# Progress in implementation of the targets of the Global Strategy for Plant Conservation 2014-2016

## Introduction

A mid-term review of progress towards the Global Strategy for Plant Conservation (GSPC) was carried out in 2014 in parallel with the review of progress towards the Strategic Plan for Biodiversity 2011-2020. The review was published by the CBD Secretariat in collaboration with Botanic Gardens Conservation International (BGCI) as CBD Technical Series No 81.

This report provides an update on progress that has occurred towards specific GSPC targets in the period since the mid-term review, highlighting how this progress contributes to the achievement of the Aichi Biodiversity targets. The report focuses on those targets for which information on recent progress is available. This information has been provided by members of the Global Partnership for Plant Conservation (GPPC). It should be noted that not all GPPC members have provided information and the report does not attempt to be fully comprehensive. Furthermore, much of the information provided has been summarised for this report, but further details are available if required.

## National / regional responses to the GSPC

### South Africa

In 2015, South Africa published its National Strategy for Plant Conservation under the leadership of the South African National Biodiversity Institute and the Botanical Society of South Africa. It includes 16 outcome-oriented targets, which are nationally relevant but closely align with the targets of the GSPC. South Africa's Strategy for Plant Conservation targets are included in the updated National Biodiversity Strategy and Action Plan (NBSAP) which was published in 2015. Through the development of this strategy a network of botanists has been developed that includes conservation agencies, non-governmental organisations (NGOs) and academic institutions. This strategy is online at http://biodiversityadvisor.sanbi.org/planning-and-assessment/plant-conservation-strategy/.

### North America

The North American Botanic Garden Strategy for Plant Conservation, original published in 2006, is presently being updated to bring it in line with the GSPC 2020 targets. Implementation of this updated strategy will take place through the North American Plant Conservation Initiative and will involve botanic gardens across the USA, Canada and Mexico.

### National / regional workshops

Workshops to discuss progress towards the GSPC targets, identify gaps and build support for plant conservation activities at government level were held in Uganda and Ethiopia and a regional

workshop was held for Africa Francophone countries.

## GSPC Target 1: An online flora of all known plants

Target 1 of the GSPC is considered to be on track for achievement by 2020 and will make a significant contribution to Aichi Target 19 (Biodiversity knowledge improved, shared and applied).

### Global progress

This target is being implemented through the World Flora Online (WFO) project, led by Missouri Botanical Garden. By the beginning of 2016 over 30 institutions worldwide had joined the project. Two Council meetings were held in 2015 and agreement reached on the software to be used for the development of a public portal for the WFO (www.plants2020.net/world_flora/).

### National progress

**Bolivia**: The Checklist of Bolivia was published in 2014 (Missouri Botanical Garden).

**Central America**: Flora Mesoamericana, Vol. 2 (3) was published in 2015 (Missouri Botanical Garden)

**China**: The Flora of China (FOC) is available on-line at: www.efloras.org/flora_page.aspx?flora_id=2. In 2014, with the addition of an Advanced Search function, the online functionality has been greatly enhanced. Over 64,000 synonyms, misapplied names, Chinese names, and pinyin names, and data on elevations, Chinese provinces, and foreign countries are now searchable. Users can generate various databases for their own purposes based on FOC data, e.g., list of species of vascular plants occurring in both China and India, or China and Greece, etc. Since 2014 a full version of the Chinese translation of FOC has been available. This has greatly expanded the readership of FOC in China.

**China**: A Comparison of the classifications of vascular plants of China was published in2015: (www.ingentaconnect.com/content/iapt/tax/2015/00000064/00000001/art00003)

**Colombia**:The Universidad Nacional de Colombia and its partners have launched the most comprehensive checklist ever documented of the plants that occur in the country. The Catalogue of the Plants and Lichens of Colombia, includes contributions from 180 botanists working in 20 countries over the last 13 years. For the first time, information about the 1,674 species of lichens and 26,126 plant species that have so far been documented in the country are compiled in one on-line resource. Colombia is one of the TOP 10 countries with the greatest botanical diversity, this inventory is therefore a fundamental step towards achieving Target 1 of the GSPC.

**Costa Rica:** The Manual de Plantas de Costa Rica, Vol. 7 was published in 2014; Vol. 8 was published in 2015 (Missouri Botanical Garden)

**Gabon:** A database of some 100,000 specimens collected in Gabon, representing more than 95% of the total for the country has been developed. This information is being used to update the checklist of the vascular plants of Gabon and map the ca. 6,000 species that grow there (Missouri Botanical Garden).

**France**: The new version of taxonomic reference TAXREF v9.0 was put online with more than 33,000 new names, the report on the conservation status of species and habitats of Community interest was published and two new Red Lists on French Polynesia have been published. New features

include the integration of the vascular flora of Mayotte and the Scattered Islands or more atypical groups such as lichens of the Pacific (https://inpn.mnhn.fr/programme/referentiel-taxonomique-taxref ) (MNHN, France).

**Madagascar:** The Catalogue of the Vascular Plants of Madagascar project has compiled information on all of the estimated 13-14,000 native and naturalized species in Madagascar (Missouri Botanical Garden).

**Morocco**: An online database has been created containing most of the plant checklists (endemic and regional hotspots floras) and including the endemic Moroccan Flora, which has been published according to APG III (Global Diversity Foundation).

**Morocco**: The final of three volumes of the Flore pratique du Maroc have been completed and published (The Scientific Institute of Rabat).

**Peru**: Publication of the Catalogue of the Trees of Peru, (in Press) (Missouri Botanical Garden).

**Puerto Rico** - A new bilingual website of the native and introduced plants of the island of Puerto Rico has been launched. This provides information on 3,500 species of plants on the island, with a focus on improving the conservation of threatened plants and native ecosystems (http://regionalconservation.org/ircs/database/site/IntroPR.asp ) (Institute for Regional Conservation).

**South Africa:** South Africa has an active e-Flora project which aims to disseminate published species descriptions online for the country's ca. 20,500 taxa. To date, 13,200 (64%) short descriptions from regional Flora's have been uploaded into the e-Flora database with another 630 taxa (3%) with more comprehensive descriptions.

**Venezuela**: The first volume of a multi-volume Flora of Guaramacal has been published (Smithsonian's National Museum of Natural History)

# GSPC Target 2: An assessment of the conservation status of all known plant species, as far as possible, to guide conservation action.

Progress towards GSPC Target 2 will make a significant contribution to Aichi Target 19 (Biodiversity knowledge improved, shared and applied).

## Global progress

IUCN and the Species Survival Commission have increased efforts to accelerate the rate of uptake of plants assessments on the IUCN Red List of Threatened Species™, recognising that the rate of uptake has been slower that than of other taxonomic groups. As a result, in2015, a further 1,017 plant assessments were published on the Red List, with 649 of these being considered under threat. This brings the total number of globally threatened plants on The IUCN Red List to 11,233 (54% of the 20,755 species so far assessed). Continued progress at this rate will result in global-level assessment of less than 10% of the world's flora by 2020, and steps should be made to address this, bearing in mind that plants are a large taxonomic group and some species are difficult to assess

To address this gap, BGCI is compiling additional conservation assessments carried out at the

national and regional level and so far has data for 90,571 unique plant species. Of these 49,037 (54%) are considered threatened. While it is recognised that the quality of all these assessments is not always known, the data does provide at least an initial assessment and can be used to guide conservation action. BGCI's list of threatened plants will be made available during 2016 as an online database.

The Global Trees campaign (a partnership between Fauna and Flora International and BGCI) has set a target to complete assessments of all tree species by 2020, and this sub-target is on track to be achieved. The *Red List of Betulaceae* was published in 2014 and efforts are presently focused on the Theaceae, Magnoliaceae, Quercus and Hydrangea families.

In 2015, IUCN Species Survival Commission launched an appeal to raise funds to Red List the world's carnivorous plants. The funding target was achieved and an assessment workshop will be held in 2016.

## National progress

**Brazil**: Brazil's Centre for Flora Conservation (CNC Flora) is currently assessing 902 endemic plants of the Rio de Janeiro State. Assessments for all endemic tree species were completed in 2015 (182 species) all of which are considered to be under threat of extinction. Brazil continues to invest strongly in Red Listing having assessed over 6,050 species for the entire country since 2010.

**Cape Verde**: IUCN Red List assessments for the endemic flora of Cape Verde was completed (78% of species are under threat) (University of Lisbon)

**China**: The Chinese Academy of Sciences published the Chinese Red List of Biodiversity – Volume on Higher Plants on-line in 2014. The publication is in preparation. This includes regional assessments for 34,450 vascular and non-vascular plants, of which 3,766 are listed as threatened (Critically endangered, Endangered and Vulnerable).

**East Africa:** The East African Plant Red List Authority is working steadily to assess all plants endemic to East Africa with a focus on Eastern Arc Endemics, between 200 and 300 species are assessed each year. Over 1,700 East African plants are already included on the IUCN Red List.

**French Polynesia:** The Red List of French Polynesia includes 460 plant species and 61 endemic species. The assessments showed that two thirds of endemic plants are currently threatened) (https://inpn.mnhn.fr/espece/listerouge/FR/Flore_Vasculaire_Polynesie_2015 ) (MNHN, France).

**Mauritius**: A new draft Plant Red List for Mauritius nears completion (Missouri Botanical Garden)

**Morocco**: The first official Red List for a taxonomic group (endemic monocotyledons) has been published. The assessment found that 94% of species are threatened. The second official Red List for a taxonomic group (Medicinal plants) has been started by the publication of the IUCN Red list of the Medicinal roots species covering 11 taxa (Global Diversity Fundation)

**Mozambique:** Mozambican botanists have been trained to do Red Listing (2014 & 2015). Endemic plants to the Rovuma centre of endemism in Northern Mozambique were assessed and published on the IUCN Red List in November 2014. During 2015 plants endemic to the Maputaland Centre of Endemism in Southern Mozambique were assessed. By 2020 all endemics (ca 500 species) will be

assessed. (SANBI)

**New Caledonia:** The newly established New Caledonia Plant Red List Authority includes staff from Missouri Botanical Garden. The Authority will assess the conservation status of the island's flora of 3,000 species (Missouri Botanical Garden).

**Tropical Africa:** Preliminary conservation assessments of almost 20,000 species from Tropical Africa have been completed using an automatic procedure based on specimen records. A Missouri Botanical Garden staff member was appointed co-coordinator of the Central Africa Plant Red List authority (CARLA) and the Garden has organized workshops and supported capacity building of local botanists for conservation assessments. (Missouri Botanical Garden).

**USA**: Scientists at Missouri Botanical Garden's Center for Conservation and Sustainable Development (CCSD) have developed a new methodology for assessing the vulnerability of rare plant species to climate change and have completed a Climate Change Vulnerability Assessment for 71 globally threatened plant species endemic to the North American Central Highlands.

**South Africa:** 700 plant species were assessed during 2015, all 20,500 plants in South Africa have been assessed but annual updates are done for plant species occurring in areas of the country experiencing high land transformation rates. Red List assessments are being focused on the Karoo Basin which constitutes ca. 30% of South Africa's land surface, and is under pressure for Shale Gas Development. Spatial data on the occurrence of threatened and rare plants is being fed into national level government infrastructure and development planning.

## Target 3: Information, research and associated outputs, and methods necessary to implement the strategy developed and shared.

A number of new publications, guidelines and resources have been published since 2014 that support the implementation of the GSPC and contribute to Aichi Target 19. These include:

- A new web-based blog titled '*Natural History of Ecological Restoration*' that focuses on restoration problems and solutions has been developed. To date it includes 22 posts and has received more than 3,500 different visitors in 2015 (Target 4) https://mbgecologicalrestoration.wordpress.com/ (Missouri Botanical Garden).
- *Best Reintroduction Practice Guidelines*, designed for conservation practitioners to use when planning and executing rare plant reintroductions (Targets 4 and 8) (http://ncbg.unc.edu/uploads/files/CPCReintroductionPracticeGuidelines.pdf ). (The Center for Plant Conservation).
- *Our Once and Future Planet – Restoring the world in the climate change century* (Author: Paddy Woodworth) (Targets 4 and 8).
- The Australian Seed Bank Partnership is holding a National Seed Science Forum in March 2016 – this is the first gathering of its kind in Australia since 2009. The Forum will bring together seed scientists, people working in the native and agricultural seed industries, and restoration practitioners and enable them to share the latest research and ideas, discuss issues being faced by industry and the conservation and restoration sectors that could be

addressed through science, and form collaborations to advance future conservation, agricultural and restoration efforts. (Targets 4 and 8).

- An *ex situ* Cycad collection guide that provides an overview of cycad conservation worldwide and guidance on developing *ex situ* collections to support cycad conservation needs (Target 8) (http://www.bgci.org/news-and-events/news/1306/) (BGCI-US).
- A series of scoping studies and benchmarking methodologies for measuring the level of forest governance for four countries; Brazil, Peru, Colombia, and Ecuador. National scoping studies for Colombia, Peru, Ecuador and Brazil have been published, presenting an analysis of illegal logging and timber trade, and the state of forest governance and management (TRAFFIC) (http://www.traffic.org/forestry/) (Target 12).
- Publication of the book '*Curating Biocultural Collections*' (Edited by Jan Salick, Katie Konchar, and Mark Nesbitt). The book places a strong emphasis on meeting the needs of collection users and encourages ethical and equitable engagement with source communities. This book gives valuable insight for anyone working to preserve valuable resources (Target 13).
- In April 2015, a new publication, *Caring for your community: A manual for botanic gardens*, was published by BGCI. This highlights case studies from gardens that are conducting exemplary work related to their social role, reaching out to hard-to-reach communities. The publication aims to encourage and support others to do the same https://www.bgci.org/files/Worldwide/Education/communitiesIN/) (Target 14).

Many countries are making progress on this achieving this target nationally. For example in South Africa botanists has secured a large government grant to survey poorly known arid desert areas of the country currently under pressure from mining and renewal energy rolls outs. Additionally good progress is being made towards botanical research priorities identified in South Africa. In 2013, 159 priority genera were identified to be in need of taxonomic revision by the end of 2015 work to revise 81 of these genera had commenced.

## GSPC Target 4: At least 15 per cent of each ecological region or vegetation type secured through effective management and/or restoration.

Progress towards Target 4 of the GSPC contributes to Aichi Target 11 (Protected areas). Some activities undertaken under GSPC Target 8 also relate to this Target.

### Global progress

While this target is mainly achieved through actions taken to implement Aichi Targets 11 and 15, a specific initiative that made progress during 2015 is the Ecological Restoration Alliance of Botanic Gardens (ERA). The ERA is a global consortium of botanic gardens actively engaged in ecological restoration. Members of the Alliance have agreed to support efforts to scale up the restoration of damaged, degraded and destroyed ecosystems around the world. Specific achievements include:

- The ERA held two international meetings, in Amman, Jordan and Edinburgh Scotland.
- Three regional working groups have been launched, for the Middle East, East Africa, and Latin America.
- Partnerships have been forged to support restoration initiatives in Jordan, Oman, Syria,

Kenya and Uganda.

- A strategy for regional outreach and action in the Middle East was agreed upon and several Society for Ecological Restoration (SER) foundation documents will be translated into Arabic.
- Five long-term goals have been agreed upon, each with their own objectives for 2020. These will be published in a five year ERA strategy in early 2016.
- A one-day public symposium was held in Amman; attended by over 100 people, this was the most significant public meeting on ecological restoration held to date in the Middle East.
- A range of how-to guides and online resources will be published as part of a restoration tool-kit for practitioners to be completed by 2020.

## National progress

**Costa Rica:** Applied restoration is being carried out on ~60 ha of degraded farmland at 24 sites across a landscape of ~76 sq km of premontane humid forest. The area under restoration is part of the Mesoamerican biodiversity hotspot and the Chiriqui zone of endemism (Missouri Botanical Garden).

**Kenya and Uganda**: Over 50 acres have been brought under restoration over the past three years, and 44,000 tree seedlings have been supplied free of charge to neighbouring communities to encourage adoption of a wider mix of indigenous species.(BGCI).

**Madagascar**: In August 2015 Madagascar's first ecological restoration workshop was held, bringing together nearly 30 people from 16 institutions (Missouri Botanical Garden).

**USA**: The habitat of endangered plants at six protected limestone cedar glades, a globally imperiled ecosystem in the southeastern United States with 30 endemic plant species is being restored and a project initiated to restore dolomite glade habitat at the Missouri Botanical Garden's Shaw Nature Reserve (Missouri Botanical Garden).

# GSPC Target 5: At least 75 per cent of the most important areas for plant diversity of each ecological region protected with effective management in place for conserving plants and their genetic diversity.

Progress towards GSPC Target 5 contributes to Aichi Target 11 (Protected areas). Activities under Target 5 also contribute to GSPC Target 7 and Aichi Target 12 (Extinction prevented), where specific species are targeted for conservation action within IPAs.

## Global progress

In 2015, the Royal Botanic Gardens, Kew (RBG Kew) published its Science Strategy 2015-2020. A strategic output for 2020 is the identification of Tropical Important Plant Areas (TIPAs), using and adapting the criteria developed by Plantlife International. Following a period of consultation, the revised criteria for TIPAs will be disseminated in 2016. The revised criteria also have a specific mechanism for incorporating socio-economic plants into the IPA network. RBG Kew has a target of carrying out IPA assessments with national partners in 7 Tropical Regions between 2015 and 2020 (Cameroon, Guinea, Mozambique, Uganda, Bolivia, the Caribbean, UK Overseas Territories, West Papua). Inception workshops were held in Bolivia and Guinea in 2015 and are planned for 2016 in Mozambique, Cameroon and the British Virgin Islands.

## National progress

**Europe**: The Wildflower Europe project finished in 2014 but several of the countries are continuing with the model of wildflower festivals and cultural appreciation of wild plants within IPAs (www.wildflowereurope.org). (Plantlife International)

**Gabon:** Missouri Botanical Garden is leading a project to employ the High Conservation Value (HCV) process to identify species, habitats and areas of conservation importance. This will support government efforts to promote sustainable management of biodiversity and will assist the private sector to mitigate the impacts of economic development through the establishment of well-designed protected areas (Missouri Botanical Garden).

**Georgia**: A workshop to build capacity for the identification of IPAs in Georgia will be held in early 2016 (BGCI and Plantlife International).

**Madagascar**: A series of key priority plant-rich areas are being protected in Madagascar through the implementation of community-based partnerships between local people and Missouri Botanical Garden. In total, an area of over 150,000 acres (+60,000ha) is protected in this network of sites. In 2015, 12 of the reserves in Madagascar were declared as national nature reserves by the Government of Madagascar (Missouri Botanical Garden).

**Mediterranean:** A project is being implemented (end 2014 to 2017) to carry out field testing of the desk survey of IPAs in 11 Mediterranean countries in Morocco, Algeria, Tunisia, Egypt, Lebanon, including incorporating IPA data into the online IPA database, creating a GIS map of IPAs throughout the Mediterranean, and in the Balkans (currently Turkey, Montenegro and Macedonia), developing national volunteer networks to carry out site and species monitoring. (IUCN Med Office, Plantlife).

**Morocco**: Ongoing and upcoming projects are prioritising research on Important Plant Areas (IPAs) in the Moroccan High Atlas, a regional hotspot, and working to implement conservation actions in these areas. Enrichment planting in IPAs is being undertaken by local people through community nurseries for medicinal plants and threatened species (Global Diversity Foundation).

# Target 7: At least 75 per cent of known threatened plant species conserved *in situ*.

Progress towards this target is difficult to measure at the global level due to the lack of information on the spatial occurrence of threatened species. However notable progress at the national level is

being made by some countries. Progress towards this target contributes to Aichi Target 12 (Extinction prevented).

## National progress

**Brazil:** In 2014 and 2015 Brazil conducted an analysis to identify priority areas to conserve threatened plants. Distribution records for 2113 threatened plant species have been included in this analysis. The optimal places to conserve the highest number of threatened species while minimizing conflicts especially with agriculture and mining sectors have been identified. Currently CNCFlora is conducting conservation action plans for three of the priority areas identified in the analysis, these plans if successfully implemented will lead to the conservation of 407 threatened species.

**China:** Around 70 projects are being implemented in Yunnan Province for the conservation of wild plants with extremely small populations. These projects take an integrated approach including *in situ, ex situ* and near-situ conservation, reintroduction and restoration. To support these projects, four *ex situ* conservation gardens and four experimental bases for species reintroduction have been established. The approach in Yunnan is being used as model for the rest of China (BGCI).

**China**: 12 practical tree conservation projects are being implemented in Zhejiang, Guangdong, Guangxi, Yunnan, Sichuan, and Xinjiang provinces, aiming to enhance efforts to conserve and restore native and threatened species and habitats, engage local communities in conservation action and improve local livelihoods. Through this integrated conservation approach, 25 highly threatened tree species are recovering (BGCI).

**South Africa:** In 2014 South African botanists conducted an analysis to show that of the 2,576 threatened plants species, 1,554 (66%) had at least one population occurring within a formally protected area. A systematic biodiversity conservation plan was conducted to identify the best sites for capturing a further 9 % of threatened species needed to achieve Target 7. Only 30 additional sites need to be conserved. Following this analysis, priority sites have been included into protected area expansion programmes. 12 of the 30 sites (40%) are under active negotiation for formal protection.

# Target 8: At least 75 per cent of threatened plant species in ex situ collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programmes

Good progress is being made towards Target 8 in many countries. This contributes to Aichi Target 12 (Extinction prevented)

## Global progress

**The Global Seed Conservation Challenge** (GSCC) is a major new BGCI initiative launched in 2015 which aims to increase the contribution of botanic gardens towards achieving GSPC Target 8 (http://www.bgci.org/plant-conservation/seedconservation/ ). As part of the GSCC, the following activities were carried out in 2015:

- A major review of seed banking in botanic gardens was undertaken and published

- A seed conservation 'hub' has also been set up to provide seed banking resources to gardens carrying out seed conservation
- More than 140 gardens in over 50 countries are already participating in the GSCC

In a number of countries, a key focus has been on the development of seed systems that will allow the production of seed of native species at the quality and quantities needed for wide-scale restoration – an activity that supports both GSPC Targets 4 and 8 (see below).

A new strategy, called Chaperoned Managed Relocation, for conserving rare species in *ex situ* collections that are threatened by future climate change has been developed. A report that outlines the concept and methodology is available on the BGCI website (www.bgci.org/climate/chaperoned-migration/ ) (Missouri Botanical Garden).

The Millennium Seed Bank Partnership continued to make progress towards its target of seed banking 25% of the world's flora by 2020. At the end of 2015, seed from 36,386 species had been collected and new partnerships established in Hawaii, Myanmar, Thailand and Ethiopia.

BGCI's PlantSearch database, which records the plants in collections of botanic gardens around the world, continues to expand. At the end of 2015 it contained over 1.3 million records related to over 1,100 institutions. An analysis of the database in 2015 revealed that at least 115,000 distinct plant species are cultivated by the world's botanic gardens, approximately one third of all known plants.

## National progress

**Australia**: In collaboration with the Atlas of Living Australia, the Australian Seed Bank Online has been developed. This publically accessible database contains detailed records for over 43,100 seed collections (reported in 2014 as 37,000 collections) and draws on the *ex situ* collections data captured by eight conservation seed banks in Australia. Around one third (34.2%; 6,325) of the estimated 18,500 flowering taxa in Australia are banked in conservation seed banks. Of the 3,574 legislatively threatened plant taxa, 1,240 (34.7%) are held in conservation seed banks (reported in 2014 as 25% of Australia's threatened flora) (Australian Seed Bank Partnership).

**Australia**: For the past three years, the Society for Ecological Restoration Australasia and 12 partner organizations have been collaborating on National Standards for the Practice of Ecological Restoration in Australia. These Standards are designed to encourage all restoration and rehabilitation projects in Australia to reach their highest potential, and involve sustainable practice. The standards will be launched at the Australian Seed Bank Partnership's National Seed Science Forum in March 2016 (Australian Seed Bank Partnership).

**China:** The Germplasm Bank of Wild Species (GBOWS) has a target of preserving 100,000 accessions of 10,000 Chinese species by 2020. Species that are threatened, endemic and economically important are prioritised for collection. The genebank holds 20,955 accessions representing ca. 8855 (ca. 30%) wild species of China and is a national centre for seed science and research.

**China**: To ensure the long-term survival of the native flora of Xishuangbanna (Yunnan State), Xishuangbanna Tropical Botanical Garden has initiated the Zero Extinction Project. Central to the project is the *ex situ* conservation of threatened species. Research is on-going for species with seeds that cannot be conserved in seed banks to identify the optimum population size for such species in

living collections (genetic optimisation). The "Zero Extinction Project" initiated by XTBG has been replicated by other botanical gardens in the Chinese Union of Botanical Gardens (CUBG).

**Madagascar and Panama**: Native plant nurseries have been developed and are supporting the conservation of rare plant species (Missouri Botanic Garden).

**Mauritius**: 30 plant species that are Critically Endangered or Extinct in the Wild have been repatriated to Mauritius (The Conservatoire Botanique national of Brest). A programme for the propagation of threatened endemic plant species and restoration of a rare plant nursery has been initiated. All known propagation data associated with the entire endemic flora of Mauritius and Rodrigues have been recorded and 57 protocols have been field tested for endangered taxa on Mauritius. This information is being used to further refine propagation techniques for the island's rare and endangered flora (Missouri Botanical Garden).

**North America: Collections assessment:** As a first step in the implementation of the North American Plant Conservation Initiative, the North American Collections Assessment will be updated. This is a voluntary inventory of threatened plants in botanic garden collections. This assessment was last carried out in 2014 when 39% of threatened US plants were found in US collections.

**Republic of Korea:** A new seed vault is under development in the Republic of Korea. This seed vault aims to be largest in Asia and will provide long-term backup storage for seeds of wild species. The seed vault will be completed in 2016.

**Sweden** - Plant collections have been increased, including the inauguration of an entirely new plantation for Scandinavian alpine plants, several of which are on the Swedish red list. This provides an opportunity to display and talk about threatened species/habitats and concerns about global warming (Uppsala Botanic Garden).

**South Africa:** The South African National Biodiversity Institute's 11 botanical gardens maintain extensive living collections and seed banking is carried out as part of the Millennium Seed Bank Partnership. Collectively seed banking and living collections now safe guard in *ex situ* collections 1,184 (46%) of the 2,576 threatened plant species in South Africa. The rate of collection is well documented and averages an increase of 3% per year. South Africa thus expects to be able to achieve its target of 60% of threatened species in *ex situ* collections by 2020.

**USA: The National Seed Strategy:** In order to meet restoration goals in the United States, the Plant Conservation Alliance, led by the Bureau of Land Management, produced the National Seed Strategy which has the goal of having "the right seed in the right place at the right time." Success on a national scale will be achieved through coordinated establishment of nationwide networks of native seed collectors, farmers and growers, nurseries and seed storage facilities, and restoration ecologists (www.blm.gov/seedstrategy) (Chicago Botanic Garden).

**USA: Seeds of Success (SOS):** Seeds of Success is the native plant seed banking program of the United States which began in 2001. Today it is a partnership between the Bureau of Land Management and 6 botanic gardens, each collecting seed from their region. Focusing on native plant taxa that are important for restoration, SOS has made over 17,000 collections of 5,165 species (174 families), in 80 ecoregions in 43 states. The seed collections are split between long term storage and use in developing plant materials to restore degraded habitats. Major funding ($3.5 million) was

received in 2015 from the Department of Interior to focus additional collection efforts on the eastern seaboard in order to restore sites after Hurricane Sandy and future superstorms (www.blm.gov/sos) (Chicago Botanic Garden).

**USA**: New protocols for creating 'restoration-ready' seeds of rare legumes in the North American Central Highlands have been developed. The protocols can be used to efficiently and effectively reintroduce these rare legumes back into their native habitat (Missouri Botanical Garden).

# Target 9: 70 per cent of the genetic diversity of crops including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated indigenous and local knowledge.

Progress towards Target 9 contributes to Aichi target 13 (Genetic diversity maintained).

## Global progress

At the global level, the Global Crop Diversity Trust has been established to ensure the conservation of crop diversity for food security worldwide. Currently, the Vault holds more than 860,000 seed samples, originating from almost every country in the world.

The project 'Adapting Agriculture to Climate Change is being led by the Royal Botanic Gardens, Kew in collaboration with Global Crop Diversity Trust. Through this project a number of crop wild relatives are being collected, protected and prepared in a form that plant breeders can readily use to produce varieties adapted to future climates. The project includes prioritisation of species and areas for collecting, the development of collecting guides and training

## National progress

**South Africa** is involved in the *in situ* conservation and use of crop wild relatives in three ACP countries of SADC region, a project led by Bioversity International. During 2015 South Africa developed a list of CWRs representing 292 taxa from 15 families. For these taxa 120,448 distribution records have been extracted from a range of data sources these are being georeferenced and will be used in a conservation plan to identify priority sites to manage *in situ* populations of Crop Wild Relatives. (SANBI)

# Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded

Progress towards GSPC Target 10 contributes to Aichi Target 9 (Invasive alien species prevented and controlled)

## Global progress

The International Plant Sentinel Network (IPSN) has been established to facilitate collaboration between botanic gardens and arboreta, National Plant Protection Organizations (NPPOs) and plant health scientists. The monitoring and surveying of exotic plant species in collections can provide an early warning of potential plant health risks through the introduction of alien pests and diseases to

the species' native environments. The IPSN now includes 27 botanic gardens in 12 countries. Training resources developed by the IPSN include: Biosecurity guides; Pest and disease identification guides; and Tools for surveying infested/diseased trees (www.plantsentinel.org/) (BGCI).

## National progress

**Australia**: A national multilateral Myrtle Rust Network has been established, coordinated through the Australian Government. This group is working to implement effective management to maintain plant diversity currently being threatened through the 2010 invasion of myrtle rust (*Puccinia psidii*) in natural systems in Australian states including Queensland, New South Wales, Northern Territory and the Australian Capital Territory. (Australian Seed Bank Partnership).

**Madagascar**: Actions to control and mitigate the impact of invasives in 12 community-based conservation projects have been developed and implemented following an international colloquium on invasive plants (Missouri Botanic Garden).

**Seychelles:** In December 31, 2015, Volume 9 Collection Inventories and Biodiversity of Invasive alien species of Seychelles was published (http://sciencepress.mnhn.fr/fr/collections/inventaires-biodiversite/invasive-alien-species-seychelles) (MNHN, France).

**South Africa:** In 2008 an Invasive Species Programme was established at the South African National Biodiversity Institute (SANBI), funded by the Working for Water Programme, to specifically tackle early detection of new alien invaders, conduct risk assessments for post-border introductions and to work on eradication of alien species that have just started to expand their ranges. In accordance with South Africa's Strategy for Plant Conservation this programme is: actively monitoring 42 emerging invasives (those that still have limited distribution); conducting research to understand the process of legal introductions and developing policy interventions to prevent these; conducting risk assessment for 174 plant species; producing Management Plans for 18 species requiring compulsory control to ensure eradication within a specified timeframe.

# Target 11; No species of wild flora endangered by international trade

Progress towards GSPC Target 11 contributes to Aichi Target 4 (Sustainable consumption and production)

## Global progress

CITES Non-detriment Finding (NDF) Guidance for Perennial Plants has been revised, based in part on the experiences of FairWild Standard implementation. Further revision of the NDF Guidance is ongoing and plans being made for presenting it at the CITES CoP in 2016. The guidance has also been used as the basis of guidance for other taxonomic groups including Seahorses, Sharks, Argali Sheep and Tortoises and Freshwater Turtle (TRAFFIC).

Successful trainings on making NDFs for perennial plants were conducted in Georgia, China and Latin America during 2014-2015 (TRAFFIC).

An MOU has been signed between the World Customs Organisation (WCO) and TRAFFIC on cooperation to sensitise Customs to wildlife conservation issues and bolster efforts to respond to the illegal trade in protected animals and plants. A presentation was made to the WCO's Enforcement

Committee meeting in 2014 to advocate for customs agencies to prioritise timber trade for enhanced monitoring and enforcement efforts by all Customs agencies (www.traffic.org/home/2013/10/21/wco-and-traffic-sign-mou-to-build-the-enforcement-capabiliti.html) (TRAFFIC).

Timber trade legality frameworks for Russia, India, Brazil, and updates for other countries were completed (TRAFFIC).

# Target 12: All wild harvested plant-based products sourced sustainably

Progress towards GSPC Target 12 contributes to Aichi Target 4 (Sustainable consumption and production)

## Global progress

The FairWild Standard, a recognised best practice tool to support the delivery of Target 12, is now available in 14 languages, together with guidance documents and other materials to support its implementation (www.fairwild.org/documents/). Under the FairWild certification scheme, operational for over five years (since 2010), 21 species have been certified in nine source countries (Bosnia and Herzegovina, Bulgaria, Georgia, Hungary, India, Kenya, Kazakhstan, Poland, Spain) and over 20 products are now sold in the USA, the European Union, Japan and other counties, labelled as 'FairWild' (http://www.fairwild.org/publication-downloads/other-documents/FairWild_species_products.pdf)

Time series information is not yet available, but the amount of sustainable ingredients on the market has clearly grown since the certification scheme was introduced in 2007, and is expected to have further increased in 2015. By volume, the largest proportion of certified ingredient is liquorice root. A third wild collection site for *Glycyrrhiza* spp. was certified in 2015, thus further stabilising certified supplies of this commercially important ingredient.

Beyond certification, other companies are using the FairWild Standard as a basis for responsible sourcing of wild plants through their internal policies and sourcing practices. This includes some key traditional Chinese medicine (TCM) manufacturers, which were the focus of a project implemented between 2013 and 2015, who are beginning to employ FairWild principles as part of their corporate social responsibility commitment.

The "Why go wild" online toolbox featuring wild harvesting of plants and the FairWild Standard continues to receive attention and use. By June 2015, the toolbox had received 54,579 visits since its launch (May 2014), from 161 countries. The toolbox is complementary to the GSPC toolkit and is available in English, Czech, Hungarian, Polish and Slovenian (www.whygowild.com/en.)

Belgian Trade Cooperation (BTC) completed studies on wild-collected botanicals from selected African, South American and Asian countries, providing opportunities to shortlist the wild-harvested plant species of with commercial and value-adding potential, including through the application of the sustainability standards and certification schemes (www.befair.be/en/publication/market-studies/wild-collected-botanicals-and-eu-market) (e.g. the FairWild Standard).

## National progress

**China:** Building around the traditional Chinese medicine (TCM) industry leaderships approach, TRAFFIC together with the World Federation of Chinese Medicine Societies (WFCMS), Zhejiang Wecome Pharmaceutical Ltd. (Wecome) and WWF China implemented the project 'Engaging the private sector in sustainable management of medicinal plants—the multiplier effect (abbreviated to EGP MAPs) over 29 months, finishing in July 2015. The project uses the FairWild Standard as a best-practice framework for sustainable wild harvesting and equitable trade in plants to underpin a long-term approach towards sustainability in the TCM industry, piloting a participatory approach to governance of China's wild plant resources. Positive results include training and capacity building for wild harvesters and collectors, CSR guidelines for businesses, Engagement with key industry stakeholders, case studies on sustainable wild-collection worldwide, a review of laws and policies governing the collection, management and use of medicinal plant resources in China and the development of policy recommendations (www.traffic.org/egp-maps) (TRAFFIC).

**India**: The first FairWild certification in Asia was achieved by Nature Connect in the North Western Ghats region of India in 2015, in the framework of the project linking *Terminalia* spp. wild-harvested fruits with a herbal product manufacturer in the UK (Pukka Herbs Ltd.) (TRAFFIC).

**Kosovo**: The FairWild Standard has been drawn upon in a revision of Kosovo's legal framework for Medicinal and Aromatic Plants resource management (TRAFFIC)

**Madagascar**: In September 2014, stakeholders in Madagascar met to discuss the timber trade and how best to carry out harvest and trade in a sustainable manner. The workshop assessed the laws and policies required as well as outlining the importance of transparency in the industry (TRAFFIC).

**Mexico**: Since 2014, CONABIO has included the FairWild Standard (Spanish version) in its website in order to promote its use in Mexico. Promoting the use of the FairWild standard is also part of the activities considered in the Mexican Strategy for Plant Conservation (TRAFFIC).

**South America:** Joint roadmaps have been developed with various stakeholders in terms of responding to the FLEGT and broader forest governance agendas with the aim of developing initiatives that reduce illegal logging and bring timber trade in line with EU FLEGT objectives, with a particular focus on trade to the European Union from Brazil, Colombia, Ecuador and Peru. Discussions have been held with private sector representatives in each of the four countries to introduce the FLEGT Action Plan (TRAFFIC).

**Vietnam**: A three-year sustainable wild plant harvesting and trade project was launched in 2015 in Bac Kan province of Viet Nam aiming to improve the livelihoods of at least 1,000 low-income households (TRAFFIC).

# Target 13: Indigenous and local knowledge innovations and practices associated with plant resources maintained or increased, as appropriate, to support customary use, sustainable livelihoods, local food security and health care

Progress towards GSPC Target 13 contributes to Aichi target 18 (Traditional knowledge resected).

## Global progress

Research on and repatriation of local and indigenous knowledge is a major research focus of the Missouri Botanical Garden's William L. Brown Center for Economic Botany in Bolivia, the Caucasus countries, the Himalayas, Peru and Madagascar. During the period 2014 – 2015, traditional knowledge has been inventoried in joint research with indigenous counterparts in those countries. Results from conservation work with communities in Peru, Bolivia and Madagascar have also all been published in local languages

## National progress

**Australia**: The University of New England's School of Law is developing protocols for Australia's botanic gardens to assist with managing Aboriginal and Torres Strait Islander traditional knowledge associated with conservation seed banked collections to maintain cultural integrity of the knowledge (Australian Seed Bank Partnership).

**Central America**: An online e-learning tool on FLEGT has been developed in consultation with indigenous community representatives Brazil, Colombia, Ecuador and Peru. Training of indigenous community leaders has already been undertaken in Colombia, Ecuador and Peru (http://traffic-cursogobernanzaforestal.com/) (TRAFFIC).

**Ireland**: Based on more than a decade of research, the first ever comprehensive survey of wild plant resources, economic botany and traditional knowledge in Ireland has been published (Missouri Botanical Garden)

**Madagascar**: Research on useful plants and traditions for pregnancy, child delivery and for post-partum care used by people living around Analavelona forest in South west Madagascar has been published (Missouri Botanical Garden).

**Morocco**: Promoting and maintaining traditional skills and indigenous conservation practices is the focus of projects in Morocco. Indigenous community members are supported to promote their indigenous knowledge and practices, and helped as they seek to adapt and modify these to ensure sustainable use (Global Diversity Foundation).

# Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes

Progress towards Target 14 contributes to Aichi Target 1 (Awareness raised).

## Global progress

Fascination of Plants Day (May 18) continues to grow in popularity with 874 events held at over 500 institutions in 54 countries around the world in 2015. Events were attended by a diverse range of people from all backgrounds and ages, and held at a variety of organizations including museums, universities, research institutes, schools and botanic gardens.

Missouri Botanical Garden hosted BGCI's International Botanic Gardens Education Congress from April 26-May 1, 2015. The Congress theme, 'Biodiversity for a Better World: Wild Ideas Worth Sharing', focused on the increasingly important and crucial role that botanic gardens play in their

own communities and around the world in cultivating a wide-spread global movement toward valuing, promoting, and planning for biodiversity. The Congress attracted 370 attendees from 40 countries.

Target 14 is a major focus for botanic gardens around the world. An analysis of visitor numbers carried out by BGCI indicated that over 500 million people visit botanic gardens each year. Below are a few examples of the types of activities undertaken.

### National progress

**Australia / New Zealand**: The inaugural Botanic Garden Open Day will be held across Australia and New Zealand on Sunday, 29th May, 2016. Botanic gardens, arboretum and gardens in Australia and New Zealand will celebrate the vital work botanic gardens do for plant conservation

**France**: Eager to help younger people discover biodiversity, the INPN (Inventaire National du Patrimoine Naturel) now offers on its website a new section "Educational Games". This section brings together a collection of educational games for children to discover biodiversity including birdsong recognition quizzes and a memory game.

**USA – Missouri Botanical Garden** - In 2015, the main Garden and its St. Louis-area sites engaged more than 100,000 people through education programs, ranging from field experiences, on-site classes, and outreach to teen apprenticeships, after-school alliances, and intensive community-based programs and partnerships. More than 9,300 Pre-K-Grade 2 students (early childhood) were engaged via the 2013-2015 program term. Of those, 600 experienced multiple outdoor discovery sessions at their schools, facilitated by Garden instructors in partnership with classroom teachers.

The Garden has continued to develop its 'BiodiverseCity St Louis' initiative as a multi-stakeholder network involved in conserving urban biodiversity and raising public awareness of the importance of biodiversity in the region.

From 2014-2015, via multi-day summits convened by the Garden and district-organized workshops, more than 470 educators from more than 100 different local schools were brought together to explore the topics of effective outdoor learning, nature-rich learning environments and experiences, STEM learning in early childhood years, citizen science, and stewardship.

## Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy

Progress towards GSPC Target 15 contributes to Aichi Target 19 (knowledge improved, shared and applied).

### Global progress

The SEP2D project, is twofold programme for the conservation of plant diversity and sustainable development in the South. The first phase of SEP had been to bring together a scientific community around the theme of plants to boost its action by networking several complementary activities.

The second phase (SEP2D), launched in 2015, building on the progress made by SEP, seeks to

strengthen scientific teams in the South by developing partnerships with the private sector, civil society and political institutions. Developed for 22 southern countries (West Africa, Central Africa, Madagascar / Comoros, Southeast Asia), the project aims to mobilize scientists in order to use research in conservation, management and development of plant diversity to address problems expressed by companies and other actors in the South. The SEP2D project focuses on professional and scientific training, pilot partnership projects in priority R & D projects, support to collections and the effective participation of developing countries in the GBIF. It also aims to facilitate communication and bring together politicians and scientists for effective participation in international processes. The SEP2D project hopes to create sub regional dynamics, bringing together the actors around four themes covering key issues in conservation and sustainable development of the plants: (1) forest / REDD +, (2) mines, (3) cosmetics and pharmacy, and (4) agro-biodiversity.

**National progress**

Many of the activities reported under other targets above include training components and these are not repeated here. A great many other plant conservation related training activities are on-going at the national and regional level. Only those for which we have received specific information are reported here.

**Argentina:** Within the framework of BGCI's Global Seed Conservation Challenge (GSCC), a seed conservation training course was organized by BGCI in December 2015 in Buenos Aires, Argentina. It was attended by 25 participants from a diverse range of botanical institutions across Argentina.

**China**: In 2015 the *First Technical Training for Protection of Species with Extremely Small Populations* was held in Yunnan Province, sponsored by the Forestry Department of Yunnan Province and organized by Yunnan Academy of Forestry and Yunnan Green Environment development Foundation. It was attended by 113 project implementers from about 73 project implementation units, including local forestry administration, forest stations, nature reserves etc. of Yunnan province, relevant scientific research institutes, universities and conservationists (BGCI).

**China**: In China's Zhoushan Archipelago, BGCI led a training course on Threatened Island Plant Conservation Techniques and Degraded Island Ecosystem Restoration in Daishan County in October 2015. Approximately 100 plant conservation practitioners attended, mainly from local forest stations (BGCI).

**China**: Improving the capacity of Chinese botanical gardens is one of the important missions of the Chinese Union of Botanical Gardens (CUBG). From 2013 to 2015, there were nine CUBG training courses held in China which covered: Plant Taxonomy and Plant Identification, Environmental Education Research and Practice, Horticulture and Landscape, and Botanic Garden Management. In total 267 trainees from over 90 botanical gardens, universities, NGOs and other relevant institutes were trained. In cooperation with the Royal Botanic Gardens Edinburgh and Bangor University in the UK, CUBG have sponsored 7 trainees from Horticulture and Landscape training courses to study in the UK for an extending three months period.

**Ethiopia**: As part of a joint partnership between BGCI and the Ethiopian Biodiversity Institute (EBI) to build capacity of Ethiopian botanic gardens, a workshop on 'Establishing and maintaining conservation collections of endangered and important ecosystem trees' was held at Wondo Genet

College, Ethiopia in December, 2015. The workshop was attended by 45 participants from government, university and private botanic gardens across Ethiopia (BGCI).

**Morocco** - Community members, students, and local researchers have been trained in developing botanical knowledge, collecting voucher specimens and building identification skills (Global Diveristy Foundation).

**Uganda**: In collaboration with the Royal Botanic Gardens, Kew and the Uganda National Gene Bank, BGCI held a three day training course on 'Tree seed collecting and conservation techniques', in Seeta, Uganda in February 2015. A total of 28 participants from Ugandan botanic gardens, universities and government departments involved in tree seed collection attended (BGCI).

**UK:** RBG Kew held a Seed Conservation Techniques training course at the Millennium Seed Bank in 2015 with 12 participants from 12 countries. In partnership with Queen Mary University of London, Kew started a new 1-year MSc course in Plant and Fungal Taxonomy, Diversity and Conservation in 2015. Kew runs an annual training course in Applied Plant Taxonomy, Identification and Field Skills, and published a second edition of The Kew Tropical Plant Families Identification Handbook in 2015.

**USA**: In order to address the need to build capacity for plant conservation in the United States, the Chicago Botanic Garden has created a continuum of conservation education opportunities engaging students from middle school through graduate school. The Science Career Continuum (SCC) starts with the programs Science First and College First that provide hands on learning opportunities for middle and high school students interested in botany and environmental science. The program focuses on students from underrepresented groups. For undergraduates, we are an NSF-REU (National Science Foundation Research Experiences for Undergraduates) site providing research opportunities for students in plant conservation. Next, our Conservation and Land Management Intern Program directly address the needs of federal agencies who are lacking botanical capacity by placing over 100 post-graduate interns on public lands each year to conduct stewardship activities. Many of these interns are involved in seed collection for Seeds of Success. Lastly, our graduate program in partnership with Northwestern University is training MS and PhD students in Plant Biology and Conservation. Collectively these programs have provided plant conservation education and opportunities to over 1800 students (www.chicagobotanic.org/research/continuum) (Chicago Botanic Garden).

The Missouri Botanical Garden also undertakes significant international contributions towards the achievement of Target 15. This includes its on-going International Professional Development Fellowships and training courses in conservation and sustainable development. Collaborating scientists receive capacity building training through interaction with MBG staff in all international programs. Some international students are included in the Garden's graduate program (currently there are students from Bhutan, Bolivia, China, Colombia, Costa Rica, Ecuador, Indonesia, Madagascar, Peru and Taiwan). The Garden also receives and facilitates visits to St Louis from a large number of scientists around the world. Ethnobotanical training courses have been taught by the Garden's staff in several countries. Since 2008, in collaboration with local universities in Madagascar, the William L. Brown Center has trained 15 Malagasy students in ethnobotany or aspects of conservation at the two sites. The Garden continues to make the training of Malagasy students a big part of its ethnobotanical and conservation programs at the Ambalabe and Analavelona sites (Missouri Botanical Garden).

# Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy

Progress towards GSPC Target 16 contributes to Aichi Target 19 (knowledge improved, shared and applied).

## Global progress

**Global Oak Conservation Partnership:** BGCI and The Morton Arboretum, Chicago, have a Memorandum of Understanding to work together on global tree conservation. In 2015, The Morton Arboretum launched a project to complete red list assessments for all of the world's oak species. Planning also began for a wider Global Oak Conservation Partnership that, in collaboration with BGCI, FFI and networks of partners, will establish conservation projects for threatened oaks in North America, China and Mexico, all of which are hotspots of oak diversity.

RBG Kew continues to publish Samara, the International Newsletter of the Millennium Seed Bank Partnership (MSBP) linking the partnership to share ideas and best practice. The MSBP continues to grow and comprises almost 200 partners in more than 95 countries. Technical visits to Kew are regularly hosted for Partners.

## National progress

As with Target 15, many of the activities reported under other targets above involve partnerships and networks. These are not repeated here. Only additional partnerships for which we have received specific information are reported here.

**China**: The Chinese Union of Botanical Gardens (CUBG), sponsored by the Chinese Academy of Sciences (CAS), State Forestry Administration, and Ministry of Housing and Urban-Rural Development, is a public organization for strategic cooperation among Chinese botanical gardens and arboreta. At present, 94 botanical gardens have joined CUBG as members.

**Morocco**: Two new networks have been established in Morocco: (1) the IUCN specialist group Moroccan Plant and Livelihoods Specialist Group, which is composed of Moroccan and foreign practitioners, scientists and professionals with an interest in Moroccan plants and livelihoods and (2) the Moroccan Biodiversity and Livelihoods Association, which is a non-profit that gathers Moroccan specialists and emerging professionals who work at the intersection of plant conservation and sustainable livelihoods (Global Diversity Foundation).

**North American Orchid Conservation Center:** NAOCC is a coalition of organizations dedicated to conserving the diverse orchid heritage of the U.S. and Canada. The network of NAOCC collaborators will foster and support efforts to preserve orchid habitats and work with land managers to restore native orchids where populations have declined. Survival of native orchids will be supported by development of national collections of orchid seeds and the fungi that orchids require. One NAOCC goal is to develop protocols and procedures for the production and propagation of all native orchid species in laboratory, greenhouse, and garden conditions (Smithsonian's National Museum of Natural History).

**USA – Russia**: The Missouri Botanical Garden has continued to facilitate a US / Russian botanical

exchange program, to build collaboration and capacity for plant conservation and research and support the development of plant collections. The program has included the organization of workshops in Russia and exchange visits by scientists and horticulturists each year.