

# TREE RED LISTING IN BRAZIL: LESSONS AND PERSPECTIVES



An individual of "Brazilwood" (*Caesalpinia echinata*) in the Rio de Janeiro Botanic Garden (Lucas Moraes)

## Introduction

Brazil has the largest number of plant species in the world (46,097) with one new species being described every two days. The country has 8,058 native tree species, mainly concentrated in the Amazon and the Atlantic Rainforest (List of Species of the Brazilian Flora, 2015). The Brazilian National Centre for Flora Conservation (CNCFlora) is responsible, at the national level, for assessing the conservation status of the

A part of the remains of the Atlantic Rainforest in Itatiaia National Park, Rio de Janeiro state, the first National Park in Brazil (Eduardo Fernandez)

Brazilian flora and developing recovery plans for species threatened with extinction. CNCFlora is 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). Since 2010, CNCFlora has assessed the extinction risk of 5,165 species of the Brazilian flora (11.2% of the national flora). As a result, 2,478 plant species are considered threatened with extinction at the national level: 527 Critically Endangered - CR; 1,378 Endangered - EN, and 573 Vulnerable - VU. (Martinelli and Moraes, 2013; Martinelli *et al.*, 2014).

## The importance of trees

Trees play a pivotal role in Brazilian ecosystems. They are important not only because of their ecology and complex interactions with other species and environments, but also because of their cultural and socioeconomic value. Considering these values is essential in understanding the threats and identifying

the knowledge gaps for tree species in Brazil. Such information will ultimately inform the development of on-the-ground conservation actions. So far, CNCFlora has evaluated the extinction risk for 1,125 tree species (13.9% of the total of Brazilian tree species), resulting in 420 tree species being assigned to a given threat category (66 CR; 224 EN and 130 VU) (Fig. 1).

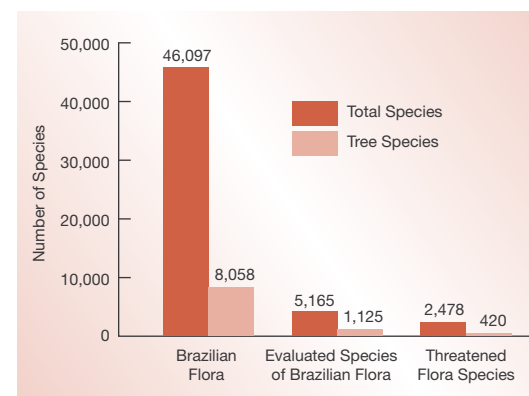


Figure 1: Risk assessment overview in Brazil considering the total number of plant species and the total number of tree species



**"Assessments so far reveal that 37% of tree species in Brazil are threatened with extinction."**

### Threats to trees in Brazil

As in many parts of the world, the main threats for native plants in Brazil are habitat conversion/alteration for cattle ranching, agricultural expansion and mining. Some tree species have also been heavily exploited due to the value of their timber for real-estate and shipbuilding applications, as well as for furniture and medicinal uses, and are consequently experiencing large population reductions. For example, the tree that originally gave the country its name, the "Brazilwood" (*Caesalpinia echinata* Lam. - Fabaceae) is currently classified as EN on the official list of threatened flora in Brazil, and it has a long track record of being unsustainably harvested. Following the colonization of Brazil in the 1500's a red dye taken from the tree's heartwood was extensively used. Although this use ceased with the advent of synthetic dyes during the 1800's, today the wood of this species is prized for the manufacture of high-quality bows for stringed instruments. Currently, the main threat to the species is the extensive habitat destruction arising from the intense urbanization and agricultural expansion that is taking place along the Brazilian coast.

**The International Pernambuco Conservation Initiative (IPCI) is dedicated to the conservation and sustainable use of *Caesalpinia echinata*, with the aim of ensuring the future of stringed instrument music.**

### Recovery plans

After the red listing process, the next step in the conservation of species identified as under threat, is the elaboration of recovery plans (referred to as 'action plans for conservation' in Brazil). Recovery plans consider information about species' ecological traits, historical and current threats and socio economic uses/conflicts to support the elaboration and execution of effective actions for conservation based on the engagement of stakeholders. The effort to produce red lists (Moraes et



*Faveiro-de-Wilson tree classified as Critically Endangered (Fernando Fernandes)*

*al.*, 2014) and recovery plans is very important, but the elaboration, implementation and monitoring of conservation action plans requires significant human and financial resources.

**"To date, Brazil has only one officially published recovery plan for a tree species."**

The only Brazilian tree species with a published recovery plan is *Dimorphandra wilsonii* Rizzini, (Faveiro-de-Wilson). This species is found in the transition zone between the Cerrado and the Atlantic Rainforest in the state of Minas Gerais, and it is classified as CR. The species was considered top priority for the elaboration of a recovery plan given that there are only 246 adult individuals known after 10 years of intense efforts for its *in situ* and *ex situ* conservation

(Martins *et al.*, 2014). Since December 2014, new Brazilian legislation protects this species from harvesting, cutting down, transporting without authorization, storing, managing and trading. Legislation also reinforces the need for robust species extinction risk assessments and the elaboration of recovery plans to guarantee the viability of populations for threatened species. Sustainable management is allowed for species classified as VU, as long as the activity respects international agreements, and the recommendations of risk assessments and recovery plans, when in place.

### Assessing species' extinction risk in the Atlantic Rainforest of the state of Rio de Janeiro

The original area of the Atlantic Rainforest has been continually devastated since the colonization period. Over the last century it is estimated that close to 86%

**Box 1. The case of *Terminalia acuminata* – Is the species Endangered or Extinct in the Wild?**

In 2013, CNCFlora assessed the risk of extinction of a mysterious species: *Terminalia acuminata* (Allemão) Eichler - Combretaceae, an endemic species of Rio de Janeiro. The species was formerly listed as Data Deficient (DD) in the last official list of threatened flora of Brazil from 2008. However, after a more comprehensive search and assessment, the species was considered threatened (Martinelli and Moraes, 2013).

The most updated information indicates its occurrence in two locations and with incident threats such as urban expansion, logging and habitat loss. This tree was last seen in nature in 1942 and further records indicated its occurrence in a mountain region of the state, as well as in the Tijuca National Park located in the city

of Rio de Janeiro, one of the most important National Parks in an urban area in the world (Pougy *et al.*, 2014). Moreover, the literature describes *T. acuminata* as rare and a timber species, since its wood is used for building and furniture making (Marquete, 1984; 2003).

This year, a new systematic search for the species has been carried out and while this text was being edited the species was found in a forest remnant in the city of Rio de Janeiro. Our field team found one fertile tree in a private property close to the limits of a state protected area, as well as a mature tree, two juveniles and two seedlings inside a municipal protected area. Local people appeared to know the species and could help to locate more individuals. This is good news, but there is still an urgent need to increase collection efforts for this species, in order to better understand its real conservation status.

survival. The data gathered during the assessment phase are stored in a database which is the basis for the elaboration of recovery plans, and which also supports the elaboration of spatial conservation plans, pinpointing priority areas for the conservation and sustainable use of threatened plants in Brazil.

In December 2014, the first results of the extinction risk assessment carried out by this dynamic and integrated online method was officially recognized by the Brazilian Ministry of Environment. This allowed the publication of the updated official list of threatened flora in Brazil, an important tool for public policy and law enforcement for the conservation of threatened flora (MMA, 443/2014), and also regulating the commercial use of tree species. This was a first and critical step towards more effective conservation in Brazil. However, further resources and means to guarantee the execution of the commitments made by the country in accordance with the GSPC targets are still required.

of this forest has been lost (Ribeiro *et al.*, 2009). However, when compared to other regions in Brazil, the Rio de Janeiro state has preserved a greater percentage of this forest (21%; Fundação SOS Mata Atlântica and INPE, 2015). This provides an enormous opportunity to focus on effective actions that will ensure the protection of what is left of this astonishing environment.

The state of Rio de Janeiro has high levels of endemism (Jenkins and Pimm, 2006). It harbors 7,662 known plant species, distributed among 198 families, of which 1,897 are trees species (List of Species of the Brazilian Flora, 2015). Nearly 1,000 of these plant species are endemic, including 230 tree species. During 2015, CNCFlora aims to assess the extinction risk of all endemic species in partnership with the Environment Secretary of the State of Rio de Janeiro.

**The challenge ahead: towards the achievement of GSPC targets**

The challenge to conserve tree species in Brazil is huge and has just started. We have a long way to go to guarantee effective protection of known threatened

species and the challenge goes beyond this. Brazil has the most diverse flora in the world and much more yet to be discovered. Since 2010, an average of 1,235 new species have been included per year in the List of Species of the Brazilian Flora.

Considering this challenging scenario, CNCFlora is focused on achieving five targets proposed by the Global Strategy for Plant Conservation (GSPC), which are (1) assessing the extinction risk for the known Brazilian flora (Target 2), (2) ensuring the *in situ* conservation of 75% of the threatened species (Target 7), (3) ensuring the *ex situ* conservation of 75% of the threatened species (Target 8), (4) capacity building for plant conservation (Target 15), and (5) establishing a broader network to accomplish strategic objectives (Target 16).

To reach these targets, CNCFlora has a trained team working with a network of over 500 botanical specialists. CNCFlora also developed a tailor-made online platform for species' evaluation, which allows the recording of up to 49 fields related to the biology of the species, ongoing threats to populations and conservation actions needed for their



*Faveiro-de-Wilson tree, the only tree that has an official published recovery plan in Brazil (Fernando Fernandes)*





*An individual of Terminalia acuminata in the Rio de Janeiro Botanic Garden, an endemic tree of Rio de Janeiro state (Lucas Moraes)*

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