CHALLENGES AND PERSPECTIVES FOR ACHIEVING THE GLOBAL STRATEGY FOR PLANT CONSERVATION TARGETS IN BRAZIL[1]

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Abstract

Brazil holds the largest flora in the world, with more than 35,000 described native species. However, a large portion of its flora is poorly known, and more than 2000 species are threatened with extinction. Because similar situations exist in virtually all other countries, the United Nations' Convention on Biological Diversity launched a program called the Global Strategy for Plant Conservation (GSPC). The vision of GSPC is to halt the continuing loss of plant diversity through the achievement of 16 outcome-oriented global targets set for 2020. Here we discuss the challenges ahead for countries committed to achieving GSPC targets and use the experience of the National Centre for Flora Conservation (CNCFlora), in Brazil, as a case study of successes in pursuing some targets, and some perceived failures. We offer information that might help other countries, decision makers, and policymakers to address difficulties and move themselves toward achieving GSPC targets. We also synthesize the main targets upon which CNCFlora acts, their current situation, and the desired improvements necessary to achieve targets by 2020. Finally, we provide recommendations to actors, stakeholders, decision makers, and policymakers in Brazil that could foster conservation actions and strategies in the country.

Key words: Aichi Targets, Brazil, conservation policy, Convention on Biological Diversity, IUCN, plant conservation, threatened species.

Brazil has an outstanding biodiversity and holds the largest number of vascular plants in the world (Forzza et al., 2012; BFG, 2015). The country harbors at least 35,726 native species, 53% of them being endemics (Brazilian Flora 2020, 2016). Despite these enormous figures, the Brazilian flora is still poorly known and needs more intensive collection efforts (Sobral & Stehmann, 2009), given that historical and current efforts have been unevenly distributed and concentrated in the eastern and southern regions of the country (Sousa-Baena et al., 2014).

Like other taxa, plants are threatened by a number of large-scale, human-induced pressures. The main threats to plants in Brazil are habitat loss and fragmentation due to land-use conversion for agriculture and cattle-raising, mining activities, infrastructure development (especially roads and hydroelectric power plants), illegal fire, and overexploitation of species of economic interest (Martinelli & Moraes, 2013). As a consequence of these threats, Brazil has an official list of threatened flora with 2113 species assigned to different threat categories at the national level (MMA, 2014a).

Knowledge of plant conservation status is now available because of the establishment in 2008 of the National Centre for Flora Conservation (CNCFlora), a department of the Research Institute of the Botanical Garden of Rio de Janeiro (JBRJ). CNCFlora acts as the Red List authority for plants in Brazil and adopts the standards and procedures recommended by the International Union for the Conservation of Nature (IUCN). It has the mandate to (1) assess the conservation status of species of the Brazilian flora and elaborate Red Lists of threatened species, supporting the government on the issuance of official Red Lists, (2) develop and coordinate species recovery plans (also referred to as actions plans in Brazil and some other countries) for threatened species, (3) coordinate the national ex situ conservation strategy for threatened species, and (4) prepare a national database and maps of occurrences and priority areas for the conservation of threatened species in Brazil (MMA, 2014b).

CNCFlora is also pivotal in developing strategies and offering support to decision makers in the Ministry of Environment in Brazil on issues that

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demand actions related to threatened plant species. Along with the Research Institute of the JBRJ, CNCFlora is one instance of decision and deliberation, among others, that dictate the environmental policy in Brazil. Brazilian environmental policy is composed of a set of national legislation, environmental programs and partnerships, and international agreements. Among these agreements is the Global Strategy for Plant Conservation (GSPC), which is a program in the United Nations' Convention on Biological Diversity. The vision of GSPC is to halt the continuing loss of plant diversity through the achievement of 16 outcome-oriented global targets set for 2020 (Convention on Biological Diversity, 2016).

Although the GSPC plays an important role in providing a strategic framework for guiding plant conservation strategies and actions in Brazil, the importance given to different targets by signatory countries varies, and in Brazil strong emphasis has been placed on extinction risk assessment and the elaboration of Red Lists of threatened species. In this paper, we discuss the challenges ahead for countries committed to achieving the GSPC targets; we use the experience of CNCFlora as a case study of successes in pursuing some targets, and some perceived failures. In the next sections, we hope to offer insightful information that might help other countries, decision makers, and policymakers to address the difficulties and move themselves toward achieving the GSPC targets. We also synthesize the main targets upon which CNCFlora acts, their current situation, and the desired improvements necessary to achieve targets by 2020.

Plant Conservation in a Megadiverse Country: Facing the Challenges

the data challenge

The challenges a megadiverse country such as Brazil faces in the process of elaborating the instruments for plant conservation are related to the acquisition and organization of all essential data for supporting action and policymaking. These challenges relate to data cleaning and experts' validation of all data for use in risk assessment and species recovery plans.

Finding information with the necessary quality is difficult, so CNCFlora invests about 30% of its processing time in data cleaning and capturing data that is not available online. Further, persuading experts to share their data and get more involved is an essential part of the work, and the time spent on it is a considerable amount in the Brazilian experience.

To overcome these challenges, Brazil needs enhanced capacity for large data sets, improving institutional capacity to provide reliable tools for data depositing, data sharing, online security, and the establishment of a national infrastructure of biodiversity, thereby allowing knowledge transfer and policy support in the country. In this context, information facilities like the National System on Brazilian Biodiversity (<http://www.sibbr.gov.br/>), the SpeciesLink database (<http://splink.cria.org.br/>, Canhos et al., 2015), REFLORA (<http://floradobrasil.jbrj.gov.br/reflora/>), and the National Infrastructure on Spatial Data (<http://www.inde.gov.br/>) are remarkable achievements aiming to address the data challenge in Brazil. However, the electronic infrastructures in Brazil are constantly struggling against the lack of financial resources to support the services in the long term; this is what usually puts data availability at risk (Canhos et al., 2015).

Another challenge is the time available and how to address knowledge gaps like the Linnaean, Wallacean, and Darwinian shortfalls (Diniz-Filho et al., 2013). Our lack of good information on the existence and geographic distribution of species (i.e., the Linnaean and the Wallacean shortfalls, respectively) is strongly related to the relatively small number of studies compared to the size of Brazil, along with little long-term biodiversity research targeted to acquire basic data, such as floristic inventories. Small sampling efforts and the uneven distribution of collections among regions (Sobral & Stehmann, 2009) demonstrate how big the ignorance about our flora is.

It is necessary to invest in field expeditions to fill the gaps of information about species that are poorly known or entirely unknown. To address our lack of knowledge on species evolutionary relationships (i.e., the Darwinian shortfall), it would be necessary to invest in molecular studies and strong computational capacity to run models and simulations needed to infer complete or aggregated phylogenies (i.e., supertrees) of all the known Brazilian flora. For all those endeavors, Brazil needs time to collect and process all data.

the red queen's challenge

As in Lewis Carroll's classic *Through the Looking-Glass*, where Alice is constantly running but remaining in the same spot, this challenge means that the speed of habitat conversion is much higher than the speed of conservation initiatives. As a result, most species end up threatened because they are losing their habitat too fast.

To address this challenge Brazil would need a detailed and more reliable process of environmental

licensing (which is constantly under political attack; see Fearnside, 2016), more engagement of different actors to foster the implementation of actions enumerated in species recovery plans, and much more monetary resources allocated to plant conservation by federal and state administration in Brazil. Current political instability in the country suggests that this challenge is perhaps the greatest one, with no hopeful future ahead (Loyola, 2014; Fearnside, 2016).

The lack-of-political-will challenge

This challenge relates to the latter, especially in regard to resources for the GSPC implementation. Real implementation of international agreements ultimately depends on the translation of the agreements to national policy, ideally, national legislation. In order for this to happen, there needs to be political will. Political will is responsible for raising the budget allocated to plant conservation; passing acts, decrees, amendments, and laws in the congress; and increasing societal awareness about the importance of plants and our ultimate dependence on the ecosystem services plants deliver.

A related topic is the lack of engagement of the Brazilian society with nature conservation and species extinction. This topic is important because politicians are elected by the population on the basis of a program, which usually has little information on environmental issues. So, the lack-of-political-will challenge might well reflect the lack of engagement of the society in general. These challenges are the toughest faced by any developing or emerging country, given that the nation needs to reconcile economic growth and infrastructure development with the conservation of natural resources. Although feasible (see Scarano et al., 2012; Loyola, 2014; Loyola & Bini, 2015), to overcome these challenges Brazil would clearly require stronger political will, multi-ministerial arrangements, and more engagement and support of the society.

Brazil and Its Engagement with GSPC Targets

In the previous section we highlighted three main challenges (which certainly unfold into many related others) that make the achievement of GSPC targets difficult, if not impossible, at least by the 2020 deadline. Here, we comment on each target pursued by CNCFlora, highlighting the lessons learned during the last eight years. Table 1 also provides a synthesis of the targets, with their description, current situation, improvements needed, and the likelihood that the targets will be achieved by 2020.

Target 1: an online flora of all known plants

In 2010, Brazil produced the first online version of the "List of Species of the Brazilian Flora" and launched the publication of *Catalog of Plants and Fungi of Brazil* (Forzza et al., 2010), therefore fully achieving Target 1. It represented a big advance and a significant milestone for the botanical scientific community, given that our last Brazilian flora, *Flora Brasiliensis*, was produced over 170 years ago by Martius et al. (1840); it encompassed 19,958 species (BFG, 2015). From the list of plants produced in 2010 (Forzza et al., 2010) until the current list (updated every day) the number of species grew by 3% and the number of endemic species increased by 4.5% (BFG, 2015).

Now, the online Brazilian flora (Brazilian Flora 2020) lists 46,188 native, naturalized, and cultivated species with occurrence in Brazil, including algae, angiosperms, bryophytes, fungi, gymnosperms, ferns, and lycophytes. The online flora shows for each species short descriptions, scientific illustrations, images of live plants and herbarium specimens, nomenclatural information, distribution, endemism, life forms, substrate, vegetation types, origin, exsiccatae vouchers, threat category (linked to the CNCFlora website), and key references (Brazilian Flora 2020, 2016).

Another great initiative related to Target 1 and integrated with the "List of Species of the Brazilian Flora" is the REFLORA Virtual Herbarium (<http://reflora.jbrj.gov.br/>). This program was created in 2010 with the objective to rescue and make available online images and information about the Brazilian plants deposited in overseas herbaria during the 18th and 19th centuries.

Aside from having achieved Target 1, these results represented a major breakthrough for plant conservation in Brazil because there is now an integrated network of about 800 botanical experts working in an online platform to achieve the target. This experts' network was a critical starting point to pursue the following GSPC targets.

Target 2: an assessment of the conservation status of all known plant species, as far as possible, to guide conservation actions

To start working on Target 2, and based on our experience with Target 1, we managed to learn from another megadiverse country that was ahead of us in the assessments of the conservation status of plants. South Africa became the example to be pursued, since the country achieved Target 2 in 2009 and launched its *Red List of South African Plants*

Table 1. Main targets of the Global Strategy for Plant Conservation (GSPC) pursued by the National Centre for Flora Conservation (CNCFlora).

GSPC targets pursued by CNCFlora	Description	Current situation	What will it take to achieve?	Likelihood of being achieved by 2020
Target 1: An online flora of all known plants in Brazil	to make a list of Brazil's known plant species	completed; now it is being developed in the context of World Flora Online 2020	already accomplished, but it is important to have financial support to maintain the online system	already achieved
Target 2: An assessment of the conservation status of all known plant species, as far as possible, to guide conservation action	to assess the conservation status of our plants, using the categories and criteria developed by the International Union for the Conservation of Nature	ongoing; so far, 17% of the plants in Brazil have been assessed	financial stability to allow for investments in permanent human capital; training program for taxonomists to work in a more integrated way with species recovery plans	very low
Target 3: Information, research and associated outputs, and methods necessary to implement, develop, and share the strategy	to ensure that useful information and technologies are shared amongst the global community and that information gaps are identified	ongoing; this target is a continuous task, but we are far away from achieving it nationwide	financial stability to allow for investments in permanent human capital for analysis and synthesis of data about our flora	low
Target 7: At least 75% of known threatened plant species conserved in situ	to conserve threatened species in their natural environments	ongoing; Brazil is very close to reaching this target, if we consider the protected areas and the occurrences of threatened species in these areas; however, a deep discussion is necessary to quantify what is a proper proxy for in situ conservation	implementation of actions recommended in species recovery plans and strategies suggested in the national priority areas scheme for threatened plant conservation in Brazil	medium
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 programs	to conserve threatened species outside their natural habitats and use these plants for recovery and restoration programs	early stage; only 20% of our officially threatened species are in ex situ collections	integration between botanical gardens; improvements in structure and function of the botanical gardens; creation of new botanical gardens, mainly in Amazonia, Pantanal, Pampa, and Caatinga biomes; commitment to GSPC targets, thereby refocusing the collections on threatened species; commitment to the institutional mission and roles of the botanical gardens; creation of a national plant record system for the botanical gardens to integrate the information about the collections	very low

Table 1. Continued.

GSPC targets pursued by CNCFlora	Description	Current situation	What will it take to achieve?	Likelihood of being achieved by 2020
Target 15: The number of trained people working with appropriate facilities sufficient, according to national needs, to achieve the targets of this strategy	to ensure that the number of trained people working with appropriate facilities are sufficient according to Brazilian needs	ongoing; this target is a continuous task, but we are far away from achieving it nationwide, considering the instability of financial support to maintain staff	financial stability to allow for investments in permanent human capital; conservation and taxonomy courses offered in universities aligned with plant conservation	low
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	to create networks to support plant conservation activities and provide the means to share experiences, exchange data, encourage professional development, and build the capacity of the plant conservation community	ongoing; this target is a continuous task, but we are far away from reaching it nationwide	commitment of institutions to align their vision and objectives with the GSPC targets; governmental policies for supporting the institutions aligned with the GSPC targets	low

(Raimondo et al., 2009). It was the first time that a megadiverse country comprehensively assessed the status of its entire flora (Raimondo, 2011).

To avoid any subjectivity, the risk assessments are made by the CNCFlora staff trained by IUCN and South Africa National Biodiversity Institute (SANBI). In CNCFlora's workflow, the specialists validate all the information and make comments only about risk assessment rationale. The Red Listing process should be the guiding principle for flora conservation, being the base for other instruments, such as recovery plans, priority maps, and field guides. The online platform, the database validated by experts, and the network consolidated in the Red List process represent a step toward completion of other conservation instruments. Moreover, in Brazil the Red List is a powerful instrument to support the government's publication of the official list of threatened flora (but see Hidasi-Neto et al., 2013). The official list is the law enforcement tool to establish protection for the Brazilian threatened species.

Since 2009, the CNCFlora team has been working through an online platform in collaboration with a network of about 400 botanical experts assessing the extinction risk of plants. CNCFlora has assessed 5194 species of the Brazilian flora. As a result, 2478 plant species are now considered threatened with extinction at the national level. These results were presented in two red books of the Brazilian flora (Martinelli & Moraes, 2013; Martinelli et al., 2014), a new initiative in Brazil. The first red book (Martinelli & Moraes, 2013), with 2113 threatened species, subsidized the official threatened flora species list (MMA, 2014a) and was a real achievement for the scientific community (Scarano, 2014). Currently, CNCFlora is concluding the third Red Book with risk assessments for the endemic species of the Atlantic rainforest in the state of Rio de Janeiro. So far, from 890 species assessed, about 55% were classified as threatened.

So far, CNCFlora has assessed the threat status of 6079 plant species, which corresponds to 17% of the native Brazilian flora. From that, 48.8% were classified as threatened with extinction (Critically Endangered: 11.4%; Endangered: 27.1%; or Vulnerable: 10.3%), 17.8% were classified as Data Deficient, 6.4% as Near Threatened, and 27% categorized as Least Concern. By 2020, based on its current workforce, CNCFlora can reach the assessment of 31% of the Brazilian vascular plants. If CNCFlora receives more funds and enhances its workforce, it would be able to reach about 50% of the vascular plants; this seems very realistic and feasible considering the megadiverse flora in Brazil.

A possible way to advance Target 2 is to use technologies that can allow rapid assessment of extinction risk, supporting trained professionals to make decisions on the final classification of species. This kind of tool is being developed in-house and performs a risk assessment based on criteria B of IUCN (IUCN, 2001), using extent of occurrence, area of occupancy, and the number of subpopulations to categorize the risk of extinction (Souza et al., 2016).

Target 3: information, research and associated outputs, and methods necessary to implement, develop, and share the strategy

To develop the GSPC in Brazil, a primary research need is the inventory of poorly explored areas (Hopkins, 2007; Sousa-Baena et al., 2014; BFG, 2015; Oliveira et al., 2016) to minimize the geographic biases in the information on species distributions and overcome basic knowledge shortfalls (Diniz-Filho et al., 2013) about poorly known or unknown species. CNCFlora has been investing in collecting plants in undersampled areas, such as the Amazonia, Pantanal, and Caatinga biomes. In the lifetime of CNCFlora, the Centre has collected about 12,000 specimens, contributing to the rediscovery of some lost species and the finding of new ones.

Learning from the historical Red List process in Brazil (Moraes et al., 2014; Martins et al., 2015) and the South Africa experience (Raimondo, 2013; Raimondo et al., 2015), CNCFlora's first step in the risk assessment process was to build an open and collaborative online platform to organize and keep safe and available all information about each species. This online platform (<http://cncflora.jbrj.gov.br/portal>) allows 49 fields that enable a variety of experts to work in collaboration to collect, analyze, and improve biodiversity and conservation information about the species, ranging from taxonomy data (integrated with the Brazilian flora list), occurrence data from various sources, ecological information, threats, and others. The online platform also keeps the information accessible and with all references associated with each assessed species. This platform has been active for the past six years and provides high-quality and documented data for the government and decision makers about the conservation status of each evaluated species.

Target 7: at least 75% of known threatened plant species conserved in situ

Brazil holds an outstanding position with the fourth-largest protected areas (PAs) system in the world, encompassing nearly 17% of the national land area (Ferreira & Valdujo, 2014). Despite the expansion of PAs, the distribution has been highly variable among ecoregions (Nori et al., 2015). Furthermore, the Brazilian network of PAs has different management categories, with 69% being sustainable-use PAs and only 31% being strict protection PAs (Ferreira & Valdujo, 2014).

In relation to the effectiveness of Brazilian PAs in representing known, officially threatened plant species, we found that 519 species (29.4%) fall completely outside PAs, 1230 species (70.3%) have at least one record in a given PA, and only 112 species (6.4%) are fully covered by Brazil's current system. Only 37.6% (463 species) have more than half of their distribution inside PAs. This information about gap species highlighted the need to propose priority areas for plant conservation and sustainable use in Brazil (Loyola et al., 2014). Considering the size of Brazil, its huge diversity, and the limited resources available for plant conservation, CNCFlora established some standards to prioritize areas for work related to the conservation of flora. The methods adopted were particularly helpful to pinpoint critical sites for the establishment of PAs, as well as the expansion of existent ones.

The map of priority areas for conservation of threatened species of the Brazilian flora considered the spatial distribution of species of threatened plants and data related to foregone opportunity costs that might imply conflicts to implementing conservation actions. The goal in the selection of the priority areas was to identify the best set of areas able to maximize the representation of threatened species, avoiding conflicts with productive sectors and favoring sites with remnants of native vegetation (Loyola et al., 2014). The map is now used by CNCFlora and the Ministry of Environment in Brazil to guide conservation actions, which include the establishment of PAs, implementation of species recovery plans, guidance of compensation and mitigation schemes in the licensing process, and definition of national strategies related to biodiversity conservation.

Beyond establishing new PAs and properly managing the existing ones, to achieve Target 7 it will be necessary to elaborate and implement many recovery plans for plants and ecosystems. CNCFlora has been elaborating regionally based species recovery plans defining in situ and ex situ conservation actions for threatened species (see Pougy et al., 2015a, 2015b; Costa & Bajgielman, 2016). The regionally based recovery plans are effective in proposing more realistic actions to suppress or minimize local threats, in optimizing human and financial resources, and in generating benefits for all

species with occurrence in the target area, including unknown species. Over the last three years, recovery plans published by CNCFlora encompassed 360 threatened species and 98 data-deficient species; it is about to finish another recovery plan covering 118 species (Pougy et al., 2015a, 2015b).

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 programs

Brazil officially has 2113 threatened species, so to achieve this target it would need to ensure the ex situ conservation of 1584 species. At the moment, we have 20% of threatened species in botanical gardens (Costa et al., 2016) and only 1.4% in seed bank collections (Forzza et al., 2016).

The current scenario of ex situ conservation in Brazil suggests that Target 8 is an unachievable goal for 2020 and maybe for other developing and megadiverse countries, such as South Africa (Raimondo, 2015). Until 2020, the number of threatened species is likely to increase, because the risk assessments are constantly produced; as a consequence, we will be getting further away from this target. Moreover, the insufficient infrastructure of some Brazilian botanical gardens and their location in urban centers restricts opportunities for new collection development, which may prevent the adequate genetic representation of the species. As an alternative, in vitro culture and cryopreservation could be used for ex situ conservation in Brazil, but these techniques are still incipient for threatened species at Brazilian botanical gardens (Costa et al., 2016).

To organize and make clear what is necessary to build an effective ex situ conservation in Brazil, CNCFlora has prepared the *National Strategy for Ex Situ Conservation of the Brazilian Threatened Species* for supporting the government (Costa & Bajgielman, 2016). This document sets the main needs for ex situ conservation structured in goals, objectives, and actions. The implementation of this strategy depends on the strengthening of the institutions, the improvement of human and financial support, and the engagement of the different stakeholders.

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

Currently, CNCFlora does not have enough people to develop capacity to match the Brazilian needs. One way to minimize the gap in knowledge about our flora is to involve local people in collecting information. Unfortunately Brazil has no tradition in plant-related citizen science; however, CNCFlora has started to involve people, using a field guide (Oliveira et al., 2015) with an accessible language and some instruction, to find threatened and data-deficient species. The guide also includes information on how to take good pictures for botanical identification. Currently, CNCFlora is also developing a mobile-based application that allows users to record and take pictures of threatened plants and send them to CNCFlora. All the information sent to CNCFlora is checked by botanical experts to guarantee quality and the precise identification of species; then it is returned to the citizens.

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

Species recovery plans represent a key opportunity to promote communication among environmental agencies, universities, research institutions, botanical gardens, non-governmental organizations, and others, with the main purpose of establishing a network of institutions that works in favor of conservation of biodiversity. The consolidation of a network of botanical experts for achieving Targets 1 and 2 and using their contributions for other targets is a significant advance.

Another important network for learning and technology exchange has been established with SANBI and with the Alexander von Humboldt Research Institute, in Colombia. These partnerships are important to avoid unnecessary duplication and overlapping efforts. For example, CNCFlora is now sharing its online system for risk assessment with these institutions, so they can adapt them for their country and for fauna.

Recommended Strategies and Actions for Plant Conservation in Brazil

Based on what we summarized in Table 1 and our experience as actors deeply involved with plant conservation in Brazil, in this final section we offer some recommendations to actors, stakeholders, decision makers, and policymakers in Brazil that could foster conservation actions and strategies in the country.

First, Target 1 was not formally included in the original mandate of CNCFlora; however, during negotiations with the Ministry of Environment in

2009 and 2010, CNCFlora demonstrated that it was impossible to build a consistent and reliable Red List without a reliable taxonomic list of Brazilian flora. Hence, the use of an online data management system and technological tools to speed up and scale up the conservation process is critical, if not mandatory. If possible, this system should be an in-house, tailor-made system adapted for different users (e.g., scientists, Red List team, decision makers, policy-makers, politicians, and citizens). Further, having this system be open source, allowing for interoperability with others systems (GBIF, Virtual Herbarium, IPNI, TROPICOS®, etc.), should be strictly enforced.

Second, based on our experience, having an online network, with hundreds of botanical experts connected in real time and up-to-date information on species, reduces uncertainties in the Red List process, increases data quality and reliability, and speeds up considerably the proper documentation of the assessments, development of recovery plans, and associated data available to government, society, and scientists. Further, it allows for a constant data update of each species listed, facilitating periodic reassessment (especially for data-deficient species). Moreover, it is important to allow open access to all information created and stored by the organization responsible for addressing the GSPC targets.

Third, having a dedicated team to conduct the risk assessments, recovery planning, and spatial prioritizing to implement action is critical to avoid duplication and get tasks and products done in a timely manner. A dedicated team has been instrumental to CNCFlora, although it also represents one of the biggest challenges of CNCFlora, i.e., to keep the team up and running with unreliable funds. Facing the responsibility to lead this huge conservation effort in Brazil, we quickly understood the importance of gathering and keeping a dedicated team.

Fourth, on the policy side, holding the official mandate and responsibilities (in the case of CNCFlora it is attributed to the Brazilian federal government) is strategic so that it can be officially adopted by the government and included in the country's environmental legislation. A related recommendation is to work closely with the public attorney's office to support environmental law rulings by the Ministry of Justice to protect threatened species.

Lastly, establishing global strategic partnerships was instrumental to getting things done. Currently, CNCFlora keeps ongoing projects and partnerships with IUCN, SANBI, Botanic Gardens Conservation International (<www.bgci.org/>), Humboldt Research Institute, Conservation International, and Global Partnership for Plant Conservation.

Concluding Remarks

One of Brazil's main challenges in achieving the GSPC targets is related to the government's commitment to investing the human and financial resources needed. In order to conduct a comprehensive risk assessment at the national level and elaborate other conservation tools in a country as big as Brazil, it is important to empower initiatives like CNCFlora with the necessary means to do lasting work.

From the seven GSPC targets that CNCFlora pursues, five have a low likelihood of being achieved by 2020 (see Table 1). While this perception could be discouraging, it is important to keep pursuing these targets and to value the GSPC. The logical structure of objectives and targets in the GSPC is a helpful general guideline for organizing and enhancing Brazil's and other countries' capacity (including infrastructure, personnel, and institutions) to manage the conservation of a diverse flora. If Brazil and other countries will actually meet the target by 2020 is another story, but we are certainly on the path to achieving the right goals.

The 16 GSPC targets aim at achieving a 2020 vision of a world without biodiversity loss or degradation of ecosystems, with a focus on plants. As part of the Strategic Plan for Biodiversity 2011–2020, they form the basis of a challenging but achievable roadmap that can advance global efforts to value, conserve, and make wise use of biodiversity by all sectors of society, and for the benefit of all people. We urge member states and stakeholders engaged with biodiversity conservation, especially in Brazil, to take our conclusions into account in their planning, recognize that plants contribute to solving the sustainable development challenges we face, and redouble efforts to achieve the GSPC goals.

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