CNCFLORA
Centro Nacional de Conservação da Flora

Rio de Janeiro Botanic Garden Research Institute - JBRJ

Brazilian National Center for Flora Conservation - CNCFlora

Project: **"Conservation assessment of Brazilian tree species towards the Global Tree Assessment"**

(REPORT 2/2020)

Based upon the project "Conservation Assessment of Brazilian tree species towards the Global Tree Assessment" here we present our main deliverable: "200 new assessments of Brazilian tree species".

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Summary

Appendix 1 - List of 200 assessed species;

Appendix 2 - Species maps (report in csv);

Appendix 3 - List of files in SIS Connect format CNCFlora BP-RLA (zip).

1. Introduction

Brazil's tree biodiversity is outstanding, with almost 9,000 native species documented so far (Beech et al., 2017; Flora do Brasil 2020 under construction, 2020). This impressive tally implies a great responsibility towards the effective conservation of this botanic group, as trees are not only important ecologically but also because it is a crucial resource for humanity and for the maintenance of basic ecosystem services.

Recognizing the need to focus efforts to guarantee the persistence of trees, the Global Trees Campaign (GTC), a joint initiative between Fauna & Flora International (FFI) and Botanic Gardens Conservation International (BGCI), was launched in 1999 to take effective conservation actions for the world's most threatened tree species, following the publication of The World List of Threatened Trees (Oldfield et al., 1998).

The Global Tree Assessment (GTA), led by BGCI and the IUCN Species Survival Commission (SSC)/Global Tree Specialist Group (GTSG), continues to develop an extensive global collaborative partnership to safeguard the world's threatened tree species from extinction. In this context, BGCI and CNCFlora/JBRJ (BP-RLA) are moving forward a joint initiative since 2018 aiming to detect the conservation status of all Brazilian tree species, to be able to face the escalating threats affecting tree species in the country.

In the third year of the project, the present report discloses the findings obtained after the extinction risk assessment of 200 Brazilian trees, which adds up to the final remarks of the ongoing initiative and represent another step in the full accomplishment to detect and monitor the conservation status of Brazilian trees.

We prioritized in this report species that, in most cases, had less than 20 occurrence records, but also some widely distributed species, which usually follow the flow of LC assessments according to the RapidLC tool of Bachman et al. (2020). This strategy was adopted as an alternative way to reduce the workload associated with data validation (where we count on expert's collaboration) and cleaning, amidst the SARS-CoV-2 (COVID-19) pandemic, which intensively hit Brazil. During these exceptional times, where most of the country's workforce is in quarantine and adapting to the new home office reality, we concentrate our efforts in the extinction risk assessments procedures and the data standardization required to submit the risk assessments results toward the IUCN Red List via IUCN SIS Connect. We

expect to submit a comprehensive report, including all assessed tree species since the beginning of the project, later in October 2020, when we conclude the assessment of further 900 species and reach a relevant benchmark of this fruitful partnership between CNCFlora/ JBRJ and BGCI.

2. Material and Methods

CNCFlora/JBRJ extinction risk assessment workflow follows the methodology established by the IUCN Red List system of criteria and categories of extinction risk for 200 Brazilian tree species. In all, 55 experts in taxonomy and botany systematics have been collaborating in data validation. More detailed information about Methods, see in Report 1/2020.

The following steps describe CNCFlora extinction risk assessment workflow:

1. Definition of the species list to be assessed in accordance with BGCI team;
2. Taxonomic verification based on Flora do Brasil 2020 and expert's opinion;
3. Occurrence data gathering (GBIF, Reflora, Jabot and CRIA SpeciesLink) and cleaning (elimination of duplicates and incomplete/non-informative or unreliable records) of samples collected within Brazilian borders;
4. RapidLC application as proposed by Bachman et al. (2020) using the following parameters to select potentially Threatened of Potentially Non-Threatened species;
5. Georeferencing of species occurrence records;
6. Data gathering: notes, population, distribution, ecology, potential uses, in situ and ex situ protection, presence in action planning, inclusion in the CITES appendices;
7. Inclusion of all collected data in CNCFlora' system. For each species included in the present initiative, we included all available data;
8. Validation of occurrence records by experts within CNCFlora system GIS environment;
9. Spatial indexes (EOO and AOO) generation within CNCFloras's system, using Minimum Convex Polygon (MCP) and UTM projection;
10. Assessment of extinction risk at global and regional scale;
11. Review of assessments by NuLV/CNCFlora/JBRJ evaluators;

12. Documentation of assessments and storage in a database (*Elasticsearch* and *CouchDB*) and in *csv* format;

13. Publication of the assessments;

14. Submission of assessments for the IUCN SIS Connect and Mapping and for CNCFlora Portal (Configuration: Maps file - *.csv* format, map coordinates in WGS84, and Universal Transverse Mercator (UTM) projection system; The 12 *.csv* files have comma as field separator, except for References, which is separated only by (|). The display mode is UTF-8).

3. Main Results

3.1 Species' conservation status, criterias and diversity botanical family

For the 200 species assessed (**Appendix 1**), 159 are considered Brazil's endemic, therefore, their assessments represent their global conservation status, while the 41 remaining species are treated as non-endemic of the country, thus, their regional/national conservation assessment is presented. The species distribution data is provided in the **Appendix 2** and a list of files in SIS Connect' format, zipped into the file '*CNCFlora BP-RLA.zip*', in the **Appendix 3**.

The largest taxonomic group is represented by the family Fabaceae, which stands out with 13% of the species (25 spp.), followed by Lauraceae with 9% (17 spp.), and Chrysobalanaceae and Myrtaceae, both with 8% (15 spp.) each one. In **Figure 01**, a list of all families and the number of species assessed and their respective categories are provided.

Among the 200 assessed species, 100 occur exclusively within the Amazon limits, 45 exclusively within the Atlantic Rainforest and other 8 and 7 species occurring exclusively in the Caatinga and Cerrado (Central Brazilian Savanna), respectively; 40 species were reported in more than one biome.
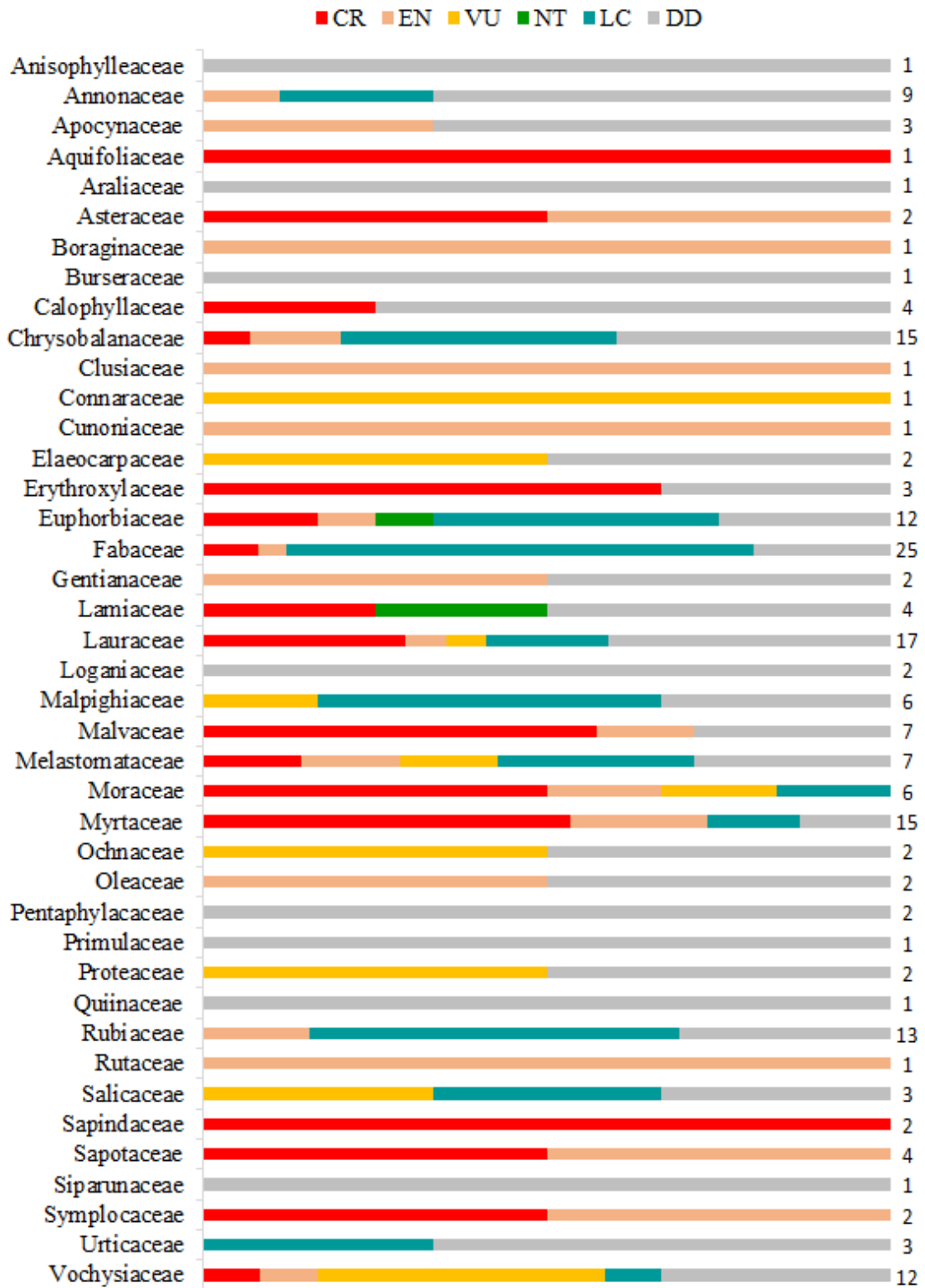
Figure 01 - Species' conservation status per botanical family.

Of 200 assessed trees, 78 species (39%) are considered Threatened, which 34 (17%) are Critically Endangered (CR), 4 are CR* possibly extinct, 26 (13%) are Endangered (EN), and 14 (7%) are Vulnerable (VU); the remaining 122 species (61%) are placed under Non-Threatened categories. Of these last, 2 (1%) are considered Near Threatened (NT), 51 (26%) are Least Concern (LC) and 69 (35%) are placed as Data Deficient (DD). The results of the assessments are summarized in Table 01.

Table 01: Category of species according to IUCN.

Category	Number Species	Percent
CR - Critically Endangered	34	17%
CR* - CR, possibly extinct	4	2%
EN - Endangered	26	13%
VU - Vulnerable	14	7%
NT - Near Threatened	2	1%
LC - Least concern	51	26%
DD - Data Deficient	69	35%
Total	200	100%

Among the CR category, 4 species are considered CR*, possibly extinct: *Ilex sapiiformis* Reissel (Aquifoliaceae), *Acalypha fragilis* Pax & K. Hoffm. (Euphorbiaceae), *Plinia rogersiana* Mattos (Myrtaceae) e *Symplocos rizzini* Occhioni (Symplocaceae). These species are known only from a few specimens, usually gathered in well sampled areas but deeply modified by anthropogenic activities, and efforts to detect it in its known range have failed so far. Detailed justification for flagging these species is provided in species' extinction risk rationale (Appendix 3).

The high percentage of species Data Deficient (DD) is directly linked with the species selection criteria (where we prioritize species with less than 20 occurrence records) and the geographic scope of their distribution (many taxa included in the list are known only from a few collections, usually very old records and undertaken in remote areas of the Amazon); 68 species were considered as DD because the information available regarding its distribution is considered incomplete to perform a reliable risk assessment, and one taxa was classified as DD

because there was a verified taxonomic incongruence regarding the species complex classification.

3.2 Threats to species trees

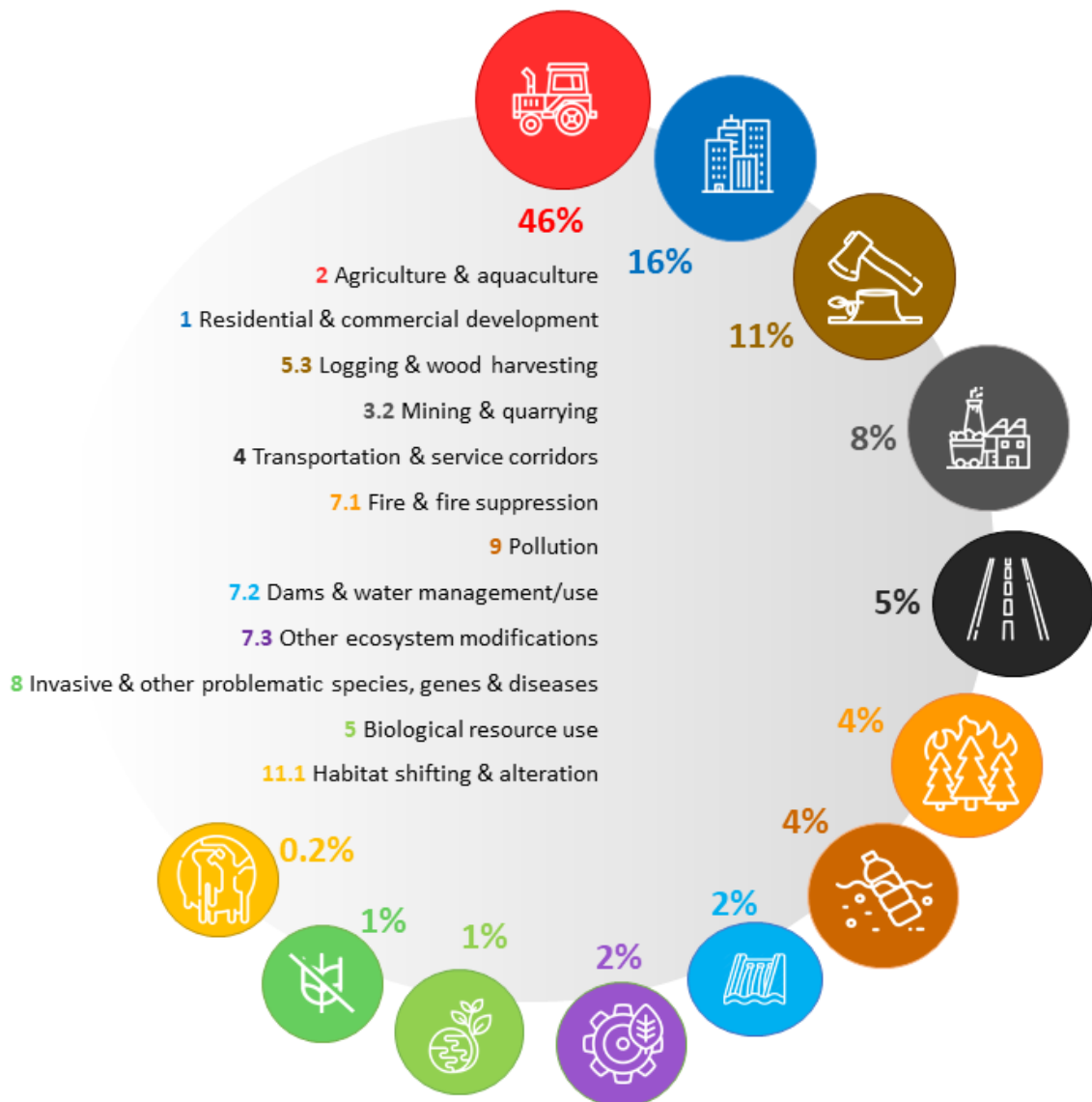Altogether, 604 threat events were inserted and associated with 200 species (**Figure 02)**.

Figure 02 - Major threats documented for 200 species following the IUCN Threats Classification Scheme (Version 3.2, 2012).

4. Conclusions and Recommendations

The findings presented in this report add up 200 new extinction risk assessments for tree species, another contribution towards the accomplishment of targets of both national and international relevance.

The application of the RapidLC tool proposed by Bachman et al. (2020) helped us to fastly identify species potentially not threatened, which improved our efforts in the development of full assessments for those taxa highlighted as potentially threatened. The workflow of LC species is more flexible because it does not require the validation of each record by an expert, but a questionnaire is used where the expert checks the information. Nevertheless, a team of CNCFlora analysts examine the species profile to prevent potentially threatened species from being evaluated as LC.

Our findings make evident the consequences of our decision to select species with less than 20 herbaria samples associated with their names in the present moment. The figure for CR and DD in this set of species can mainly be attributed to the nature of available data.

As population trends data is rarely available for Brazilian trees, we assessed most species using criteria B, which is readily accessible for taxa that there is no available information beyond distribution data.

For those species that were considered Threatened, it is highly recommended that we can secure enough resources to be able to guarantee their persistence in the wild, since threats arising from human activities are constantly increasing in the country. We think it is crucial to invest time in order to conduct extensive, targeted fieldwork aiming to bring new data of the numerous DD species.

Brazilian public investments in protected areas, ex situ conservation and action planning are also needed to protect threatened species that were recently assessed.

5. References

Bachman, S., Walker, B., Barrios, S., Copeland, A., Moat, J., 2020. Rapid least concern: Towards automating red list assessments. Biodiversity Data Journal 8. https://doi.org/10.3897/bdj.8.e47018 (accessed 29 May 2020).

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