

DRAFT REPORT

GLOBAL STRATEGY FOR PLANT CONSERVATION

Implementing Target 8 of the Global Strategy for Plant Conservation: 60% of threatened plant species in accessible ex situ collections, preferably in the country of origin, and 10% of them included in recovery and restoration programmes

A Report of the Stakeholder Consultation on Target 8 of the Global Strategy for Plant Conservation

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This report represents the results of a stakeholder consultation meeting hosted by the National Botanic Garden, Belgium from 19-20 July, 2003, organised and sponsored by Botanic Gardens Conservation International (BGCI), the International Plant Genetic Resources Institute (IPGRI) and the HSBC “Investing in Nature” initiative. Further contributions were received and incorporated during the drafting of this report and a list of the contributors is contained in Annex II.

INTRODUCTION

1. The Conference of the Parties (COP) to the Convention on Biological Diversity, at its sixth meeting, adopted decision VI/9 on the Global Strategy for Plant Conservation, including 16 outcome-oriented global targets for 2010 (UNEP/CBD/GSPC/2/2).
2. The COP requested the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), *inter alia*, to develop ways and means, within the Convention’s thematic and cross-cutting programmes of work, for promoting implementation of the Global Strategy for Plant Conservation, and for monitoring and assessing progress; and to report to the Conference of the Parties at its seventh meeting (paragraph 10).
3. It was recognised moreover, that further work is required to develop and implement the Strategy, as described in annex I to decision VI/9. Thus,
 - (a) For each target, the scope of activities may need to be clarified and sub-targets, or milestones developed. In order to monitor progress towards achieving the targets, baseline data and a series of indicators may need to be developed. This would draw upon relevant national and international data sets (such as national “red lists”), and make full use of the clearing-house mechanism (paragraph 17);
 - (b) Regional components of the Strategy might be developed, perhaps using a biogeographical approach (paragraph 18);

(c) In addition to the Parties to the Convention, the design, development and implementation of the strategy should involve a range of actors, including: international initiatives, conservation and research organizations, communities and major groups including indigenous and local communities, governments and the private sector (paragraph 19); and

(d) In order to promote implementation of the strategy and facilitate cooperation between these initiatives, consideration might be given to the establishment of a flexible coordination mechanism (paragraph 20).

4. In response to these provisions of decision VI/9, the Executive Secretary invited a group of experts whose selection was determined by the Secretariat on the basis of their expertise and previous involvement in the development of the Strategy; as an informal liaison group to provide additional guidance on the implementation and monitoring of the strategy. A meeting of these experts was held in Cartagena, Colombia, on 11 - 12 October 2002.

5. The recommendations of the liaison group included the need for a programme of meetings, workshops and consultations to be held prior to the ninth meeting of SBSTTA to review the development of sub-targets, milestones and indicators for each of the 16 targets included in the GSPC, as well as to elaborate baseline data available and necessary for monitoring. It was suggested by the group that the Executive Secretary should invite a number of international organisations to help lead and facilitate this programme of consultations (UNEP/CBD/LG-GSPC/1/2).

6. The recommendations of the liaison group were approved by the Executive Secretary who subsequently, in January 2003 (SCBD/STTM/JM/33075) wrote to a range of the international organisations to invite them to organise the proposed stakeholder consultations. Botanic Gardens Conservation International (BGCI) and the International Plant Genetic Resources Institute (IPGRI) were jointly invited to facilitate a stakeholder consultation on Target 8.

7. The stakeholder consultation process agreed between BGCI and IPGRI was to organise a meeting of international experts in the fields of *ex situ* conservation and threatened plant species recovery and restoration, with the aim of preparing a draft report addressing the need for and proposing sub-targets, milestones, indicators and a series of recommendations on the ways and means in which Target 8 may be achieved both through actions undertaken at national levels, as well as with the support and involvement of regional and international organisations, agencies and other initiatives. The stakeholder consultation would be further implemented by the wide circulation of the draft report of the meeting for further refinement and review by relevant stakeholder organisations throughout the world.

8. The Stakeholder Consultations were also requested to address other important issues in relation to the implementation of the GSPC including consideration of:

- the ways and means, within the Convention's thematic and cross-cutting programmes of work, for promoting implementation of Target 8, and for monitoring and assessing progress.
- the implications and means of achieving Target 8 by applying the ecosystem approach.
- the ways in which the GSPC can contribute to poverty alleviation and sustainable development.

- on-going monitoring and coordination requirements and possibilities including the potential role of a flexible coordination mechanism.
- the ways in which the CBD Clearing House Mechanism can contribute to the implementation / coordination / monitoring of the achievement of Target 8.

9. BGCI and IPGRI subsequently organised a stakeholder consultation meeting on Target 8 that took place on 19-20 July in Meise, Belgium, hosted by the National Botanic Garden, Belgium and sponsored by BGCI, IPGRI and HSBC through the “Investing in Nature” initiative.

10. The draft report, recommendations sub-targets and milestones prepared during the stakeholder consultation meeting is being circulated to botanic garden organisations, genebank networks and relevant other bodies in August/September for further refinement and review.

11. The draft recommendations of the Stakeholder Consultation meeting thus included in Part 4 of this report and a list of participants is provided in Annex I.

12. The stakeholder consultations were requested to review the potential role of the strategy in contributing to poverty alleviation and sustainable development. *Ex situ* collections are often a valuable source of accessible plant material useful for a variety of purposes for human usage, including the restoration of damaged or degraded habitats, for research and education, for selecting materials for introduction into the nursery trade, local agriculture and crop breeding programmes, amenity planting, local forestry etc. As such *ex situ* collections may have an extremely important function to support poverty alleviation and sustainable development and national and local levels. Recovery programmes may be developed for species which are important for human use particularly at local levels (e.g. medicinal plants, fodders, timbers, fuelwoods, wild collected foods (including famine foods)).

PART 1. CLARIFICATION OF THE SCOPE OF ACTIVITIES OF TARGET 8 AND IMPLICATIONS FOR ACHIEVING THE TARGET BY APPLYING THE ECOSYSTEM APPROACH.

13. The target addresses the Plant Kingdom with focus on higher plants, and other well-described groups such as Bryophytes and Pteridophytes. The setting of measurable targets for this set of taxa is more credible than for many lower plant groups. This does not imply that these groups do not have important ecological functions, nor that they are threatened. However, effective action will be best achieved by focusing, in an initial phase at least, on achievable outcomes for known taxa. Parties may choose on a national basis to include lower taxa, such as Algae.

14. *Ex situ* collections are those collections of plant diversity held outside their natural habitats to safeguard identified populations or individuals from danger or loss. *Ex situ* conservation involves the collection, conservation and maintenance of samples of organisms outside of their natural habitats, usually in the form of live whole plants, seed, pollen, spores, vegetative propagules, tissue or cell cultures and other genetic material of growing or preserved individuals. These collections should preferably be held in the country of origin, duplicated and be accessible under the terms defined in the CBD (Articles 8j and 15) and relevant National legislation.

15. The known number of threatened plants species will not be fixed in time, but will change as more plant species are assessed for their conservation status and conservation actions to reduce

their threat status are underway. Consequently, for the purposes of Target 8, threatened species should refer to a “sliding baseline” of known threatened plants species at a stated point in time.

16. The 60 per cent of threatened plant species as identified by Target 2 should be represented in *ex situ* collections and where possible these species should be included in active conservation programmes.

17. 10 per cent of threatened plant species as identified by Target 2 should be included in restoration and recovery programmes and where possible be a subset of the threatened plant species included in *ex situ* collections. Recovery and restoration programmes may be defined as ones where genetically representative, self-sustaining populations of the species are established or re-established in the wild in appropriate natural habitats. They may adopt a single species approach, or ecosystem approach, focusing on the conservation of all the components of an ecosystem, containing one or more threatened plant species. Through the implementation of co-ordinated restoration and recovery programmes, Target 8 can make a significant contribution to the implementation of Target 7.

18. Selection of threatened plant species to be included in Target 8 should focus, where appropriate, on the categories in Box 1.

Box 1. Priority categories for focused *ex situ* conservation programmes:

- Species or taxa that are in immediate danger of extinction, either locally, nationally or globally.
- Species or taxa that are of local economic importance, such as minor food crops, medicinal plants and wild or cultivated plants providing the basis of local industries, agriculture, horticulture and crafts.
- Species or taxa, such as local ecotypes, that may be required for specific reintroduction or habitat restoration and management schemes.
- Local 'flagship' species or subspecies that will stimulate conservation awareness and can be incorporated into education and fund raising programmes.
- Species or taxa that are of special scientific interest, such as narrow endemics or geographical relics.

Source: *International Agenda for Botanic Gardens in Conservation* (2000)

19. The target does not specify to what extent *ex situ* collections of a particular species should be representative of the genetic diversity of that particular species in order to be regarded as conserved *ex situ*. In practice there is little comprehensive information available on whether existing *ex situ* collections are genetically representative although such information is becoming increasingly available through the application of molecular analysis of plant species genetic diversity variation and patterns. It should be presumed however that the achievement of the target requires that adequate representation of genetic diversity of threatened species be included in *ex situ* collections, as defined by currently available genetic conservation guidelines and best practice manuals. Sampling strategies adopted for *ex situ* conservation programmes should be as sophisticated and comprehensive as the national capacity, time and policy allows in order to maximise the conservation value of the collections maintained. Further development of appropriate accessible modules and protocols for rapid assessments of genetic diversity of threatened species should be undertaken to establish minimum standards for *ex situ* collections (this is relevant to the achievement of Target 3).

20. The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. The effective conservation of plants species *ex situ* requires due cognisance to be given to applying the ecosystem approach and be regarded as a complementary approach. The management of plant diversity may often require the use of *ex situ* conservation techniques in support of integrated conservation and sustainable use. Further recovery and restoration programmes for specific *ex situ* conserved species should necessarily adopt such an ecosystem approach.

PART 2. DEVELOPMENT OF SUB-TARGETS, MILESTONES, BASE-LINE DATA AND A SERIES OF INDICATORS FOR MONITORING PROGRESS TOWARDS ACHIEVING THE TARGET.

Development of sub-targets and milestones

21. The following text proposes the adoption of a limited number of sub-targets at international level which may be monitored through the achievement of a series of specific milestones. Collectively, these milestones may also act as appropriate international indicators for monitoring progress towards the achievement of the target.

SUB TARGETS

22. Two sub-targets are proposed, as follows.

Sub-target 1.

Development of time-bound sub-targets, preferably on an annual basis, at appropriate national, regional and international levels indicating [actual] numbers of species, and where possible their names and regions of origin to be included in ex situ conservation collections and in recovery and restoration programmes based on available and developing baseline information.

Sub-target 2.

90% of critically endangered species included in ex situ conservation collections by 2010.

23. Proposed temporal sub-targets towards the achievement of Target 8 indicating the percentage of threatened plants to be included in accessible *ex situ* conservation collections, preferably in the country of origin and included in recovery and restoration programmes in 2004 and 2007 might be as follows:

	<i>% of threatened plant species in accessible ex situ collections, preferably in the country of origin</i>	<i>% of critically endangered plant species in accessible ex situ collections, preferably in the country of origin</i>	<i>% of threatened species included in recovery and restoration programmes</i>
<i>2003/4 (current estimated baseline)</i>	10 - 20%	10%	2%
<i>2007</i>	40%	40%	5%
<i>2010</i>	60%	90%	10%

24. Further work is required to determine the current baseline percentage and numbers of threatened plant species in accessible *ex situ* collections maintained in the country of origin and to propose sub-targets for 2007.

25. If the current available estimates of 100,000 threatened plant species worldwide (see paragraph 41), of which an estimated 30% (30,000) are critically endangered, are accurate this would translate the above percentages into actual numbers of species due to be conserved in *ex situ* collections and through restoration and recovery measures as follows (see also paragraph 41):

	<i>No. of threatened plant species in accessible ex situ collections, preferably in the country of origin</i>	<i>No. of critically endangered plant species in accessible ex situ collections, preferably in the country of origin (estimated at 30% of the total)</i>	<i>No. of threatened species included in recovery and restoration programmes</i>
<i>2003/4 (current estimated baseline)</i>	10,000 to 20,000	3,000	2,000
<i>2007</i>	40,000	12,000	5,000
<i>2010</i>	60,000	27,000	10,000

MILESTONES

26. Twelve milestones are proposed at international level. The relevance of these milestones to achievement of other targets in the Global Strategy for Plant Conservation is also indicated under each milestone.

Milestone 1.

Compile and make accessible a consolidated list of networks involved in ex situ conservation and related activities worldwide by 2004. (Target 16)

Milestone 2.

All institutions holding ex situ collections of plant resources are identified and are included in a worldwide process to monitor the achievement of Target 8 by 2004.

Milestone 3.

Mechanism and process established to facilitate the addition of an annual number of threatened plants to be included in ex situ conservation collections, preferably in their country of origin, by [2004].

Milestone 4.

Globally accessible databases of expertise, knowledge and resources compiled and available to support the implementation of Target 8 by [2004] (Targets 15 and 16)

Milestone 5.

Establishment of internationally accessible preliminary database on threatened species included in recovery and restoration programmes by 2004 (Target 9).

Milestone 6.

Mechanism and process established to facilitate the addition of an annual number of threatened plants to be included in recovery and restoration programmes by 2005 (Target 9).

Milestone 7.

Accessible consolidated preliminary list of plants held in ex situ collections available by 2005.

Milestone 8.

Existing and required models and protocols assessed and/or developed and made widely available to support minimum standards for ex situ conservation collections by [2005] (Target 3).

Milestone 9.

Identification of an indicative list of priorities for urgent plant conservation programmes (e.g. threatened species of wild relatives of crops, medicinals, keystone and/or flagship species, ecotypes, taxa of special scientific interest) by [2005] (Target 9), .

Milestone 10.

Studies completed indicating genetic consequences of seed banking in indicative plant groups by 2005 (Target 3).

Milestone 11.

Tools established for development of a genetic provenance atlas for model and/or priority plant taxa as a guide to collection strategies by [2006] (Targets 3 and 15).

Milestone 12.

Identification of a minimum of 20,000 threatened species held in accessible botanic garden ex situ conservation collections by 2006 (Target 12).

Development of base-line data

27. Baseline data are those required to serve as the basis for comparisons against which to judge progress toward a specified goal. The identification of key goals as making up Target 8 dictates the kind of information that would be desirable to be able to use as baseline.

28. In order to be able to guide programmes toward the successful achievement of Target 8, and indeed to be able to judge whether the target has been achieved, consideration must be given to four basic issues:

- national monitoring and reporting of *ex situ* collections and their use (potential or actual) in restoration and recovery
- data requirements and variables

- adaptive management model for performance assessments
- potential for individual accessions to be useful in recovery

A. *National monitoring and reporting of ex situ collections and their use (potential or actual) in restoration and recovery*

29. Botanic Gardens Conservation International and the International Plant Genetic Resources Institute have been identified as lead organisations to support the achievement of Target 8, and bring considerable resources to the matter of aggregating the required information base, especially for their respective sectors. In addition, Parties to the Convention should be encouraged to undertake active monitoring of the *ex situ* collections of threatened plants maintained within their territory and used for recovery and restoration purposes as well as invited to provide regular updates on their *ex situ* collections and holdings and on their threatened plant recovery activities, in order to facilitate the development and maintenance of comprehensive baseline data.

B. *Data Requirements And Variables*

30. Reporting of information on a species-by-species basis is ultimately necessary to be able to gauge performance relative to Target 8 goals and milestones. The following lists indicate the variables that are desirable to have available for quantitative assessment of progress toward the specified goals and milestones. Where possible these variables should use the fields defined by and included in international standards for botanical and collection recording (such as the International Transfer Format – ITF, 1987 and 1999 and in a global checklist of plant species proposed for the implementation of Target 1) to facilitate compatibility during reporting and compilation procedures.

Institutional Level - Each taxon:

1. Taxon name and authority
2. Country of origin
3. Wild origin (Y/N)
4. International conservation status ranking (e.g. IUCN Red Data Book category applied)
5. National conservation status ranking
6. State/type and condition of *ex situ* accession (live plant, seed, pollen, cryo/tissue, etc.)
7. Quality/accuracy of location data/source information (location information maybe be confidential)
8. Availability/accessibility
9. Present inclusion in recovery/restoration programme
10. Potential or suitability for use in species recovery (e.g. size of accession, genetic representation, quality of source information)
11. Security of accession/Regeneration status

31. Baseline information on organisations, institutions and facilities involved in *ex situ* conservation is also required to monitor progress towards the achievement of Target 8. Such baseline information may include some or all of the following information:

Description of Institution/organisation/facility:

1. Institution name
2. Location
3. Status of the *ex situ* collection (governmental/private etc)
4. Involvement in national networking
5. Involvement in regional networking
6. Involvement in global networking
7. Staffing of education programmes associated with conservation activities
8. Staffing of *ex situ* conservation management
9. Staffing in other conservation programmes
10. Staffing in training
11. Area (ha) available for maintenance of live *ex situ collections*, including for the regeneration of seed, and its current percentage utilisation
12. Potential for *ex situ* collection expansion
13. Present capacity for seed storage, including by cryopreservation and its current percentage utilisation
14. Potential to increase seed storage capacity
15. Database on *ex situ* collections available and permitting electronic access (Y/N)

32. Baseline information included in national lists of threatened plants varies from country to country and information available may be comprehensive to non-existent. The following list provides a suggested minimum level of information required for the achievement of Target 8; most of which will be provided through the implementation of Targets 1 and 2.

National or Regional Level: Species Lists

1. Taxon name and authority
2. National conservation status ranking
3. IUCN Red Data Book category applied (at national and international levels)
4. Priority category (for example using categories derived from Box 1. - species which are in immediate danger, local economic importance, 'flagship', special scientific interest or have special reintroduction value)
5. Inclusion in national recovery plans or conservation management programmes (Y/N)
6. Endemic (Y/N)
7. Participant in Relevant Habitat Recovery (Y/N)

National Data

1. Country/country subdivision Name
2. Total wild flora
3. Total endemic flora
4. Total number of taxa at risk
5. Identity of National Focal Point
6. Description of known collections

C. Adaptive Management Model For Performance Assessments

33. Judging whether or not the activities of Parties and stakeholders have been sufficient to achieve the quantitative expectations of Target 8 requires flexibility of expectations with regards baseline data in particular. This is necessary because the two basic quantities needed to assess progress (number of globally threatened species and number of species under *ex situ* protection or subject to recovery) are not known with precision at this time. Over time, estimates of these

quantities will be refined as new capacities are developed allowing for greater accuracy of the number of globally threatened species and an increased number of species are part of *ex situ* conservation programmes.

34. As the refinement of the estimate of the number of species that are threatened with extinction is itself specified as Target 2 of the Global Strategy for Plant Conservation, it is necessary that “sliding baselines,” (see paragraph 15.) useful at each stage but accepted as tentative, be used when gauging progress toward each of the milestones established for Target 8.

D. Potential for Individual Accessions to be Useful in Recovery

35. Further consideration needs to be given to the matter of the usefulness of any given *ex situ* accession for restoration and recovery programmes (See also paragraph 19 above). It is clear that in extreme cases an *ex situ* collection consisting of even a few individuals of a species that is extinct in nature is of valuable conservation significance. However, in most cases application of an integrated model of *in situ* and *ex situ* processes being applied to reduce or eliminate the risk of extinction depends upon the *ex situ* collection consisting of representative samples of genetic diversity below the species level. While the goals of Target 8 are specifically aimed at the species level, in order to achieve conservation at the level of the species, due consideration must be paid to the diversity below the species level and over time, both as samples of interesting or important genetic adaptation, temporal changes in diversity and also as functional elements necessary for the survival of the species itself.

36. In the absence of assessments of genetic diversity, location information is often used as a surrogate measure of genetic diversity information, for example in the management of forest genetic resources. At the very least, information on each accession should include, where possible, original location data and some descriptor indicating the quality/accuracy of that location data.

- Development of a series of indicators for monitoring progress towards achieving the target.

37. The milestones have been formulated in such a way as to constitute and incorporate relevant indicators for monitoring progress towards the achievement of Target 8. The development and implementation of sets of appropriate indicators at national and regional levels may be valuable in many cases, particularly where useful comprehensive baseline data is not currently available.

- Flexible coordination mechanism

38. The inclusion of a means to monitor and assist in the coordination of the achievement of Target 8 in a flexible coordination mechanism for the Strategy is desirable. Such a means might include an on-going Stakeholder Consultation process and a broadly-based and geographically representative international group of experts on *ex situ* conservation and threatened plant species recovery and restoration. The stakeholder consultation process might also be applied to reviewing the achievement of the milestones.

- Institutions/organisations holding information relevant to these technical aspects of the target, and the availability of this information for the purposes of achieving the target.

39. A wide range of institutions and organisations hold information relevant to the technical aspects of *ex situ* conservation and species recovery and restoration. Information is made

available in published and electronic formats on many techniques relevant to the achievement of Target 8. Meta data (on institutions and organisations undertaking *ex situ* conservation and maintaining *ex situ* collections) relevant to the achievement of the target is by-and-large widely available (although not sufficiently collated to date). However, access to specific and detailed information *ex situ* collections varies very considerably both from institution to institution and between countries. Such access is often hindered by poor quality, availability or accessibility of data in electronic formats. The achievement of Target 8 requires effective dissemination of technical information required to support *ex situ* conservation and recovery and restoration programmes. An urgent review is needed to ensure that *ex situ* conservation practitioners have adequate access to up-to-date guidance, data, protocols and technical assistance and other forms of information.

- Existing base-line data: review and assessment.

40. Botanic Gardens Conservation International has estimated that over 10,000 threatened species are maintained in living collections (botanic gardens, seed banks, and tissue culture collections) at this time, representing some 30% of known threatened species (although for the most part these are probably not adequately genetically representative). Furthermore, approximately 2% of threatened species are currently included in recovery and restoration programmes.

41. If the current number of threatened species is in the region of 100,000 (D. Bramwell, pers. com.), a first order approximation suggests that *ex situ* conservation of threatened species must be increased by at least 500 per cent above the present coverage by 2010 to achieve the 60 per cent goal. Similarly, coverage of threatened species in recovery and restoration programs must be increased by 500 per cent over the next six years to achieve the 10 per cent goal.

42. Examples of information on existing baseline data include the following:

- According to the FAO World Information and Early Warning System (WIEWS) database, approximately six million accessions are contained in over 1,300 genebanks, with over 5.5 million of those accessions stored in regional or national genebanks and c. 600,000 maintained within the Consultative Group on International Agricultural Research (CGIAR) system (FAO, 1998). Many of these collections are included in the International Network of *Ex Situ* Collections under the auspices of FAO (including the collections of the International Agricultural Research Centres – IARCs). It should be noted also that SINGER database administered by System-wide Genetic Resources Programme of IPGRI contains all the collection of the IARCs. Seed storage accounts for about 90% of the total accessions held *ex situ* (FAO, 1996). The extent to which threatened plant species are included in these collections is not fully known. Information on the types of collections held are only available for approximately one third of the accessions listed in the WIEWS database. However, it has been estimated that 48% of all accessions are advanced cultivars or breeders' lines, while over one third are landraces or old cultivars and about 15% are wild or weedy plants or crop relatives (FAO, 1996). Few accessions in the WIEWS database are likely to be of threatened species, all of which will be from the 15% representing wild or weedy plants or crop relatives. The WIEWS database will have particular relevance to the implementation of Target 9 of the GSPC.

- Botanic Gardens Conservation International estimates that in excess of 80,000 plant species are in cultivation in botanic gardens worldwide, represented by some 6,130,900 living plant accessions in 2,178 botanic gardens (Wyse Jackson et al., 2001). A recent preliminary electronic analysis of accession information from 445 botanic gardens (undertaken by BGCI in 2002) indicated that between them they cultivate 80,070 taxa, of which 8,823 are species included in the 1997 IUCN Red List of Threatened Plants (Walter & Gillett, 1998). BGCI reports that there are currently botanic gardens known in 153 countries. Such information is now accessible via BGCI's website (www.bgci.org).
- Laliberté (1997) reports that 152 botanic gardens have seed/genebanks containing at least 255,832 accessions and an additional 17,069 germplasm accessions in botanic garden field genebanks. Of the long-term botanic garden seed banks surveyed by Laliberté, approximately 77% of their accessions are of germplasm collected directly from the wild. These same seed banks estimated that approximately 27% of their accessions are of rare and endangered species.
- The Millennium Seed Bank Project (MSBP) of the Royal Botanic Gardens Kew, U.K. with partners from 16 countries aims to collect and conserve 10% of the world's seed-bearing flora (some 24,000 species), principally from the drylands by 2010 focusing on, where possible, priority species such as nationally threatened species, endemics and economically important species (Roger Smith, pers. comm. 2002). The MSBP has already collected c.99% of the UK flora.
- An example of baseline information on *ex situ* conservation of a particular taxonomic group (conifers) is provided in Box 2.

Box 2: Threatened conifers and *ex situ* conservation

1. Threatened conifers

- 361 threatened conifers currently listed by the IUCN SSC Conifer Specialist Group
- 266 (74%) of these are represented in cultivation by at least 1 accession within 1 botanic garden.
- Of the 95 not believed to be cultivated, 43 belong to the Podocarpaceae

2. Critically endangered conifers

- 16 of the 21 CR conifers are believed to be in cultivation
- 3 species have extensive *ex situ* programmes.

3. Conifers not known in cultivation

- IUCN Red Data Book status
 - CR: 5; EN 10; VU 29; LR (nt/cd) 21; DD 29 (24 Podocarpaceae): **Total 94**
- 33% are from SE Asia, especially Malesiana; 26% are from Central America and the Caribbean.

Data Sources; Conifer Specialist Group, IUCN Red List, BGCI web database, ICCP database

- **Relationship with Decisions and Provisions of the CBD in different programme areas with relevance to the Global Strategy on Plant Conservation**

43. An analysis of the relationship between the achievement of Target 8 and Decisions and Provisions in different CBD programme areas is provided in UNEP/CBD/COP/6/INF/21/ADD2. This analysis should be updated to include recent CBD decisions and activities.

PART 3: RELATIONSHIP AND CROSS-SECTORAL RELEVANCE OF THE TARGET TO THE ACHIEVEMENT OF OTHER TARGETS INCLUDED IN THE GSPC

- Relationship and cross-sectoral relevance of the target to the achievement of other targets, and in particular the GSPC cross-cutting targets 3, 14, 15 and 16. This includes consideration of the development of relevant sub-targets, milestones and indicators which also relate to the achievement of other targets, particularly the cross-cutting targets 3, 14, 15 and 16.

44. The relevance of particular milestones to the achievement of other targets has been indicated in paragraph 25 and included as relevant in the Recommendations (below). Specific contributions of *ex situ* conservation to the achievement of other aspects of the Global Strategy for Plant Conservation may be usefully determined at all levels and it is recommended that further work be undertaken to determine cross-sectoral significance of *ex situ* conservation and species recovery and restoration. At national levels such information may be included in NBSAPs.

PART 4: RECOMMENDATIONS, PROPOSALS AND SUGGESTED TIMETABLE FOR ACTION

45. A series of recommendations are provided below:

(i) **ACTIONS BY PARTIES.**

DEVELOPMENT OF SUB-TARGETS AND MILESTONES AT NATIONAL LEVELS

1. Recommend that Parties and other Governments set time-bound sub-targets, preferably annually, for threatened plants to be included in *ex situ* conservation programmes and in recovery and restoration programmes, based on national lists of threatened species. Such sub-targets should ideally specify the identity and number of threatened species to be included in *ex situ* conservation collections as well as in recovery and restoration programmes.
2. Recommend that Parties and other Governments should develop and adopt appropriate milestones towards the achievement of the 2010 target in order to ensure that national targets adopted can be monitored in an effective and timely fashion.

NATIONAL BIODIVERSITY STRATEGIES AND ACTION PLANS

3. Recommend that Parties and other Governments incorporate the achievement of Target 8 goals into National Biodiversity Strategies and Action Plans (NBSAPs).

CAPACITY NEEDS ASSESSMENTS AT NATIONAL LEVELS

4. Recommend that Parties and other Governments undertake urgent assessments of national capacity (existing and required, especially of human resources and institutional capacities), including gap analysis, in order to determine baseline data and requirements to achieve nationally adopted targets and to minimise duplication of effort.

CAPACITY BUILDING AT NATIONAL LEVEL

5. Recommend that Parties and other Governments build and sustain institutional capacity, as identified by national capacity assessment exercises.

NETWORKS AND LINKAGES

6. Recommend that Parties and other Governments seek to encourage the development and maintenance of appropriate networks and linkages among plant conservation facilities at local, national, regional and international levels to facilitate close cooperation and exchanges, subject to relevant national laws and policies on biodiversity and IPRs.

- (ii) ACTIONS BY INTERNATIONAL/REGIONAL AGENCIES CHARGED WITH BIODIVERSITY CONSERVATION AND SUSTAINABLE USE OF NATURAL RESOURCES. IN RELATION TO THEIR RESPONSIBILITIES UNDER INTERNATIONAL CONVENTIONS AND OTHER RELEVANT INTERNATIONAL/REGIONAL INITIATIVES.

HARMONIZATION OF MONITORING DATABASES

7. Recommend that international and regional agencies, organisations and other bodies holding, developing and maintaining baseline data and databases relevant to the achievement of Target 8 should urgently seek to ensure accessibility and close compatibility between their databases and data management procedures, in order to facilitate greater coordination, synergies and for the development of accurate baseline data to monitor timely progress towards the 2010 target.

RE-EVALUATION OF INFORMATION MANAGEMENT STANDARDS

8. Recommend that relevant international and regional agencies, organisations and other bodies undertake an urgent re-evaluation of the prevailing information standards used in the management of data for *ex situ* collections and for the implementation of recovery and restoration programmes for threatened plant species, including greater emphasis on the taxonomic and biological verification and how representative is the material held/used in conservation programmes.

TECHNICAL SUPPORT AND ASSISTANCE IN *EX SITU* CONSERVATION

9. Recommend that relevant international and regional agencies, organisations and other bodies provide assistance to Parties, especially developing countries, small island developing states and countries with economies in transition, in the form of technical support, training opportunities, access to *ex situ* technical expertise, methodologies and databases and other forms of assistance relevant to the achievement of nationally adopted targets in *ex situ* conservation and the recovery and restoration of threatened plant species.

- (iii) ACTIONS IN RELATION TO REGIONAL INITIATIVES FOR PLANT CONSERVATION.

10. Recommend the development and incorporation of sub-targets, milestones and indicators for Target 8 into any regional initiatives undertaken or proposed for plant conservation (including regional plant conservation strategies) based on the compilation of best available baseline data, with the aim of ensuring a regional approach to coordinating and

monitoring the delivery of *ex situ* conservation measures for threatened species, and in particular for those that are critically endangered.

- (iv) ACTIONS BY CBD INCLUDING THE SECRETARIAT (EXECUTIVE SECRETARY), ADVISORY BODIES (e.g. SBSTTA) AND COP.

FLEXIBLE COORDINATION MECHANISM

11. Recommend that the Executive Secretary establish and support an on-going Stakeholder Consultation process, including a broadly-based and geographically representative international group of experts on *ex situ* conservation and threatened plant species recovery and restoration, as part of a flexible coordination mechanism, to help monitor and integrate the achievement of Target 8 at international and regional levels.

EDUCATION, COMMUNICATION AND PUBLIC AWARENESS (GSPC Target 14)

12. Recommend that COP invite Parties, other Governments, international organisations, intergovernmental agencies and NGOs and other relevant institutions and bodies to develop and implement targeted educational, communication and awareness programmes on *ex situ* plant conservation in order to enhance public understanding of the importance of *ex situ* conservation of threatened species and its role in conserving vital germplasm and in making it available for human use.

INSTITUTIONAL CAPACITY BUILDING

13. Recommend the need to build, sustain and retain institutional capacity in each country in order to achieve the requirements of Target 8 (GSPC Target 15). The identification of priorities for capacity building should be undertaken by the implementation of needs assessments at all appropriate levels. The results of such assessments may be disseminated through the Clearing House Mechanism.

DEVELOPMENT OF TRAINING MODULES IN *EX SITU* CONSERVATION

14. Recommend the identification of appropriate existing or creation of new training modules in *ex situ* conservation and ensure that they are available to support capacity building particularly in developing countries, small island developing States, and countries with economies in transition.

FINANCIAL SUPPORT FOR *EX SITU* CONSERVATION

15. Recommend that COP instructs the financial mechanism to support the implementation of Target 8 initiatives by prioritising and allocating funding to prerequisite and capacity building programmes of work in order to support and achieve the sub-targets and milestones of the GSPC within the proposed timeframe.
16. Recommend that COP invite Parties, other Governments, financial mechanisms and funding organisations provide adequate support for a programme of capacity building and for the elaboration of best practices in *ex situ* conservation at appropriate national, regional and international levels, particularly in developing countries, small island developing States, and countries with economies in transition.

STRENGTHENING NETWORKING

17. Recommend that COP invite SBSTTA, Parties, other Governments, international organisations and intergovernmental agencies adopt measures to strengthen networks of organisations, institutions and individuals involved in *ex situ* conservation, particularly at national and regional levels.

ENHANCING INTER-SECTORAL LINKAGES IN *EX SITU* CONSERVATION

18. Recommend that COP invite SBSTTA, Parties, other Governments, international organisations and intergovernmental agencies adopt measures to enhance linkages and synergies between different sectors involved in *ex situ* conservation, including botanic gardens, genebanks, ngos, thematic networks (such as horticultural societies and specialist growers) and the private sector.

INTEGRATED METHODOLOGIES FOR RECOVERY AND RESTORATION PROGRAMMES

19. Recommend that the SBSTTA should consider and recommend the adoption by Parties, other Governments, international and national bodies of methodologies for recovery and restoration programmes for threatened species that are based on the best integrated conservation principles, including utilising where possible appropriate *ex situ* conservation collections.

TIMETABLE FOR ACTION

20. Recommend that the development and on-going monitoring of an international timetable for action towards the achievement of Target 8 be undertaken by the flexible coordination mechanism and that this timetable be widely disseminated to relevant bodies through the Clearing House Mechanism.

APPENDICES

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Annex III. Key references

- BGCI (1987) The International Transfer Format for Botanic Garden Plant Records (ITF), Hunt Institute for Botanical Documentation, Pittsburgh, 1987 and ITF 2, (1999).
- FAO (1996). *Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture and the Leipzig Declaration Adopted by the International Technical Conference on Plant Genetic Resources, Leipzig, Germany 17-23 June, 1996*. Food and Agriculture Organisation of the United Nations, Rome, Italy.
- FAO (1998). *The State of the World's Plant Genetic Resources for Food and Agriculture*. Food and Agriculture Organisation of the United Nations, Rome, Italy. Pp.510.
- Hilton-Taylor, C. Compiler(2000). *2000 IUCN Red List of Threatened Species*, IUCN, Gland, Switzerland and Cambridge, UK. xviii+61 pp.
- Laliberté, B. (1997). Botanic garden seed banks / gene banks worldwide, their facilities, collections and network. *Botanic Gardens Conservation News*, 2(9) December 1997. Botanic Gardens Conservation International, Richmond, UK. pp. 18-23.
- Walter, K.S. and Gillett, H. (eds) (1998). *1997 IUCN Red List of Threatened Plants*. Compiled by the World Conservation Monitoring Centre, IUCN, Gland, Switzerland and Cambridge, UK.
- Wyse Jackson, P.S. and Sutherland L.A. (2000). *International Agenda for Botanic Gardens in Conservation*. Botanic Gardens Conservation International, Richmond, Surrey, UK.
- Wyse Jackson, P.S. et al. (2001). *An International Review of the Ex Situ Plant Collections of the Botanic Gardens of the World – reviewing the plant genetic resource collections of botanic gardens worldwide, as a contribution to decision V/26 on Access to Genetic Resources*. Report prepared by Botanic Gardens Conservation International for the Secretariat of the Convention on Biological Diversity. Pp. 48 + 320.