

Native Seed Production – the Role of Botanic Gardens



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Botanic Garden Collections

Botanic gardens manage at least one-third of the world's flowering plants in their living collections and seed banks, representing a very significant potential resource for ecological restoration.



Seed Banks

Currently around 400 botanic gardens have seed banks.

- Genetically representative collections
- Long term security
- Limited space requirement
- Relatively low-cost.



Location of Seed Banking Institutions

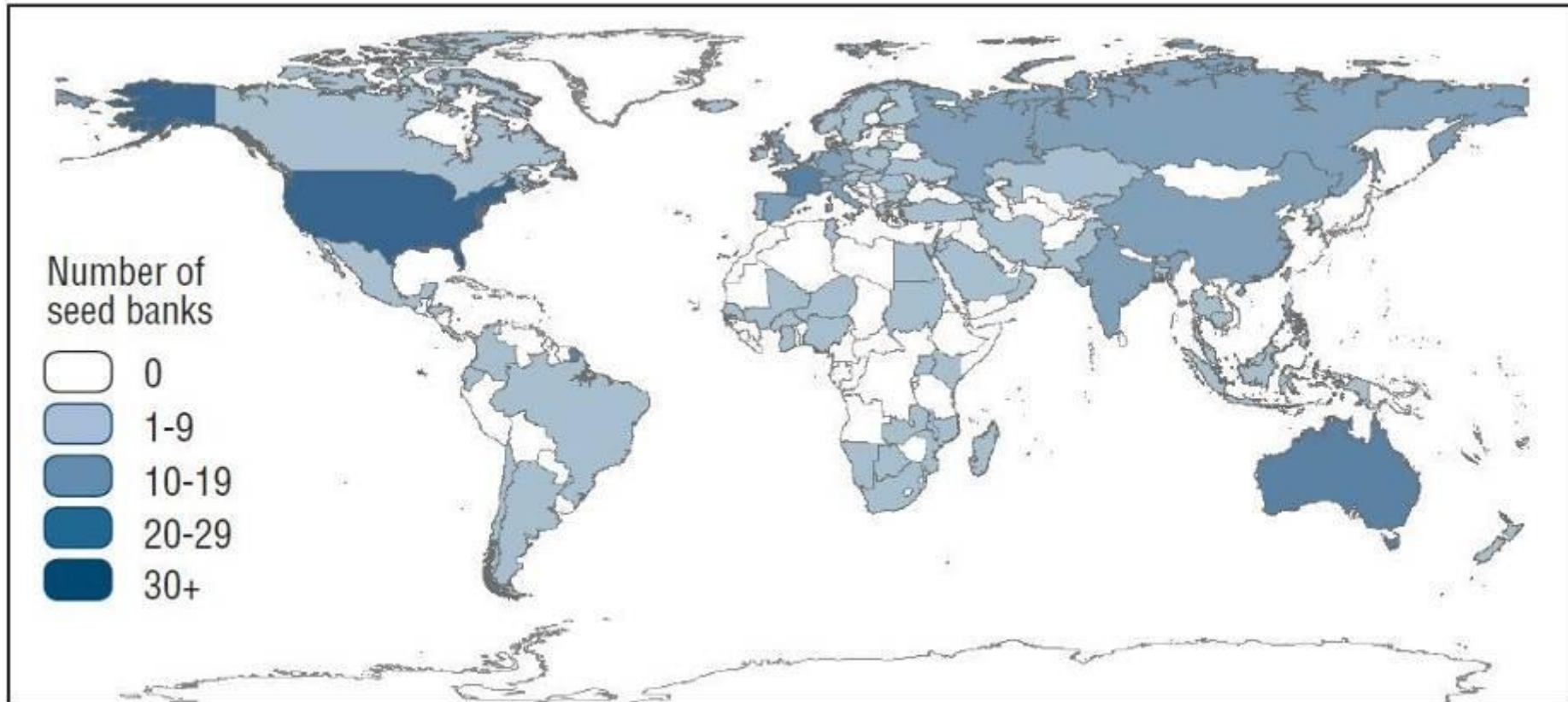


Figure 1. Number of seed banks per country.

Number of wild taxa banked per country

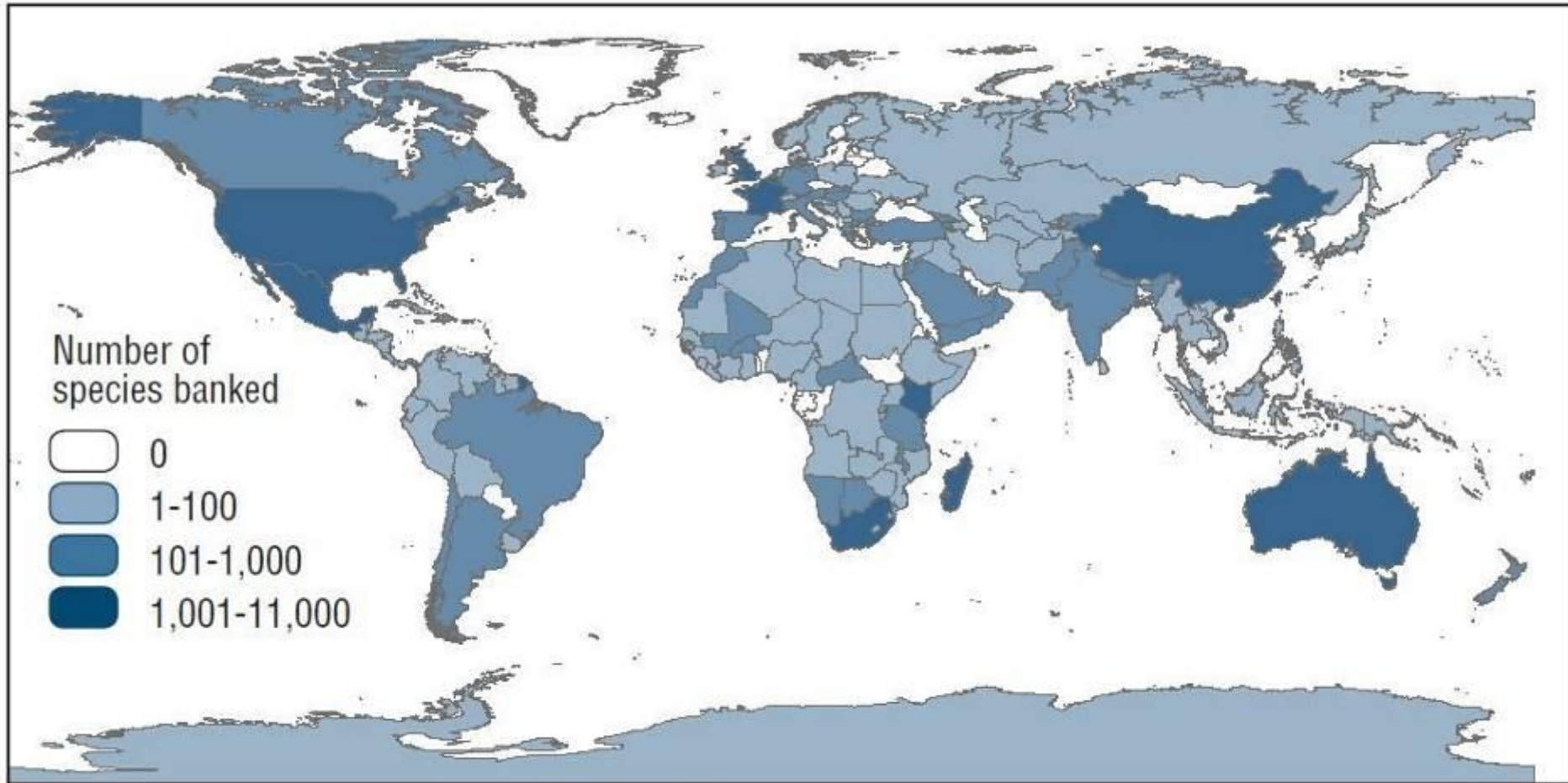
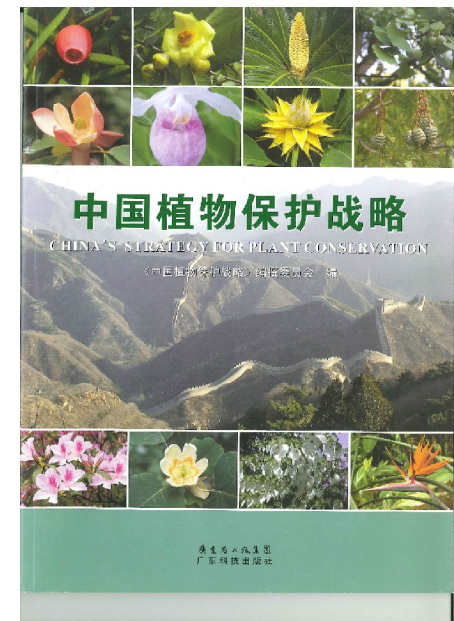
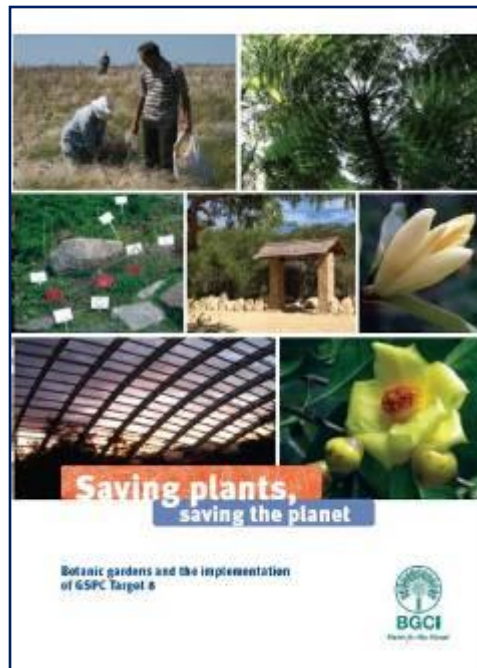
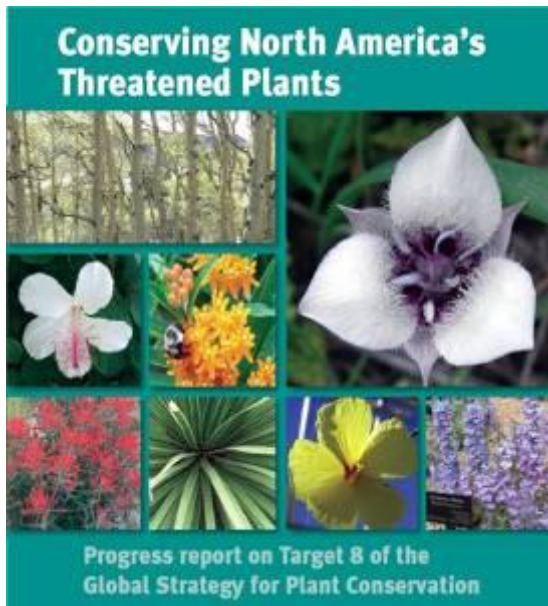


Figure 3. The number of wild taxa banked per country

Conservation Role

GSPC Target 8 - At least 75% of threatened plant species in *ex situ* collections, preferably in the country of origin, and at least 20% available for recovery and restoration programmes

39% of 9496 North American threatened taxa are maintained in germplasm or living collections compared with 40% of 1,918 European species and 37% of 4,404 threatened taxa of China (in 10 major gardens).



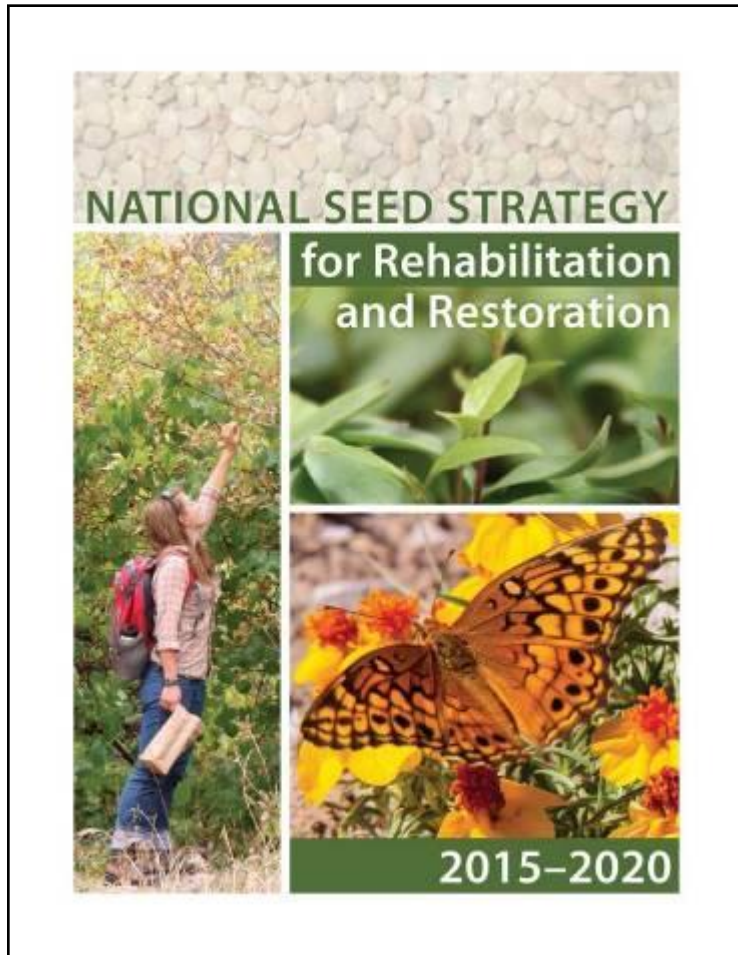
Ecological Restoration Role

2010 CBD paper noted that nearly two-thirds of the world's ecosystems are degraded to some degree

Resilient, well connected ecosystems suffer fewer ill effects from climate change than fragmented, overexploited ecosystems

Global shortage of appropriate plant materials for ecological restoration – botanic gardens may need to consider increased emphasis on “common” species required to meet restoration needs

Supporting the National Seed Strategy



- **Botanic gardens can support:**
- Propagation protocols for “workhorse species”
- Partnerships with Federal Agencies & others to supply the restoration plants they need now
- Public outreach and political advocacy
- As well as rare & threatened species conservation

Colorado Plateau Native Plant Program

Partners:

- Arboretum at Flagstaff
- Desert Botanical Garden, Phoenix



East Coast Restoration

North Carolina Botanic Garden: Responsible for collecting in Maryland and Virginia for the current SOS East project. In 2015, 234 collections were made representing 91 species and 75 genera. Training workshops held in 2015 & 2016



East Coast Restoration

New England Wildflower Society: Responsible for collecting in Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut for the current SOS East project. In 2015, 254 collections were made representing 91 species and 67 genera.



Photo credit: SOS/Mid Atlantic Regional Seed Bank

Global Seed Conservation Challenge

Launched by BGCI in 2015.

Over 170 gardens are involved

<https://www.bgci.org/plant-conservation/seedconservation/>



GLOBAL
SEED
CONSERVATION
CHALLENGE

Global Seed Conservation Challenge

Botanic Gardens Conservation International
The world's largest plant conservation network



Module 1: Planning a Collection



IUCN SSC Seed Conservation Specialist Group

Agreement to establish the Group with BGCI providing the Secretariat was reached at the IUCN World Conservation Congress.

Elected co-chairs will work with BGCI to bring together experts in seed conservation from botanic gardens, universities, and the agricultural and forestry sectors.

Ecological Restoration Alliance

- Ecological Restoration Alliance of botanic gardens established in 2012 and facilitated by BGCI.
- *To mobilize botanic gardens, arboreta & seed banks to carry our science-based ecological restoration*
- MoU with UNESCO Man & Biosphere (MAB) Reserve Programme to train & advise protected area managers



Why botanic gardens?

- Emphasize science-based approaches
- Well-documented living plant, seed and voucher collections
- Generate knowledge of the genetic, physiological, horticultural and ecological characteristics of plants (and their seeds)
- Stewards of rare & threatened species
- Expertise for teaching, training and outreach
- Collaborative – global network (BGCI); regional networks (APGA, CPC); and through Ecological Restoration Alliance of Botanic Gardens (ERA)

Supporting Native Plant Production in the UK

About 120 native “wild flowers” are currently available with only about 30 spp. sown at quantity

Native Seed Hub at RBG Kew’s Millennium Seed Bank is developing a research and development program to support high quality native seed production and habitat restoration.



Supporting Native Plant Production in China

- 25,000 plant species in botanic garden collections – 90% native
- China's national seed bank - the Germplasm Bank of Wild Species at the Kunming Institute of Botany in Yunnan
- 8,855 species in 2015
- 10,000 species by 2020
- No Government Policy requiring native seed for restoration



Supporting Native Plant Production in China

Kadoorie Farm and Botanic Garden (KFBG) in Hong Kong is the first to establish a native seed nursery. Every year, more than 25,000 seedlings are grown for its ecological restoration programme.



Supporting Native Plant Production in China

Xishuangbanna Tropical Botanical Garden (XTBG) is working with BGCI on the restoration of a tropical forest remnant based on historical records and *ex situ* plant collections. 67 tree species initially selected. Cultivated in XTBG's nurseries, over three hundred saplings of 16 native species of local provenance have been planted.



Supporting Native Plant Production in Africa

Survey of native tree species held in *ex situ* collections of botanic gardens and arboreta throughout Africa

Promote partnerships between botanic gardens & forest restoration projects & the use of a wider range of indigenous species

Active collaboration with botanic gardens in 6 countries





Supporting Native Plant Production in Africa

Tooro Botanical Garden



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Plant Search



The only global database of living plant, seed and tissue collections:

- Search 1,320,236 collection records, representing 525,916 taxa, at 1,144 contributing institutions
- Locate threatened, rare, medicinal and other plant species in living collections
- Connect with living collections to aid your conservation, education and research efforts

Enter search criteria below (all fields optional)

Scientific
name:

Genus

Species

Infraspecific Epithet

 Exclude cultivar
names

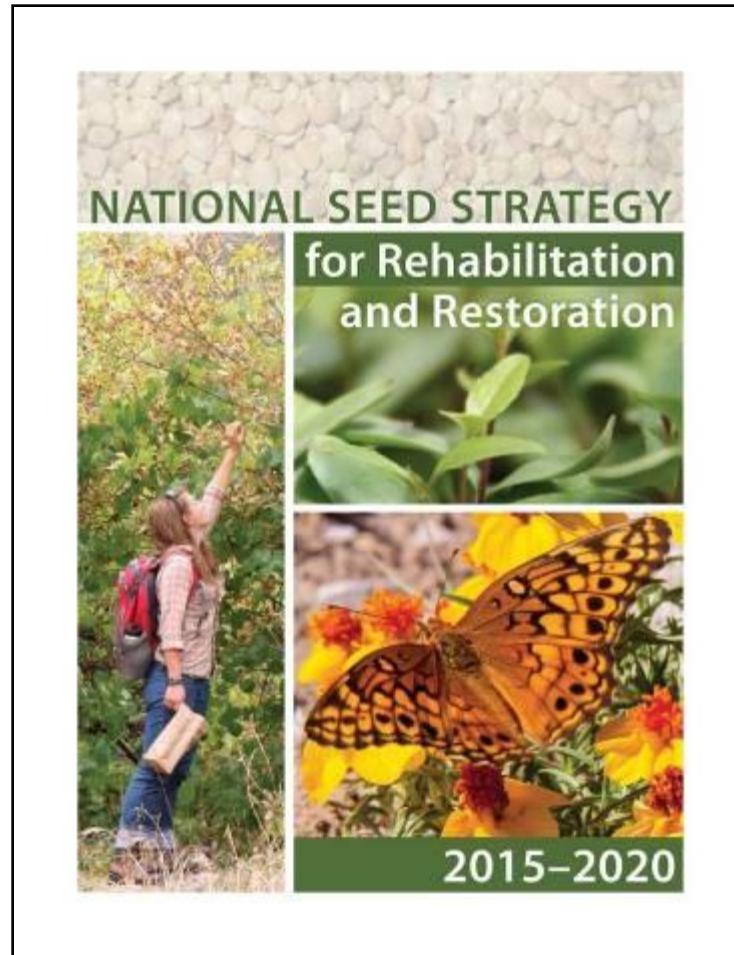
Conservation Status:

IUCN Red List ▾IUCN Red List 1997 ▾ CITES listed species

Additional Status:

Crop Wild Relative ▾ Medicinal plant species

Information, policy & urgent need for more action!



THANK YOU



Thank you to BGCI and BLM for use of images



The preceding presentation was delivered at the

2017 National Native Seed Conference

Washington, D.C. February 13-16, 2017

This and additional presentations available at <http://nativeseed.info>

