasive alien species, pollution and climate change. The Millennium Ecosystem Assessment noted that approximately 60% of the ecosystem services evaluated are being degraded or used unsustainably.[4] The degradation of ecosystem services often causes significant harm to human well-being and represents a loss of a natural asset or wealth of a country. The assessment also noted a continual decline in the status of provisioning services of the environment, especially wild foods, timber, cotton, wood-fuel, genetic resources, and medicine. It is clear that the overall trend for plant diversity is declining.

The Global Strategy for Plant Conservation (GSPC)

The 16th International Botanical Congress in St. Louis, Missouri in 1999 called for plant conservation to be recognized as an outstanding



1 Wilson, E.O. (1992). The Diversity of Life. Penguin, London, UK. 432 pp

2 http://www.underutilized-species.org/documents/PUBLICATIONS/gfu_icuc_strategic_framework.pdf

3 Blackmore, S.; Bramwell, D.; Crane, P.;Dias, B;Given, F.,T.,Leiva, A; Morin, N.R.; Pushpangadan,P.; Raven, P.H.; Samper, C.; Sarukhan, J.,J.; Simiyu, S.;Smirnov,I; and Wyse Jackson, P.S. (2000). The Gran Canaria Declaration, BGCI, Richmond, U.K.

4 www.milleniumassessment.org

global priority in biodiversity conservation, given the continuing loss of plant diversity and the fundamental role played by plants for sustenance of human life and other biodiversity.

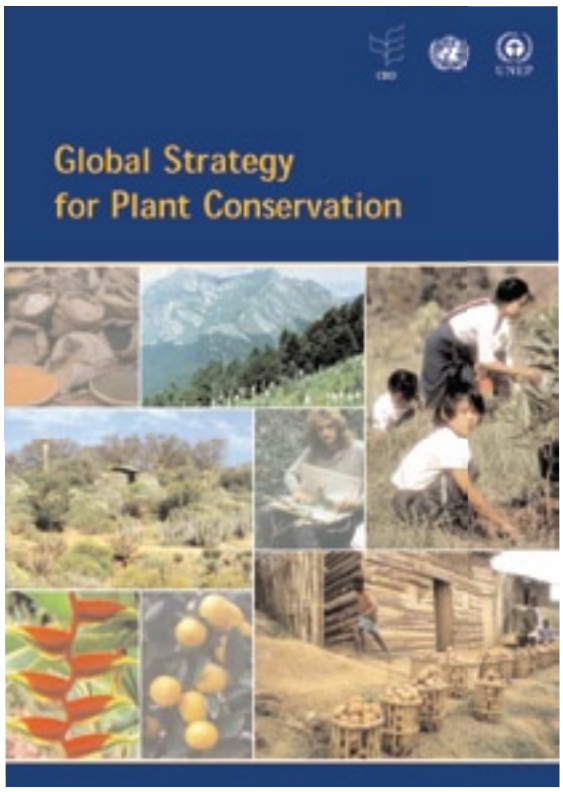
In response to this call, in 2000, Botanic Gardens Conservation International convened an *ad hoc* meeting for a group of leading botanists and conservationists representing a range of international and national organizations, institutions and other bodies from 14 countries. The outcome of this meeting was the Gran Canaria Declaration (2000), outlining the need for a global initiative to address the loss of plant diversity. As a result of this call for action, it was proposed that a Global Strategy for Plant Conservation should be developed and implemented through the framework of the Convention on Biological Diversity (CBD).

A 16 target framework was developed and adopted by the sixth meeting of the Conference of the Parties to the CBD in 2002 addressing the five themes of the GSPC:

1. Understanding and documenting plant diversity;
2. Conserving plant diversity;
3. Using plant diversity sustainably;
4. Promoting education and awareness about plant diversity; and
5. Building capacity for the conservation of plant diversity.

Since its adoption, the GSPC has been implemented throughout the world through an impressive combination of local, national and international initiatives.

This Plant Conservation Report outlines progress made from 2002 to 2008. The Report also highlights the urgent challenges and some priorities for further implementation up to 2010, as well as providing a background and rationale for further global initiatives in plant conservation beyond 2010.



Goal: "...to halt the current and continuing loss of plant biodiversity..."

One of the world's most remarkable plants, the fully underground orchid *Rhizanthella gardneri* from the Western Australian biodiversity hotspot produces a tulip-like cluster of small orchid flowers from a leafless underground plant. The GSPC has facilitated action to save this critically endangered orchid with a population size of less than 50 mature individuals as an *ex situ* collection of seed and plants as part of a major program by Kings Park and Botanic Garden aimed to secure seed and mycorrhiza of all orchids from the Western Australian biodiversity hotspot.
Photo: K. Dixon

A SUMMARY OF THE IN-DEPTH REVIEW OF THE IMPLEMENTATION OF THE STRATEGY BY THE CONFERENCE OF THE PARTIES TO THE CBD

The Global Strategy for Plant Conservation was adopted in 2002 (annex to decision VI/9) with the ultimate goal to halt the current and continuing loss of plant diversity. It includes 16 outcome targets to be met by 2010. In line with the multi-year programme of work of the Conference of the Parties up to 2010, adopted through decision VII/31, an in-depth review of the GSPC has been carried out, based on (i) information compiled from the third national reports; (ii) additional information submitted by Parties, stakeholders and partners; and (iii) input from the meeting of a liaison group convened by the Executive Secretary in collaboration with the Global Partnership for Plant Conservation, held in Glasnevin, Dublin, from 23 to 25 October 2006.

Landscape diversity securing plant diversity (Photo: PlantLife International).

The review indicates that, in line with its objectives, the Global Strategy has provided a useful framework to harmonize and bring together various initiatives and programmes in plant conservation at both the national and regional levels. The GSPC has been notably successful in stimulating the engagement of the botanical and plant conservation communities in the work of the Convention, through *inter alia* the establishment of national, regional and global networks, including in particular the Global Partnership for Plant Conservation, launched at the seventh meeting of the Conference of Parties to the Convention. The GSPC has also stimulated the development of new projects and initiatives and helped to mobilize resources for the implementation of its targets. The findings of the Millennium Ecosystem Assessment provide a further rationale for implementing the Strategy, including at the national level, with a view to securing plant resources and their provisioning services and allowing communities to continue to derive benefits from plant diversity, for example, food, medicines, fuel, fibre, wood and other uses. In addition, the context of national implementation of the GSPC provides opportunities to address the Millennium Development Goals especially by seeking to reduce poverty (Goal 1), combat diseases (Goal 6) and promote environmental sustainability (Goal 7).

Efforts are being made to facilitate national implementation of the Strategy, including through the development of national strategies and targets, and/or the integration of the GSPC targets into national plans, programmes and strategies including the national biodiversity strategies and action plans (in response to decision VI/9, paragraphs 3 and 4). Currently however, less than 10% of Parties have developed national strategies and/or targets, or incorporated these into their national biodiversity strategies and action plans.

Constraints to the national implementation of the Strategy include limited institutional integration, lack of mainstreaming, and inadequate policies and legal frameworks at the planning stage; and at the operational level, lack of data, tools and technologies, limited sectoral collaboration and coordination, as well as limited financial and human resources. The review indicates also that further implementation of the Global Strategy should include considerations related to: (i) climate change, a driver of biodiversity loss increasing in intensity in recent years; and (ii) the impacts of nutrient loading on plant diversity.

With the key challenges for plant conservation identified, it should now be possible to focus on enhanced implementation of the Strategy up to and beyond 2010. This should include reaching beyond the botanical and conservation communities to address the wider impacts on plant diversity from agriculture and climate change, integrate the Strategy into poverty reduction initiatives and development strategies, and consider the ways in which the Strategy can be developed beyond 2010 (see Annex 1 of SBSTTA recommendation XII/2 on the in-depth review of the Strategy in 2007).

Left: Habitat destruction leading to loss of plant diversity (Photo: Peter Wyse Jackson). Right: Change in land use affecting plant diversity (Photo: Christopher Willis).

PROGRESS IN THE NATIONAL AND REGIONAL IMPLEMENTATION OF THE GLOBAL STRATEGY FOR PLANT CONSERVATION

Information on the implementation of the Strategy at the national level is based on information provided by the national focal points for the Convention and for the Global Strategy for Plant Conservation, reports on the establishment and implementation of national and regional strategies, and responses to the third national reports.

A. National reports

In response to paragraph 10 of decision VII/10, the targets of the Strategy were integrated into the format of the third national reports under Article 26 of the Convention on Biological Diversity. To date, only one out of three Parties has set one or more national targets corresponding to the global targets and integrated these into relevant, plans programmes and strategies.

Workshop to facilitate preparation of the Fourth National Reports (Photos: SCBD).

Less than 10% of Parties reported having set national targets, baselines, milestones and indicators related to the Strategy. This makes it difficult to analyse and consolidate the information provided into a global status report on the progress in implementation of the Strategy.

Most Parties mentioned activities being undertaken at national level that were of relevance to the targets of the Strategy but did not provide a precise indication of the status of implementation of those activities in terms of specific indicators and milestones. Also, a large number of responses were qualitative in nature rather than providing quantitative indications.

For all targets, the main constraints were: technical (lack of data, tools and technologies), financial (limited funding available), institutional (poor sectoral coordination and limited institutional capacity and capability) and regulatory (lack of appropriate supporting policies and legal framework).

B. National focal points for the GSPC

At its seventh meeting, the Conference of the Parties encouraged Parties to nominate focal points for the Strategy, or to designate them from among the existing focal points (decision VII/10, para. 6) so as to facilitate national implementation of the Strategy.[5] To date, 71 Parties have nominated national focal points for the Strategy. These national focal points have played a key role in building awareness on the need for national strategies and targets. They have also been instrumental in bringing together various stakeholders through national workshops and consultations to establish national baselines in plant conservation and sustainable use and in facilitating the development of national responses to the Strategy. Some of them have participated in liaison group meetings related to the Strategy, as well as other regional and international meetings and presented their national experiences and

5 http://www.cbd.int/doc/lists/nfp-cbd-gspc.pdf

challenges, including at the first meeting of the Global Partnership for Plant Conservation held in Dublin, Ireland.[6]

C. National and regional strategies

In accordance with paragraph 4 of decision VI/9, various countries have developed national and/or regional targets and developed national Strategies, using the global targets as a flexible framework. These include China[7], Ireland[8], the Philippines, Seychelles[9] and the United Kingdom of Great Britain and Northern Ireland[10]. South Africa[11] has developed a national response that provides a status report on the national implementation of the Strategy and a summary of actions required to achieve the targets by 2010. Colombia has developed a National Plant Conservation Strategy that pre-dates the GSPC.

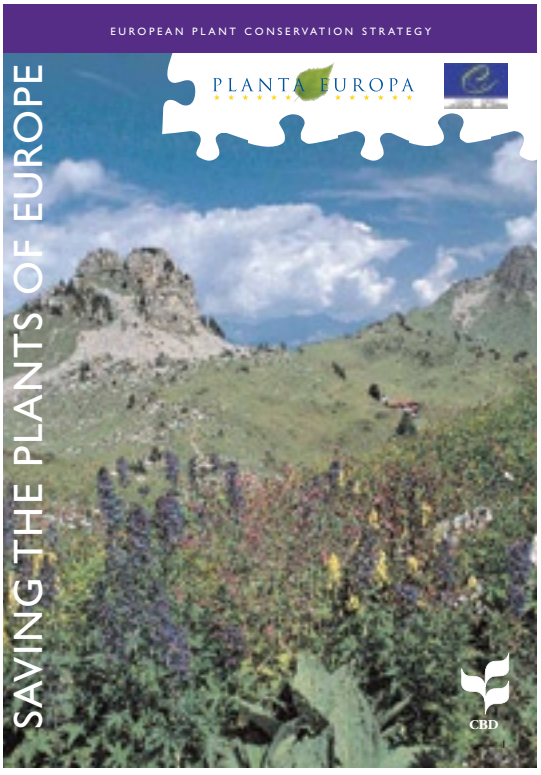
In Germany, Honduras, Malaysia, Mexico and Spain, initiatives aimed at developing national strategies are underway. Germany has integrated most of the GSPC targets in the National Strategy on Biological Diversity.

Brazil[12] has developed a set of national targets on the basis of the global targets for the Strategy and the sub-targets contained in the Convention's framework for the assessment of progress towards the 2010 biodiversity targets. While the initial response to the development of national and/or regional strategies by Parties has been slow, there is now growing momentum using various approaches including national workshops and consultations. In some countries, such as the United Kingdom, the global targets have been adopted in the national context, whereas in others, e.g. Seychelles and Brazil, they have been viewed as a flexible framework from which national targets have been developed. There are now valuable experiences at national and regional level that could be used as models for the development of national strategies and targets. These experiences will be included in the toolkit requested in paragraph 7 of decision VII/10 to further enhance the development of national targets and strategies.

At a regional level, the targets adopted as part of the European Plant Conservation Strategy[13] have been harmonized with the Strategy during its mid-term review in 2004.

The final review in 2007 provided an insight into the progress, challenges and opportunities for implementation of the Strategy at the regional level. As a result, a new Strategy for the period 2008-2014 has been developed[14] and launched at the ninth Conference of the Parties to the Convention on Biological Diversity.

Other initiatives, which have focused on developing regional strategies and/or responses, include the IUCN-Species Survival Commission's Arabian Plant Specialist Group, which held two regional meetings to explore the potential for an Arabian Regional Plant Conservation Strategy (in 2004 and 2005) and the XIII[th] Latin American Botanical Congress, which reviewed potential opportunities for regional and/or national responses to the Strategy[15] .



6 http://www.botanicgardens.ie/news/20051027.htm
7 http://english.cas.cn/eng2003/news/detailnewsb.asp?infono=27039
8 http://www.botanicgardens.ie/gspc/gspc.htm
9 http://www.botanicgardens.ie/gspc/gspc.htm
10 http://www.plantlife.org.uk/uk/plantlife-saving-species-global-strategy-PDCC2006.html
11 http://www.sanbi.org/biodivseries/1strategyplantcons.htm
12 http://www.mma.gov.br/index.php?ido=conteudo.monta&idEstrutura=72&idMenu=2337
13 http://www.plantlife.org.uk/international/plantlife-policies-strategies-epcs.html
14 http://www.plantaeuropa.org/
15 http://www.botanica-alb.org/

Non-governmental partners have also been active in enhancing national, regional and global implementation of the Strategy. For example, targets based on the Strategy have been developed as part of the International Agenda for Botanic Gardens[16] , the African Botanic Gardens Network[17] , the North American Botanic Gardens Strategy for Plant Conservation [18] , the Canadian Botanical Conservation Network [19], the Australian Network for Plant Conservation[20], the New Zealand Plant Conservation Network[21] , Centre for Plant Conservation (United States of America)[22] , the Brazilian Botanic Gardens Action Plan, and the Association of Botanic Gardens in German-speaking countries, among others.

The Executive Secretary in collaboration with members of the Global Partnership for Plant Conservation, assisted Parties, in particular developing country Parties, in the development of their national targets and strategies, by organizing a number of training and capacity-building activities, including the African Regional Expert Training Course on the implementation of the Strategy (2004), the Caribbean Regional Workshop on the Strategy (April 2006), the Global Leadership in Plant Conservation Workshop in China (November 2006) and the Asian Regional Workshop on the Strategy (April 2007). In addition, the Global Partnership for Plant Conservation organized the Plants 2010 Conference in Dublin, Ireland, from 22 to 25 October 2005, whose focus was to strengthen national implementation of the Strategy[23] .

Field trip (above) and training led by Stella Simiyu (below) in a plant conservation workshop in Montserrat (Photos: Colin Clubbe, RBG Kew).

The Caribbean Regional GSPC training workshop in Montserrat hosted by the CBD Secretariat, Botanic Gardens Conservation International, the Joint Nature Conservation Committee and Royal Botanic Gardens Kew with support from the Department for Environment, Food, and Rural Affairs, UK (Photo: M. Hamilton, RBG Kew).

16 http://www.bgci.org/ourwork/international_agenda/
17 http://www.bgci.org/africa/abgn
18 http://www.azh.org/Conservation/NorthAmericanBotanicGardenStrategy2006.pdf
19 http://www.rbg.ca/cbcn/
20 http://www.anbg.gov.au/anpc
21 http://www.nzpcn.org.nz/
22 http://www.centerforplantconservation.org/
23 http://www.plants2010.org

TARGET 1:

A WIDELY ACCESSIBLE WORKING LIST OF KNOWN PLANT SPECIES, AS A STEP TOWARDS A COMPLETE WORLD FLORA

Introduction

A working-list of known plant species is essential for biodiversity management. It is an inventory of resources and a means of organizing information in a logical and retrievable way. It also helps prevent duplication of effort and accidental oversight when planning conservation action. The name of a plant is the key to information about its uses, conservation status, relationships and place within ecosystems. Most plants have more than one name. The target seeks to link the accepted Latin name for a particular species to all its other names (synonyms). The accepted name is a unique identifier for species without which it is impossible to find the information necessary to plan and manage the conservation and sustainable use of plants, and understand their role in ecosystems. Thus a working list of known plant species has a very broad range of potential users.

RBG Kew Herbarium, UK (Photo: RBG Kew).

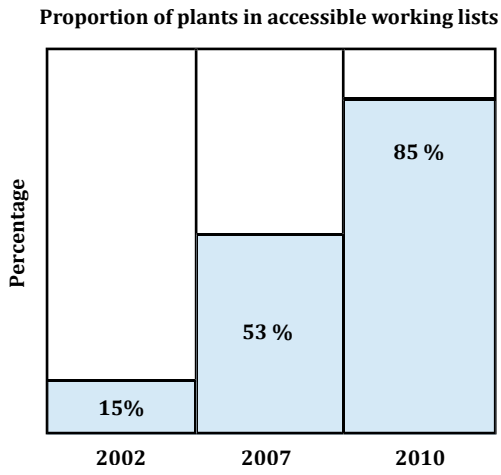
Taking a medicinal plant example, in a recent study of the medicinal uses of the genus *Plectranthus*, the five most used species are referred to using a name other than the current accepted name in 80% of literature citations. The medicinal uses of the plants within this genus can never be effectively studied without an adequately referenced synonymized list.

Completing or even measuring progress towards the other 15 targets of the GSPC is extremely difficult or impossible in the absence of a working list of the accepted names of known plant species. For example, Target 2, "to measure and achieve a preliminary assessment of the conservation status of all known plant species", can be tackled on the basis of current knowledge, but a comprehensive assessment cannot be achieved without a backbone list of those species to be assessed. Likewise, Target 7, "to conserve 60 % of the world's threatened species *in situ* ", and Target 8, "to conserve 60 % of threatened plant species in accessible *ex situ* collections", also depend on having a correct and accurate list of accepted names and their synonyms as a robust baseline.

Plecranthus sp., a widely used medicinal plants (Photo: SCBD).

Progress

Globally, good progress has been made with working lists for just over half of all plants available on the Internet, as shown in the figure below.



Working lists for mosses, ferns and gymnosperms are close to completion, and working lists exist for about half of the 370,000 flowering plants. At current rate of progress, the target will be around 85% complete by 2010. However, there is a chance of complete coverage by the end of 2010 by making use of existing resources such as the International Plant Names Index and TROPICOS.

Benin Flora

In 2006 Benin became the first West-African country to have an up-to-date list of flora in its official language. By means of this book, Benin's various endangered ecosystems can be researched, described and managed more effectively.

Several large botanical institutions are engaged in synthesizing global working lists from existing sources. In recent years, developments by the Species 2000 & ITIS Catalogue of Life Partnership (CoL) and Global Biodiversity Information Facility (GBIF) have done much to provide the technological means for serving the content of a widely accessible list of known species via the Internet from a variety of sources[24].

The shortage of taxonomic skills remains a barrier to effective implementation of the Convention. There are also various large regional flora projects that provide useful baselines and, through large botanical institutes with a regional or global outlook, have become an important mechanism for stimulating the production of regional checklists, such as the African Plants Initiative, which brings together over 50 institutions.

Production of working lists of known plants is greatly facilitated by increasing access to botanical literature and to herbarium type specimens. Several countries have produced national inventories of their floras. The main constraints continue to be lack of funds, limited investment in taxonomy, lack of institutional capacity, lack of legislative framework, lack of taxonomists/ experts and poorly maintained collections.

Future

The large majority of plant families for which there is no working list available are either cosmopolitan or pan-tropical in distribution. However, progress to date suggests that neither broad distribution nor large numbers of species in a family are insurmountable problems in compiling working lists. Such lists have already been compiled for eight of the ten largest and most widely distributed families such as orchids and grasses.

The Chinese Virtual Herbarium

This provides immediate on-line access to the wealth of data associated with several million plant specimens maintained in Chinese herbaria and related botanical databases. http://www.cvh.org.cn/

24 www.catalogueoflife.org; and www.gbif.org

TARGET 2:

A PRELIMINARY ASSESSMENT OF THE CONSERVATION STATUS OF ALL KNOWN PLANT SPECIES, AT NATIONAL, REGIONAL AND INTERNATIONAL LEVELS

Introduction

An assessment of which species are threatened allows resources for species conservation to be prioritized. However, despite the importance of this target, presently, only a small fraction of plant species has been assessed in a globally comparable way.

This is the only target in the Strategy that is explicitly designed to include national and regional components in addition to a global assessment. The global target is imperative, but the need for national and regional assessments will need to be considered according to national priorities and capacities. The global assessment can provide context for all national prioritizations, whilst national and regional assessments can be more focussed on providing input to legislation and on specific species groups of concern.

There are clear economic arguments for target implementation, and these go beyond providing a prioritization of resources. National assessments can focus on threats to traded species and other species of socio-economic importance, such as crop wild relatives and medicinal and aromatic plants. Livelihoods are dependent on all three levels of biodiversity: ecosystems, species, and genetic diversity. Impoverishment of ecosystems as a consequence of gradual threats to the component species and genetic diversity, can affect local livelihoods to the same degree as the global extinction of species.

The dominant method for assessment, particularly at global level, has been the IUCN Red List process. However, it is unlikely that the target can be reached using this process alone, and hence it should be stressed that it is a preliminary assessment that is called for, and that this need not be a full Red List assessment.

Prunus africana, *now listed as Vulnerable because of its wide medicinal use (Photo: SCBD).*

Plant assessments on the IUCN Red List of Threatened Species

Progress has been made in increasing the number of plant assessments on the IUCN Red List: all known cycad species have now been assessed, and there is also complete coverage of the conifers.

In 2003, 1,164 plant species from Ecuador were included in the Red List of which 813 were threatened. Ecuador is extremely important for plant conservation, with four highly diverse regions - the Galapagos archipelago, the coastal lowlands, the Andes, and the Amazon - all squeezed into an area the size of Italy. Cycads, the oldest seed plants on Earth, are now also amongst the most threatened plants. Two species are categorized as Extinct in the Wild, and there are likely to be more. Again, in 2003, 303 cycads were evaluated and 155 of them (more than 50%) were categorized as Threatened. Botanists were excited by the discovery of a new conifer, *Xanthocyparis vietnamensis*, in Vietnam in 2001, but the species has been assessed as Endangered based on its restricted range and ongoing deforestation in the area. www.iucnredlist.org

In the last decade there has been a gradual increase in the number of species included in the IUCN Red List at a global level. However, given an estimate of approximately 370,000 flowering plants, the global assessments still only include 3-4% of plant species. More encouraging progress has occurred at a national level. During the consultation on this target, 52% of countries indicated that they had completed some form of Red List assessment. This figure is known to have increased since the consultation, and would be even greater if assessments other than Red Lists were included. It is not known how comprehensive some of these national assessments have been, which makes it of considerable concern that a full global assessment is lacking to provide context to these national priorities. In response to the need for a more rapid

global process focussed on providing a preliminary assessment, IUCN has developed a new method named 'RapidList' (see end of Target 3 for further details).This method was developed specifically as a response to the need articulated by the GSPC, and can be regarded as a significant achievement for the Strategy. The new method and free online tool was launched in 2007, and hence progress towards the target cannot yet be measured, but it will hopefully encourage a rapid acceleration in preliminary and full assessments towards 2010.

Another major contribution will be the Sampled Red List Index project, which will produce 1,500 full IUCN Red List assessments for each major plant group: bryophytes, pteridophytes, gymnosperms, monocots and dicots. For gymnosperms there are fewer than 1,500 taxa, so in total around 7,000 assessments will be added by 2010.

Full IUCN Red Listing remains a popular approach to target implementation due to its high public profile; target outputs lend themselves to public awareness campaigns as a part of Target 14, and there have been significant achievements in raising awareness of threatened species. There has also been progress in increasing capacity for making assessments, with a number of training initiatives worldwide, as a part of implementing Target 15. Fieldwork and taxonomic publications are also more focused on making status assessments than they were prior to the Strategy being adopted.

Major constraints include lack of funding for field work and assessment activities leading to *inter alia* insufficient research and data; lack of experts taxonomists/plant experts; limited collaboration; incomplete taxonomic knowledge of some families; limited herbarium and *ex situ* facilities, and lack of an active global or regional assessment initiative for vascular plants.

Future

It will remain important for Parties and the global community to be able to prioritize the resourcing of species conservation. Sustainable development requires that species are not being threatened by over-exploitation and trade, and this requires a method for assessing threat. It is clear that an accelerated rate of global assessment is urgently needed if we are to come close to achieving this target by 2010. The new RapidList method, being offered by IUCN as a complementary tool to the full IUCN Red List approach, may help in achieving this acceleration. Climate change will increase the threats posed to species, and we will need to greatly improve data accessibility and analysis methods if we are to cope with the challenges it poses.

Assessing magnolias

Some two thirds of known magnolia species are found in Asia, with over 40% occurring in southern China. Popular as ornamental plants in gardens around the world, magnolias in the wild are a source of timber, food and medicines for local communities. The evaluation of the conservation status of the Magnoliaceae, using the IUCN Red List categories and criteria was carried out by a group of experts brought together by the IUCN/SSC Global Trees Specialist Group. The evaluation was based on the analysis of distribution data for each species compiled from various sources.

Underpinning the report was a comprehensive mapping exercise, which now provides an excellent baseline for future monitoring and conservation planning. The Red List identified 131 wild magnolias as being in danger of extinction, from a global total of 245 species.

South Africa's Red Data List for Plants

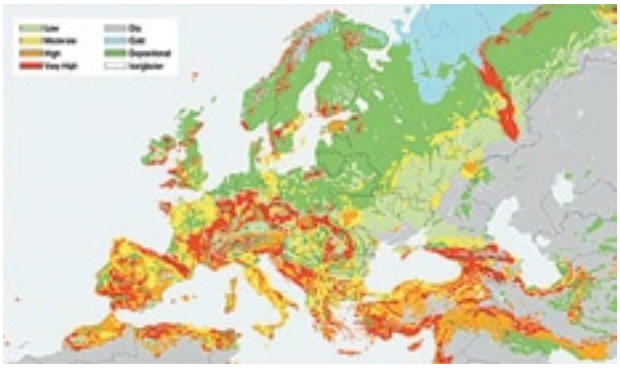
The South African National Biodiversity Institute has recently completed assessing the conservation status for all 20,456 plant taxa that occur in South Africa. The listing process is complete and has resulted in an addition of 6% of the world's flora having been assessed, bringing the portion of plants assessed globally to over 10%.

TARGET 3:

DEVELOPMENT OF MODELS WITH PROTOCOLS FOR PLANT CONSERVATION AND SUSTAINABLE USE, BASED ON RESEARCH AND PRACTICAL EXPERIENCE

Introduction

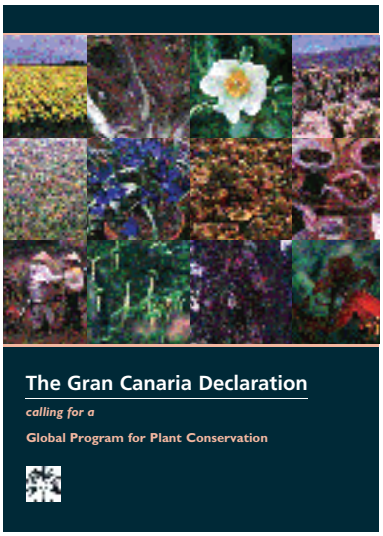
The aim of this target is to enhance the development of tools and protocols relevant to all aspects of plant conservation, but with an emphasis on those that have been tested, are based on research and experience, and optimized for use by plant conservation practitioners. While this may focus on optimizing existing tools and adapting them to local needs, improved access to such tools is also pivotal to this target.



Soil erosion in Europe (www.worldmapper.org)

Progress

Various protocols, tools and technologies linked to the achievement of the Strategy targets have been highlighted in the national reports. Examples include: tools and technologies for *in vitro* propagation (Algeria), recovery planning and threat abatement (Austria and Australia), translocation of threatened species (Australia), greening using native seed (Australia), propagation and harvesting protocols (Chile), implementation of the ecosystem approach (Germany), species action plans taking into consideration various national and international conventions and legislation (Hungary), designation of Important Plant Areas (IPAs) (Belarus, Romania and Slovenia), *ex situ* and *in situ* conservation (Colombia, Chile, China, India, Indonesia and Iran), forest tree breeding (Japan), GIS-based conservation models and permanent ecological plots (Malawi), sustainable forest management models (Malaysia), and sustainable use models in community forest and pro-poor leasehold forests (Nepal). Other tools and protocols include primordial botanic gardens and grand forest parks (Indonesia), wild relatives projects and integrated management of cedar forests (Lebanon), medicinal and useful plants (Nepal), conservation of threatened species (Philippines), propagation and cultivation of South African threatened species (South Africa), special use forests (Viet Nam), economic valuation of forests (Malaysia) and eco-agriculture and sustainable tourism (China). Many international agencies also have tools and protocols related to various targets such as Bioversity International for Targets 1, 2, 8, 9, 13, 14 and 15; Botanic Gardens Conservation



International for Targets 1, 2, 7, 8, 9, 10, 13 and 14; the Food and Agriculture Organization of the United Nations for Targets 6, 8, 9, 12, 13, 14 and 15; the Global Invasive Species Programme for Target 10; IUCN for Targets 2, 4, 5, 7, 10, 11, and 16; and Plantlife International for Targets 5 and 15.

Future

The in-depth review of the GSPC noted that the main gap for this target is access to, and dissemination of information on the existing tools and protocols in appropriate formats. It is therefore critical that a means for disseminating such tools and protocols is developed. A useful option will be collation of these in the toolkit to be developed by the CBD Secretariat and as part of both the CBD and GPPC websites.

RapidList: A new tool for preliminary assessments of the conservation status of plant species

Target 2 calls for: A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels. Given that there are at least 370,000 vascular plant species in the world, achieving this target will be extremely challenging. IUCN has provided a new methodology and accompanying tool to conduct preliminary assessments.

Preliminary assessments can prioritize species for full assessments, directly inform further conservation work, or help in the achievements of other GSPC targets, especially Target 5. A user should conduct a preliminary assessment when:

- There is insufficient data for full biodiversity assessments;
- There are situations/ regions where resources are insufficient for full assessments;
- Prioritising resource allocation for full assessments; and/or
- A list of likely threatened species is required urgently.

Tools and Protocols

IUCN's RapidList, a free web-based tool, is now available for use by any plant conservationist who would like to conduct preliminary assessments of plant species. RapidList is an online software application that asks the user a series of questions based on the IUCN Red List Categories and Criteria (Version 3.1) and quickly classifies the species into one of three categories: likely threatened, likely not threatened, or data deficient. With minimal data, it can take an assessor just a few minutes to obtain a preliminary assessment. It can be used at national, regional or global scale.

Preliminary assessments using RapidList are based on the global gold standard of the IUCN Red List, facilitating a robust preliminary overview of the conservation status of all plants through a standardized and manageable process. Categories and criteria, allow the conservation status of all plants to be assessed through standardized, manageable criteria. Plant experts, especially in developing countries, are increasingly unable to cope with the resource-intensive process of Red Listing; RapidList offers a complementary and in some cases alternative method to assess the status of plants.

RapidList is available online for anyone to use as best suits their needs; users can store and manipulate their data in their secure online space. IUCN will not collect or store preliminary assessments generated through this tool but will continue to consult RapidList users for any consultation on reporting progress towards Target 2.

RapidList is *not* a replacement or quick method for full biodiversity assessments, it is designed to help conservationists gain a preliminary overview of the conservation status of species where full assessments are not possible, and in some cases to prioritize species for full assessment work. RapidList and full IUCN Red List tools are available at: www.iucnsis.org

IUCN RapidList Consultation Workshop in East Africa, Nairobi (Photo: JRS Project BGCI/NMK).

Ex situ *conservation collections of threatened species— Durban Botanical Gardens (Photo: Christopher Willis).*

TARGET 4:

AT LEAST 10% OF EACH OF THE WORLD'S ECOLOGICAL REGIONS EFFECTIVELY CONSERVED

Introduction

The protection of ecological regions is one of the principal means for the conservation of biological diversity. This target calls for the identification of each of the world's ecological regions, and the conservation of at least 10% of its area. This is particularly important as it treats plant conservation within the context of the protection of communities, rather than individual habitats, sites or species.

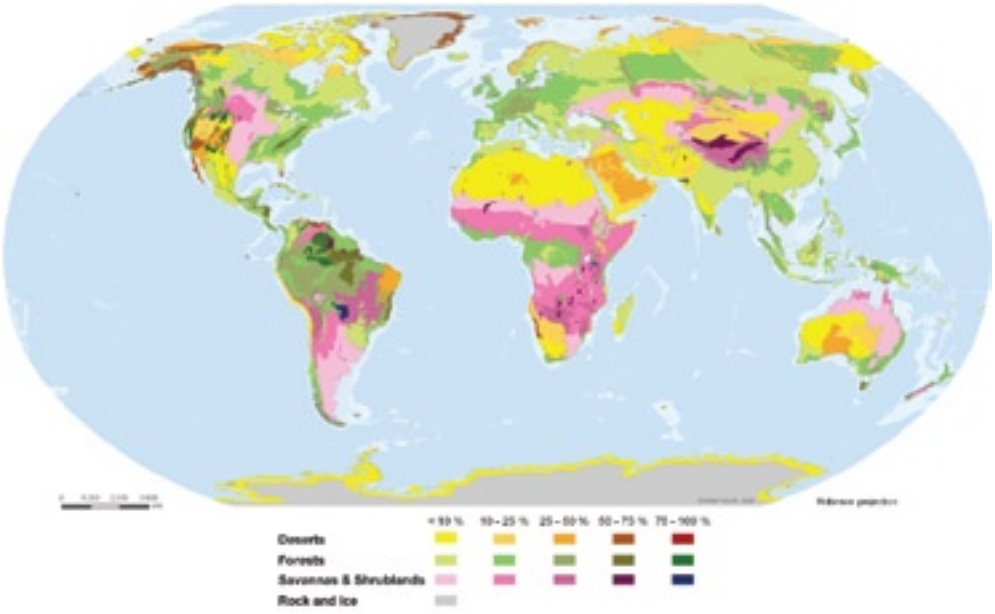
Target 4 is clearly related to Target 5; that of having the protection of 50% of the most important areas of plant diversity assured. The protection of plant diversity through the conservation of ecological regions also provides an element of mainstreaming for plant conservation, and a ready linkage to ecological planning and monitoring. Furthermore, achievement of Target 4 would be a substantial contribution to the 2010 Biodiversity Target, "to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth."

The planning required to identify and protect ecological regions has to be based on objective classification of the regions themselves, through well-established procedures using both abiotic and biotic factors that delineate ecologically distinct regions. Protecting ecological regions also requires working with multiple jurisdictions and levels of government as well as the appropriate management across ecological scales, as eco-region boundaries do not necessarily follow administrative or political boundaries.

Effective protection of 10% of ecological regions would be of direct assistance in protecting migratory and dispersal routes of threatened taxa by extending protection to habitats and ecosystems within regions. A regional approach ensures that habitats with important ecological functions such as grasslands, wetlands and others are protected. It can also assist in the identification of overlooked ecosystems through gap analyses.

Progress

According to the World Database on Protected Areas[25] , maintained by UNEP-WCMC, the current estimate for coverage of the global network of protected areas is that at present it includes 11.6% of the Earth's land surface, totalling 19 million square kilometres, within 106,926 areas. The degree to which protection is effective, and actually represents each ecological region, is uncertain.



Source: UNEP-WCMC, 2008.

Regional processes such as Natura 2000, the Habitats Directive of the European Union and the Emerald Network, provide good frameworks for implementing this target at national level in Europe. Some countries have set national targets, e.g. Canada, China and Thailand, while Ireland and Netherlands indicate having already achieved this target at the national level. The achievement of this target is dependent upon countries being able to identify and find resources with which to

25 http://www.wdpa.org

Protected areas network in Canada

In Canada, protection of representative portions of ecological regions is an established priority, and includes incorporation of national and global targets. The protected areas system in Canada includes both terrestrial and marine protected areas. The Federal Government administers the formal system including about 3,500 areas, 800 of which are larger than 1,000 ha. The national parks system in Canada is dedicated to the restoration and recovery of natural habitats. Individual parks range in size from 900 ha to almost 4,500,000 ha. Together, federal, provincial and territorial governments have designated about 9% of the area of Canada as "protected". By ecoregion, the average varies from over 90% of some ecoregions to none in others. Protected areas include wilderness and conservation areas, forest and wildlife reserves, and parks designated through legislation at the federal, provincial and territorial levels. In addition to protection through legislation, lands are being conserved through measures that provide tax incentives for donating lands for conservation purposes to authorized management agencies. The network of protected areas administered by Environment Canada now totals over 11 million hectares of terrestrial habitat, or an area twice the size of the province of Nova Scotia. The system is made up of three main components: National Wildlife Areas (51 sites), Migratory Bird Sanctuaries (92 sites) and Marine Wildlife Areas (1 proposed). Marine Wildlife Areas and Migratory Bird Sanctuaries protect approximately 1.5 million ha of aquatic habitats.

protect - or even acquire - land. As such, conflicts can arise between conservation and other land use needs, and between conservation and economic development. Operationally, there is often a lack of a nationally agreed framework including a lack of indicators for monitoring the effectiveness of protection. Conflicts can be made worse by a lack of compensation mechanisms. Many areas set aside for plant conservation are small in size (1,000-10,000 ha), often representing remaining fragments that, although valuable, may be inadequate for maintaining large-scale processes. There are also evident gaps in coverage of existing protected area networks.

Future

The risks posed by climate change increase the importance of effective conservation of ecological regions. Currently there is uncertainty as to how the 10% level of this target relates to the conservation of either species-rich hotspots or areas of high threat or endemism, as these are not always correlated. Ensuring that all ecological regions are represented within protected areas will require further research and modelling in the face of climate change, in addition to overcoming resource limitations and potential or actual conflicts. Modelling, especially of climate change scenarios, may generate valuable understanding of the value of this target in the future. An assessment of the ecological regions that are most at risk due to current and projected climate change trends might suggest that the conservation of 10% of ecological regions could be too small a threshold to prevent further extinctions.

Biodiversity in an urban environment

Singapore's first green roof, the 'Green Pavilion' in the Botany Centre of Singapore Botanic Gardens.

Singapore was once an island covered with dense natural vegetation, however rapid industrialization and urbanization have almost completely eradicated the natural ecosystems. The Singapore Botanic Gardens has a small tropical rainforest, of around six hectares in size, which is older than the gardens itself. The Botanic Gardens' rainforest and its bigger cousin at Bukit Timah Nature Reserve are located well within the Singapore's city limits. Singapore is one of the only two major cities with a tropical rainforest within its city limits - the other is Rio de Janeiro's Tijuca Forest. Threatened species in Singapore cannot be managed just in protected areas. They must be conserved in regional and neighbourhood parks in which both recreation and conservation are priority uses. Species that are rare are propagated in the nurseries and planted out in the appropriate natural sites as well as in the parks and on roadsides.

TARGET 5:

PROTECTION OF 50 % OF THE MOST IMPORTANT AREAS FOR PLANT DIVERSITY ASSURED

Introduction

This target aims to improve site-based protection of the most important plants and plant habitats around the world. 'Protection' encompasses both legal protection mechanisms and other on-the-ground conservation activities as they are both required to effectively safeguard important sites for plant diversity.

The importance of maintaining prime biodiversity sites has long been recognized. Intact natural areas provide a range of valuable ecosystem services, and reducing habitat fragmentation allows plant populations to build resilience by facilitating exchange of pollen/seed, thus maintaining diverse gene pools and diverse plant resources for the future. These flagship sites also have intrinsic value, often with deep cultural resonance for citizens at national and local scales. Despite all the uncertainties for biodiversity inherent within climate change scenarios, it is certain that existing areas of high plant diversity are, and will remain, important as both refuges and resources, and these areas will be the building blocks for future mitigation measures against biodiversity loss.

Progress

Significant progress has been made with Target 5. Over 10% of the Earth's surface is now officially classed as protected areas. This, however, is not a measure of either the effectiveness of the protection or the quality of conservation. The Important Plant Areas (IPAs) programme methodology, an approach widely used to address this target, aims to conserve the best areas for plants around the world. Sites are identified using standard criteria and their conservation is promoted through various mechanisms, not just formal protection. Community-based conservation, with an emphasis on delivering sustainable livelihoods from plant resources, is recognized as one of the most effective approaches to plant conservation in IPAs.

To date sixty-nine countries from all continents, have participated in Important Plant Area (IPA) initiatives[26] that contribute to Target 5. More than 50% of these countries have taken steps to identify important plant sites and at least 24% (17 countries) have ongoing programmes that are addressing conservation issues as well as documenting sites. For example China has designated 14 IPAs, and established 418 nature reserves accounting for 24.19% of the area of IPAs Many national projects have been initiated as a result of regional workshops: in Central and East Europe, the Mediterranean, the Himalayas, the Caribbean, the Arab region, south-east Asia, southern Africa and the UK overseas territories. Some IPAs are within officially protected areas (in Europe this is approximately 66%) though the percentage of IPAs protected does not necessarily mean the site is maintained in good condition. What is urgently needed in many countries, are the resources to develop conservation methodologies on the ground, which will provide successful plant conservation tools and protocols.

It is essential that these actions to conserve plants on the ground (a 3-5 year timeframe) are undertaken alongside the actions aimed at integrating the conservation of plants into policy, legislative and institutional frameworks (a 10-20 year timeframe), to ensure sustained results for this target.

Future

The conservation of important areas for plant diversity remains a core element of plant conservation activities in all countries as a basis for the provision of ecosystem services

26 http://www.plantlife-ipa.org/reports.asp

and maintaining the diversity that supports sustainable livelihoods. Formal protection of these sites alone, though critically important, will not result in safeguarding the diversity on important areas for plants. Affecting change in policy, legislation and institutional frameworks (required by this target) is a long-term process, but to be successful in conserving plant diversity, this target must be driven by on-the-ground conservation. Community-based conservation that works to improve livelihoods, healthcare and quality of life, is proving the most effective way of implementing this target in many areas of the world.

Climate change considerations imply that there are many uncertainties in future patterns of plant diversity. Whether mitigation measures to maintain biodiversity focus on building resilience within plant populations (by filling gaps near/within existing areas) or increasing landscape permeability (creation of wildlife corridors), existing important areas for plant diversity will remain a cornerstone of conservation in any climate change scenario. The Gran Canaria Declaration II on Climate Change and Plant Conservation (April 2006) recognized that the development of national networks of areas that are important for plants provide the basis for *in situ* conservation matrices. These matrices, that incorporate sites and corridors in the wider landscape, will provide a mechanism to help protect plant diversity from the effects of climate change.

Working with local communities to prioritize Important Plant Areas (IPAs) for medicinal plants in the Himalayas (Photo: Plant Life International).

The conservation of the IPAs for medicinal plants in the Himalayas

In 2006, fifty-three IPAs for medicinal plants (sites of international significance for conservation recognized at national level) were identified across the Himalayas by organizations in Bhutan, China, India, Nepal, and Pakistan in a regional project with Plantlife International. Larger IPAs were identified according to criteria with a significant number of smaller sites at local level, often nested within them. IPAs were found to be useful for landscape planning and conservation monitoring, based on the gross geography of the Himalayan IPA network. Protected area networks in the region should be reviewed to ensure they have good coverage on the east-west and altitudinal axes. Involving local communities was found to be fundamental to conserving medicinal plants at the local level and projects continue to be developed on these sites involving all stakeholders (traditional doctors, cultural leaders and industry) to facilitate IPA conservation.

Medicinal plant cultivation in the Himalayas (Photo: Plant Life International).

TARGET 6 :

AT LEAST 30 % OF PRODUCTION LANDS MANAGED CONSISTENT WITH THE CONSERVATION OF PLANT DIVERSITY

Introduction

In the context of this target, 'production lands' refer to lands where the primary purpose is agriculture (including horticulture), grazing and wood production. Diversity in a production system can be used as a resource to mediate potential stresses of the surrounding environment. For example, a crop population with a diverse genetic makeup may have a lower risk of being entirely lost to any particular stress, such as temperature extremes, droughts, floods, pests, and other environmental variables.

Furthermore, conserving and harnessing biodiversity can provide additional benefits to farmers, such as the presence of a diversity of pollinators, including bees, butterflies, humming birds and bats.

Coastal forest and the challenge of urbanization in Latin America (Photo: Peter Wyse Jackson).

This target incorporates a number of objectives, including the on-farm conservation of crop diversity (landraces, traditional varieties), the conservation of threatened wild plants growing on production lands and the prevention of impacts on plant diversity in surrounding ecosystems. Measures taken at the national level to implement this target include: use of good agriculture practices, good forestry practices and national certification schemes.

Progress

Indicators to assess progress towards the 2010 biodiversity target include the indicator on "Area of forest, agricultural and aquaculture ecosystems under sustainable management". This indicator could eventually be used as a proxy for assessing progress towards implementing Target 6 at the global level. In addition, at the 6th meeting of the United Nations Forum on Forests, four global goals on forests were agreed. Among these, goal 3 is directly relevant to this target (and to sustainable forest management) "Increase significantly the area of protected forests worldwide and the area of sustainably managed forests and increase the proportion of forest products from sustainably managed forests."

It should be noted that implementation of this target is closely linked to the programme of work on agricultural biodiversity. Noting too that sustainable management of production lands has consequences on reduction of poverty, improved livelihoods, the development of national targets linked to Target 6 will likewise enhance the achievement of Millennium Development Goals and of targets set under other multilateral agreements.

Increasingly, integrated production methods are being applied in agriculture, including integrated pest management, conservation agriculture and on-farm management of plant genetic resources. Similarly, sustainable forest management practices are being more broadly applied. The 2005 Global Forest Resources Assessment[27] showed that 11% of total forest area is designated primarily for the conservation of biological diversity while 65% of the total forest area has conservation of biodiversity as one of the designated functions.

The Forest Stewardship Council's (FSC)[28] Principles and Criteria for responsible forest management, address environmental impact of logging activities and require the maintenance of High Conservation Value Forests. FSC has certified more than 100 million hectares of forest in 70 countries, and other national forest certification schemes have been developed in over 35 countries. Although a comprehensive analysis of the overall impact of certification is lacking, positive effects on biodiversity and the increased use of reduced impact practices can be seen within individual certified forest management units. However, the main benefits of certification continue to be seen in the management of northern forests

27 http://www.fao.org/forestry/site/fra/en/
28 http://www.fsc.org/en/

and certification has been a less effective tool in tackling the crisis of forest destruction and degradation in tropical forests.

Increasing concern over the environmental impact of agriculture in Europe has led to the introduction of agri-environment schemes. These schemes compensate farmers financially for any loss of income associated with measures that aim to benefit the environment and biodiversity. There are currently agri-environment schemes in 26 out of 44 European countries. In addition, a recent study shows that over 30 million hectares are currently certified according to organic standards[29].

Over the last ten years Bioversity International has worked with institutions and farmers in eight countries on over 20 different crops to explore the maintenance of traditional varieties in crop production systems. This has resulted in the identification of many practices and policies that can support the maintenance of diversity in production lands and will provide one of the first global overviews of the maintenance of crop diversity in different countries and ecosystems.

The Food and Agriculture Organization of the United Nations helps member countries to achieve sustainable increases in production of crops and grasslands through, amongst others, the development of integrated production systems, and rational grassland management.

East African sandalwood (Osyris lanceolota) *Bushes being cultivated in mixed woodlands in Central Kenya (Photo: Peris Kamau).*

Future

One of the challenges of this target is in establishing a definition for management systems that are 'consistent with the conservation of plant diversity'. While many countries are implementing agri-environment schemes and the organic production sector is expanding rapidly, there are questions concerning the extent to which plant diversity specifications are incorporated within such schemes. It is believed that a better understanding of plant conservation needs by the agriculture and forestry sectors would help the achievement of this target.

Bioversity International and the Community

Working with the international networks on coconut and banana, Bioversity has collaborated with community-based organizations to implement poverty reduction research in a way which is consistent with this target: socio-economic factors and needs of the farmer are taken in to account in the management of their production system which maintains high levels of biological diversity. The International Coconut Network (COGENT) collaborates with community-based organizations to implement poverty reduction research in which coconut seedling nurseries are established and maintained. Seedlings of farmers' varieties selected from the local communities are propagated and planted in the communities. In 2006, over 25,000 seedlings were planted in 34 communities in 12 countries with support from COGENT project funds and in collaboration with local/national coconut planting initiatives.

The South African Biodiversity and Wine Initiative

The location of the best agricultural soils for the cultivation of table wine grapes coincides with South Africa's most threatened lowland ecosystems. These lowland ecosystems harbour large numbers of threatened and endemic plant species. The challenge is to guide the expansion of vineyards in a way that avoids further transformation of priority biodiversity areas. The Biodiversity and Wine Initiative seeks to influence environmental management within vineyards and in adjacent areas. There are two main mechanisms, one involving the stewardship by estate managers of priority biodiversity resources on these lands, and the other involving the promulgation and adoption of industry-wide guidelines and standards for land management and wine production, avoiding such negative impacts as water abstraction and pollution through runoff of agri- chemicals. The industry has now incorporated the biodiversity guidelines into their Integrated Production of Wine Guidelines and is exploring the potential marketing benefits of using the biodiversity of the Cape Floristic Region as a unique selling point for South African wine.

29 The World of Organic Agriculture: Statistics and Emerging Trends 2008 - orgprints.org/13123

TARGET 7:

SIXTY PERCENT OF THE WORLD'S THREATENED SPECIES CONSERVED IN SITU

Introduction

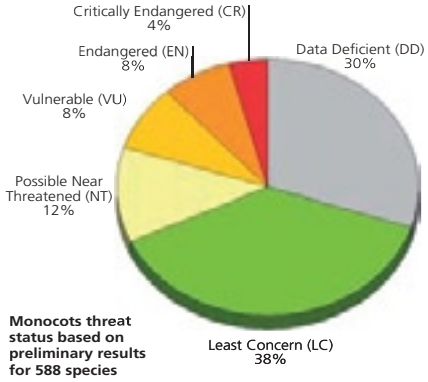
This target is concerned with conserving threatened plant species in their natural habitats. These species are those considered the most likely to become extinct, and hence achieving this target would be a major step forward in halting the loss of plant diversity. Threatened species include many medicinal plants, timber species and crop wild relatives, which are important for livelihoods.

The exact number of threatened species in the world remains to be determined through the achievement of Target 2. Among the plant groups, only the gymnosperms have a complete assessment, and one third of all gymnosperm species are considered threatened. It is not known what proportion of other plant groups is threatened. Some estimates suggest that more than one third of all plant species are currently threatened with extinction.

Conserving threatened species often requires more than the designation of protected areas although these are important. Some countries have put in place a legislative framework for conserving threatened species, in addition to designating protected areas. Threatened species need to be conserved wherever they grow, and this can include urban landscapes and production lands as well as natural and semi-natural habitats.

Conserving threatened species can pose challenges, particularly where these are found in habitats under private land ownership. However there are also important opportunities for partnerships with business.

Target 7 can be considered as the plant component of the 2010 Target 2.2: 'Status of threatened species improved'. It is also explicitly linked to the achievement of the Millennium Development Goals to ensure environmental sustainability through the use of the Red List Index as an indicator of achieving a reduction in the rate of biodiversity loss.

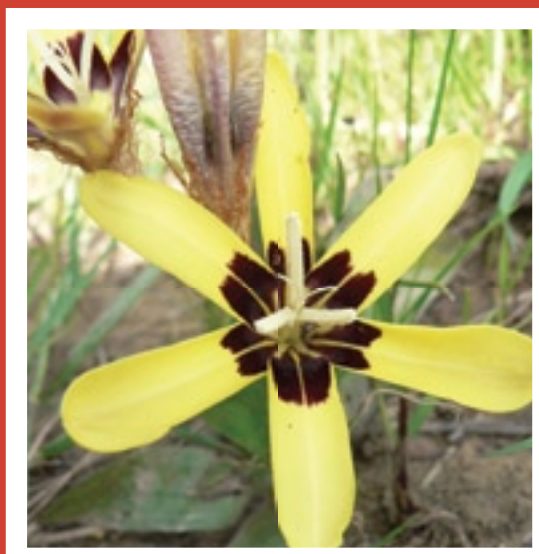


An indicator on the change of 'Status of Threatened Species'. For plants there is currently only a baseline assessment available, shown for monocots. Source: Kew Scientist April 2008

Progress

The indicator for this target is the plant part of the 2010 Indicator on the change in status of threatened species. This is measured using a Red List Index for birds, mammals, amphibians, cycads and conifers, and a Sampled Red List Index for all other species groups. Eventually the indices will show trends in the proportion of species for which the risk of going extinct increases without additional conservation interventions. The Red List Index for birds shows a continuing deterioration. Trends in other groups are less certain, but are believed to also show a continuing deterioration.

A number of countries report that protected areas have been specifically designated to protect threatened species, although it is still believed that too few protected areas include conserving plant species within their management objectives. A number of plant groups have complete status assessments published alongside action plans for their conservation, these include conifers and cycads, and these action plans will make a positive difference to the conservation of these groups.



Sparaxis maculosa*, a Critically Endangered species occurring in the Overberg region of the South WesternCape, South Africa (Photo: SANBI).*

CREW, the Custodians of Rare and Endangered Wildflowers, is a programme that involves volunteers from the public in the monitoring and conservation of South Africa's threatened plants. In so doing CREW aims to capacitate a network of volunteers from a range of socioeconomic backgrounds. The programme linksvolunteers with their local conservation agencies and particularly with local land stewardship initiatives to ensure the conservation of key sites for threatened plant species.

South Africa has a significant 2577 threatened plant species. Over 350 CREW volunteers make significant contributions to ongoing monitoring and conservation of these plant species by:

- Surveying remaining patches of natural vegetation for threatened plant populations;
- Actively adopting key sites for conservation of threatened plants;
- Working with landowners on whose land threatened plants occur;
- Conducting demographic monitoring of certain populations on an annual basis; and
- Conducting threatened plant/habitat awareness raising activities.

CREW is managed by the South African National Biodiversity Institute.

The Future

It will remain vital for the most threatened species to have conservation interventions planned explicitly to achieve their conservation. If we are to achieve the overall objective of halting the loss of plant diversity (or that of biodiversity), it will be necessary to move from conserving 60% *in situ* to the conservation of 100%. Therefore the actions underpinning this target will remain essential beyond 2010, as the current target is only a milestone towards the final objective. Climate change poses new threats to species, and new approaches to modelling plant responses will need to be developed to detect potentially threatened species. Already it is known that the projected climate space for species will change, and hence the threat to species will also change. Enhanced target implementation will be necessary both to achieve the long-term objective and to counter the new threats from climate change. It is believed that enhanced implementation will require new partnerships to be made, for instance between botanists and landowners or between protected area management authorities and botanic gardens. It is desirable that countries should develop their own measures of progress in conserving nationally threatened species.

Warburgia ugandensis *bushes in production landscapes in East Africa (Photo: National Museums of Kenya).*

TARGET 8:

SIXTY PER CENT 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

Introduction

Ex situ conservation of plants is defined as the conservation of plant diversity outside its natural habitat to safeguard identified families or individual plant species from danger or loss. It has been developed as a vital tool for plant conservation and is today integrated closely and effectively with protection of plants in their wild habitats. The increasing awareness of the effects of climate change on plant distributions *in situ* has made the appropriate application of *ex situ* techniques potentially more crucial to assist in the adaptation of species and ecosystems to changed conditions in the wild. *Ex situ* conservation involves the collection, maintenance and conservation of samples of organisms usually in the form of live whole plants, seeds, pollen, spores, vegetative propagules, tissue or cell cultures or other genetic material of growing or preserved individuals. The focus of Target 8 has been on higher plants (and other well-described groups such as Pteridophytes) for which there are already well established *ex situ* facilities and programmes operating worldwide.

Ex situ *collections of various highly threatened Mexican succulent species (Photo: Stella Simiyu).*

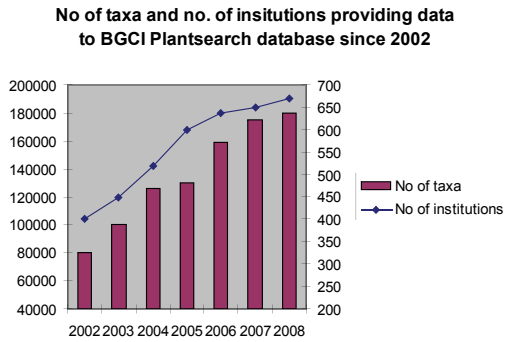
Those involved in *ex situ* conservation include botanic gardens, gene and DNA banks, agriculture and forestry bodies and a diversity of other Governmental and non-governmental organizations. *Ex situ* conservation networks operate globally and in many regions and countries (see also Target 16). The focus and emphasis of different sectors involved are varied, in botanic gardens (wild plant species) and in gene banks (crop varieties and crop wild relatives). The scale of *ex situ* conservation efforts also varies greatly with some institutions and organizations conserving tens of thousands of accessions, while others focus on just a few priority species, often from their own region.

Ex situ *conservation of threatened caatinga species at the Jardim Botânico de Belo Horizonte, Minas Gerais, Brazil (Photo: Peter Wyse Jackson).*

Target 8 does not specify to what extent *ex situ* collections of a particular species should be representative of the genetic diversity of that species to be regarded as conserved *ex situ.* In practice however there is little information available on whether most existing *ex situ* collections are genetically representative or not. The target also includes recovery programmes, which may be implemented at the level of single species or include the recovery of whole ecosystems involving some or all of the species they contain.

Progress

Major progress in the achievement of this target has been made, advances that were unlikely without the adoption of the GSPC. Target 8 has helped to stimulate a much more focused approach to the *ex situ* conservation of plant species, highlighting those that require particularly urgent action. Progress has been due to a number of factors including increased capacity, the creation or enlargement of existing programmes and heightened collaboration



between *ex situ* practitioners. This has included the establishment or re-development of many botanic gardens where native plant conservation is a priority.

The Millennium Seed Bank Project, initiated by the Royal Botanic Gardens Kew and its partners worldwide, now includes 37,000 accessions of 20,000 plant species, mainly from drylands. Another important initiative is the creation of the Global Crop Diversity Trust which has made significantprogresstowardsits$260mendowment target to fund the effective conservation of the biological basis of all agriculture.

When the GSPC was adopted it was estimated that 10% to 20% of known globally threatened species were already included in *ex situ* conservation, and about 2% included in recovery programmes. In response to Target 8 a new global plant search mechanism and database was established by Botanic Gardens Conservation International involving botanic gardens worldwide to monitor the achievement of the target. At the end of 2007 it was estimated that 30% to 40% of globally threatened plant species were included in *ex situ* conservation and about 5% in recovery programmes. Good progress has been made in linking *ex situ* conservation to the *in situ* management of plant diversity, particularly in helping to define priorities for *ex situ* programmes and to provide material for research in conservation biology and recovery and re-introductions.

Ex situ techniques and technologies have also significantly advanced. Particular progress has been made in advancing the genetic characterization of *ex situ* collections as well as storage methodologies, such as cryo-preservation, ultra-dry seed storage and *in vitro* culture. Particular emphasis has thereby been placed on crop plants and their relatives.

Future

The achievement of this target remains a major challenge but nevertheless feasible by 2010. Ensuring the adequate genetic representation of *ex situ* collections will be dependent on better characterization of existing collections and implementation of comprehensive sampling protocols. More integration of the activities undertaken by botanic gardens and gene banks is needed to ensure that shared priorities can be developed, and experiences, resources and technologies shared. There are still serious gaps in capacity for *ex situ* conservation, especially in Africa, parts of Asia, the Caribbean, Latin America and the Middle East, where existing institutions involved in *ex situ* conservation are often poorly resourced. An analysis of the extent to which *ex situ* collections are held within the country of origin needs to be undertaken. Progress in identifying conservation priorities for this target have been hindered by the lack of data on the conservation status of many species (Target 2) as well as the definition of threatened species, compromising efforts to ensure that capacity can be directed towards the conservation of species of greatest immediate concern. In the absence of global data, priorities have often been determined with reference to national lists of rare or threatened species. While many recovery programmes have focused on critically endangered species, there is a need for more recovery and restoration programmes that include species of actual or potential economic concern (medicinal plants, crop wild relatives etc). The impacts of climate change on conservation of species in the wild will make effective *ex situ* conservation even more important than ever before.

ENSCONET coordinates seed conservation activities of wild plants within Europe. The network involves 24 institutions in 17 countries, working jointly on seed preservation for the future, to enhance the study, information and research on seed biology with the aim of exchanging experiences, protocols and facilities to optimize seed conservation practices. The network has linked a powerful group and diversity of institutions to target seed conservation needs for European wild plants for the first time. www.ensconet.com

TARGET 9:

SEVENTY PER CENT OF THE GENETIC DIVERSITY OF CROPS AND OTHER MAJOR SOCIO-ECONOMICALLY VALUABLE PLANT SPECIES CONSERVED, AND ASSOCIATED INDIGENOUS AND LOCAL KNOWLEDGE MAINTAINED.

Introduction

Plant genetic resources of crops and other major socio-economically valuable plant species are the biological base for food security and, directly or indirectly, support the livelihoods of every person on Earth. This target recognizes the central role that within-species genetic diversity plays in improving production of crops and other useful species. Socio-economically valuable plant species, which are not crops include important forage, agro-forestry and forestry species, as well as important ornamentals, medicinal plants and crop wild relatives. Such plant genetic resources, and the associated indigenous knowledge, are among the most important, and often the only, assets available in many poor, rural communities and their significance increases as other resources dwindle or disappear.

A variety of medicinal products from plants (Photo: Peter Wyse Jackson).

It has been demonstrated that 70% of the genetic diversity of a crop can be contained in a relatively small sample (generally, less than one thousand accessions). Indeed, for some 200 to 300 crops, it is expected that 70% of genetic diversity is already conserved *ex situ* in gene banks. Genetic diversity is also conserved through on farm management and by working with local communities. Maintenance of local and indigenous knowledge associated with useful medicinal plants, crop wild relatives and other useful wild plant species presents its own distinct challenges, especially given the large number of species to be considered.

Progress

The Global Crop Diversity Trust has been established to ensure the conservation and availability of crop diversity for food security worldwide. The Trust is assembling an endowment fund, the income from which will be used to support the conservation of distinct and important crop diversity in perpetuity, through existing institutions. The Trust has also played a key role in the planning of the Svalbard Global Seed Vault, which has been constructed in Norway, close to the Arctic Circle, to provide the ultimate safety net against accidental loss of diversity in traditional gene banks. While approximately 1.5 million distinct seed samples of agricultural crops are thought to exist, the facility has a capacity to conserve 4.5 million. The first seeds arrived in January 2008.

Ex situ *conservation collection of kiwi germplasm in Wuhan Botanical Gardens, China (Photo: BGCI).*

Regarding forest tree genetic resources, apart from a few tree species of major socio-economic value, there is little reliable information on the genetic diversity of tropical tree species (80% of the total number of tree species). The genetic diversity of wild, highly variable, undomesticated forest trees is conserved on site. Assessing the genetic diversity of these species is challenging, especially since there is rarely quantitative data on population size or decline upon which to base a characterization of their genetic diversity.

A study conducted for the Food and Agriculture Organization of the United Nations (FAO) in 2002 concluded that the issue of forest tree genetic diversity was not well addressed in any process, except for the European Forest Genetic Resources Programme established in 1994 by the Ministerial Conference on the Protection of Forests in Europe. Summary information on species management has partly been compiled in the FAO information system on forest genetic resources (REFORGEN)[30], which contains information from 150 countries and 1,600 tree species collected and checked between 1995 and 2003.

Maintenance of associated indigenous and local knowledge is also an aspect of Target 9 that presents a particularly significant challenge. Efforts are underway to identify indicators suitable for determining trends in maintenance of indigenous and local knowledge, innovations and practices. However, to date there is a lack of tested methodologies and limited assessments of indigenous and local knowledge associated with plant genetic diversity.

Future

During its Tenth Regular Session, the FAO Commission on Genetic Resources for Food and Agriculture adopted indicators and a reporting format to monitor implementation of the Global Plan of Action on the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture [31]. Some of these indicators are pertinent to measuring progress in the conservation of crop genetic diversity *in situ* and *ex situ*, as well as of crop wild relatives and other wild plants used in food production.

FAO continues to assist Member States to develop national information-sharing mechanisms on plant genetic resources for food and agriculture (PGRFA). Databases of national mechanisms are stored/mirrored under the FAO World Information and Early Warning System (WIEWS)[32] for PGRFA. The data are being rolled out at regional and global levels during 2007-09 and published in the second Report of the State of the World's Plant Genetic Resources for Food and Agriculture (SoW-PGRFA), planned for 2008.

The preparation of this report can further contribute to developing baseline data and tools to assess progress towards the implementation of GSPC targets, in particular Target 9. To this end, some of the proposed thematic background studies of the second SoW-PGRFA report can assist in the process of facilitating the implementation of the GSPC. These are:

- Plant genetic resources of forage crops, pasture and rangelands;
- The conservation of crop wild relatives;
- Indicators of genetic diversity, genetic erosion and genetic vulnerability;
- The contribution of plant genetic resources to health and dietary diversity; and
- Managing plant genetic resources in the agro-ecosystem; global change, crop-associated biodiversity and ecosystem services.

It should be emphasised that achievement of this target will become more critical given the continuing and increasing challenge of climate change, while further recognising the need to maintain local and indigenous knowledge and technologies.

Photo: Millenium Seed Bank, RBG Kew

Photo: Peter Wyse Jackson

30 http://www.fao.org/forestry/reforgen/index.jsp
31 ftp.fao.org/ag/cgrfa/cgrfa10/r10i5e.pdf
32 apps3.fao.org/wiews/wiews.jsp?i

TARGET 10:

MANAGEMENT PLANS IN PLACE FOR AT LEAST 100 MAJOR ALIEN SPECIES THAT THREATEN PLANTS, PLANT COMMUNITIES AND ASSOCIATED HABITATS AND ECOSYSTEMS

Introduction

Invasive alien species of animals, plants and micro-organisms threaten and degrade plants and their habitats in almost every region, ecosystem, latitude and longitude. Invasives were shown by the Millennium Ecosystem Assessment to be a major agent of ecosystem degradation as they affect not only plant species and populations, but precious and vital plant associations and habitats while reducing ecosystem services and values to people. Plants are threatened by disease agents such as viruses, bacteria, fungi and micro-organisms in plankton and algal blooms that can destroy species and habitats. Herbivorous invading animals of all types (from insects, crustaceans and mollusks to fish, birds and mammals) affect plants and their associations as do many alien species of plants themselves – through competition for space, light and nutrients as well as physical damage and allelopathy. The impacts of these invasions are not only on biological diversity *per se*, but have developmental and economic effects on peoples' livelihoods and health. A classic example is the great range of impacts of the water hyacinth, *Eichhornia crassipes*, which dominates and degrades a range of aquatic plant communities.

***Prosopis juliflora*, a spiny leguminous shrub from the drier areas of tropical America (one of the "mesquites") has covered 700,000 ha of previously open grasslands in the Afar Region of eastern Ethiopia.**

Alien plant invasion of Prosopis juliflora ***preventing native plant growth (Photo: Geoffrey Howard, IUCN).***

Most developed countries have controls on the introduction of potentially invasive species and procedures for risk assessment of intentional introductions, especially those with government agencies devoted to biosecurity. This is less true of many developing countries where awareness of the threats of invasive species is more limited and the capacity to prevent and manage invasions is often inadequate. Target 10 is closely linked to the 2010 Biodiversity Target 6.2 ("Management plans in place for major alien species that threaten ecosystems, habitats or species") and contributes to Millennium Development Goal 7 – as well as having increasing relevance in multilateral environmental agreements such as the Ramsar Convention and many aspects of the CBD. The International Plant Protection Convention provides a framework for protection from threats to plants by alien species of all types.

It is difficult to assess on the global scale the importance of an invasive species that seriously impacts a specific ecosystem in comparison to another species that affects a large number of ecosystems but causes little damage.

Progress

The target has already been met in that there are over 100 management plans in place for important invasive alien species that threaten and affect plants. The Invasive Species Specialist Group of IUCN produced a publication in 2002 entitled "100 of the world's worst invasive alien species" of which at least 55 affect plants or their habitats.[33] However, the very wording of the title implies that it is difficult to decide upon the most important invasive alien species on a global basis. This is because every country that has addressed this issue has a list of species, which differs from other countries, regions and dominant ecosystems. The Global Invasive Species Programme (GISP[34]) produced an awareness leaflet on Target 10 entitled "Protecting plants and plant habitats from invasive alien species" and then began a consultation process to examine how the target

33 www.issg.org/database
34 www.gisp.org

Managing Alien Invasive Species in Africa

Lantana camara *(Photo: Ramesh Kannan).*

The Global Environment Facility (GEF) funded project "Removing Barriers to Invasive Plant Management in Africa" managed by CABI is working at all levels in Zambia, Uganda, Ethiopia, and Ghana to find the best ways to stop new invasives crossing their borders and to manage existing problematic species. Pilot sites have been set up to test management otions, and ecosystem management plans and schedules are being agreed. Training courses to build in-country expertise are a priority and these are backed up with the provision of key scientific equipment needed for quarantine efforts. The main target taxa are water hyacinth (*Eichhornia crassipes*), Paper mulberry (*Broussonetia papyrifera*), Parthenium weed (*Parthenium hysterophorus*), Citronella (*Cymbopogon nardus*), mesquite (*Prosopis juliflora*), *Mimosa pigra*, *Lantana camara* and *Senna spectabilis.*

could be assessed by contacting 700 invasive alien species specialists across the world. It became clear that to expect agreement on the 100 most serious invasive alien species that affect plants globally would be an enormous task with doubtful relevance to many countries. It also was apparent that there was a general need for local adaptation of globally available management plans. GISP then initiated a pilot programme (implemented through IUCN) to ask specific countries and regions (in Africa, Asia and Latin America) to discuss their own most important species for Target 10. An additional attempt by GISP to address this issue using a web-based tool awaits funding.

Some developed countries have reported taking steps towards achieving Target 10 at national level in relation to their most important invasive alien species affecting plants. GISP intends to bring these together towards a global assessment during 2008/9. Management plans for these species are mostly site-specific and there is need to build capacity in other countries to adapt them to local conditions and expand such plans for global use. Information about the existence, spread and impact of invasive alien species on plants has increased in recent years through the many specific, local and global databases and other information sources on the Internet. Global guidance has been provided by GISP, the IUCN-Invasive Species Specialist Group (ISSG)[35] and the Global Invasive Species Information Network (GISIN). Threats by invasive alien species to plant species on the Red List are now being systematically recorded, although the more rapid assessments developed for Target 2 are unable to record these details.

Eichhornia crassipes *has infested many tropical and sub-tropical water bodies (Photo: SCBD).*

Future

There is urgent need to recognize that climate change will enhance the spread and impact of some of these significant invasive alien species. Hence, future work on this target should ensure that there is adequate preparedness and that management plans should include options for adaptation to climate change.

35 http://www.iss.org/database/welcome

TARGET 11:

NO SPECIES OF WILD FLORA ENDANGERED BY INTERNATIONAL TRADE

Introduction

Many countries have indicated ongoing activities on Target 11 which is linked to the national implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In response to paragraph 11 of decision VII/10, the Plants Committee of CITES has submitted to the Executive Secretary a report which summarizes information relevant to this target. The purpose of CITES, as outlined in the CITES Strategic Vision through 2007, is to ensure that no species of wild fauna or flora becomes or remains subject to unsustainable exploitation because of international trade. This purpose, central to all CITES activities, is well aligned with Target 11 of the GSPC 'no species of wild flora endangered by international trade'. In essence, Target 11 forms the core business of CITES activities.

Encephalartos latifrons *a Critically Endangered cycad species listed on CITES Appendix 1 (Photo: SANBI).*

For plant species already included in CITES Appendix I, the CITES Plants Committee suggests that CBD Parties, and in particular their GSPC focal points, be aware of the provisions in place through CITES and that they be provided with a full list through the respective convention secretariats.

CBD Parties are further encouraged to take Appendix I species into consideration in their *in situ*, *ex situ* and sustainable use actions (CBD Articles 8, 9 and 10), particularly in actions outlined in their National Biodiversity Strategies and Action Plans (Article 6). For example, CITES Parties have agreed to encourage cooperation between Parties with *ex situ* breeding operations and those with *in situ* conservation programmes (CITES Resolution Conf. 13.9). CBD Parties may wish to consider similar actions of cooperation when developing or updating their National Biodiversity Strategies and addressing the GSPC.

Progress

Approximately 300 plant species are included in CITES Appendix I; over 28,000 in Appendix II, including the entire orchid family; and 10 in Appendix

Aloë *species, international trade regulated by CITES (Photo: National Museums of Kenya).*

III. The implementation of provisions relating to all Appendices should help to implement Target 11 of GSPC. International trade in wild specimens of Appendix I species is effectively banned and this may encourage artificial propagation of wild species reducing the pressure on wild populations. For Appendix II species, the requirement that a non-detriment finding be made before trade is allowed

is particularly important. This links trade to the management of the species and should help to ensure sustainability and reduction of the threat of over-exploitation .

All endangered plant species, which are threatened at least in part by levels of international trade are currently included in the Appendices of CITES. Listing of high value species such as trees traded for timber has been particularly slow. Nevertheless there is now a recognition that CITES can support the sustainable management of timber species and good collaboration has developed between CITES and the International Tropical Timber Organization (ITTO).

The CITES Plants Committee plays an important role in the provision of biological and other specialized knowledge regarding species of plants that are (or might become) subject to CITES trade controls. Its role is, *inter alia*, to provide technical support to decision-making about these species. Among others, the terms of reference for the Plants Committee include: undertaking periodic reviews of species to ensure appropriate categorization in the CITES Appendices, advising when certain species are subject to unsustainable trade and recommending remedial action (through a process known as the 'Review of Significant Trade') and drafting resolutions on plant matters for consideration by the Conference of the Parties.

Ongoing actions undertaken for plant species included in CITES Appendix II can help ensure that Target 11 is met. Appendix II species can be subject to a Review of Significant Trade if monitoring of CITES trade data raises a concern with potentially harmful levels of international trade in the species. Under this process, international trade in important listed plant groups such as cycads, tree ferns, agarwood and some medicinal plants has been analysed, resulting in measures being taken to ensure that such trade is sustainable. Overall, however, CITES has given relatively low priority to plants. One measure to address this is to encourage botanic gardens to support the Convention in a variety of ways. The second edition of a CITES Manual for Botanic Gardens has recently been published in three languages[36] and this highlights the links between CITES and the GSPC.

Future

CITES provides a well-established and successful mechanism for preventing plant species from being endangered by international trade but its role is limited to those species that are currently listed. More research is needed into the impact of international trade on wild plant species and a broader range of management responses needs to be developed. Independent certification of sustainability carried out to internationally recognized standards, both of timber and non-timber forest products, is one mechanism which should help ensure that no plant species is endangered by international trade. The value of both the sustainable harvesting and use of forest products and independent certification are promoted through the CBD expanded programme of work on forest biological diversity.

Other measures include the development of locally-based propagation schemes for threatened plant species for which there is an international trade demand. The development of such schemes is recommended in the CBD Technical Series report 6 on the sustainable management of non-timber forest resources. [37]

Trade in *Hoodia*

Uprooted Hoodia gordonii *plant in Tanqua Karroo, Western Cape Province, South Africa (above) and bags of harvested* Hoodia *(below) (Photos: David Newton, TRAFFIC E/S Africa).*

Hoodia spp. are slow-growing succulent plants that occur in southern Africa. Ten of the 16 species are classified as 'threatened' according to the IUCN Red List categories and criteria. Traditionally, they are used by the San bushmen as a natural appetite suppressant. A strong commercial interest in the genus has resulted from the isolation and patenting of an active ingredient which is claimed to help weight loss. All *Hoodia* species were listed in CITES Appendix II in 2005. The listing includes provisions for labelling products that have been harvested in a sustainable way.

36 www.bgci.org/resources/news/0451

37 www.cbd.int/doc/publications/cbd-ts-06.pdf

TARGET 12:

THIRTY PER CENT OF PLANT-BASED PRODUCTS DERIVED FROM SOURCES THAT ARE SUSTAINABLY MANAGED

Introduction

Plants and their derivates provide a range of products including amongst other things fuel, food, shelter, clothing and medicines. Such plants or plant products may be harvested from wild or semi-natural conditions, or cultivated. This target requires a coordinated approach that applies across all sectors of international, national and local production and trade of plant products. In the case of plant material collected from wild or semi-natural ecosystems, harvesting must be below replacement rates to be sustainable, and the process of harvesting should not cause significant damage to other components of the ecosystem. Sustainable management of plants and their products relates to environmental as well as social issues, including fair trade, equitable sharing of benefits and participation of indigenous and local communities.

Progress

Indicators of progress towards this target include the percentage of products derived from independently certified production areas, including forest certification and organic production, as well as from sources with sustainable harvesting plans in place.

The organic sector is growing rapidly with global sales of organic food and drink increasing by around $5 billion over the last six years to nearly $40 billion in 2006[38] . In Europe, the organic share of the total food market varies from approximately 6% of total food sales in Switzerland and Austria, 4.5% in Denmark, to 3% in Germany and 1.6% in the UK [39]. In the USA, the organic food market currently has a 3 % share of total food sales and grew by 21 % in 2006 according to the Organic Trade Association (OTA).

With regard to sustainable forest production, in December 2006, a total of nearly 300 million hectares were reported to be under certification,[40] of which 84.2 million hectares were certified under the Forest Stewardship Council (FSC) scheme. FSC has met with an enthusiastic response in many countries and demand for FSC-certified products outstrips supply. Major retail outlets in the UK and USA for example are committed to stocking as much FSC as they can and several governments have developed timber procurement policies that require them to seek certified products.

Bark of Warburgia ugandensis*, in high demand for local traditional medicine (Photo: National Museums of Kenya).*

FAO has facilitated the collection, analyses and dissemination of national, regional and international statistics on all aspects of forest resources, forest products and their trade and other important socio-economic variables at regular intervals. FAO also provides support to the United Nations Forum on Forests as well as to regional criteria and indicators processes for monitoring progress towards sustainable forest management. Moreover, FAO provides support to countries to implement sustainable forest management practices.

FAO also works towards the enhancement of forests and forest products and their contribution to poverty alleviation while ensuring environmental sustainability, by *inter alia*:

- Identifying the potential of non-wood forest products (NWFPs), improved harvesting and production methods, and wide dissemination of related knowledge at all levels;

38 Institute of Rural Sciences, Aberystwyth Univesity, Wales
39 Soil Association Market Report, 2007
40 www.forestrycertification.info

- Re-appraising the value and potential of wood fuels as a clean, safe and economical energy source and raising awareness of their importance at policy level, including improved information systems; and

- Developing a regional code of forest harvesting for South America and assisting countries in Asia, Africa and South America to introduce reduced impact logging practices based on regional codes of harvesting.

Various national initiatives are being developed to support the sustainable management of useful plants. For example, the German Federal Agency for Nature Conservation has supported the development of the "International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants" [41], which also addresses Targets 6, 12, and 13. In Uganda, the BioTrade Initiative of the United Nations Conference on Trade and Development[42], which provides a useful model for refining and transforming medicinal and aromatic plants products, has focused on promoting trade and investment in products and services derived from native or indigenous biodiversity.

Future

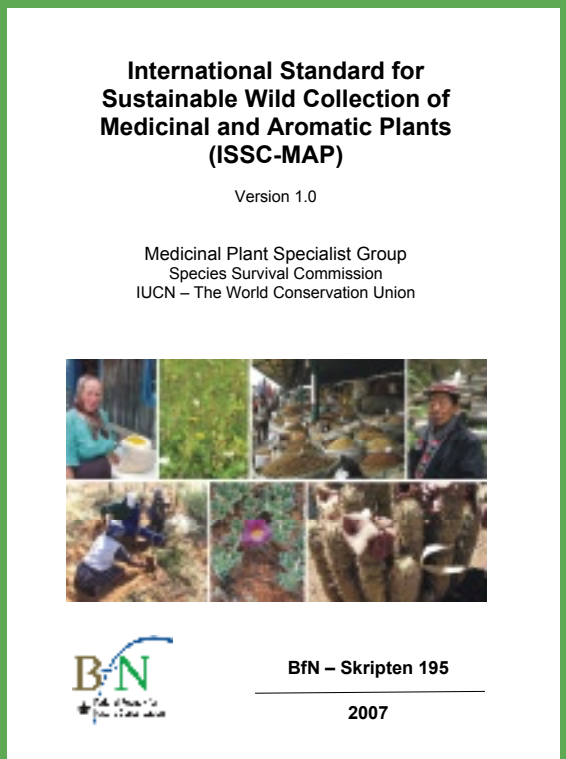
Further work to explore ways in which sustainable management can be adequately described and estimated by countries would be valuable. There are a number of important sustainable production initiatives that are being developed by the private sector and an exchange of experiences and identification of lessons learnt to provide a framework for development of good practices, tools and estimation procedures would be extremely beneficial.

Global standard for sustainable wild medicinal plant harvesting

A new standard to promote sustainable management and trade of wild medicinal and aromatic plants was launched in 2007. The standard is needed to prevent plants used in medicine and cosmetics from being over-exploited. More than 400,000 metric tons of medicinal and aromatic plants are traded every year, and about 80 % of the species involved are harvested from the wild.

Following extensive consultation with plant experts and the herbal products industry, the International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants, ISSC-MAP, was drawn up by the Medicinal Plant Specialist Group of IUCN.

The German Federal Agency for Nature Conservation was involved in the consultation along with WWF-Germany, and the wildlife trade monitoring network TRAFFIC. Industry associations, companies, certifiers and community-based non-governmental organizations assisted in the development of the standard. The standard is based on six principles: maintaining medicinal and aromatic plant resources in the wild; preventing negative environmental impacts; legal compliance; respecting customary rights; applying responsible management practices; and applying responsible business practices.



41 www.floraweb.de/map-pro/Standard_Version1_0.pdf
42 http://www.biotrade.org

TARGET 13:

THE DECLINE OF PLANT RESOURCES, AND ASSOCIATED INDIGENOUS AND LOCAL KNOWLEDGE, INNOVATIONS AND PRACTICES THAT SUPPORT SUSTAINABLE LIVELIHOODS, LOCAL FOOD SECURITY AND HEALTH CARE, HALTED

Introduction

This target is concerned with the availability of local plant resources to support people's diets, health and livelihoods. It covers the spectrum from agricultural land to natural habitats, with a special focus on traditional, biodiversity-rich agricultural systems and on resources gathered from wild plants. Traditional agriculture and many wild plant resources have been in decline over recent years, under pressure from the spread of industrial agriculture and much higher demands for resources from plants, both cultivated and wild.[43]

There are close links between this target and economic development. From the subsistence viewpoint, the availability of traditional vegetables or medicinal plants can be crucial for maintaining good health or combating disease, resulting in an increased ability to benefit from gainful employment. More directly, the sale of resources from wild plants can be a major source of financial income.[44]

Piles of illegally harvested Osyris lanceolata *roots for extracting essential oils (Photo: National Museums of Kenya).*

This target is also closely linked to several of the Millennium Development Goals (MDGs), including the goal on promotion of gender equality and empowerment of women (MDG 3). This is because in developing countries women are mostly responsible for the collection of wild plant resources, such as firewood for domestic use, and because globally women are the principal homemakers and caregivers. Another target of relevance is MDG 6 (combat HIV/AIDS, malaria and other diseases), given the great use made of medicinal plants in tackling many serious diseases, for instance for treating diabetes, opportunistic infections associated with HIV/AIDS, and malaria in East Africa.[45],[46],[47]

Women carrying sandalwood (Osyris lanceolata) *to local market for essential oil extraction in the international markets (Photo: National Museums of Kenya).*

Progress

This target cannot be accurately quantified. It was proposed in 2006 that several sub-targets should

43 Hamilton, A.C. and Hamilton, P.B. (2006). Plant Conservation: an ecosystem approach. Earthscan, London

44 Salick, J. et al. Tibetan Medicine Plurality. Economic Botany 60, 227-253 (2006)

45 Mainen, J. & Mbwambo, Z.H. (2002) Experience of Tanzanian traditional healers in the management of non-insulin dependent diabetes mellitus. Pharmacetical Biology, 40, 552-560

46 Koch.A., Tamez, P., Pezzuto, J., & Soejarto, D. (2005) Evaluation of plants used for antimalarial treatment by the Maasai of Kenya. Journal of Ethnopharmacology, 101, 95-99.

47 McMillen, H (2004) The adapting healter: pioneering through the shifting epidemiological and sociocultural landscapes. Social Science and Medicine, 59, 889-902

be developed, taking an ecosystem-by-ecosystem approach (e.g. for agriculture, forest resources and pasture resources), but there has been no progress in this respect and no milestones have been defined.

Positively, there appears to be much more awareness among technical experts engaged in plant conservation now (compared with ten years ago) of the critical need to engage local people seriously in efforts aimed at *in situ* plant conservation. Overall, progress is slow compared with the magnitude of the task and there is much need for good case studies, and analyses, and the dissemination of best practices.

There have been many studies documenting indigenous botanical knowledge and the use of plant resources. Examples include research by Bioversity International on coconut diversity, and on banana diversity in Uganda[48]. The Netherlands has been instrumental in building major programmes to record knowledge about plant resources in South East Asia (PROSEA) and tropical Africa (PROTA[49]). Typically such efforts have not been linked to any practical measures in favour of sustainable development, so their usefulness for conservation is limited. There are exceptions, however. For example, a study of indigenous leafy vegetables in Africa has resulted in some practical benefits in Kenya in terms of enhanced cultivation of traditional varieties and their marketing in Nairobi with nutritional benefits for urban dwellers[50].

Progress with Target 13 is greatly affected by rapid globalization. Cultural and economic globalization tend to promote the globalization of biodiversity, just as cultural diversity and traditional lifestyles can have strong links to biological diversity. Traditional knowledge of plants continues to decline worldwide posing a major problem for plant conservation, because knowledge of the details of the local plant world is a necessary foundation everywhere for practical conservation efforts. Realizing this, several conservation initiatives have placed great stress on the revitalization of local botanical traditions, for example those of the Foundation for Revitalisation of Local Health Traditions in India.[51]

Medicinal plant conservation through traditional health care development in Ladakh, India

Tibetan medicine has been the traditional health system of Ladakh for over 1000 years. This scholastic healing system contains elements of Ayurveda and Chinese medicine, combined with the philosophy and cosmology of Tibetan Buddhism. For centuries, amchi (traditional doctors following the Tibetan medical tradition) have been the only providers of medical treatment throughout Ladakh. They remain central health actors to this day, particularly in remote areas. Remote rural communities in Ladakh are often deprived of primary healthcare, having little money and living far from medical checkpoints. That is why a programme called Revitalisation of Tibetan Medicine in Ladakh was started and continues to be developed by the Ladakh Society for Traditional Medicines (LSTM) and Nomad Recherche et Soutien International (Nomad RSI), with support from Plantlife International. The overall aims of the programme are to improve the standards of amchi practice, ensure that amchi medicine is available in rural areas, preserve and support the amchi knowledge system, and guarantee sustainable access to essential medicines.

Villagers being interviewed on their knowledge of medicinal plants (Photo: Tsewang Gonbo of the Ladakh Society for Traditional Medicine)

Village woman at Sapi consulting Amchi Psering Paljan (Photo: Tsewang Gonbo of the Ladakh Society for Traditional Medicine).

48 A review of the activities of major partners and organizations in implementing the Global Strategy for Plant Conservation. 12th Meeting. SBSTTA, France, 2-6 July 2007.

49 www.prota.org

50 Report on the implementation of the Global Strategy for Plant Conservation, prepared by Bioversity International, November 2006

51 www.frlht.org

TARGET 14:

THE IMPORTANCE OF PLANT DIVERSITY AND THE NEED FOR ITS CONSERVATION INCORPORATED INTO COMMUNICATION, EDUCATIONAL AND PUBLIC-AWARENESS PROGRAMMES

Introduction

Plants are often under-represented in the conservation debate and neglected in efforts to engage the public in environmental action. Furthermore, increasing urbanization and population movements are resulting in a growing disconnect between people and nature, a trend that is especially notable amongst the young. Plant conservation targets will only be achieved if changes are made at all levels of society, from policy makers through to the general public. For this reason, communication, education and public awareness programmes are essential in underpinning the Strategy. This is a cross-cutting target, relevant to all targets of the Strategy and indeed to the implementation of the Convention itself. However, because of the specific need to raise awareness of the importance of plants as the basis of all life on Earth, an explicit target on this has been articulated in the GSPC. There is a lack of quantitative baseline data against which to measure progress, but it is generally recognized that there is a very low level of understanding amongst the general public of 'biodiversity' and more specifically, the important role of plants in supporting human well being. This target is understood to refer to both informal and formal education at all levels including primary, secondary and tertiary levels. In the formal sector, there is a need to engage with Ministries of Education as well as Ministries of Environment and Conservation.

Progress

The publication of the GSPC brochure and its translation into 10 languages, going beyond the official UN languages is a key achievement allowing easy access to the text of the Strategy for policy makers. However, although a growing number of countries are developing national responses to the GSPC, there is still a lack of awareness of the GSPC at the policy level in many countries

Botanical school trip at Cibodas Botanical Gardens, Indonesia (Photo: Bian Tan , BGCI).

With regard to the general public, a stakeholder consultation on this target in six countries (Brazil, China, Indonesia, Russia, UK and USA) identified similar issues across countries, but the responses to these would differ, according to all local needs and cultural differences. Issues to be addressed include the over-emphasis on animals and neglect of plants in environmental education programmes, a need for increased teacher-training relative to plant diversity, a lack of opportunity to experience nature first hand and messages being lost under an overwhelming level of advertising in all media.

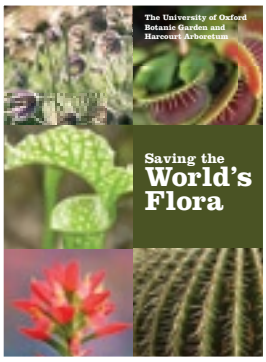
An information board on the kiwi fruit, its history, use and conservation, for public awareness and education at Wuhan Botanical Garden, China (Photo: Junko Oikawa, BGCI).

Botanic Gardens

BGCI, with the support of HSBC through the Investing in Nature Programme, supported teacher training environmental education programmes in botanic gardens in Brazil and Indonesia. At least 150,000 children were reached through this programme and the teachers were trained on how to use the gardens as outdoor classrooms.

Oxford Botanic Garden

This Garden was established in 1621 ' to promote learning.' The GSPC has been incorporated into the teaching in all years of the Biological Sciences degree course at the Oxford University. The Strategy itself has become the syllabus for a module in the Plant Conservation course. Every one of the 12,500 school children who visit this Garden is shown how they can contribute to at least one of the targets of the GSPC. Every visitor to the Garden & Arboretum is given a guide to the GSPC that takes the visitor through the sixteen targets.



National Botanic Gardens of Ireland

Programmes on the theme of plant conservation, sustainability and climate change are a key component of many botanic gardens educational activities (Photo: Peter Wyse Jackson).

The world's botanic gardens, which together receive over 300 million visitors per year, are a gateway to information on plant diversity and this community has largely taken forward the education and public awareness elements of this target. Almost all botanic gardens are involved in education activities and many focus specifically on educating children.

Future

Educationalists have not always been included in stakeholder consultations on the GSPC and there is a need for greater engagement with this community. There is an opportunity to benefit from the increasing awareness and understanding of the public on climate change issues and the associated educational opportunities should be capitalized upon.

Plants are of great importance in relation to both mitigation and adaptation to climate change, and it will be essential to mobilize support for plant conservation through education and public awareness programmes to avoid mass extinctions in the future. Engaging the public in new and innovative ways is key to raising awareness of plant conservation issues. Examples include the increasing popularity of citizen science projects focused around plant monitoring in a changing climate. Indeed, botanic gardens have the challenge to showcase the importance of plant conservation for ecosystem services and safeguarding useful species given the uncertain future.

School Children on an educational visit to Kirstenbosch Botanic Gardens, South Africa (Photo: SANBI).

TARGET 15:

THE NUMBER OF TRAINED PEOPLE WORKING WITH APPROPRIATE FACILITIES IN PLANT CONSERVATION INCREASED, ACCORDING TO NATIONAL NEEDS, TO ACHIEVE THE TARGETS OF THIS STRATEGY

Introduction

Achievement of the targets included in the Strategy will require considerable capacity building, particularly to meet the need for conservation practitioners trained in a variety of disciplines, with access to adequate facilities. As one of the cross-cutting targets of the Strategy, this target, although not specifically quantitative, is central to the achievement of each of the Strategy's targets as well as its overall aim of halting the loss of plant diversity on a global scale. Appropriate facilities are understood to include adequate technological, institutional and financial resources. Access to, and appropriate dissemination of, skills, tools and relevant information is central to the achievement of this target. Capacity-building should be based on national needs assessments across the plant conservation sector. The Strategy estimates that the number of trained people working in plant conservation worldwide would have to double by 2010. Given the geographical disparity between biodiversity and expertise, however, this is likely to involve more than doubling trainees in many developing countries, small island developing States and countries with economies in transition. Increased capacity includes not only in-service training but also the training of additional staff and other stakeholders, especially at the community level.

Progress

While there is no global baseline from which progress can be measured, and despite relatively few countries having conducted needs assessments, several global programmes have nevertheless made considerable progress in increasing the number of trained people in plant conservation, particularly in developing countries. Various collaborative projects have been developed between institutions. These include training programmes that meet the needs of the individual countries to enable them to meet their obligations under the CBD, including the GSPC. Several programmes combine scientific research on plants with training and community capacity building. In addition to providing training, some programmes host formal workshops and provide specialist equipment and advice on the design of appropriate in-country facilities. Plant conservation networks have played an important role in developing training programmes and building capacity for the conservation of plant diversity.

Training teachers on plant conservation in Southeast Asia (Photo: Bian Tan, BGCI).

For example, the Red Latino Americana de Botánica (RLB; Latin American Plant Sciences Network), a member of the Global Partnership for Plant Conservation, has been engaged in augmenting the number of qualified Latin American botanists to adequately survey vegetation, understand the functioning of the ecosystems and provide the basis for the conservation and management of the important natural resources within Latin America. Through a consortium of a select number of prestigious Latin American institutions located in Mexico, Costa Rica, Venezuela, Brazil, Chile and Argentina, the RLB has trained almost 200 graduate level researchers from 18 countries as well as offered 56 short-term specialized

graduate courses. It has funded around 100 scientific events and provided more than 160 small grants for botanical research in Latin America. Over the years, RLB has developed these and other activities focused on capacity-building, education, conservation and sustainable use of plant biodiversity in Latin America.

Future

The development of adequate human capital with access to the appropriate resources will remain critical for the achievement of the Strategy beyond 2010. Challenges provided by climate change will require new skills and capacity-building across most countries of the world. An audit is required of what has been achieved in terms of capacity-building across the various targets to determine where the gaps and capacity needs are. Parties are also required to conduct national needs assessments and determine national priorities in terms of training and funding allocation. The ongoing support, mentorship and coaching of trained staff, particularly those who have benefited from training courses associated with donor-funded projects with a limited lifespan, is critical. Technology should be used to the maximum and consolidated multi-lingual training materials developed and made accessible. More local training is needed to address contextual issues. Without a lead agency or institution associated with this target, coordination and monitoring of progress as well as measuring of the impact of training provided will remain an ongoing challenge.

Building capacity of horticultural staff in plant conservation techniques (Photo: SANBI).

The African Regional Course in Plant Conservation Strategies

Building capacity for the implementation of the GSPC in Africa was the aim of the first tailor-made training course designed to support the implementation of the GSPC. It was developed by the Royal Botanic Gardens Kew, together with BGCI and the CBD Secretariat. Hosted by Makerere University, Kampala, Uganda, and funded by British American Tobacco via Kew's capacity-building programme, the course brought together delegates from 16 African countries. The two-and-a-half week course mixed theory and practice and concluded with a 5-day field trip that focused on conservation issues. Following the course, all participants produced a report on the status of GSPC implementation in their own countries. A similar course has been held in the Caribbean Region in Montserrat.

CREW volunteers being trained to map and monitor endangered species in South Africa (Photo: SANBI).

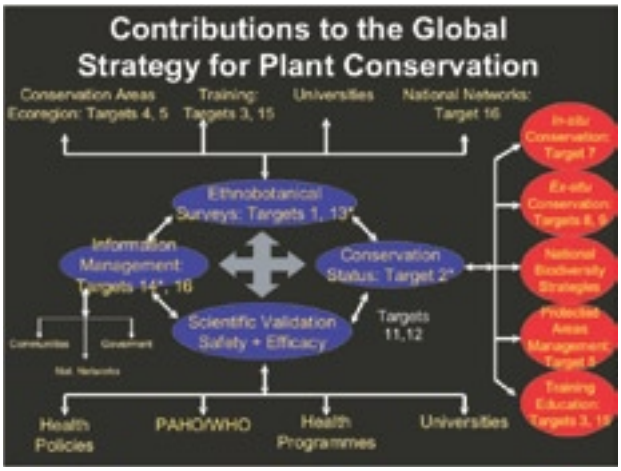
Training children in plant identification (Photo: Bian Tan, BGCI).

TARGET 16:

NETWORKS FOR PLANT CONSERVATION ACTIVITIES ESTABLISHED OR STRENGTHENED AT NATIONAL, REGIONAL AND INTERNATIONAL LEVELS

Introduction

Networks supporting plant conservation activities provide the means to share protocols and celebrate successes, exchange data, encourage professional development of conservation specialists and build capacity of the plant conservation community. Organizations participating in such networking include government agencies, museums, academic specialists, botanic gardens and non-governmental organizations. Importantly, networks are not constrained to follow any particular model and often extend across political or sectoral boundaries to most effectively mobilize resources for particular purposes. For smaller organizations, participating in networks provides a direct means to contribute to larger projects, benefit from mutual exercises in building capacity and expertise. For larger organizations and government agencies, networks provide efficient means to coordinate projects across large distances and aggregate observations and results. The majority of networks are self-organizing, arising in response to needs and opportunities. Many different models exist for networks, ranging from informal, sometimes transient, efforts to share information or cooperate on specific projects, to large national and international associations with paid staff and secretariats. Recently the concept of grids, or networks of networks, has also been recognized. For example, the Global Partnership for Plant Conservation consists of a variety of partners, many of which are themselves networks. Making progress on many of the other fifteen targets of the GSPC depends upon strengthening existing networks or forming new ones. For example, the development, testing and sharing of protocols for plants conservation (Target 3) and training and increasing capacity for plant conservation through increasing numbers of workers (Target 15) requires effective sharing among agencies of information, resources and in some cases personnel.



Contribution of the TRAMIL[1] network to the implementation of the GSPC (Photo: Sonia Lagos-Witte).

1 www.rlbbotanica.org

Progress

In many respects the GSPC itself has been a grass-roots networking programme. Target 16 calls for the establishment or strengthening of networks; GSPC is both a product of networking and has facilitated and strengthened networking as organizations respond to the Strategy.

The GSPC has been particularly effective in generating cross-sectoral networks. The botanic gardens community, organizations involved in the Global Invasive Species Programme, FAO, Bioversity International and other genetic resource programmes, sustainable use initiatives, and the forestry sector are in communication and share experiences relevant to the targets. This exchange has taken place at all levels. National and global networks and within-country cross sectoral networks have been generated or strengthened to implement the GSPC.

This effort has also catalysed networking among herbaria, zoological parks and other organizations that might not previously have considered that they have a plant conservation role. Many regional networks have focused on enhancing national and regional implementation of the Strategy. The symposium and workshop at the Latin American

Botanical Congress in Santo Domingo, Dominican Republic, in June 2006 was a particularly noteworthy activity that helped raise awareness of, and promote national implementation of the GSPC in Latin American countries and support the development of a regional partnership for plant conservation in Latin America (Asociación Latinoamericana de Botánica and the Global Partnership for Plant Conservation). Other network efforts were the organization of a workshop in December 2005 in Bogota, Colombia, for botanic gardens in Latin America to develop regional 2010 targets for Latin American botanic gardens (Asociación Latinoamericana y del Caribe de Jardines Botánicos, BGCI, the Red Nacional de Jardines Botánicos de Colombia and partners).

In Europe, effective cooperation is impossible without the focussed cooperation of networks or working groups. Planta Europa, European Council for the Conservation of Fungi (ECCF), the European Native Seed Conservation Network (ENSCONET), European Committee for Conservation of Bryophytes (ECCB) and the newly established European Mycological Association (EMA) are just a few examples of cooperation for plant conservation in Europe. Through links with Planta Europa, they are actively contributing to the implementation of the European Strategy for Plant Conservation.

Future

Parties to the CBD should continue to nominate national focal points and encourage the participation of a wide variety of sectors in achieving the targets of the GSPC. Approximately a third of Parties have at this stage nominated focal points for the GSPC.

Particularly important to the GSPC is the Global Partnership for Plant Conservation. As a key component of the flexible coordinating mechanism for the GSPC, the Partnership is encouraging and promoting achievement of all targets. Advances will continue in electronic networking, and new tools are emerging such as social and professional networking web sites, but access to these specific tools remains limited in many areas.

The GSPC provides an entry point for thousands of institutions to contribute to the implementation of the Convention on Biological Diversity. The Strategy will continue to provide an active means of engaging conservationists, scientists and civil society in a participatory programme where the contributions of all are important.

Sharing experiences in plant conservation between UK and China at the Beijing Institute of Botany (Photo: Stella Simiyu).

Networking to complete South Africa's Red Data List for Plants

As described under Target 2, the South African National Biodiversity Institute has recently completed assessing the conservation status for all 20,456 plant taxa that occur in South Africa. The assessment was conducted in constant collaboration with 169 botanists and it cost $570,000. It is estimated that it is possible for a flora of around 20,000 plant species to be assessed over a period of five years if three experienced botanists and two support staff work full time. Moreover, the experience demonstrates that it is possible to do comprehensive conservation assessments for all of the taxa within a highly diverse flora if dedicated individuals and financial resources are made available. Electronic herbaria, such as the system developed by China, greatly assist in speeding up conservation assessments. In addition accurate spatial land cover information is key for determining threats to species.

Drosanthemum micans, *a plant on South Africa's Red Data list (Photo: Karoo Desert NBG).*

www.plants2010.org

The Global Partnership for Plant Conservation (GPPC) is a voluntary initiative that brings together international, regional and national organizations to contribute to the implementation of the GSPC. The GPPC was launched in February 2004 at the seventh meeting of the Conference of the Parties to the CBD in Kuala Lumpur, Malaysia and now includes 34 member institutions and organizations worldwide with significant programmes in plant conservation. The Partnership aims to link existing initiatives for plant conservation, promoting the identification of gaps and the mobilization of the necessary resources. A major objective is to provide practical assistance, support and technical guidance for national implementation of the GSPC, which is supported by a Secretariat provided by BGCI.

Activities organized or supported by the Partnership include:

- **Supporting the development of national plant conservation strategies;**
- **Organizing regional training courses in plant conservation;**
- **Developing GSPC-related 2010 targets at national and other levels (e.g. for botanic gardens);**
- **Undertaking plant conservation assessments at national, regional and global levels;**
- **Identifying and defining criteria for important areas for plant diversity;**
- **Developing projects at all levels for conservation and sustainable use of threatened plants and their habitats;**
- **Working towards completing a working list of all known plant species;**
- **Establishing networks;**
- **Organizing public awareness and education initiatives;**
- **Participating in the flexible coordination mechanism of the GSPC, including assistance in organising GSPC Liaison Group meetings;**
- **Translating the GSPC brochure into major world languages.**

In October 2005 the 1st Conference of the GPPC was held in Dublin, Ireland, to discuss GSPC progress (Proceedings of the conference on www.botanicgardens.ie). The GPPC has also helped with an in-depth review of the GSPC in 2008 in the preparation of this Plant Conservation Report and will contribute to discussions on options for the GSPC beyond 2010.

GPPC Conference at the National Botanic Gardens of Ireland, October 2005. Credit: National Botanic Gardens, Ireland.

ANNEX 1

SBSTTA 12 RECOMMENDATION XII/2.

IN-DEPTH REVIEW OF THE IMPLEMENTATION OF THE GLOBAL STRATEGY FOR PLANT CONSERVATION

1. The Subsidiary Body on Scientific, Technical and Technological Advice in its consideration of the in-depth review of the implementation of the Global Strategy for Plant Conservation, based on background documentation, expert inputs and scientific dialogue, brings the following key messages to the attention of the Conference of the Parties at its ninth meeting:

a. In general, the Global Strategy has provided a useful framework to harmonize and bring together various initiatives and programmes in plant conservation at both the national and regional levels;

b. The Global Strategy has been notably successful in stimulating the engagement of the botanical and plant conservation communities in the work of the Convention, through, *inter alia*, the establishment of national, regional and global networks, including in particular the Global Partnership for Plant Conservation, launched at the seventh meeting of the Conference of Parties to the Convention;

c. The Millennium Ecosystem Assessment provide a further rationale for implementing the Strategy, including at the national level, with a view to securing plant resources and their provisioning services and allowing communities to continue to derive benefits from plant diversity, especially for food, medicines, fuel, fibre, wood and other uses;

d. The national implementation of the Strategy provides opportunities for addressing the Millennium Development Goals especially poverty reduction (goal 1), the health crisis (goal 6) and environmental sustainability (goal 7);

e. There has been progress in achieving Targets 5 (Protection of 50% of the most important areas for plant diversity assured;), 8 (60% 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), 9 (70 per cent of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained), 11 (No species of wild flora endangered by international trade), 14 (The importance of plant diversity and the need for its conservation incorporated into communication, educational and public awareness programmes);

f. However, limited progress was made with respect to the targets 1 (A widely accessible working list of known plant species, as a step towards a complete world flora), 2 (A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels), 4 (At least 10% of each of the world's ecological regions effectively conserved), 6 (At least 30 per cent of production lands managed consistent with the conservation of plant diversity), 10 (Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems), and 12 (30 % of plant-based products derived from sources that are sustainably managed) and 15 (The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this Strategy);

g. There are some gaps in achieving Target 3 (Development of models with protocols for plant conservation and sustainable use, based on research and practical experience) especially in relation to the development of tools and protocols for the targets of the Strategy whose progress is limited;

h. Efforts to achieve target 7 (60 % of the world's threatened species conserved *in situ*) have been constrained by limited progress in achieving target 2, as target 7 is dependent on the baseline data generated under target 2;

i. Constraints to the national implementation of the Global Strategy include limited institutional

integration, lack of mainstreaming, and at national level, lack of taxonomic capacity, lack of data (taxonomy, biology and conservation), tools and technologies, limited sectoral collaboration and coordination, and limited financial and human resources;

j. The emerging issues of global environmental change, namely, the impact of climate change and nutrient loading can be addressed through the achievement of the existing targets.

2. The Subsidiary Body on Scientific, Technical and Technological Advice recommends that the Conference of the Parties at its ninth meeting:

(a) Urges Parties that have not yet done so, to:

(i) Nominate focal points for the Strategy;

(ii) Develop national and/or regional strategies for plant conservation with targets as appropriate, within the context of national biodiversity strategies and action plans and other relevant national and regional policies and action plans, as part of broader plans to achieve the 2010 biodiversity target and the relevant Millennium Development Goals;

(b) Recommends parties, other governments and relevant organizations to consider:

(i) Activities for achieving enhanced implementation of the Strategy, in particular its targets 1, 2, 3, 4, 6, 7, 10, 12 and 15;

(ii) Providing as appropriate additional information on the progress made towards achieving the targets of the Strategy, including quantitative data and information from other sectors and processes such as in forestry and agriculture, to strengthen future reviews of the implementation of the Strategy;

(c) Considers the further development of the Strategy beyond 2010 including a review of the current targets. Such consideration should be carried out in the broader context of the Strategic Plan, within the further development of the Convention beyond 2010, taking into account national priorities, capacities and differences in plant diversity between countries;

(d) Requests the Executive Secretary, in collaboration with the Global Partnership for Plant Conservation and other relevant organizations:

(i) To develop a toolkit, in pursuance of paragraph 7 of decision VII/10 of the Conference of Parties, that describes *inter alia* tools and experiences that can help enhance national, sub-regional and regional implementation of the Strategy. The toolkit should be made available in all the United Nations languages in both electronic and printed form, with the option of making the electronic version interactive in the long term;

(ii) To facilitate the development of capacity-building, technology transfer, and financial support programmes to assist developing countries, in particular Least Developed Countries (LDCs), small island developing States, and countries with economies in transition, to effectively implement or achieve enhanced implementation of the Strategy;

(iii) To identify regional tools for the exchange of information and capacity-building;

(e) Expresses appreciation to Botanic Gardens Conservation International for the secondment of a Programme Officer to the Secretariat of the Convention to support the implementation of the Strategy.

3. The Subsidiary Body on Scientific, Technical and Technological Advice requests the Executive Secretary to develop by the ninth meeting of the Conference of the Parties, in collaboration with the Global Partnership for Plant Conservation, UNEP-World Conservation Monitoring Centre and relevant organizations, and taking into account contributions from Parties, other governments and relevant stakeholders, a “Plant Conservation Report” that could provide input to the third edition of the Global Biodiversity Outlook and serve as a communication and awareness-raising tool on the implementation of the Strategy.

ANNEX 2: INFORMATION NOTE FOR COP 9 ON THE PLANT CONSERVATION REPORT

UNEP

CBD

Convention on Biological Diversity

Distr.
GENERAL

UNEP/CBD/COP/9/INF/25
5 May 2008

ENGLISH ONLY

CONFERENCE OF THE PARTIES TO THE
CONVENTION ON BIOLOGICAL DIVERSITY
Ninth meeting
Bonn, 19-30 May 2008
Item 3.2 of the provisional agenda *

PLANT CONSERVATION REPORT

A review of progress in implementing the Global Strategy for Plant Conservation (GSPC)

Note by the Executive Secretary

1. In decision VII/31, on its multi-year programme of work up to 2010, the Conference of the Parties decided to consider the Global Strategy for Plant Conservation (GSPC) as an issue for in-depth consideration at its ninth meeting. In preparation, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) carried out a review of the GSPC. At its twelfth meeting, SBSTTA considered the in depth review of the implementation of the GSPC and adopted recommendation XII/2 for consideration by the Conference of the Parties.

2. Paragraph 3 of that recommendation requests the Executive Secretary to develop by the ninth meeting of the Conference of the Parties, in collaboration with the Global Partnership for Plant Conservation, UNEP-World Conservation Monitoring Centre and relevant organizations, and taking into account contributions from Parties, other Governments and relevant stakeholders, a "Plant Conservation Report" that could provide inputs to the third edition of the Global Biodiversity Outlook and serve as a communication and awareness-raising tool on the implementation of the Strategy.

3. Accordingly, the Executive Secretary is pleased to circulate herewith, for the information of participants in the ninth meeting of the Conference of the Parties to the Convention on Biological Diversity, the "Plant Conservation Report: a review of progress in implementing the Global Strategy for Plant Conservation (GSPC)".

4. The Plant Conservation Report outlines progress made to date, from 2002 to 2008. The Report also highlights the urgent challenges and some priorities for further implementation up to 2010, as well as providing a background and rationale for further global initiatives in plant conservation beyond 2010.

* UNEP/CBD/COP/9/1.

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ANNEX 3: COP 9 DECISION IX/3

GLOBAL STRATEGY FOR PLANT CONSERVATION

The Conference of the Parties,

Having considered the outcomes of the in-depth review of the Global Strategy for Plant Conservation conducted by the Subsidiary Body on Scientific, Technical and Technological Advice and the key messages resulting from the review as transmitted to Conference of the Parties by the Subsidiary Body in paragraph 1 of its recommendation XII/2 (UNEP/CBD/COP/9/2, annex),

Noting that the Global Strategy has stimulated the engagement of the botanical and plant conservation communities in the work of the Convention, through, inter alia, the establishment of national, regional and global networks, including in particular the Global Partnership for Plant Conservation,

1. Urges Parties that have not yet done so, to:

(a) Nominate focal points for the Strategy; and

(b) Develop national and/or regional strategies for plant conservation with targets as appropriate, including within the context of national biodiversity strategies and action plans and other relevant national and regional policies and action plans, as part of broader plans to achieve the 2010 biodiversity target and the relevant Millennium Development Goals;

2. Urges Parties and invites other Governments and relevant organizations to further implement:

(a) Activities for achieving enhanced implementation of the Strategy, in particular its targets 1, 2, 3, 4, 6, 7, 10, 12 and 15, including by reaching other relevant sectors beyond the botanical and conservation communities; and

(b) Providing, as appropriate, additional information on the progress made towards achieving the targets of the Strategy, including quantitative data and information from other sectors and processes such as in forestry and agriculture, in order to strengthen future reviews of the implementation of the Strategy;

3. Decides to consider the further development and implementation of the Strategy beyond 2010, taking into account current and emerging environmental challenges on plant diversity, including an update of the current targets within the broader context of and consistent with the new Strategic Plan beyond 2010, taking into account national priorities and circumstances, capacities and differences in plant diversity between countries;

4. Requests the Subsidiary Body on Scientific, Technical and Technological Advice to provide, prior to the tenth meeting of the Conference of the Parties, proposals for a consolidated update of the Global Strategy, taking into account the Plant Conservation Report, the third edition of the Global Biodiversity Outlook, the fourth national reports and additional inputs from the Global Partnership for Plant Conservation and other relevant organizations;

5. Further requests the Subsidiary Body on Scientific, Technical and Technological Advice to consider the review of the implementation of targets 3, 6, 9, 11, 12 and 13 that are related to sustainable use of plant diversity, when it undertakes the in-depth review of the work on sustainable use prior to the tenth meeting of the Conference of the Parties;

6. Requests the Executive Secretary, in collaboration with the Global Partnership for Plant Conservation and other relevant organizations:

(a) To develop a practical and user-friendly toolkit, in pursuance of paragraph 7 of decision VII/10 of the Conference of the Parties, that describes inter alia tools and experiences that can help enhance national, subregional and regional implementation of the Strategy. The toolkit should be made available in all the United Nations languages in both electronic and printed form, with the option of making the electronic version interactive in the long term;

(b) To identify regional tools for the exchange of information and capacitybuilding;

(c) To publish the Plant Conservation Report (UNEP/CBD/COP/9/INF/25) in all the United Nations languages as a communication and awareness-raising tool on the implementation of the Strategy;

(d) To facilitate capacity-building, technology transfer, and financial support programmes to assist developing countries, in particular least developed countries, small island developing States, and countries with economies in transition , including those with high levels of biodiversity and are centres of origin, to effectively implement or to achieve enhanced implementation of the Strategy; and

(e) Coordinate regional workshops with support of Parties and other relevant organizations on the implementation of the Global Strategy for Plant Conservation, subject to available resources, and to include the Global Strategy in the agenda of regional workshops for national biodiversity strategies and action plans and compile these results including an assessment of capacity needs for consideration of the Subsidiary Body on Scientific, Technical and Technological Advice;

7. Acknowledges the work of the Global Partnership for Plant Conservation, the World Conservation Monitoring Centre of United Nations Environment Programme, other organizations, and the Executive Secretary in developing the Plant Conservation Report, and expresses its appreciation to the Government of Ireland for the preparation of this Report, and further extends itsappreciation to Botanic Gardens Conservation International for the secondment of a Programme Officer to the Secretariat of the Convention on Biological to support the implementation of the Strategy;

8. Urges donors and other organizations to support the implementation of the Strategy at the national and regional levels.

Published by:

Convention on
Biological Diversity

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