

The Red List of Magnoliaceae

revised and extended

Malin Rivers, Emily Beech, Lydia Murphy & Sara Oldfield





BOTANIC GARDENS CONSERVATION INTERNATIONAL (BGCI)

is a membership organization linking botanic gardens in over 100 countries in a shared commitment to biodiversity conservation, sustainable use and environmental education. BGCI aims to mobilize botanic gardens and work with partners to secure plant diversity for the well-being of people and the planet. BGCI provides the Secretariat for the IUCN/SSC Global Tree Specialist Group.



FAUNA & FLORA INTERNATIONAL (FFI), founded in 1903 and the world's oldest international conservation organization, acts to conserve threatened species and ecosystems worldwide, choosing solutions that are sustainable, are based on sound science and take account of human needs.



THE GLOBAL TREES CAMPAIGN (GTC) is undertaken through a partnership between BGCI and FFI. GTC's mission is to prevent all tree species extinctions in the wild, ensuring their benefits for people, wildlife and the wider environment. GTC does this through provision of information, delivery of conservation action and support of sustainable use, working with partner organisations around the world.



THE IUCN/SSC GLOBAL TREE SPECIALIST GROUP (GTSG)

forms part of the Species Survival Commission's network of over 7,000 volunteers working to stop the loss of plants, animals and their habitats. SSC is the largest of the six Commissions of IUCN – The International Union for Conservation of Nature. It serves as the main source of advice to the Union and its members on the technical aspects of species conservation. The aims of the IUCN/SSC Global Tree Specialist Group are to promote and implement global red listing for trees and to act in an advisory capacity to the Global Trees Campaign.

Published by Botanic Gardens Conservation International Descanso House, 199 Kew Road, Richmond, Surrey, TW9 3BW, UK.

© 2016 Botanic Gardens Conservation International

ISBN-10: 1-905164-64-5
ISBN-13: 978-1-905164-64-6

Reproduction of any part of the publication for educational, conservation and other non-profit purposes is authorized without prior permission from the copyright holder, provided that the source is fully acknowledged.

Reproduction for resale or other commercial purposes is prohibited without prior written permission from the copyright holder. Recommended citation: Rivers, M., Beech, E., Murphy, L. and Oldfield, S. (2016). The Red List of Magnoliaceae - revised and extended. BGCI. Richmond, UK.

AUTHORS

Malin Rivers is the Red List Manager at BGCI.

Emily Beech is a Conservation Assistant at BGCI.

Lydia Murphy is the Global Trees Campaign Intern at BGCI.

Sara Oldfield is the co-chair of the Global Tree Specialist Group.

The opinion of the individual authors does not necessarily reflect the opinion of either the authors or Botanic Gardens Conservation International.

The authors and Botanic Gardens Conservation International take no responsibility for any misrepresentation of material from translation of this document into any other language.

COVER PHOTOS

Front cover: *Magnolia ventii* in South China Botanical Garden by Yang Keming
Back cover: *Magnolia coriacea* by Weibang Sun

DESIGN

Seascape. www.seasapedesign.co.uk

Printed on 75% recycled, 25% Mixed Credit FSC certified paper.

The Red List of
Magnoliaceae

revised and extended

March 2016

Malin Rivers, Emily Beech,
Lydia Murphy & Sara Oldfield



CONTENTS

Acknowledgements	3
Acronyms	3
Foreword	4
Executive Summary	5
Background	6

PART 1

Methodology	7
Taxonomic scope and concepts	7
Conservation assessment methodology	7
Review and evaluation	8
Red List report format	8
Case studies	9
Red List results	12
Threat status	12
Criteria used	12
Geographical analysis	13
Major threats	14
Population trends	15
Comparisons with the 2007 <i>Red List of Magnoliaceae</i>	15
<i>Ex situ</i> survey of Magnoliaceae	16
Species in <i>ex situ</i> collections	16
Number of <i>ex situ</i> collections	17
Comparison with 2008 <i>ex situ</i> survey	18
Conclusions and Recommendations	19
Policy relevance	19
Recommendations	19
References	20

PART 2

Globally threatened Magnoliaceae species	21
Magnoliaceae species evaluated as Near Threatened	42
Magnoliaceae species evaluated as Data Deficient	43
Magnoliaceae species evaluated as Least Concern	46

APPENDIX 1

Full list of evaluated Magnoliaceae species and their number of <i>ex situ</i> collections	49
--	----

APPENDIX 2

Number of Magnoliaceae species in each country	53
--	----

APPENDIX 3

Additional Magnoliaceae taxa (not included in analysis)	54
---	----

APPENDIX 4

Participating institutions	55
--------------------------------------	----

APPENDIX 5

IUCN Red List Categories and Criteria (version 3.1)	57
---	----



Monitoring of Magnolia in the wild

ACKNOWLEDGEMENTS

To achieve a complete evaluation of conservation assessments for Magnoliaceae, a wide range of people have shared their knowledge and expertise about this fascinating group of species and the habitats in which they grow. Without their generous assistance, this global Red List of Magnoliaceae would not have been possible, and everyone's contributions are gratefully acknowledged.

Members of the IUCN/SSC Global Tree Specialist Group and the BGCI network were especially helpful in providing information and facilitating the involvement of additional experts. Particular thanks go to: Marie-Stéphanie Samain and Esteban Martínez Salas for their contributions towards the Mexican assessments; Eduardo Calderón, Alvarez Cogollo and Marcela Serna-González for

the Colombian assessments, CNC Flora Brazil for the Brazilian assessments, Álvaro Pérez Castañeda for his contributions on the Ecuadorian assessments, Frank Arroyo for contributions towards the Peruvian assessments, and the Cuban Plant Specialist Group for the Cuban assessments. In addition, highly valuable information was sourced at the International Symposium on Neotropical Magnoliaceae in Puyo, Ecuador in July 2015.

At BGCI, in addition to the authors, Lisa Wheeler, Sonia Khela and Fran Culverhouse provided valuable help in sourcing reference material, collating information and producing conservation assessments and maps. Initial work and original maps produced by Daniele Ciczuzza are also acknowledged.

The authors are extremely grateful to Fondation Franklinia for supporting BGCI's red listing work. IUCN kindly provided financial assistance for this publication, support that was made possible by the Environment Agency – Abu Dhabi.

Special thanks also go to all the botanic gardens that shared their Magnoliaceae collection information and published their data on BGCI's PlantSearch database. Pam Hayward (of the RHS Rhododendron, Camellia and Magnolia Group) provided invaluable assistance in securing *ex situ* collection information and photographs. The Magnolia Society has also provided valuable contacts.

The provision of beautiful photographs by a wide range of talented photographers is gratefully acknowledged with credits given alongside each image.

LIST OF ACRONYMS

BGCI	Botanic Gardens Conservation International
CBD	Convention on Biological Diversity
FFI	Fauna & Flora International
GSPC	Global Strategy for Plant Conservation
GTA	Global Tree Assessment
GTC	Global Trees Campaign
GTSG	Global Tree Specialist Group
IUCN	International Union for Conservation of Nature
SSC	Species Survival Commission

IUCN RED LIST CATEGORIES

EX	Extinct
EW	Extinct in the Wild
CR	Critically Endangered
EN	Endangered
VU	Vulnerable
NT	Near Threatened
DD	Data Deficient
LC	Least Concern
NE	Not Evaluated

FOREWORD



Magnolia sieboldii (Arboretum Wespelaar)

Magnolias indeed are a plant 'passion' of mine and I have been extolling their virtues ever since seeing the magnificent Asiatic tree magnolias in the Valley Gardens at Windsor in the late 1960's. Being asked to write this Foreword for the Red List is both an honour and a pleasure as this will highlight how much is known about the family, its taxonomy, distribution and threats thus building on the information found in the first Red List printed in 2007. But it also highlights the world-wide wealth of knowledge and expertise there is out there in organisations, societies and private collectors who are passionate about this plant family.

This updated Red List highlights a number of important facts. 48% of all *Magnolia* species are threatened in the wild, with habitat loss due to logging and agriculture

being identified as the main threats. China and Latin America (Neotropics) are the two botanical 'hotspots' with many organisations involved with specific conservation projects.

This was demonstrated when the 'World Magnolia Center' was established in the South China Botanical Garden (SCBG) in partnership with Botanic Gardens Conservation International (BGCI) and the Magnolia Society International (MSI) in 2009. Such partnerships are key given the importance of both *in* and *ex situ* conservation work that is currently being undertaken around the world. The Magnolia Society International also plays a key role with conservation initiatives involving threatened species primarily from the Neotropics. This is important particularly as c.100 species have been discovered over the past 15 years. An example of this is funding of the Conservation, Propagation and Restoration of Costa Rican species. In addition, the First International Symposium on Neotropical Magnoliaceae held in Ecuador (2015) and co-running the Third International Symposium in Cuba in 2016 are key features of the MSI's work.

Ex situ conservation too is of significant importance: 50% of species are found in *ex situ* collections, while 22 species not included in 2007 are now safeguarded. As well as SCBG, there are many collections of note in China including the Kunming Institute of Botany and Kunming Botanical Garden. Professor Sun Wei-Bang has been successfully propagating several species that are Critically Endangered or Endangered enabling the reintroduction of *Magnolia decidua* and *Magnolia sinica* in particular back into their native habitats.

In the UK, organisations including the Royal Horticultural Society, Plant Heritage, RBG Kew, The Rhododendron, Camellia and Magnolia Group and the International Dendrology Society all have substantial collections in their own or their members' gardens that are open to the public. In mainland Europe, both the Arboretum Wespelaar in Belgium and Parco Botanico del Gambarogno (ParcoEisenhut) in Switzerland hold significant collections, while the latter is one of the world's major suppliers of cultivated magnolias. Substantial *ex situ* collections are also found in New Zealand and North America while the MSI holds the registration page for the International Cultivar Registration Authority.

This Red List of Magnoliaceae ably brought together by BGCI highlights the huge amount of work that is being carried out around the world. At the same time, it provides a focus on how many habitats are 'vulnerable' as magnolias are key constituents of forest habitats. By publishing this, it will publicise the significant amount of work that is being undertaken around the world by passionate people yet at the same time stimulate a wider audience to support this.

Jim Gardiner
Executive Vice President-
Royal Horticultural Society
President Emeritus-
Magnolia Society International

EXECUTIVE SUMMARY

The evaluation of the conservation status of all species in the Magnoliaceae has long been a global conservation priority recognised by Botanic Gardens Conservation International (BGCI). Since the publication of *The Red List of Magnoliaceae* in 2007, 93 new *Magnolia* species have been described, additional information on existing species has been published in botanical literature, and new threats to species have emerged. In light of this new information, and with 93 new species requiring conservation assessments, we have compiled an updated and extended version of *The Red List of Magnoliaceae*.

The new *Red List of Magnoliaceae* contains conservation assessments for 304 Magnoliaceae species. All assessments are also submitted for publication on the IUCN Red List of Threatened Species. These assessments show that a large proportion of Magnoliaceae species are threatened with extinction in the wild (at least 48%). Nearly one third of all species are still too poorly known to make a conservation assessment. Overall, only one in five species of Magnoliaceae is considered not threatened.

The main centre of species diversity for Magnoliaceae is in China, however there is a second centre of diversity in the Neotropics where a large number of new species have been recently described and published. The Neotropics has the highest proportion of threatened *Magnolia* species; 75% of the Neotropical *Magnolia* are under threat.

The main threats to *Magnolia* are extensive logging, both selective and more general, together with habitat loss



Magnolia biondii (Arboretum Wespelaar)

due to agriculture and livestock farming. Sustainable forestry practices and more protected areas are urgently needed to conserve *Magnolia* in the wild.

A survey of *ex situ* Magnoliaceae collections was also carried out as part of this conservation assessment. At present, only 43% of threatened *Magnolia* species are represented in *ex situ* collections, falling significantly short of requirements under Target 8 of the Global Strategy for Plant Conservation. The majority of threatened *Magnolia* species are only found in a very small number of collections (fewer than five). However, considerable progress has been made since the last *ex situ* survey of Magnoliaceae in 2008, with 22 species that were then absent from *ex situ* collections now safeguarded in botanic gardens and arboreta worldwide.

The Red List of Magnoliaceae aims to stimulate conservation action for *Magnolia* species under threat. BGCI and the Global Trees Campaign work with botanic gardens and other conservation partners to enhance *ex situ* conservation for globally threatened *Magnolia* taxa where appropriate and to promote *in situ* conservation planning, ecological restoration and sustainable use.



Magnolia sprengeri (Arboretum Wespelaar)

PART 1

BACKGROUND

The magnolia family, Magnoliaceae, is found in temperate and tropical regions of Eastern and Southeast Asia, and the Americas. The Magnoliaceae consists of over 300 species in two genera – *Magnolia* L. and *Liriodendron* L. They are evergreen or deciduous trees and shrubs. Many species are widely appreciated around the world as ornamental trees due to their attractive flowers and foliage. In the wild, these plants are also widely appreciated, and used for timber and medicines by local communities as well as in international trade. There are conservation concerns for many of the species in the wild due to threats such as habitat destruction, overharvesting for timber and medicinal uses, and low natural regeneration. In order to assess the impact of these threats on the world's Magnoliaceae species, there is a need for a global assessment of their conservation status to guide conservation action.

The evaluation of the conservation status of trees has long been a global conservation priority recognised by Botanic Gardens Conservation International (BGCI). BGCI, in partnership with Fauna & Flora International, coordinates the Global Trees Campaign (GTC). GTC is a joint initiative to safeguard the world's threatened tree species from extinction. Part of the task of GTC is to assess the conservation status of trees in the wild and in *ex situ* collections – and in such a way prioritise species in need of conservation action. BGCI, working with the IUCN/SSC Global Tree Specialist Group (GTSG), has for the last eight years been working towards this goal, producing global conservation assessments of trees both with taxonomic and regional foci (Table 1). These tree conservation assessments contribute directly to the Global Tree Assessment (GTA), which aims to have conservation assessments for all trees by 2020 (Box 1, Newton *et al.* 2015).

Red List	Year published
The Red List of Magnoliaceae	2007*
The Red List of Oaks	2007*
The Red List of Maples	2009
The Red List of Trees of Central Asia	2009
The Red List of Mexican Cloud Forest Trees	2011
The Red List of Rhododendrons	2011
A Regional Red List of Montane Tree Species of the Tropical Andes	2014
The Red List of Betulaceae	2014
*Published by Fauna & Flora International	

Table 1. Summary of Red Lists produced by Botanic Gardens Conservation International in partnership with Fauna & Flora International and the Global Tree Specialist Group.

Global Tree Assessment (GTA)

Despite the importance of trees, many are threatened by over-exploitation and habitat destruction, as well as by pests, diseases, drought and their interaction with global climate change. In order to estimate the impact of such threats to trees there is an urgent need to conduct a complete assessment of the conservation status of the world's tree species – the Global Tree Assessment.



The Global Tree Assessment aims to provide conservation assessments of all the world's tree species by 2020. The assessment will identify those tree species that are at greatest risk of extinction. The goal of the Global Tree Assessment is to provide prioritization information to ensure that conservation efforts are directed at the right species so that no tree species becomes extinct.

The Global Tree Assessment is an initiative led by BGCI and the IUCN/SSC Global Tree Specialist Group. Work is ongoing to develop an even more extensive global collaborative partnership, involving the coordinated effort of many institutions and individuals. These steps will enable the Global Tree Assessment to achieve its 2020 target.

The first of such Red Lists was *The Red List of Magnoliaceae* produced in 2007 (Cicuzza *et al.* 2007). Since this publication, new information on existing taxa has been published and new threats have emerged. In addition, since 2007, 93 new *Magnolia* species have been described and published (IPNI 2015).

The majority of these are from the Neotropical region. In the light of this new information and new taxa, it is now time to produce an updated and extended version of *The Red List of Magnoliaceae*.

METHODOLOGY

TAXONOMIC SCOPE AND CONCEPTS

All species in the family Magnoliaceae that were published prior to December 2015 were included in this assessment. We focused on species-level assessments, as the IUCN Red List of Threatened Species only accepts infraspecific conservation assessments once a species-level assessment has been carried out. Infraspecific taxa were not included, unless the taxonomic concept was unresolved and there were data indicating that the taxon might be considered an accepted species. Hybrids within Magnoliaceae were not assessed.

The taxonomic concepts followed are those reflected in The Plant List version 1.1 (The Plant List 2013); new species described since then as well as taxonomic updates since 2013 were included following the World Checklist of Selected Plant Families (WCSP 2016) and after consultation with taxonomic experts.

Plant authority names followed those from The International Plant Names Index (IPNI 2015).

CONSERVATION ASSESSMENT METHODOLOGY

Conservation assessments were conducted following the IUCN Red List of Threatened Species Categories and Criteria version 3.1 (IUCN 2001, Appendix 5). Assessments were compiled using the IUCN's Species Information Service (SIS), which is a web-based database for storing and managing IUCN conservation assessments. Information for each species was assembled for a range of areas including:

- Distribution
- Population
- Habitat and ecology
- Threats
- Uses
- Conservation
- References



Magnolia jardinensis (Marcela Serna)

A wide range of resources were consulted to gather all the required information. Sources include: national and regional floras, taxonomic databases, scientific papers, published and unpublished reports, expert knowledge, herbarium records and national red lists. In addition, expert opinions were consulted at the *1st International Symposium on Neotropical Magnoliaceae* held in Puyo, Ecuador in July 2015.

Using all the available information, a conservation category was assigned. Species were assigned one of nine categories: Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD) and Not Evaluated (NE) (Figure 1). CR, EN and VU are the three threatened categories. Taxa that did not qualify for a threatened category, but were close to qualifying for, or are likely to qualify for, a threatened category in the near future, were assigned to the category NT. LC was used for species that are assessed but are not considered threatened including widespread species and rare but stable species. The use of the category DD is discouraged, but may be assigned to poorly known taxa. Species not yet evaluated were classified as NE. In this report NT and LC taxa were considered “not threatened”.

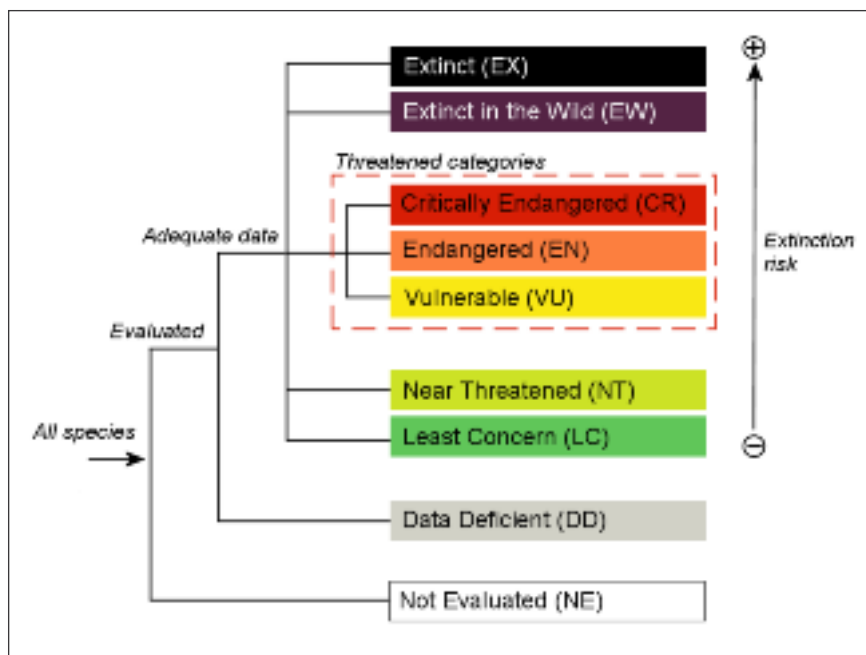


Figure 1. Structure of the IUCN Red List Categories (version 3.1) (Credit: IUCN)

In order to assess whether a species belongs to a threatened category (CR, EN, VU), the species were evaluated in relation to five criteria: A) Population reduction; B) Geographic range; C) Small population size and decline; D) Very small or restricted population; and E) Quantitative analysis. The criteria are based on a set of thresholds and subcriteria. Extensive guidelines available to facilitate the process for the conservation assessors were consulted (IUCN Standards and Petitions Subcommittee 2014). In practice, most assessments were based on population size and/or range size, either observed, estimated, projected, inferred or suspected. Assessors are encouraged to evaluate taxa using all five criteria, but a taxon only needs to fulfil one of the five criteria to qualify for a threatened category. When several criteria were met resulting in different status assessments, the precautionary principle was applied and the most threatened category was assigned (IUCN 2001). Once completed and reviewed, the assessments were sent for publication to the IUCN Red List of Threatened Species (IUCN 2015).



Magnolia dawsoniana (Arboretum Wespelaar)



Magnolia macrophylla (Arboretum Wespelaar)

All assessments in this report were assessed on a global scale. Assessments carried out by national red list efforts, were only included if species were country endemics (i.e. the national assessment covered the full geographical distribution).

REVIEW AND EVALUATION

Wherever possible, expert opinions were sought for all species assessed. Sometimes experts carried out the conservation assessment for their own species (assessors), and sometimes they contributed data for the conservation assessment to be carried out (contributors). In accordance with IUCN Red List regulations, all assessments were also reviewed by a member of the GTSG (reviewer).

RED LIST REPORT FORMAT

This report lists all species with their authors, country distribution and conservation assessment ratings. The threatened species are also listed with the rationale for the conservation assessment.

All other information (including synonyms, full distribution information, habitat, ecology, conservation measures, threats and uses) can be found on the website for the IUCN Red List of Threatened Species (IUCN 2015, www.iucnredlist.org). Distribution maps have also been submitted to IUCN.

The threatened (CR, EN, VU) species are listed in alphabetical order in Part 2, followed by the Near Threatened species, the Data Deficient species and the Least Concern species.

In this report assessors are only listed for the threatened species, and when the assessors were not the authors of this report, BGCI staff or interns. For full details of the assessors, contributors and reviewers, see the IUCN Red List of Threatened Species website (www.iucnredlist.org).

A full list of species with their *ex situ* collections is found in Appendix 1.

CASE STUDIES

CASE STUDY 1: INTEGRATED CONSERVATION ACTION FOR *MAGNOLIA WOLFII* IN COLOMBIA

Nearly all of Colombia's 33 *Magnolia* species, many of which are endemic, are threatened with extinction, as a result of habitat loss and extraction for their high-quality timber. BGCI has been working with in-country partners Jardín Botánico de Medellín Joaquín Antonio Uribe (JAUM) and Jardín Botánico Universidad Tecnológica de Pereira (JBUTP) to counteract the impact of these threats through a series of integrated *in situ* and *ex situ* conservation measures.

Since 2013, work has focused on *Magnolia hernandezii*, *Magnolia gilbertoi*, *Magnolia jardinensis*, *Magnolia silvioi* and *Magnolia wolfii*. All these species have restricted distributions and extremely small populations, but none more so than

M. wolfii. This species is only known from a single location, in the Risaralda department in west Colombia, where the population is down to fewer than ten mature trees.

Despite its Critically Endangered conservation status, however, work carried out by BGCI and its in-country partners is ensuring that *M. wolfii* will have a more secure future. Propagation material collected from the wild population has been used to establish *ex situ* seed and living plant collections of *M. wolfii* at five botanic gardens in Colombia. During these surveys, project staff discovered another three mature *M. wolfii* trees – a vital boost to the species' tiny population.

In addition to building up *ex situ* collections, work has been underway to reinforce existing wild populations of *M. wolfii*. In 2013, 400 nursery-grown

seedlings were transferred to Marcella Botanical Garden which is close to the location of the only known wild population. Botanists have carried out repopulation trials to evaluate the species' growth responses under different habitat and light conditions. This work has involved the cooperation of local farmers, with 5,000 saplings of *M. wolfii* and other *Magnolia* species planted on their land. During the trial plantings, farmers and protected area staff participated in workshops providing vital training in collection, propagation and recovery techniques for *Magnolia* species. A broader education campaign at JBUTP communicated Colombia's unique Magnoliaceae diversity and the need for its conservation to the 10,000 visitors it receives at its botanic garden each year.

At the same time, JAUM succeeded in securing the inclusion of a 140ha area of tropical forest, located on the eastern slopes of Colombia's Western Cordillera, within the Colombian Association of Civil Society Natural Reserves. This area was identified during field surveys as a hotspot for *Magnolia* species, and it is hoped that its designation will continue to encourage local participation in developing and implementing conservation measures for *M. wolfii* and Colombia's other threatened *Magnolia*.



Fruit of *Magnolia wolfii*

CASE STUDY 2: CONSERVATION OF THREATENED *MAGNOLIA SINOSTELLATA* IN ZHEJIANG PROVINCE, CHINA

Since *Magnolia sinostellata* was first described in 1989, this highly attractive species has become a popular horticultural plant. Its popularity has proved to be its undoing, however, as widespread harvesting of specimens from wild populations for use in commercial nurseries has seen the species rapidly decline. Today only three small populations of *M. sinostellata* remain in the wild, in the mountains of Zhejiang province, south-east China. These populations are all showing signs of poor reproductive performance, which is further accelerating the species' decline and limiting the genetic diversity of each population.

In 2015, BGCI and staff from Fairy Lake Botanical Garden, Shenzhen, initiated a project to bring *M. sinostellata* back from the brink. The project is taking an integrated approach, with plans to establish *ex situ* living collections and to reinforce wild populations of the species. By the end of 2015, project staff had already successfully propagated 2,800 *M. sinostellata* individuals, bolstering the species' limited seed output with grafting and cutting techniques.

A key part of the project is to continue enabling local people to harness the horticultural and economic value of *M. sinostellata* without further endangering wild populations. To this end, 2015 saw the launch of a series of workshops and training courses designed to train local people and forest agency staff in propagation and cultivation techniques for *M. sinostellata*, with more workshops planned for 2016. Work is also underway to develop two cultivars of *M. sinostellata*

specifically for cultivation purposes. Building local capacity in horticultural techniques will reduce their dependence on wild populations of *M. sinostellata*, and allow the species to recover.

As well as reducing human pressure on *M. sinostellata*, plans are also in place to reinforce wild populations with individuals grown in *ex situ* collections. Efforts will focus on a population located on Mount Yandang in the south-east of Zhejiang province. This population has been singled

out as requiring the most urgent conservation action as it currently comprises just 3-5 individuals, and is the most genetically distinct population of the three. Mount Yandang is also a popular tourist destination, and provides an ideal opportunity to publicise the project and raise awareness of *M. sinostellata* conservation. Meanwhile, monitoring of the health and status of all three wild populations will continue, along with surveys to identify any new, as yet undocumented populations of this species.



Magnolia sinostellata sapling in a nursery (Shouzhou Zhang)

**CASE STUDY 3: MAGNOLIA
CUBENSIS SSP. ACUNAE:
A FLAGSHIP SPECIES FOR THE
RESTORATION OF CUBAN CLOUD
FORESTS**

Magnolia cubensis ssp. *acunae* is endemic to the montane rainforests of Cuba's Guamuha mountains. Forest clearance has destroyed much of its habitat, with most of its former range now occupied by coffee plantations, shaded by non-native invasive tree species. All remaining populations of *M. cubensis* ssp. *acunae* are located in highly fragmented or degraded habitat. The largest population lies outside any protected area boundaries, which puts it at permanent risk of clearing for further coffee plantations.

The rapid decline of *M. cubensis* ssp. *acunae* and other local trees also has wider repercussions for local ecosystems and the communities living within them. The Guamuha cloud forests, of which *M. cubensis* ssp. *acunae* was once a major component, play an important regulating role, capturing rainwater and humid air and thus controlling soil erosion, run-off and flooding further down the watershed. This



Magnolia cubensis ssp. *acunae*

ecosystem service is vital to the sustainability of the local coffee industry, but with the disappearance of much of the native cloud forest, such systems are at risk of breaking down altogether.

Since 2009, BGCI has been working with in-country partners the National Botanic Gardens Havana and the Cuban Botanical Society to address the decline in coverage and quality of the cloud forests in Guamuha. As a previously dominant structural cloud forest species which is classified as Critically Endangered, and a highly attractive tree valued locally for its timber, *M. cubensis* ssp. *acunae* acts as a strong flagship species for this project.

Extensive field surveys have been carried out to map the full distribution of *M. cubensis* ssp. *acunae* and to collect propagation material for establishing the first *ex situ* collections for the species. A major challenge in establishing *ex situ* collections of cloud forest species such as *M. cubensis* ssp. *acunae* is that they require very different conditions to those found in established botanic gardens in Cuba. However, the project partners came up with a way of establishing *ex situ* collections of *M. cubensis* ssp. *acunae* that also facilitated the species' conservation in the wild.

With the cooperation of local farmers, native plant nurseries have been established on coffee farms, with training given to coffee farmers and farm workers to enable them to propagate and grow *M. cubensis* ssp. *acunae* and other threatened native trees. The programme has expanded rapidly, and by 2013, propagation efforts of 12 local nurseries had raised over 1,500 individuals of *M. cubensis* ssp. *acunae*. Having started the process of controlling and eradicating non-native invasive trees from coffee



Magnolia cubensis ssp. *acunae*

plantations, project staff and local farmers have been able to reinforce wild populations of *M. cubensis* ssp. *acunae* through planting out nursery-grown trees on the coffee plantations, in place of the non-native tree species.

In addition to practical interventions to restore *M. cubensis* ssp. *acunae*, project partners have worked hard to raise awareness among local communities of the benefits of conserving native tree species and cloud forest habitats. In August 2013, an environmental festival "Del Monte Soy" was held in Topes de Collantes to celebrate the relationship between humans and plants, highlight the value of the local flora, and to communicate the threatened conservation status of many native plants in the region, including *M. cubensis* ssp. *acunae*. One of the key focuses of the training workshops held with coffee farmers was also the importance of native tree species and habitats for local communities.

Work to conserve *M. cubensis* ssp. *acunae* and its native habitat is set to continue into the future. One of the latest developments has been the provision of toolkits to coffee farmers to help them to manage their native tree nurseries independently. Two project workers continue to be available to provide advice, but it is the farmers and their communities who will lead the work to conserve *M. cubensis* ssp. *acunae* into the future.

RED LIST RESULTS

THREAT STATUS

All species in the family Magnoliaceae published prior to December 2015 are included in this Red List assessment, totalling 304 species, which makes this *Red List of Magnoliaceae* the most comprehensive analysis of the family.

Globally, 147 species were considered threatened. Sixty species were considered not threatened (Least Concern and Near Threatened). The remaining species, (97) were Data Deficient (Figure 2). Data Deficient species may be either threatened or not threatened when a full assessment is possible. The recommendation for reporting this uncertainty is to give a range, which means that the proportion of threatened species is between 48-80%.

More detailed summary results are found in Table 2. None of the species were considered Extinct, although two species were considered possibly extinct (*Magnolia dixonii* and *Magnolia emarginata*). Among the 60 not threatened species, there were



Liriodendron chinense (Philippe de Spoelberch)

IUCN Red List category	Number of species
Extinct	0
Critically Endangered	37
Endangered	84
Vulnerable	26
Data Deficient	97
Near Threatened	13
Least Concern	47
Not Evaluated	10
Total	314

Table 2. Summary of conservation assessments for species of Magnoliaceae.

13 species assessed as Near Threatened (NT), these were species that nearly fall into a threatened category. One example is *Liriodendron chinense* this species is under pressure across its range from a combination of factors including habitat decline, degradation and fragmentation, as well as issues resulting from hybridisation and poor regeneration, with subsequent population reduction.

Eleven infraspecific taxa were also assessed, but not included in the species-level analysis (Appendix 3a). More information on these can be found on the IUCN Red List of Threatened Species website (www.iucnredlist.org).

Ten species, published recently were not evaluated (NE), as no information on these species (including the papers where the species were described) could be accessed (Appendix 3b).

CRITERIA USED

In order to list a species as threatened all five criteria should be used, although only a single criterion needs to be met for a species to be considered threatened. However, for many plant species there are not sufficient data available to allow all the criteria to be used. Most (77%) threatened species were assessed using criterion B, i.e. listed as threatened due to their restricted geographic range (Table 3). A quarter (26%) of threatened species used criteria C and D, which are based on small or restricted population size. Only 9% of threatened species were listed using criterion A, which shows that population reductions (and generation length) are difficult to calculate for these long-lived taxa. No species were evaluated using criterion E (quantitative analysis of extinction risk).

Most species were listed using a single criterion, but 16 (11%) threatened species had multiple criteria applied.

Criterion A	13 (9%)
Criterion B	113 (77%)
Criterion C	14 (10%)
Criterion D	24 (16%)
Criterion E	0
Total	164 (147 species)

Table 3. The number of threatened Magnoliaceae conservation assessments using the five different Red List criteria, and the percentage of threatened species assessed under each criterion.

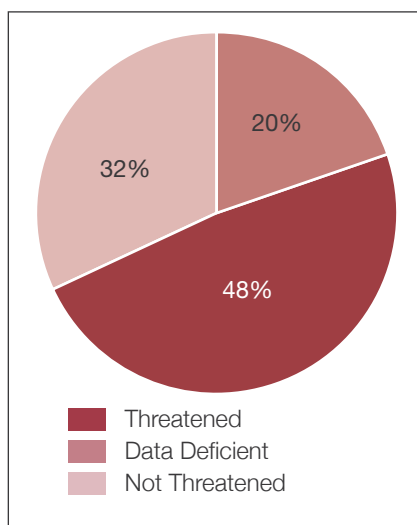


Figure 2. Summary of the threatened, Data Deficient and not threatened species of Magnoliaceae.

GEOGRAPHICAL ANALYSIS

Magnoliaceae species were found in 47 countries (Figure 3, Appendix 2). The country with the most species was China with 108 species (33 threatened), followed by Vietnam with 45 species (14 threatened). Seven of the ten most species-rich countries were located in East and Southeast Asia. Another centre of diversity was in the Neotropics, with Colombia, Mexico and Ecuador

having a very high number of *Magnolia* species. Nearly two thirds (198) of species were single country endemics.

When comparing the proportion of threatened species, the Neotropics (Mexico, Colombia and many of the Caribbean islands) showed a very high proportion of threatened species (Figure 4). For most countries in the Neotropics, with only a few exceptions (Brazil,

Panama, El Salvador and Nicaragua), more than 50% of their *Magnolia* species were considered threatened.

As a whole, 75% of the Neotropical *Magnolia* were considered under threat; and the Neotropics have more than two thirds of the world's most threatened *Magnolia* species – those found in categories Critically Endangered and Endangered.

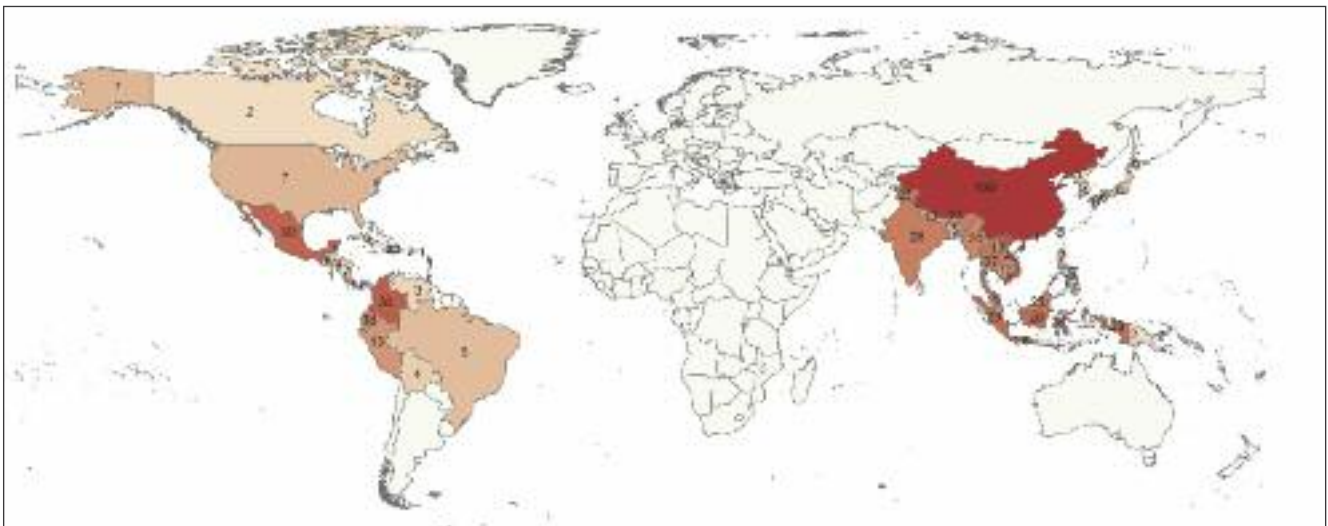


Figure 3. Magnoliaceae species richness per country.

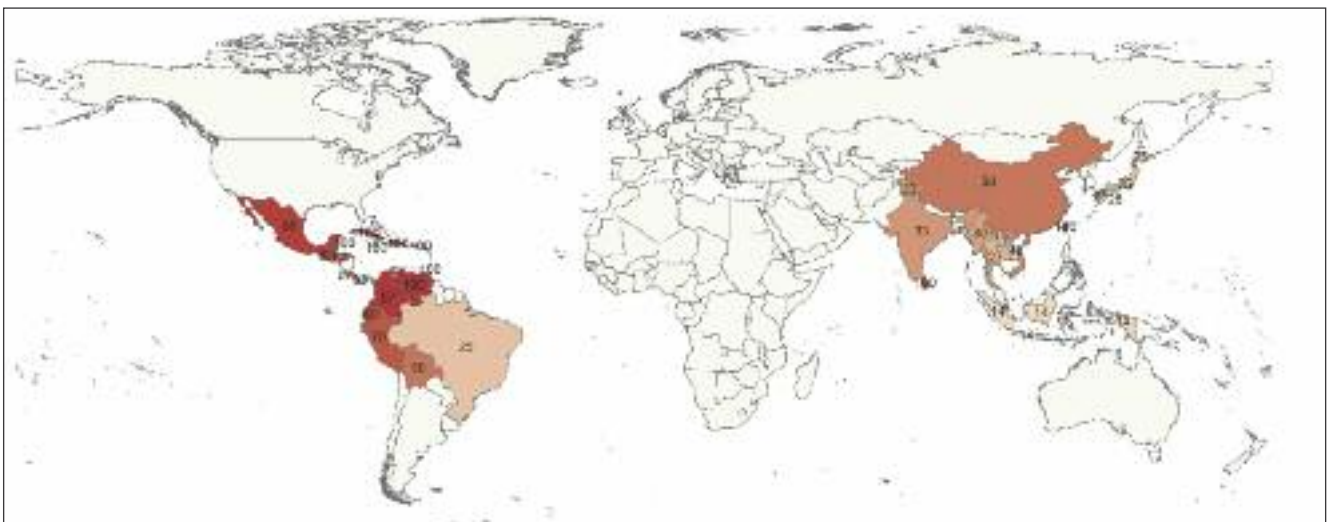


Figure 4. The percentage of Magnoliaceae species for each country that are threatened (excluding Data Deficient species)

MAJOR THREATS

The majority of Magnoliaceae species were found in subtropical or tropical forests, with a few species found in temperate climates. A range of threats have been recorded, associated both with the species as well as the habitat in which they grow. The threats were recorded using the IUCN threat classification scheme (IUCN 2012).

The most common threats to Magnoliaceae are shown in Figure 5. Logging/wood harvesting was the most significant threat to all Magnoliaceae species, both threatened and not threatened. It impacted nearly half (44%) of all species. Impacts from agriculture (annual and perennial non-timber crops) accounted for the second biggest threat and was identified as a significant factor in over one third of all species (36%). Habitat loss due to livestock farming and human development were also significant factors. Other threats included collections of wild plant material and climate change.



Magnolia grandiflora (Peter Timmermans)



Magnolia obovata (Arboretum Wespelaar)

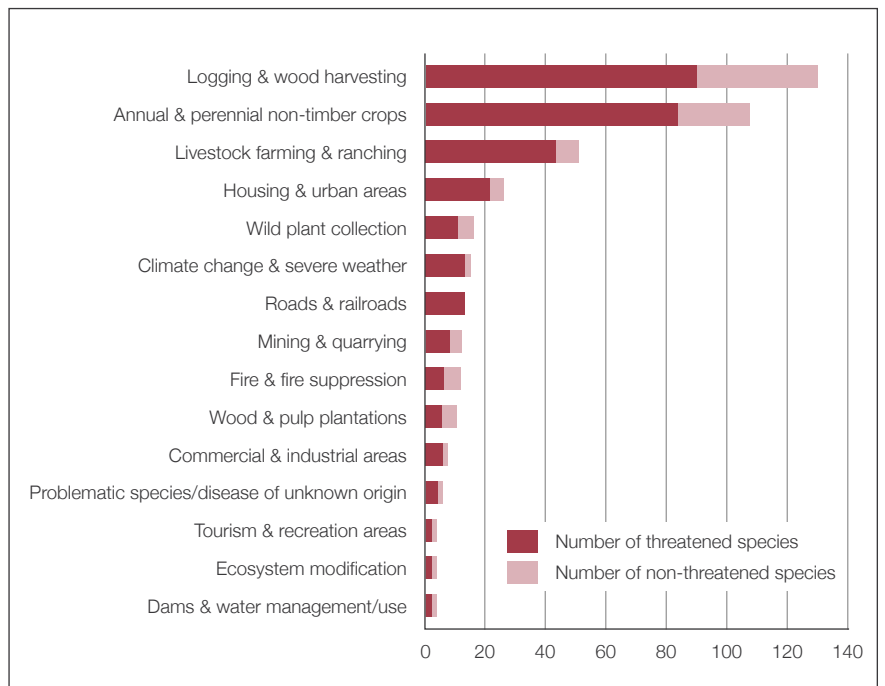


Figure 5. Major threats to threatened and non-threatened Magnoliaceae species, using the IUCN threat classification system.

POPULATION TRENDS

The population trend for each assessed Magnoliaceae species was also recorded as part of the conservation assessment process. These data showed that less than 5% of species have a stable or increasing population; 42% of species have a documented decreasing population (Figure 6). For more than half of the species assessed, the population trend was not known. This lack of information on population trends can lead to species being assessed as Data Deficient.

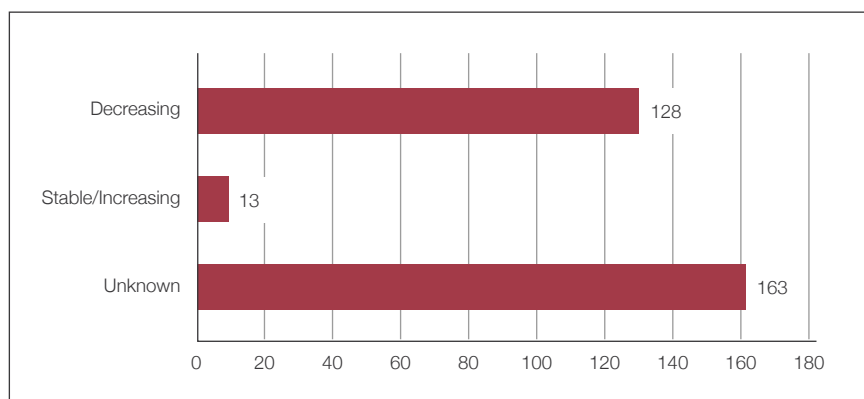


Figure 6. Population trends of Magnoliaceae species.

COMPARISONS WITH THE 2007 RED LIST OF MAGNOLIACEAE

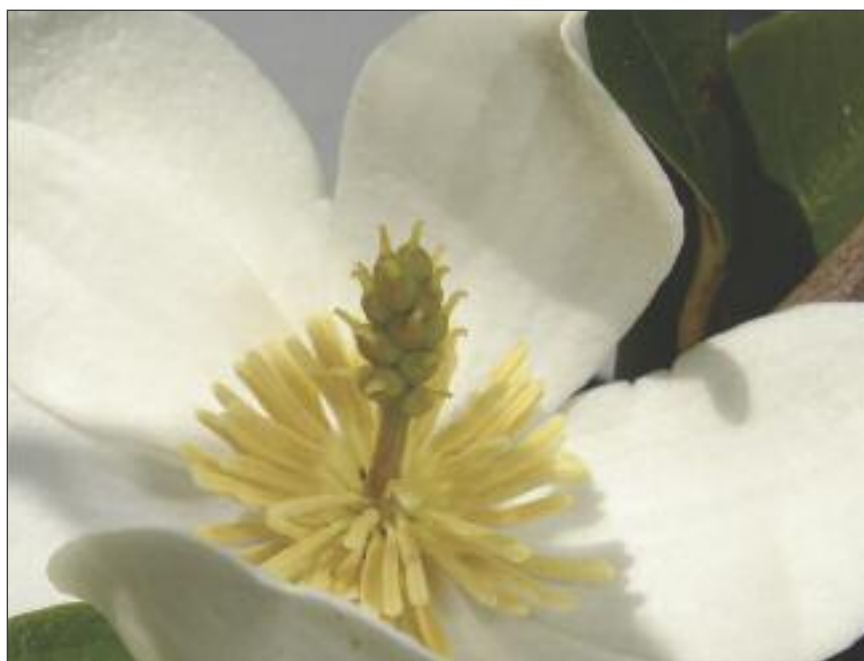
The Red List of Magnoliaceae (Cicuzza *et al.* 2007) included 151 Magnoliaceae taxa, of which 120 were species-level assessments (Table 4). This new Red List update contains 304 species. 107 species from the original publication were assessed again. The 13 species which were not evaluated again are now considered synonyms, and the accepted name has been listed instead.

Of the 107 reassessed species, most (78 species) had the same conservation assessment category. However, 29 had a different rating: 12 species were given a higher category of threat, while ten species were moved from Data Deficient to another conservation rating. Seven species were categorised as less threatened (i.e. a lower category of threat), but none of these species fell out of a threatened category.

Compared to the 2007 publication, the 2016 *Red List of Magnoliaceae* lists 52 additional species that have been identified as at risk of extinction. There are also 44 additional species that have been identified as not at risk of extinction, and, worryingly, 88 species that have insufficient information to assess their conservation status.

	2016	2007
Threatened	147 species (152)	95 species (112)
Data Deficient	97 species (92)	9 species (10)
Not threatened	60 species (62)	16 species (29)
Total species evaluated	304 species (315)	120 species (151)

Table 4. Comparison of conservation assessments in *The Red List of Magnoliaceae* in 2016 and 2007. Numbers in brackets include infraspecific taxa.



Magnolia laevifolia

EX SITU SURVEY OF MAGNOLIACEAE

In addition to the conservation assessments, we also carried out an *ex situ* survey to assess the representation of Magnoliaceae species in *ex situ* collections of botanic gardens, arboreta and seed banks around the world.

All Magnoliaceae records were downloaded from BGC's global database of plants in cultivation - PlantSearch (Box 2) (as of 26 January 2016). In addition, lists of *ex situ* *Magnolia* collections sent to us from specialist collections not on PlantSearch and the Chinese checklist of *ex situ* cultivated flora (Huang 2014) were consulted.

The *ex situ* survey identified 9,918 records of Magnoliaceae from 490 institutions (Table 5). This number represents the presence of a single taxon in a collection within an institution and does not take into account the number of accessions or individuals. Only species records were included in the analysis; records of cultivars or infraspecific taxa were excluded. In total 4,476 records matched with Magnoliaceae species included in this Red List or with synonyms.

SPECIES IN EX SITU COLLECTIONS

Exactly half of all Magnoliaceae species (152 of 304 species) are found in *ex situ* collections. However, species in *ex situ* collections are often (82 of 152) those listed as Least Concern or Data Deficient (Figure 8). Only 43% (63 of 147) of threatened *Magnolia* species (Critically Endangered, Endangered and Vulnerable) are found in *ex situ* collections (Figure 7), well below Target 8 of the Global Strategy for Plant Conservation which calls for 75% of threatened plants to be held in *ex situ* collections (CBD 2012).

Fifty-nine percent of the Critically Endangered and Endangered *Magnolia* species (71 out of 121 species) are not

PlantSearch

BGC's PlantSearch database is the only global database of plants in cultivation. It is available online, and it is free to contribute to and access. PlantSearch connects around 2,000 researchers and horticulturists to collections every year. Locations and gardens are not publicly revealed and requests can be made via blind email messages. PlantSearch is an easy way for *ex situ* collection holders to contribute to broader *ex situ* assessments, such as this survey. By uploading a taxa list to PlantSearch, collection holders can connect their collections to the global botanical community and find out the conservation value of their taxa, including the number of locations each taxon is known from globally and its current global conservation status. It is important for institutions with *ex situ* collections to share accurate data and keep it updated, and PlantSearch relies on collection holders to upload up-to-date taxa lists on an annual basis to ensure accuracy and enhance usability of the data.

www.bgci.org/plant_search.php

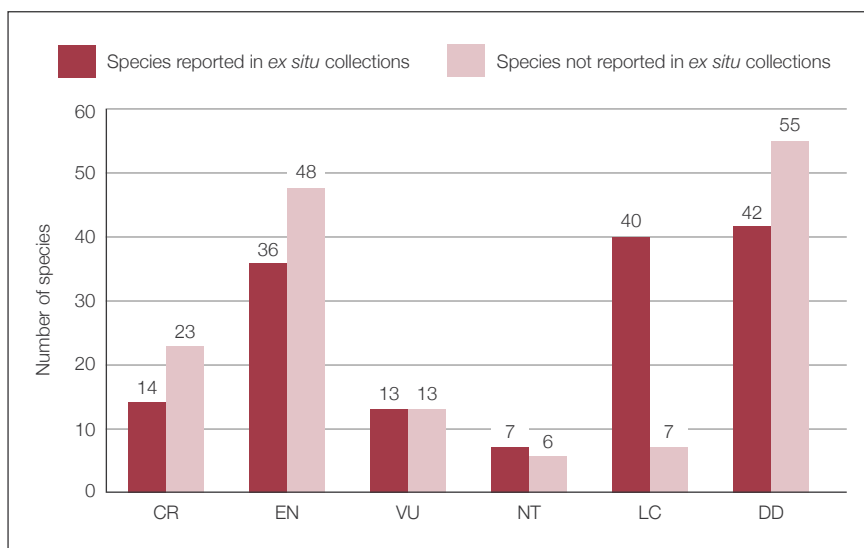


Figure 7. Presence and absence of Magnoliaceae species in *ex situ* collections per IUCN Red List Category.

	2016 <i>ex situ</i> survey
Number of records	9918
Number of institutions	490
Number of countries	61

Table 5. Summary statistics for the *ex situ* survey of Magnoliaceae.

reported in *ex situ* collections and these should be prioritised to be brought into collections. Species that are not in an *ex situ* collection have no safeguard in the event their wild populations are lost. Twenty-three Critically Endangered species not found in collections are listed in Table 6 together with their country of occurrence; of these, 20 are endemic to the Neotropics. Successful efforts have been made by BGCI to target threatened *Magnolia* species in these regions previously (See Case Studies 1 and 3). Further efforts should be made to bring the remaining Critically Endangered species into collections as soon as possible.

NUMBER OF EX SITU COLLECTIONS

Sixty-two percent (39 of 63 species) of threatened *Magnolia* species are found in a very small number of collections (fewer than five collections), with the majority only found in a single collection (Figure 8). Species found in only a few collections do not have sufficient protection against stochastic events or loss from natural causes. Furthermore, small collection numbers are unlikely to capture sufficient genetic diversity to enable the collections to be used in restoration or reintroduction programmes.



Magnolia sprengeri (Arboretum Wespelaar)

Species	Country
<i>Magnolia calimaensis</i>	Colombia
<i>Magnolia canandean</i>	Ecuador
<i>Magnolia cararensis</i>	Colombia
<i>Magnolia cespedesii</i>	Colombia
<i>Magnolia chimantensis</i>	Colombia
<i>Magnolia coronata</i>	Colombia
<i>Magnolia dixonii</i>	Ecuador
<i>Magnolia domingensis</i>	Haiti, Dominican Republic
<i>Magnolia ekmanii</i>	Haiti
<i>Magnolia emarginata</i>	Haiti
<i>Magnolia faustinomirandae</i>	Mexico
<i>Magnolia gustavii</i>	India, Myanmar, Thailand
<i>Magnolia lacandonica</i>	Mexico
<i>Magnolia manguillo</i>	Peru
<i>Magnolia mayae</i>	Mexico
<i>Magnolia narinensis</i>	Colombia
<i>Magnolia ofeliae</i>	Mexico
<i>Magnolia pleiocarpa</i>	India
<i>Magnolia sanchez-vegae</i>	Peru
<i>Magnolia tiepii</i>	Vietnam
<i>Magnolia vallartensis</i>	Mexico
<i>Magnolia virolinensis</i>	Colombia
<i>Magnolia wendtii</i>	Mexico

Table 6. Critically Endangered *Magnolia* species not in *ex situ* collections.

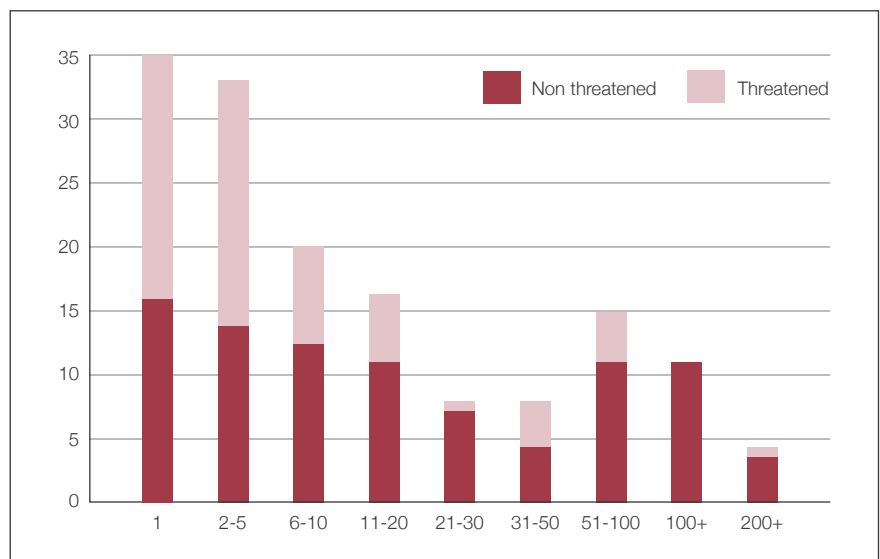


Figure 8. Number of collections of Magnoliaceae species.

In contrast, some species are widespread among botanic gardens and arboreta around the world (Table 7). These species are generally considered not threatened, one exception being *Magnolia stellata*, which is listed as Endangered in the wild and is present in over 200 *ex situ* collections and is also widespread in general horticulture. The quality of *ex situ* Magnolia collections, in terms of size of collections and genetic diversity, is not included in the remit of this survey. It will be important to consider these two factors when bringing new species into collections, to maximise the conservation value of the *ex situ* collection. Further work on the genetic components and relevance of *ex situ* collections have been carried out for Magnoliaceae (Cires *et al.* 2013), and in more detail for other groups (i.e. Griffith *et al.* 2015).

COMPARISON WITH 2008 EX SITU SURVEY OF MAGNOLIACEAE

A comparison of the results from this survey with those of an *ex situ* survey of Magnoliaceae carried out in 2008 (BGCI 2008) show an increase in the number of records of Magnoliaceae in *ex situ* collections of 7,644. This is due in part to data being provided from a further 252 institutions from 14 additional countries. But importantly Magnoliaceae species are now better conserved in *ex situ* collections. In addition, there are 22 species that were not present in cultivation in 2008 that are now available in *ex situ* collections (Table 8). This shows the impact and importance of the Red List assessments and the subsequent *ex situ* survey highlighting and prioritising conservation action.

Species	<i>Ex situ</i> collections	Red List Category
<i>Liriodendron tulipifera</i>	255	LC
<i>Magnolia grandiflora</i>	225	LC
<i>Magnolia kobus</i>	211	DD
<i>Magnolia stellata</i>	206	EN
<i>Magnolia tripetala</i>	159	LC
<i>Magnolia acuminata</i>	157	LC
<i>Magnolia virginiana</i>	152	LC
<i>Magnolia sieboldii</i>	148	LC
<i>Magnolia denudata</i>	145	LC
<i>Magnolia obovata</i>	136	LC
<i>Liriodendron chinense</i>	134	NT
<i>Magnolia macrophylla</i>	121	LC
<i>Magnolia wilsonii</i>	111	NT
<i>Magnolia figo</i>	103	LC
<i>Magnolia campbellii</i>	103	LC

Table 7. Species in over 100 *ex situ* collections.

Taxon Names	<i>Ex situ</i> collections	Red List Category
<i>Magnolia colombiana</i>	1	CR
<i>Magnolia dandyi</i>	15	LC
<i>Magnolia duperreana</i>	1	DD
<i>Magnolia espinalii</i>	1	CR
<i>Magnolia henaoui</i>	1	EN
<i>Magnolia katiolum</i>	1	CR
<i>Magnolia lanuginosa</i>	13	DD
<i>Magnolia lenticellata</i>	1	EN
<i>Magnolia longipedunculata</i>	1	CR
<i>Magnolia macclurei</i>	20	LC
<i>Magnolia mahechae</i>	1	EN
<i>Magnolia nilagirica</i>	1	VU
<i>Magnolia pallescens</i>	1	EN
<i>Magnolia platyphylla</i>	1	DD
<i>Magnolia pugana</i>	1	EN
<i>Magnolia rajaniana</i>	1	VU
<i>Magnolia sabahensis</i>	1	LC
<i>Magnolia sambuensis</i>	9	NT
<i>Magnolia striatifolia</i>	1	EN
<i>Magnolia urraoensis</i>	1	EN
<i>Magnolia utilis</i>	1	DD
<i>Magnolia vrieseana</i>	1	DD

Table 8. Species unreported from *ex situ* collections in 2008 now present in *ex situ* collections.

CONCLUSIONS AND RECOMMENDATIONS

POLICY RELEVANCE

This new *Red List of Magnoliaceae* contributes directly to Target 2 of the Global Strategy for Plant Conservation of the Convention on Biological Diversity, which calls for “an assessment of the conservation status of all known plant species, as far as possible, to guide conservation action” by 2020 (CBD 2012). In addition, an assessment of threatened species is also needed to ensure that Target 8 of the Global Strategy for Plant Conservation is met. This target calls for “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” (CBD 2012).

The *Red List of Magnoliaceae* aims to stimulate conservation action for *Magnolia* species under threat. The aim is for these conservation assessments for Magnoliaceae to guide conservation action and policy decisions for the very rare and threatened species. The priority is to protect *Magnolia* in their natural habitats. Many of the most threatened species are still absent from *ex situ* collections, and should also be prioritised for targeted collection efforts.

BGCI and the Global Trees Campaign work with botanic gardens to enhance *ex situ* conservation for globally threatened *Magnolia* taxa where appropriate and to promote *in situ* conservation planning, ecological restoration and sustainable use. More information about these projects are available online (www.globaltrees.org/projects).

RECOMMENDATIONS

The *Red List of Magnoliaceae* is a step towards the Global Tree Assessment (GTA) which will provide information on the threat status of all the world's trees. In order to achieve the GTA and, more specifically,



Magnolia acuminata (Arboretum Wespelaar)

improve the conservation status for Magnoliaceae, a number of conservation measures are recommended:

Collect more information on Data Deficient species:

- More information is needed on the large proportion of species for which there was not enough data to assess their conservation status (listed as Data Deficient).
- Report any known information on these species to redlist@bgci.org to allow a full assessment to take place.
- Target fieldwork and data collection for priority regions where these species occur.

Ensure threatened species of Magnoliaceae are conserved *in situ* and *ex situ*:

- Develop *ex situ* conservation collections for the threatened Magnoliaceae species not yet represented in any *ex situ* collections.
- Wherever possible, house *ex situ* collections in more than one institution and location.
- Ensure genetic diversity is taken into account when building *ex situ* collections.

- Assess the extent to which species are included in protected areas.
- Develop integrated conservation action plans for the most threatened species.

Raise awareness and build capacity locally and internationally:

- Empower and inform communities about the uniqueness and importance of the Magnoliaceae species found in their local environment.
- Use local plant nurseries and planting schemes to enhance the status of the most threatened *Magnolia* species in the wild.
- Build horticultural capacity of in-country partners and local communities, including protocols for collection, propagation and cultivation.

There has been significant progress since the last *Red List of Magnoliaceae* was produced in 2007: more *Magnolia* species have been discovered and described, more *Magnolia* species have a conservation assessment, and more *Magnolia* species are now conserved in *ex situ* collections. Nevertheless, much more needs to be done in order to save many *Magnolia* species from extinction. Future work should focus on the recommendations above, and use the information gathered in this publication to effectively prioritise conservation action.



Magnolia equatorialis (Alvaro Perez)

REFERENCES



Magnolia wilsonii (Arboretum Wespelaar)

BGCI (2008) *Global Survey of Ex situ Magnoliaceae Collections*. Botanic Gardens Conservation International. Richmond, UK. Available from: http://www.bgci.org/files/Worldwide/global_survey_of_ex_situ_magnoliaceae_collections.pdf (accessed: 18 September 2015).

Cicuzza, D., Newton, A. & Oldfield, S. (2007) *The Red List of Magnoliaceae*. Fauna & Flora International. Cambridge, UK.

Cires, E., De Smet, Y., Cuesta, C., Goetghebeur, P. Sharrock, S., Gibbs, D., Oldfield, S., Kramer, A. & Samain, M-S. (2013) Gap analyses to support *ex situ* conservation of genetic diversity in Magnolia, a flagship group. *Biodiversity and Conservation* 22(3): 567-590.

CBD (2012) *Global Strategy for Plant Conservation: 2011-2020*. Botanic Gardens Conservation International. Richmond, UK.

Griffith, M.P., Calonje, M., Meerow, A.W., Tut, F., Kramer, A.T., Hird, A., Magellan, T.M. & Husby, C.E. (2015) Can a Botanic Garden Cycad Collection Capture the Genetic Diversity in a Wild Population?. *International Journal of Plant Sciences*, 176(1): 1-10.

Huang, Hongwen (2014) *A checklist of ex situ cultivated flora of China*. Science Press, Beijing.

IPNI (2015) *The International Plant Names Index*. Royal Botanic Gardens, Kew, UK. Available from: <http://www.ipni.org/> (accessed: 20 August 2015).

IUCN (2001) *IUCN Red List Categories and Criteria: Version 3.1*. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.

IUCN (2012) *IUCN –CMP Unified Classification of Direct Threats*. International Union for Conservation of Nature and Natural Resources. Available from: http://www.iucnredlist.org/documents/Dec_2012_Guidance_Threats_Classification_Scheme.pdf (accessed: 3 February 2016).



Trunk of Magnolia (Lou Jost)

IUCN (2013) *Rules of Procedures IUCN Red List Assessment Process 2013-2016*. International Union for Conservation of Nature and Natural Resources. Available from: http://cmsdocs.s3.amazonaws.com/keydocuments/Rules%20of%20Procedure%20for%20Red%20List_2013-2016.pdf (accessed: 18 September 2015).

IUCN Standards and Petitions Subcommittee (2014) *Guidelines for Using the IUCN Red List Categories and Criteria*. Version 11. Prepared by the Standards and Petitions Subcommittee. Available from: <http://www.iucnredlist.org/documents/RedListGuidelines.pdf> (accessed: 20 August 2015).

IUCN (2015) *The IUCN Red List of Threatened Species*, version 2015.4. International Union for Conservation of Nature and Natural Resource. Available from: <http://www.iucnredlist.org/> (accessed: December 2015).

Newton, A., Oldfield, S., Rivers, M., Mark, J., Schatz, G., Tejedor Garavito, N., Cantarello, E., Golicher, D., Cayuela, L. & Miles, L. (2015) Towards a Global Tree Assessment. *Oryx*, 49: 410-415. doi:10.1017/S0030605315000137.

The Plant List (2013) *The Plant List* version 1.1. Royal Botanic Gardens, Kew, UK. Available from: <http://www.theplantlist.org/> (accessed: 20 August 2015).

WCSP (2016) *World Checklist of Selected Plant Families*. Facilitated by the Royal Botanic Gardens, Kew. Available from: <http://apps.kew.org/wcsp/> (accessed: 28 January 2016).

PART 2

GLOBALLY THREATENED MAGNOLIACEAE SPECIES

Magnolia albosericea Chun &

C.H.Tsoong

VU D1+2

China, Vietnam

Although little is known about *Magnolia albosericea* there are thought to be very few mature individuals (fewer than 1,000), across its range of evergreen broadleaved forests of southern China and northern Vietnam. It is only known to occur in three to five locations, where land use change is a plausible threat. Therefore, it is assessed as Vulnerable.

Magnolia allenii Standl.

EN B1ab(iii)

Panama

Locally frequent in dense forests, this species is restricted to one area of western Panama at about 1,000 m asl. The extent of occurrence (EOO) is estimated to 1,142 km² and the habitat is inferred to be declining in extent and quality. The primary threat is deforestation, which has caused significant declines in the past. This species is Endangered.

Magnolia amoena W.C.Cheng

VU B1ab(iii,iv)

China

Magnolia amoena is found only in China but is scattered across many provinces. The population is highly fragmented and collection of flower buds for medicinal purposes is believed to be reducing its ability to regenerate. It occurs in small scattered stands in hilly lowland mixed forest so the extent of occurrence is likely to be much less than the forest extent of 24,769 km² and is estimated at less than 20,000 km². It is listed as Vulnerable.

*Magnolia amoena* (Don Mahoney)***Magnolia angustiblonda*** (Y.W.Law &

Y.F.Wu) Figlar

EN D

China

This species has a very limited distribution within the Maolan Natural Reserve, Guizhou. It has an area of suitable forest habitat (extent of occurrence), based on remote sensing imagery and distribution data, of 4,713 km² and an estimated 100-200 mature individuals remaining. The Endangered category is based on the small population size. The threats and cause of decline are not fully understood.

Magnolia annamensis Dandy

VU B1ab(iii,v)

Vietnam

This species is classified as Vulnerable as the extent of occurrence (EOO) is 13,949 km², it occurs at four locations and, although it remains common in protected areas, its range is relatively restricted and subpopulations are declining outside protected areas as a result of deforestation. The species may be reassessed as more threatened with further research.

Magnolia arcabucoana (Lozano)

Govaerts

EN B1ab(ii,iii,v)

Colombia

This species is considered to be Endangered due to its restricted range. It is only known from three locations in the eastern mountain range between Santander and Boyaca and the east of Cundinamarca, Colombia with an extent of occurrence (EOO) of 2,385 km². Further surveying is needed to determine whether the species occurs in less accessible areas. The remaining populations are under pressure from habitat conversion and logging.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia argyrothricha (Lozano)

Govaerts

EN B1ab(i,ii,iii,v)+2ab(i,ii,iii,v)

Colombia

Magnolia argyrothricha is considered to be Endangered as it has a restricted distribution in Colombia. It is known from just four locations in the Eastern mountain range between southern Santander (Virolin and El Taladro) and central-north Boyaca (Togui and Arcabuco), with an extent of occurrence (EOO) of 357 km² and an area of occupancy (AOO) of 135 km². The forests in the region are highly disturbed and fragmented.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia aromatica (Dandy)

V.S.Kumar

EN C2a(i)

China

Magnolia aromatica is classified as Endangered as only a few scattered stands of this important timber tree remain. Several subpopulations are reported to have become extinct in Chinese provinces, largely as a result of over-exploitation of the timber. Similar pressure affects the potential subpopulations in Vietnam. The species is also threatened by habitat loss due to agricultural expansion. There are fewer than 2,500 mature individuals remaining with each subpopulation consisting of fewer than 250 mature individuals. *Ex situ* conservation collections have been made and reintroduction trials are taking place.



Magnolia aromatica (Ouyang Zhiqin)

Magnolia bankardiorum M.O.Dillon &

Sánchez Vega

VU B1ab(iii)

Ecuador, Peru

Magnolia bankardiorum is thought to be rare but more research is needed to determine the population size and trend of this species. This species' estimated extent of occurrence (EOO) is 14,250 km² and it is present in three to four locations. The forests near Aguas Verdes where the type specimen of this species was found have been felled for coffee plantations. It is likely that this species has been extirpated in this area, but is thought to still be present further south in the Rio Alto Mayo watershed. The rest of the habitat of this species is severely deforested which is causing a continuing decline in both area and quality of habitat. Therefore, *Magnolia bankardiorum* has been assessed as Vulnerable.

Assessors: Rivers, M.C., Arroyo, F. & Pérez Castañeda, Á.



Magnolia bankardiorum (Alvaro Perez)

Magnolia bidoupensis Q.N.Vu

EN B1ab(iii)

Vietnam

Magnolia bidoupensis is endemic to the Bidoup-Nui National Park in south Vietnam. This species has an estimated extent of occurrence (EOO) of 700 km² and occurs in fewer than five locations. Continuing decline in the area and quality of habitat has been reported due to encroachment, fire and illegal logging. Therefore, this species is listed as Endangered.

Magnolia blaoensis (Gagnep.) Dandy

VU B1ab(iii)

Vietnam

This species is classified as Vulnerable as the potential forest distribution is 12,537 km², its range is severely fragmented, and its habitat is continuing to decline in area and quality.

Magnolia boliviana (M.Nee) Govaerts

EN B2ab(iii)

Bolivia

Magnolia boliviana occurs in very few localities in Bolivia and is predominantly found in the Amboro and Madidi National Parks. The forest habitat is threatened by ongoing deforestation, and the population is likely to be fragmented but population data are not available. The extent of occurrence (EOO) is around 48,709 km². However, given that it has been recorded in low densities the area of occupancy (AOO) is estimated to be much less than 100 km². There are fewer than five locations. Therefore, this species is Endangered. The population is under pressure outside of protected areas by deforestation and needs to be monitored.

Magnolia calimaensis (Lozano)

Govaerts

CR B1ab(i,ii,iii,v)

Colombia

Magnolia calimaensis is only known from a single location, where its extent of occurrence is less than 100 km², in the Bajo Calima in the western part of the Valle del Cauca in the Choco region. Its habitat is declining in extent and quality due to logging and the number of mature individuals is also declining as it is a targeted timber species.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia calophylla (Lozano) Govaerts
EN B1ab(iii,v)

Colombia

Magnolia calophylla has a very restricted distribution and is only known from three locations at low altitude in the Choco region, with an extent of occurrence (EOO) of less than 5,000 km². Logging and clearance for cultivation take place in the lowland forests where this species occurs causing a continuing decline in the area and quality of habitat and reducing the number of mature individuals of this species. Therefore, this species is assessed as Endangered.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M., Garcia, N & Rivers, M.C.

Magnolia canandeana F.Arroyo

CR B1ab(iii)

Ecuador

Magnolia canandeana is a tree endemic to Ecuador. The type collection of this species comes from a private protected area (Reserva Río Canandé) with an extent of occurrence (EOO) of 18 km². Outside this area, the forest is being completely cleared by a logging company, through a Government Concession. Cleared areas are later used for agricultural and pasture land. More research is needed on the conservation status of the species inside and outside the protected area as it is unlikely that the reserve can provide for a secure and viable reproductive population. This species has been assessed as Critically Endangered.

Assessors: Rivers, M.C. & Pérez Castañeda, Á.

Magnolia cararensis (Lozano)

Govaerts

CR B1ab(iii,v)+2ab(iii,v)

Colombia

Magnolia cararensis is only known from a single population in a strip of mature forest no more than 20 km long and 600 metres wide. In addition to being exploited for its timber for roundwood and sawlogs in the Tama region, the forests in the region have been subject to land clearance for livestock and agriculture. The extent of occurrence is less than 100 km², the area of occupancy is less than 10 km² and it is known from a single location.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia caricifragrans (Lozano)

Govaerts

EN A2acd+4acd

Colombia

This is an endemic species found in just a few sites in Colombia. The population is fragmented with few individuals at each locality, and it is estimated that the overall population has decreased by over 50% in the last 50 years and the decline is continuing. Logging is a major ongoing threat for this species and this decline is expected to carry on into the future. Therefore, this species is assessed as Endangered.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M., Garcia, N., Wheeler, L. & Rivers, M.C.

Magnolia cattienensis Q.N.Vu

EN B1ab(iii); D

Vietnam

Magnolia cattienensis is only found in the Cat Tien National Park in Vietnam. The extent of occurrence (EOO) is less than 750 km². It is known from a single location with fewer than 250 mature individuals. The habitat is declining in quality and extent due to illegal logging and agriculture encroachment, a trend that is likely to continue with a growing human population. Due to a very small and restricted population, *Magnolia cattienensis* is listed as Endangered.

Magnolia cespedesii (Triana & Planch.)

Govaerts

CR B1ab(iii,v)

Colombia

This is a restricted-range species, known from a single location on the western side of the eastern mountain range of the Magdalena valley, Cundinamarca department, thought to have an extent of occurrence (EOO) of less than 100 km². The forest areas of the region have been fragmented due to land clearance for agriculture and logging. *Magnolia cespedesii* has been specifically targeted for its timber. This species is Critically Endangered.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia chimantensis Steyerem. &

Maguire

CR C2a(i); D

Colombia, Venezuela

Magnolia chimantensis is reported from only two localities, one in Colombia and one in Venezuela. In Colombia this species is located in one strip of mature forest. It is considered to be Critically Endangered as the total number of mature individuals, as well as the number in the largest subpopulation, is fewer than 50 and there is a continuing decline. It is also range-restricted with an area of occupancy (AOO) less than 500 km² and the habitat is declining due to expansion of agriculture. This species has also been exploited for charcoal extraction and timber. The natural regeneration of this species is limited and it does not exist in any *ex situ* collection.

Assessors: Rivers, M.C. & Serna-Gonzalez, M.

Magnolia choacoensis (Lozano)

Govaerts
EN B1ab(iii,v)
Colombia

This species is only known from three locations in the western mountain range between the Choco and Risaralda departments, has a restricted extent of occurrence (EOO) of less than 5,000 km², and occurs in an area where the forest habitats are declining due to pressure from logging activities.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia cochranii A.Vázquez

EN B1ab(iii)
Honduras

This is a tree endemic to Honduras where it is only known from a few localities in the departments of Comayagua, Cortés and Yoro. Deforestation rates are high in the region which is estimated to be causing a decline in area and quality of habitat of this species. The estimated extent of occurrence (EOO) is less than 5,000 km² and it is found in three to five locations. Therefore, this species is assessed as Endangered.

Magnolia colombiana (Little) Govaerts

CR B1ab(iii,v)
Colombia

Magnolia colombiana is listed as Critically Endangered as a result of its severely fragmented and restricted distribution (EOO estimated to be 77 km²), as it is known only from three locations, and as there is a continuing decline in the quality of the habitat and number of mature individuals. The population is also under direct pressure from logging.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia coriacea (Hung T.Chang &

B.L.Chen) Figlar
EN B1ab(iii,v)
China, Vietnam

Magnolia coriacea is restricted to southeast Yunnan and north Vietnam with a remaining forest area of 4,190 km² in fewer than five locations. Within this area there were 300-500 scattered individuals recorded in 2005, which is likely to have reduced recently as they are mainly outside reserves; this needs to be confirmed by another field survey. Given the small area it is likely that there are one or two subpopulations, with the majority of the recorded individuals being in one subpopulation surveyed in China.



Magnolia coriacea (Weibang Sun)

Magnolia coronata M.Serna,

C.Velásquez & Cogollo
CR A2acd
Colombia

Magnolia coronata is a canopy tree endemic to Colombia. It occurs in small isolated fragments of secondary forests generally located on mountain peaks. Its population has declined by over 80% (over three generations) due to the fragmentation of habitat resulting from land clearance for agriculture and livestock farming in addition to direct pressure on the species from charcoal production and roundwood. It has a restricted distribution and has an extent of occurrence (EOO) of less than 1,345 km² which continues to decline in area and quality.

Assessors: Serna-Gonzalez, M. & Rivers, M.C.

Magnolia costaricensis A.Vázquez

VU B1ab(iii)
Costa Rica

This scarce species with a scattered distribution is endemic to Costa Rica where it occurs in lowland tropical wet forest of Heredia and Limón provinces and on the border of Alajuela and Guanacaste provinces. It may also occur in Cartago province. Clearance for agriculture is a threat causing a continuing decline in area and quality of habitat. Its extent of occurrence is less than 15,000 km² and it occurs in fewer than ten locations. Therefore, this species is assessed as Vulnerable.

Magnolia crassifolia F.Arroyo &

Á.J.Pérez
CR B1ab(iii)+2ab(iii); D
Ecuador

Magnolia crassifolia is a large tree only known from the type locality in Ecuador. A total of six individuals (including the type specimen and two resprouting stumps) were seen in a forested hilly area of less than 10 km² subjected to clearing for agricultural land and included in plans for mining exploitation (Arroyo and Pérez pers. obs.). Efforts of conservation in this area, as well as exploration of nearby areas to find more individuals, are urgently needed. Increased *ex situ* conservation with research into propagation techniques is also an urgent priority. This species is assessed as Critically Endangered.

Assessors: Rivers, M.C., Wheeler, L. & Pérez Castañeda, Á.

Magnolia crassipes (Y.W.Law)

V.S.Kumar
EN B2ab(iii,v); C2a(ii)
China

Magnolia crassipes is classified as Endangered as it is known from one location in Guangxi, China. It has an area of occupancy less than 100 km². The population is thought to be fewer than 1,000 individuals in a single subpopulation. The causes of its decline need to be fully determined, but forest fires and general deforestation are impacting the species' habitat.

Magnolia cristalensis Bisse

EN B1ab(iii,v)+2ab(iii,v)

Cuba

Magnolia cristalensis is endemic to Cuba. It is considered Endangered as its population is very small and severely fragmented, it is known from five locations and it has declined due to exploitation for its timber and habitat loss and degradation. The extent of occurrence (EOO) is 4,700 km² and the area of occupancy (AOO) is estimated between 350 and 500 km².

Magnolia cubensis Urb.

VU B2ab(iii,v)

Cuba

Magnolia cubensis is an endemic tree to Cuba. It is considered to be Vulnerable as it is found in fewer than ten locations and has an area of occupancy (AOO) below 2,000 km². It is threatened by deforestation, land conversion and habitat degradation. Further research is required on how best to ensure the survival of this species.

*Magnolia cubensis* (Luis Roberto Gonzalez Torres)***Magnolia cylindrica*** E.H.Wilson

VU B2ab(iii)

China

Magnolia cylindrica is classified as Vulnerable as it has an area of occupancy estimated to be between 500 km² and 2,000 km², its range is severely fragmented, it is known from only ten locations, and there is a decline in the area, extent and quality of its habitat.

*Magnolia cylindrica* (Arboretum Wespelaar)***Magnolia dawsoniana*** Rehder &

E.H.Wilson

EN B2ab(iii)

China

The subpopulations of this species are scattered and severely fragmented over two (or possibly three) provinces in China within a forest area of c. 200 km². The area of occupancy is thought to be above 10 km² (but less than 200 km²) and there is a continuing decline in the extent of forest cover and the habitat quality. *Magnolia dawsoniana* is therefore classified as Endangered.

*Magnolia decidua* (Daniel Mosquin)***Magnolia decastroi*** A.Vázquez &

Muñiz-Castro

EN B1ab(iii)

Mexico

Magnolia decastroi is only known from the type locality in the lowlands of Chinantla Baja, Oaxaca. This area is threatened by deforestation and habitat alterations due to plantation and pastures. Climate change is also projected to alter the forest habitat here. Although there is little information on the distribution and population size, the extent of occurrence (EOO) is restricted and estimated to be less than 5,000 km². The number of locations is five or fewer. This species is therefore listed as Endangered
Assessors: Rivers, M.C., Samain, M.S. & Martínez Salas, E.

Magnolia decidua (Q.Y.Zheng)

V.S.Kumar

EN B1ab(iii,v)+2ab(iii,v); C2a(ii)

China

Magnolia decidua is classified as Endangered because it is known only from one subpopulation (representing one location) which is thought to have fewer than 500 individuals, with an extent of occurrence of less than 4,000 km² and area of occupancy less than 500 km². Its habitat is also declining in extent and quality due to exploitation of timber.

Magnolia dixonii (Little) Govaerts

CR (Possibly Extinct) B1ab(iii,v)

Ecuador?

Magnolia dixonii is a large tree endemic to Ecuador and restricted to low elevations. It has a highly restricted extent of occurrence (EOO), which is less than 100 km², and is known from a single location. This species is also under pressure from a continuing decline in area and quality of habitat due to agricultural expansion and the opening of roads. In addition, this species was recorded as used for its timber. It is only known from the type collection and has not been rediscovered for 50 years. It is therefore listed here as Critically Endangered (Possibly Extinct).

Assessors: Rivers, M.C. & Pérez Castañeda, Á.

Magnolia dodecapetala (Lam.)

Govaerts

VU B1ab(iii)

Dominica, Guadeloupe, Martinique, Saint Vincent and the Grenadines; Trinidad and Tobago?

Although there are limited data available on this species, it is suspected to be in rapid decline due to deforestation and habitat conversion. The total area of suitable forest type on all five islands is estimated to be around 6,975 km² but the area of occupancy (AOO) is unknown. In addition to loss of habitat, *Magnolia dodecapetala* is also at risk from hurricanes and tropical cyclones, especially if these increase in severity and/or frequency as a result of climate change. It is classified as Vulnerable due to its restricted distribution, small extent of occurrence and the threats this species is likely to face in the future as well as existing pressures from deforestation on subpopulations which are inferred to be declining.

Magnolia domingensis Urb.

CR A2ac

Dominican Republic, Haiti?

Magnolia domingensis may possibly be extinct in Haiti where forest cover has declined by 98% over the last 300 years and only 2% of forests still remain. It occurs in a national park in the Dominican Republic but it is suspected to be undergoing a rapid and ongoing decline, owing to habitat loss and degradation. It has been assessed as Critically Endangered as the population has declined by at least 80% over the last three generations due to deforestation and it is likely that the area of occupancy (AOO) of 30-35 km² has also been reduced.



Magnolia domingensis (Emily Veltjen)

Magnolia ekmanii Urb.

CR A2ac

Haiti

Magnolia ekmanii is endemic to Haiti. In the past 100 years there has been a reduction in forest area cover in Haiti of 97% causing a decline in quality and extent of habitat. The total area of remaining forest in Haiti was reduced to 3-4% total land area by 2010. *Magnolia ekmanii* does occur in a Key Biodiversity Area of Massif de la Hotte. This species is also not known in any *ex situ* collections. This species has been assessed as Critically Endangered due to the decline in forest cover in Haiti. It is inferred that this species population has gone through a similar decline in the last three generations.



Magnolia ekmanii (Emily Veltjen)

Magnolia emarginata Urb. & Ekman

CR (Possibly Extinct) A2ac

Haiti?

Magnolia emarginata is endemic to northern Haiti. Given the extremely high deforestation rates in Haiti, combined with no recent confirmed records of individuals, the continued survival of this species has to be questioned. A major storm destroyed forest in one area from which the species was collected and it is not certain whether this species survived. It is not known to in any *ex situ* collections or to have been cultivated in the past. Further surveys are urgently required to determine if this species still exists in the wild. This species has been assessed as Critically Endangered due to a decline in forest cover in Haiti of 97% over three generations. It is inferred that this species population has gone through a similar decline of 80-100% in the last three generations. There is a continued decline in the population and degradation of the habitat due to continued deforestation and storm damage. Any significant future event of this kind could reduce any regeneration of this species if it still exists in the wild.

Magnolia espinalii (Lozano) Govaerts
CR C2a(i); D

Colombia

The distribution of *Magnolia espinalii* is severely fragmented. This species is restricted to approximately ten localities with only a few mature individuals remaining in each locality. There are an estimated 50 known mature individuals remaining and there has been an overall population reduction of over 50% over three generations, due to habitat conversion and loss, which is continuing. Therefore, this species is assessed as Critically Endangered.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M., Garcia, N. & Rivers, M.C.

Magnolia fansipanensis C.B.Callaghan & Png
CR D

Vietnam

Magnolia fansipanensis is a tree found only at a single locality in the Hoang Lien National Park, Vietnam. The population size is very small, with fewer than 50 mature individuals. It is assessed here as Critically Endangered.

Assessors: Q.N.Vu & Rivers, M.C.

Magnolia faustinomirandae

A.Vázquez

CR B1ab(iii)

Mexico

Magnolia faustinomirandae is a tree endemic to Chiapas, where it is only known from the municipality of Jitotol. For the last three decades no other localities have been identified. The known extent of occurrence (EOO) is less than 100 km². Deforestation rates are very high, with the habitat declining continuously. The habitat is also threatened by climate change in the future. This species is considered Critically Endangered. Research into the distribution and legal protection for this species is urgently needed.

Assessors: Rivers, M.C., Samain, M.S. & Martínez Salas, E.

Magnolia gentryi A.Vázquez

EN B1ab(iii); D

Peru

Magnolia gentryi is a small tree, only known from a restricted range near Pasco, Peru. It is known from fewer than 200 mature individuals with the largest subpopulation having 15 individuals. The extent of occurrence (EOO) is 1,703 km² and the number of locations is two to four. The species' habitat is threatened by cattle ranching and slash and burn agriculture. This species is assessed as Endangered.

Assessors: Rivers, M.C. & Arroyo, F.

Magnolia georgii (Lozano) Govaerts

EN B1ab(iii,v)

Colombia

Magnolia georgii is a range-restricted species, with extent of occurrence (EOO) of less than 5,000 km². It is known from two locations in forests that are fragmented due to pressure from habitat conversion for agriculture and roads. It has a very restricted altitudinal distribution. This species has experienced a continuing decline in area and quality of habitat due to deforestation for agriculture and infrastructure. The number of mature individuals is also likely to be declining as this species is used for timber. Therefore, this species is assessed as Endangered.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia gilbertoi (Lozano) Govaerts

EN B1ab(iii,v)

Colombia

Magnolia gilbertoi is Endangered based on its extent of occurrence (EOO) of a maximum of 1,752 km² and its existence at a limited number of locations (five). The forest habitat is fragmented and declining. The number of individuals continues to decline with deforestation and use for timber.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia grandis (Hu & W.C.Cheng)

V.S.Kumar

CR B2ab(i,ii,iii,v); D

China

Magnolia grandis was previously assessed as Vulnerable in 1998, but a survey in 2005 revealed this species is highly threatened and has suffered substantial population declines due to habitat loss, primarily for agricultural expansion and logging. Although previously recorded from two provinces, the few remaining known individuals exist in one location and are threatened by a continuing decline in the area, extent and quality of habitat. The area of occupancy is less than 10 km² and the population is fewer than 50 individuals.



Magnolia grandis (Weibang Sun)

Magnolia guanacastensis A.Vázquez

EN B1ab(iii)

Costa Rica

Magnolia guanacastensis is a rare species distributed in the northwestern part of Costa Rica. The total extent of occurrence is less than 1,500 km² and it occurs in fewer than five locations. There are high rates of deforestation threatening the habitat quality and extent of the species. Therefore, this species has been assessed as Endangered.

Magnolia guatapensis (Lozano)

Govaerts
EN B1ab(iii,v)
Colombia

Magnolia guatapensis is endemic to Colombia. The species is listed as Endangered based on its extent of occurrence (EOO) measuring 2,800 km². There is evidence that a large abundant subpopulation once existed but it is now limited to just two or three locations in Antioquia. It is found in relict forest patches which have survived general habitat conversion, logging and flooding following hydrological projects.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M., Garcia, N. & Rivers, M.C.

Magnolia guerrerensis J.Jiménez

Ram., K.Vega & Cruz Durán
EN B1ab(iii)
Mexico

This species is classified as Endangered as it is only known from cloud forest in Guerrero. The extent of occurrence (EOO) is estimated to be less than 4,000 km² and it occurs in four locations. This species is threatened by current deforestation and future climate change, which is expected to cause a decline in the area and quality of habitat. Therefore, this species is assessed as Endangered. Assessors: Rivers, M.C., Samain, M.S., Martínez Salas, E. & Wheeler, L.



Magnolia gustavii (Piya Chalermglin)

Magnolia gustavii King

CR C2a(i)
India, Thailand

Magnolia gustavii was classified as Vulnerable in 1998 when the population was believed to be fewer than 1,000 individuals. Since then the area of forest cover has decreased and the number of individuals has declined substantially, and there are believed to be fewer than 50 individuals in India. Subpopulations in Thailand are small and scattered. There is no population information for Myanmar and only a single tree has been recorded from across the border of Thailand. It is thought that there are fewer than 250 mature individuals of this species and recruitment rates are very low with an estimated germination failure of 40-55%. No seedlings have been recorded from Thailand since its discovery there. It is likely that there are fewer than 50 mature individuals in each subpopulation. Therefore, this species has been assessed as Critically Endangered.

Magnolia hamorii Howard

EN B1ab(i,iii)
Dominican Republic

The extent of occurrence of this species is estimated to be less than 2,857 km² and it is known from at most five locations. It is likely that the population is fewer than 2,500 individuals as it is found in small stands but there is no survey data to support this. Deforestation has caused a significant decline in the extent of occurrence and quality of habitat. Concessions for bauxite and limestone mining have been granted in the area.



Magnolia hamorii (Emily Veltjen)

Magnolia henaoui (Lozano) Govaerts

EN B1ab(iii,v)+2ab(iii,v)
Colombia

Magnolia henaoui is endemic to Huila department, Colombia, and restricted to just two locations within the National Park Cueva de Los Guacharos, with an extent of occurrence of c. 3,056 km² and an area of occupancy of less than 100 km². Both populations are very small and exhibit little natural regeneration; in a recent expedition only a single adult was seen but no saplings were found. The major threat is logging of this species.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia hernandezii (Lozano)

Govaerts
EN A2cd
Colombia

The forest fragments where *Magnolia hernandezii*, an endemic to Antioquia department, is found contain small isolated subpopulations. The species is considered Endangered, based on estimates that the population has been reduced by over 50% in the last three generations due to overharvesting and declines in the extent and quality of its habitat. This species is known from more than 20 localities, some of which can be found in protected areas.

Magnolia hongheensis (Y.M.Shui &

W.H.Chen) V.S.Kumar
VU B1ab(iii)

China

Magnolia hongheensis is classified as Vulnerable as it is known from fewer than ten locations and is restricted to southeast Yunnan where the extent of occurrence (EOO) is estimated as 8,392 km². There is widespread deforestation throughout Yunnan and so it is estimated that there is a continuing decline in the area and quality of the habitat.

Magnolia iltisiana A.Vázquez

VU B1ab(iii,v)

Mexico

This large tree from Jalisco and Michoacán in Mexico is a range-restricted species, known from fewer than ten locations. The extent of occurrence (EOO) is 15,900 km² and deforestation poses a threat to the quality and extent of the habitat of the species. In addition, the species is selectively logged for its valued timber. These threats are likely to continue, and this species is listed as Vulnerable.

Assessors: Rivers, M.C., Martínez Salas, E. & Samain, M.S.

Magnolia inbioana A.Vázquez

EN B1ab(iii)

Costa Rica

Magnolia inbioana is endemic to Costa Rica where it grows in primary forest and land transformed for pasture. The estimated extent of occurrence (EOO) is 2,798 km² and it is thought to occur in fewer than five locations. There is a general threat of land conversion to pasture in the area. Therefore, this species is assessed as Endangered.

Magnolia irwiniana (Lozano) Govaerts

EN B1ab(iii)

Brazil

Magnolia irwiniana is considered to be Endangered as it has an extent of occurrence of c. 5,000 km², is known from fewer than five locations and is undergoing a continuing decline in its extent and quality of habitat.

Magnolia jaenensis Marcelo-Peña

EN B1ab(iii,v)

Ecuador, Peru

Magnolia jaenensis is a medium-sized tree only known from the Jaen province, Peru and Zamora Chinchipe, Ecuador. Its forest habitat is severely threatened as a result of logging and expansion of pasture lands and agriculture causing a continuing decline in the area and quality of habitat. Its wood has high local demand causing a continuing decline in the number of mature individuals. The estimated extent of occurrence (EOO) is less than 1,000 km² and it is thought to occur in two locations. Therefore, this species is assessed as Endangered.

Assessors: Rivers, M.C., Arroyo, F. & Pérez Castañeda, Á.

Magnolia jaliscana A.Vázquez &

R.Guzmán

EN B1ab(iii,v)

Mexico

Magnolia jaliscana has a restricted distribution in Jalisco, Mexico, occurring along riverines of the southern slopes of the Sierra de Manantlán, between 700 and 1,000m asl. It also occurs in Colima. Its habitat is threatened by high rates of deforestation for conversion to pasturelands. The extent of occurrence (EOO) is less than 3,000 km², and there is a continuing decline in mature individuals and habitat quality and extent. This species is therefore listed as Endangered.

Assessors: Rivers, M.C., Samain, M.S. & Martínez Salas, E.

Magnolia jardinensis M.Serna,

C.Velásquez & Cogollo

CR C2a(i); D

Colombia

Magnolia jardinensis, endemic to Jardín Municipality, Antioquia Department (Colombia) has fewer than 50 mature individuals remaining following habitat conversion and fragmentation. In addition, the species is targeted by selective logging. This species is suffering from continuing decline, and as the population is small, no subpopulation is bigger than 50 mature individuals. The species is listed as Critically Endangered.

Assessors: Calderon, E., Cogollo, A, Rivers, M.C. & Serna-Gonzalez, M.



Magnolia jardinensis (Marcela Serna)

Magnolia juninensis F.Arroyo

EN B1ab(iii,v)

Peru

Magnolia juninensis is a tall tree from Peru. The estimated extent of occurrence (EOO) for this species is 987 km² and it occurs in three locations. This species is threatened by selective logging for its wood and expanding coffee cultivation, which are causing continuing decline in its habitat and the number of mature individuals. It is listed as Endangered.

Assessors: Rivers, M.C. & Arroyo, F.

Magnolia kachirachirai (Kaneh. &

Yamam.) Dandy

EN B1ab(i,iii)

Taiwan

Magnolia kachirachirai is classified as Endangered based on its extent of occurrence of 2,158 km², its severely fragmented population and occurrence at fewer than five locations. Further research is required on the population declines and conservation efforts should focus on protecting the remnant individuals. The area of its habitat has significantly declined and deteriorated due to increased human settlement and urbanisation in Taiwan.

Magnolia katorum (Lozano) Govaerts
CR B1ab(iii,v)

Colombia

Magnolia katorum is currently only known from a single locality which has been highly degraded and fragmented due to habitat conversion for livestock, banana plantations and the construction of access roads for logging. It was previously assessed as Endangered in 1998 but the extent of occurrence has decreased from 842 km² to less than 100 km².

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.



Magnolia katorum (Marcela Serna)

Magnolia kichuana A.Vázquez

EN B1ab(iii)

Ecuador

Magnolia kichuana is a rare tree present in forests along the central and southern part of the eastern Andean piedmont in Ecuador growing between 800-1,800m asl. This area is heavily disturbed, presenting a high rate of deforestation and forest fragmentation, due to agricultural activities and urban expansion. Within its range this species has been reported in two protected areas. However, its scarce presence and the threats outside these areas may negatively affect the viability of the population. The estimated extent of occurrence (EOO) of this species is 4,580 km² and it occurs in three to five locations. Therefore, this species is assessed as Endangered.

Assessors: Rivers, M.C. & Pérez Castañeda, Á.

Magnolia krusei J.Jiménez Ram. & Cruz Durán

EN B2ab(i,ii,iii)

Mexico

Magnolia krusei is considered to be Endangered as it has an area of occupancy less than 500 km², and is known from only two locations with a continuing decline in its extent of occurrence, area of occupancy and quality of habitat. It only remains in one locality in central Guerrero and has also been recorded in Oaxaca, which have could be part of its native range before all the trees were logged.

Assessor: Luna-Vega, I.

Magnolia kwangsiensis Figlar & Noot.

VU B2ab(v)

China

Magnolia kwangsiensis is classified as Vulnerable as the area of occupancy is estimated to be less than 2,000 km², it is known from only three locations and the number of individuals continues to decrease as it is exploited for its timber. It occurs in a small area in three subpopulations where the population is fragmented. A survey is required to determine the number of individuals remaining.

Magnolia lacandonica A.Vázquez,

Pérez-Farr. & Mart.-Camilo

CR C2a(i)

Mexico, Guatemala?

Magnolia lacandonica is a large tree known only from Lacandonian tropical rainforests in Chiapas. Its extent of occurrence (EOO) is up to 13,000 km². The population is thought to consist of fewer than 250 mature individuals and the largest subpopulation consists of 13 mature trees. It occurs in rainforest habitats that are severely fragmented and declining outside protected areas due to logging and the rapid expansion of agriculture, pasture and human settlement. The number of mature individuals are declining. These threats are likely to continue. This species is listed as Critically Endangered.

Assessors: Rivers, M.C., Samain, M.S. & Martínez Salas, E.



Magnolia lacandonica (Marie-Stephanie Samain)

Magnolia lacei (W.W.Sm.) Figlar

EN D

China, Vietnam

Magnolia lacei is known from fewer than five localities with an estimated 50-60 mature individuals in China, and fewer than 200 individuals in Vietnam. It is therefore classified as Endangered based on the number of mature individuals being fewer than 250. It requires further study, particularly on the subpopulations in Vietnam. The threats to the species are also not known, and further efforts to secure in situ and ex situ collections are desired.

Magnolia lenticellata (Lozano) Govaerts

EN B1ab(iii,v)

Colombia

Magnolia lenticellata is known from three locations in Colombia in the Antioquia department, the Choco region and the Murri and Penderisco river basins. One subpopulation is located within a protected area, but the other two subpopulations are exposed to both timber exploitation and habitat degradation. This species has an extent of occurrence (EOO) of 537 km² and is found in three locations. There is continuing decline in area and quality of habitat due to deforestation and decline in number of mature individuals due to selective logging for wood. Therefore, this species is assessed as Endangered.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.



Magnolia lenticellata (Abel Alan Marcanini)

Magnolia longipedunculata

(Q.W.Zeng & Y.W.Law) V.S.Kumar

CR D

China

Magnolia longipedunculata is considered to be Critically Endangered due to its very small population (only 11 individuals found in last survey) known from only one locality in Guangdong. Conservation efforts are addressing this through reinforcement planting, the establishment of a new population and *ex situ* conservation research.



Magnolia longipedunculata (Yang Kerning)

Magnolia lotungensis Chun &

C.H.Tsoong

EN A2a; C1

China

Magnolia lotungensis is classified as Endangered as the total population size is now thought to be fewer than 2,500 mature individuals. This species has suffered a population decline of over 50% in China; although the timescale is uncertain, it is estimated that the decline occurred over the last two generations. It was previously thought to be Near Threatened but logging and deforestation have caused further declines and fragmentation of the population.

Magnolia lucida (B.L.Chen & S.C.Yang)

V.S.Kumar

EN B1ab(iii)

China

Magnolia lucida is known only from Yunnan in China and is considered to be Endangered due to its restricted distribution (extent of occurrence is estimated as under 5,000 km²), single location and continuing decline in habitat quality. There are no published data or information available on population trends or threats and further research is required.



Magnolia lucida (Zhangzhugang)

Magnolia madidiensis A.Vázquez

EN B1ab(iii)

Bolivia

Magnolia madidiensis is endemic to the Madidi National Park. Surrounding forests are declining due to logging and conversion for agriculture and pasture which is likely to be causing a decline in area and quality of the habitat for this species. The estimated extent of occurrence (EOO) is less than 4,000 km² and it is found in three or fewer locations. Therefore, this species is assessed as Endangered.

Magnolia neomagnifolia (Lozano)

Govaerts

EN B1ab(iii,v)

Colombia

This species has a restricted distribution, an EOO between 1,000-5,000 km² and is known from only four localities. The remaining unprotected trees of *Magnolia neomagnifolia* are under pressure from habitat degradation and direct exploitation for its timber, which is resulting in a continuing decline in habitat quality and the number of mature individuals.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia mahechae (Lozano)

Govaerts

EN B1ab(iii,v)

Colombia

This species is listed as Endangered as it has a very limited distribution (EOO is less than 1,000 km²) and is known from just two locations, with one subpopulation partly protected within difficult-to-access areas of Farallones de Cali National Park. *Magnolia mahechae* is being selectively logged and is under pressure from habitat degradation and fragmentation. It was previously thought to be Critically Endangered but recent work by Colombian botanists has resulted in this revised category.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia manguillo Marcelo-Peña &

F.Arroyo

CR B1ab(iii)+2ab(iii)

Peru

Magnolia manguillo is a tree only known from one locality at the Bosques de Huamantanga protected area, in Jaen province, Peru. Its forest habitat is severely threatened because of logging, expansion of pasturelands and subsistence agriculture. It has a very restricted distribution with an extent of occurrence (EOO) and an area of occupancy (AOO) of both 1-4 km² and only one location. This species is assessed as Critically Endangered.

Magnolia mannii (King) Figlar

VU B1ab(i,iii)

India

This species is classified as Vulnerable based on the potential forest distribution of 19,491 km². It is known from fewer than ten locations and the forest area is continuing to decline in area and quality due to deforestation.

Magnolia mayae A.Vázquez & Pérez-

Farr.

CR C2a(i); D

Guatemala, Mexico

Magnolia mayae is currently only known from six localities in Chiapas, Mexico and Guatemala. It has a restricted range, with an extent of occurrence (EOO) of c. 3,000 km². The lower montane rainforest where this rare species occurs is threatened by conversion for agriculture, pasture and coffee plantations. Recent studies show that fewer than 25 individuals are known, with 12 or fewer adult individuals. Due to this very small population size, this species is listed as Critically Endangered. Assessors: Rivers, M.C., Martínez Salas, E. & Samain, M.S.



Magnolia mayae (Marie-Stéphanie Samain)

Magnolia mexicana DC.

VU B1ab(iii,v)

Mexico

Magnolia mexicana is a large tree confined to central Mexico. It consists of relict subpopulations. The extent of occurrence (EOO) is 15,000 km² and the number of locations is around ten. The number of mature trees continues to decline as it used for its timber and its habitat is also threatened by deforestation and land use change. It is likely to occur in the Biosphere Reserve of Los Tuxtlas. It is listed as Vulnerable due to its restricted range.

Assessors: Rivers, M.C., Martínez Salas, E. & Samain, M.S.

Magnolia minor (Urb.) Govaerts

VU B1ab(iii,v)

Cuba

Magnolia minor is a tree endemic to Cuba. It is at risk of extinction due to its restricted range. The extent of occurrence (EOO) is less than 20,000 km² and it is known from eight locations. It is a scarce species found in the Sierra Maestra where the habitat has been significantly disturbed. Logging is also a significant threat. It is necessary to determine how many individuals occur in national parks and what proportion of the population is not protected from logging. Without conservation actions this species is at risk of further decline. It is assessed as Vulnerable.

Assessors: Cuban Plant Specialist Group, Wheeler, L. & Rivers, M.C.

Magnolia morii (Lozano) Govaerts

EN B1ab(iii)

Panama

This species is relatively unstudied and very little is known about it except that the potential forest distribution (extent of occurrence) is 890 km² and the forest area is continuing to decline in area and quality, which classifies the species as Endangered. It is only known from a small area in Panama, at fewer than five locations, and based on satellite imagery there is not much forest remaining within its area of distribution.

Magnolia multinervia A.Vázquez

VU D2

Costa Rica

Magnolia multinervia has a very restricted range, known from one locality at Limón province in Costa Rica. It grows at an altitude of 600m asl. in the La Amistad International Park. This species is relatively well protected but if encroachment into the park occurs this species could become threatened by agriculture and expansion of human settlements. This would mean that this species could be driven to Critically Endangered B1ab(iii)+2ab(iii) in a very short time frame. Therefore, *Magnolia multinervia* is assessed as Vulnerable.

Magnolia nana Dandy

EN B1ab(iii)

Vietnam

This species is classified as Endangered as it is endemic to a small area of Vietnam with a potential forest distribution and extent of occurrence of 2,984 km², in which it occurs at fewer than five locations. The forest is continuing to decline in area and quality of habitat. A survey of the habitat of this species would be valuable to assess conservation measures that can be implemented.

Magnolia narinensis (Lozano) Govaerts
CR B1ab(i,iii)

Colombia

This species is only known from a single location with a restricted distribution (extent of occurrence (EOO) under 100 km²), and is considered at high risk of extinction. Research into its current population status is urgently required since it has not been collected since 1973. The remaining habitat is under pressure from degradation and fragmentation due to timber extraction and conversion to agriculture. It has been impossible to revisit the type locality in recent years due to illegal plantations. This species is listed as Critically Endangered. Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M., Garcia, N & Rivers, M.C.

Magnolia neillii (Lozano) Govaerts
EN B2ab(iii)

Columbia, Ecuador

Magnolia neillii is considered to be Endangered as it occurs in few localities with an area of occupancy between 44 and 500 km² based on collection records. It is threatened by habitat loss and fragmentation in Ecuador and Colombia.

Magnolia nilagirica (Zenker) Figlar
VU A2cd

India, Sri Lanka

This species is under severe threat due to logging for good quality timber. Rapid deforestation in its range of natural habitat has resulted in population decline. In the CAMP workshop organised at Bangalore in 1997 it was collectively agreed by experts that 40% of the wild population in its natural habitat had declined in the past three generations (180 years). As the situation has not improved it is inferred that this status is still valid. The species is therefore assessed as Vulnerable.

Assessors: Haridasan, K., Ved, D., Saha, D. & Ravikumar, K.



Magnolia nilagirica (Sureshmagnolia)

Magnolia nitida W.W.Sm.

VU A2cd

China, Myanmar

Magnolia nitida was thought to be restricted to China but it has also been described from north Myanmar. There is no information about the population size in Tibet and Myanmar but the population overall has declined significantly as a result of logging. Population decline is estimated to have been at least 30% in the past three generations, due to poor regeneration and exploitation.



Magnolia nitida (Arboretum Wespelaar)

Magnolia nuevoleonensis A.Vázquez
& Domínguez-Yescas

EN B1ab(ii,iii)+2ab(ii,iii)

Mexico

Magnolia nuevoleonensis is a large tree endemic to Nuevo Leon in Mexico. It is very restricted in range, and only occurs at two locations with an area of occupancy (AOO) of 4 km² and an extent of occurrence (EOO) of less than 280 km². It is also affected by a decline in AOO and in habitat quality and extent due to deforestation and land use change. This species is listed as Endangered.

Magnolia oaxacensis A.Vázquez

EN B1ab(v)

Mexico

This species is only known from the Sierra Mazateca, Oaxaca, Mexico. It has an extent of occurrence (EOO) of less than 1,000 km² and is found in fewer than five locations. The main threat to this species is its restricted range and there is a projected decline in mature individuals due to poor recruitment. Only scattered trees have been observed, with no seedlings or saplings nearby. This species is listed as Endangered.

Assessors: Rivers, M.C., Martínez Salas, E. & Samain, M.S.

Magnolia odora (Chun) Figlar & Noot.
VU C1

China, Laos, Vietnam

Magnolia odora is classified as Vulnerable, although it is widespread in China, Vietnam and Laos. Mature trees are reportedly rare. Experts believe fewer than 10,000 individuals remain. Population declines have occurred because of extensive logging, habitat clearance and urbanisation over decades, a trend that is not likely to be reversed. Although the exact decline is not known, it is thought to be more than 10% over the last 30-45 years (three generations).

Magnolia odoratissima Y.W.Law &

R.Z.Zhou

EN D

China

Magnolia odoratissima is considered to be Endangered due to its restricted population size. It is also under threat from timber extraction and a decline in habitat, which are continuing to occur in Yunnan. It is estimated to have only 200 mature individuals surviving. It has been successfully propagated in *ex situ* collections and has been reintroduced so the population may be increasing but the number of individuals is still very low and regeneration is slow. The survival of this species will depend on these conservation efforts to save it.



Magnolia odoratissima (Yang Keming)

Magnolia ofeliae A.Vázquez & Cuevas

CR B1ab(iii)

Mexico

Magnolia ofeliae is only known from the type locality. It is extremely rare, despite intensive explorations in the Talpa de Allende region and elsewhere in Jalisco. The area is currently undergoing deforestation for conversion to pasture lands. The extent of occurrence (EOO) is less than 100 km² and it is known from a single location. It is considered Critically Endangered.

Assessors: Rivers, M.C., Samain, M.S. & Martínez Salas, E.

Magnolia officinalis Rehder &

E.H.Wilson

EN A2bd

China

Magnolia officinalis is a large tree found in broad-leaved forests in central China. It is a very important medicinal species. Although it has an overall wide distribution in China, the wild population is thought to mainly exist in protected areas. The decline in native forest habitat and the impacts of bark stripping of wild trees has caused a severe decline in the number of individuals of *Magnolia officinalis* of at least 50% in the last three generations. It is therefore assessed as Endangered. Today the species is widely cultivated in order to supply bark to the commercial market.



Magnolia officinalis (Arboretum Wespelaar)

Magnolia omeiensis (W.C.Cheng)

Dandy

CR C2a(i)

China

Magnolia omeiensis is classified as Critically Endangered as there are only 100 individuals recorded to be remaining in the wild, with a maximum of 50 mature individuals in the largest subpopulation. All are male. Logging appears to be continuing in the area and no special protection is yet in place to ensure that the population remains intact. The potential forest distribution for the species is 1,910 km².

Magnolia ovoidea (Hung T.Chang &

B.L.Chen) V.S.Kumar

CR D

China

Magnolia ovoidea is classified as Critically Endangered as there are fewer than 50 individuals in four subpopulations, with fewer than 30 individuals in each subpopulation, remaining in Yunnan.

Magnolia pacifica A.Vázquez

EN B1ab(iii)

Mexico

Magnolia pacifica is considered to be Endangered as its extent of occurrence is 4,732 km², it is known from fewer than five locations and is facing continuing declines in the area and quality of its habitat as a result of deforestation.



Magnolia pacifica (Yoonrk)

Magnolia palandana F.Arroyo

EN B1ab(iii)

Ecuador

Magnolia palandana is a large tree only known from the province of Zamora Chinchipe, Ecuador. The extent of occurrence (EOO) is 484 km² and there are three locations. The habitat is declining due to expansion of agriculture and livestock farming. This species is assessed as Endangered. More research is needed into the population size and trend, and on the threats to this species. Assessors: Rivers, M.C. & Pérez Castañeda, Á.



Magnolia palandana (Alvaro Pérez)

Magnolia pallescens Urb. & Ekman

EN B1ab(i,iii)+2ab(i,iii)

Dominican Republic

This species is considered to be Endangered because its extent of occurrence is c. 2,703 km², its area of occupancy is c. 447 km², and it is known from fewer than five locations. The extent of the decline of *Magnolia pallescens* is unknown and there has been no evidence of recovery or regeneration. Deforestation has caused a significant decline in the extent of occurrence and quality of habitat. It remains unclear if this species is recovering or if subpopulations are stable in the protected reserves depending on management. This species has a high risk of becoming further threatened without monitoring and management of the reserves.



Magnolia pallescens (Scott Zona)



Magnolia pastazaensis (Alvaro Pérez)

Magnolia pastazaensis F.Arroyo &

Á.J.Pérez

EN B1ab(iii)

Ecuador

Magnolia pastazaensis is a large tree endemic to Ecuador. Its extent of occurrence (EOO) is less than 2,500 km², it is known from five locations, and there are continuing declines in the quality and area of habitat due to agriculture and cattle ranching. This species is found in three protected areas although all of these are small. This species is assessed as Endangered. More research is needed on the distribution, population size and threats to this species.

Assessors: Rivers, M.C. & Pérez Castañeda, Á.

Magnolia patungensis (Hu) Noot.

EN C2a(i)

China

This species is listed as Endangered due to a population size of fewer than 2,500 mature individuals, subpopulations consisting of ten or fewer individuals and ongoing declines in habitat.

Magnolia pealiana King

EN B1ab(iii)

India

This species is classified as Endangered as it is restricted to Assam with a potential forest distribution of 1,765 km², and is found in fewer than five locations. Habitat loss is continuing throughout the species' range.

Magnolia pedrazae A.Vázquez

EN B1ab(iii)

Mexico

Magnolia pedrazae is endemic to Landa de Matamoros and Jalpan, Querétaro, where it is known from the type locality and surroundings. The known extent of occurrence (EOO) is 180 km² in up to three locations. There is a continuing decline in the extent and quality of its habitat due to wood extraction and pastureland expansion. It occurs in a protected natural area (Sierra Gorda Biosphere Reserve). No *ex situ* collections are known. This species is listed as Endangered.

Assessors: Wheeler, L., Culverhouse, F., Samain, M.S., Martínez Salas, E. & Rivers, M.C.

Magnolia perezfarrerae A.Vázquez &

Gómez-Domínguez

EN B1ab(iii)

Mexico

Magnolia perezfarrerae is known from three locations in an extent of occurrence (EOO) of approximately 600 km². Although population numbers are not known from the entire range, the population is thought to be small with only ten mature trees present at the type locality. No regeneration has been observed in the natural population but there is some local cultivation. Threats to the habitat quality and extent are from forest conversion for agriculture and pasture. *Magnolia perezfarrerae* is listed as Endangered.

Assessors: Rivers, M.C., Samain, M.S. & Martínez Salas, E.

Magnolia pleiocarpa (Dandy) Figlar & Noot.

CR B1ab(i,iii)

India

This species is classified as Critically Endangered as it is known from only one location and its overall potential forest distribution is only 123 km². Occurrence within that range is considered to be a significantly smaller area with an extent of occurrence (EOO) less than 100 km². The Assam region has high rates of deforestation which is continuing to cause a decline in the area and quality of suitable habitat. Once an area has been disturbed this species is unable to recover. It is considered extremely rare and any remaining individuals will be unable to sustain any future populations.

Magnolia polyhypsophylla (Lozano)

Govaerts

CR B1ab(iii,v); C2a(i,ii); D

Colombia

Magnolia polyhypsophylla is only known from a single locality with an extent of occurrence less than 100 km², and has a known population of only 12 mature individuals. Regeneration is unlikely in the degraded habitats and this previously widely exploited species faces extinction in the wild.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia portoricensis Bello

EN B1ab(iii,v)

Puerto Rico

This species is classified as Endangered as it is endemic to Puerto Rican montane forests with a potential remaining forest distribution of 3,054 km². The species has declined as a result of selective logging of large adult trees for its valuable timber. There is a continuing decline in habitat and the number of mature individuals and the species is currently only known from four locations.



Magnolia portoricensis (Emily Veltjen)

Magnolia pugana (Ilitis & A.Vázquez)

A.Vázquez & Carvajal

EN B1ab(iii)+2ab(iii)

Mexico

Magnolia pugana has a very small population size. However, as the number of mature individuals is not known, it is classified as Endangered based on the extent of occurrence (EOO) of 2,460 km², the area of occupancy (AOO) of 114 km² and occurrence at two locations in Jalisco and Zacatecas. There is ongoing degradation of the species' habitat.

Magnolia quetzal A.Vázquez, Véliz &

Tribouill.

EN B1ab(iii,v)+2ab(iii,v)

Guatemala

The extent of occurrence (EOO) of *Magnolia quetzal* is likely less than 4,000 km² and it occurs in fewer than five locations. Its forest habitat is fragmented and declining due to logging and the rapid expansion of pasture, agriculture and human settlements in the area. Furthermore, this species is used for firewood. These threats are likely to continue. Therefore, this species is assessed as Endangered.

Magnolia rajaniana (Craib) Figlar

VU B1ab(iii,v)

Thailand

Magnolia rajaniana is classified as Vulnerable as it has a restricted extent of occurrence (11,550 km²) which is continuing to decline in area and quality, and is known from no more than ten locations. The species has been exploited extensively for its timber in the past so the number of mature trees is said to have declined significantly. It may be more threatened than evaluated here, further research is needed.

Magnolia rostrata W.W.Sm.

EN B2ab(v)

China, Myanmar

Magnolia rostrata is classified as Endangered as the area of occupancy (AOO) is estimated to be less than 500 km², the population occurs over four locations and it is heavily exploited for its bark. The population has significantly declined and if exploitation continues it has a high chance of becoming extinct. There are no current data on population size.



Magnolia rostrata (Arboretum Wespelaar)

Magnolia rufibarbata (Dandy)

V.S.Kumar

EN B2ab(iii)

China, Vietnam

This species is known from three populations in Vietnam and China with large distances between them. The known area of occupancy is around 500 km² and the habitat is inferred to be in decline as a result of deforestation. It is unlikely that there is any conservation action for this species as little is known about it. Further research is required on the threats and number of individuals.

Magnolia rzedowskiana A. Vázquez,
Domínguez-Yescas & R. Pedraza
EN B1ab(v)

Mexico

Magnolia rzedowskiana is a tree found in the cloud forest of three Mexican states: Querétaro, San Luis Potosí and Hidalgo. It has a restricted range, with three locations and an extent of occurrence (EOO) of 145 km². This species is threatened by the use of the flowers, which often involves the cutting down of the entire mature tree. This species is listed as Endangered.

Magnolia sanchez-vegae Marcelo-
Peña

CR B1ab(iii)

Peru

Magnolia sanchez-vegae is a tree known from only one location in Amazonas, Peru. It has a narrow range and its estimated extent of occurrence (EOO) is less than 100 km². The habitat of this species is seriously threatened by deforestation for agriculture and pasture. *Magnolia sanchez-vegae* is assessed as Critically Endangered.

Magnolia santanderiana (Lozano)

Govaerts

EN B1ab(iii)

Colombia

Magnolia santanderiana is only known from two locations in the Santander department of Colombia. Within its restricted distribution, habitats are highly degraded principally due to land clearance for livestock, agriculture and construction of access roads. This is causing a continuing decline in area and quality of habitat. Its extent of occurrence (EOO) is 1,090 km². Therefore, this species is considered to be Endangered. Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia sapaensis (N.H.Xia &
Q.N.Vu) Grimshaw & Macer
VU D2

Vietnam

Magnolia sapaensis is a small tree found in northern Vietnam. It is known from fewer than five locations, and at the type locality only six mature individuals, have been recorded. The species is found in secondary forest and nearby areas have been cleared by fire. There are real threats from fire and clearance even within protected areas. There is clearly a risk of this species going extinct in the very near future if no further protection is given. It is listed as Vulnerable.

Magnolia sargentiana Rehder &
E.H.Wilson

VU B2ab(iii,v)

China

Magnolia sargentiana was previously classified as Endangered. However, further survey work has revealed extensive and protected populations in southern Sichuan of at least 20,000 individuals. It is exploited for medicinal use and threatened by habitat clearance, although the areas where the extensive populations occur are protected within reserves. Its area of occupancy is 860 km².



Magnolia sargentiana (Daniel Mosquin)

Magnolia schiedeana Schltl.
VU B1ab(iii)

Mexico

Magnolia schiedeana is an endemic Mexican cloud forest species. It is considered to be Vulnerable based on its extent of occurrence of 17,411 km², its occurrence at five locations and a continuing decline in habitat.

Assessors: Luna-Vega, I. & Gonzalez-Espinosa, M.

Magnolia sharpii V.V.Miranda

EN B1ab(iii,v)

Mexico

Magnolia sharpii is considered to be Endangered as its extent of occurrence (EOO) is 2,228 km², its cloud forest habitats are severely fragmented and degraded and it is known from only five locations. The forests have been impacted mainly by wood extraction, clearance for agriculture, cattle grazing and fire.

Assessors: Luna-Vega, I., Gonzalez-Espinosa, M. & Ramirez-Marcial, N.



Magnolia sharpii (James Gaither)

Magnolia shiluensis (Chun & Y.F.Wu)

Figlar

EN A2ac; B1ab(iii,v)

China

Magnolia shiluensis is classified as Endangered as its population is thought to have declined by more than 50% during the last ten years. The extent of occurrence is less than 5,000 km² and it is only known from five locations in Hainan. Further research is required to determine the threats to this species and implement adequate conservation actions.

Magnolia shuarorum F.Arroyo &

A.Vázquez

EN B1ab(iii)+2ab(iii)

Ecuador

This tree species is known from three localities within Shuar native reserves in Ecuador. Despite a certain degree of protection in these areas, *Magnolia shuarorum* has a restricted area of occupancy (AOO; less than 500 km²) and there is a lack of knowledge of this species outside these reserves. The estimated extent of occurrence (EOO) is less than 1,955 km². It is threatened by climate change and mining, leading to continuing declines in habitat. This species is listed as Endangered.

Assessors: Rivers, M.C. & Pérez Castañeda, Á.

Magnolia silvioi (Lozano) Govaerts

EN B1ab(iii,v)

Colombia

Magnolia silvioi is known from five locations in small fragments of remnant primary forests and has a restricted extent of occurrence less than 5,000 km². It occurs in the Central mountain range in two regions in the northeast and east of the Antioquia, some areas of which have been seriously disrupted by mining activities, livestock farming and sugar cane cultivation.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.



Magnolia silvioi (Marcela Serna)



Magnolia sinica (Jackson Xu FF)



Magnolia sinostellata (Shouzhou Zhang)



Magnolia sirindhorniae (Yang Kening)

Magnolia sinica (Y.W.Law) Noot.

CR D

China

With only c. 50 mature individuals in the wild and 5,000-6,000 saplings in nurseries, *Magnolia sinica* is classified as Critically Endangered on the basis of its very small population size.

Magnolia sinostellata P.L.Chiu &

Z.H.Chen

EN B1ab(iii,v)

China

Magnolia sinostellata is endemic to southern Zhejiang Province, China. It has an estimated extent of occurrence (EOO) of 3,100 km² and is found in three locations. The wild population of this species is declining in the number of individuals and the genetic diversity is decreasing. Since it was first described individuals have been taken from the wild and transferred to commercial nurseries due to its value as a garden plant. Deforestation in the area is also causing a continuing decline in area and quality of habitat. It is assessed as Endangered.

Magnolia sirindhorniae Noot. &

Chalermglin

EN B2ab(iii)

Thailand

This species is classified as Endangered on the basis of its area of occupancy of c. 35 km², the continuing decline in its habitat and its occurrence at fewer than three locations.

Magnolia sulawesiana Brambach,

Noot. & Culmsee

EN B1ab(iii)

Indonesia

Magnolia sulawesiana is a large tree endemic to Sulawesi. It can be locally abundant, but is found only in three sites in the centre of Sulawesi. The extent of occurrence is 160 km² for the known locations of this species. The quality and extent of the habitat of this species is decreasing due to deforestation. Further botanical exploration would be beneficial to firmly establish population trends and distributions.

Magnolia splendens Urb.

EN B1ab(iii,v)+2ab(iii,v)

Puerto Rico

This species is classified as Endangered as it has a potential forest distribution, based on remote sensing imagery and species distribution data, of 206 km², an area of occupancy (AOO) of 20-40 km² and is known from fewer than five locations. Further information on the status of its habitat and levels of exploitation is desirable.

*Magnolia splendens* (Emily Veltjen)***Magnolia stellata*** (Siebold & Zucc.)

Maxim.

EN B1ab(iii,v)

Japan

Magnolia stellata is considered to be Endangered based on its restricted extent of occurrence and continuing decline in the number of mature individuals and quality of habitat. It has an estimated extent of occurrence of 3,000 km² and is known from fewer than five locations. This species is highly threatened because of urban development and local populations are small and fragmented. It is widespread in cultivation.

*Magnolia stellata****Magnolia striatifolia*** Little

EN B1ab(iii,v)

Colombia, Ecuador

Magnolia striatifolia occurs in four locations in the border region between Colombia and Ecuador at very low altitudes. This places it at risk from habitat conversion for agriculture and illicit crop production. The species is being targeted for its wood, causing the number of mature individuals to continue to decline. The extent of occurrence (EOO) is 4,907 km². Therefore, it is assessed as Endangered.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia talamancana A.Vázquez

VU D2

Costa Rica

Magnolia talamancana is only known from the type locality on the margins of Río Urén, Cantón Talamanca, Costa Rica at 450m asl. It occurs in the La Amistad International Park, where the tropical forest has some protection. However, if encroachment into the park continues this species could become threatened by agriculture and expansion of human settlements; the threat of a newly planned dam also projects a decline in habitat quality and extent. If this occurs this species would be driven to Critically Endangered B1ab(iii)+2ab(iii) in a very short time frame. Therefore, *Magnolia talamancana* is assessed as Vulnerable.

Magnolia taulipana A.Vázquez

EN B1ab(iii)

Mexico

Magnolia taulipana is considered to be Endangered as the potential forest distribution for this species, based on remote sensing imagery and species distribution records, is 2,458 km². There is a continuing decline in habitat and it is known from fewer than five locations. The exact causes of decline are unknown but inferred to be by past hurricane activity, poor regeneration and habitat loss.

Assessors: Luna-Vega, I. & Gonzalez-Espinosa, M.

*Magnolia taulipana* (James Gaither)***Magnolia thailandica*** Noot. &

Chalermglin

VU B1ab(iii,v)

Thailand

Magnolia thailandica is classified as Vulnerable based on a limited extent of occurrence (EOO) of 8,000-12,200 km². In addition, the species is only known to occur at four locations and there is continuing decline in its habitat quality and extent, as well as a reduction in the number of mature individuals.

Magnolia tiepii V.T. Tran & Duy

CR B1ab(iii)

Vietnam

Magnolia tiepii is a large tree endemic to the Khanh Vinh Mountain in Vietnam. It is a range-restricted species with an extent of occurrence (EOO) of less than 100 km² and is only known from a single location. The area, extent and quality of the habitat is declining due to forest conversion to coffee plantations and agricultural land. There are no known conservation actions for this species. It is listed as Critically Endangered.

Magnolia urraoensis (Lozano)

Govaerts

EN B1ab(iii,v)+2ab(iii,v)

Colombia

Magnolia urraoensis is found in forest fragments created by land conversion for livestock and agriculture, and is subjected to overexploitation for its timber. With a restricted distribution and occurring at low densities with little or very poor natural regeneration, the species is at risk. It has an extent of occurrence (EOO) of c. 4,389 km², an area of occupancy (AOO) of 32 km² and is known from five locations. It is assessed as Endangered on the basis of its geographic range and declining habitat. Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia vallartensis A.Vázquez &

Muñiz-Castro

CR B1ab(iii)

Mexico

This species is endemic to the regions of Puerto Vallarta and Cabo Corrientes in Jalisco, Mexico. It is found in one location and the extent of occurrence (EOO) is estimated to be less than 100 km². The forest habitat of *Magnolia vallartensis* is declining due to forest fires, logging and rapid conversion for pasture. There are no known *ex situ* collections of this species. This species is listed as Critically Endangered.

Assessors: Rivers, M.C., Samain, M.S. & Martínez Salas, E.

Magnolia vazquezii Cruz Durán &

K.Vega

EN B1ab(iii)

Mexico

Magnolia vazquezii is a cloud forest species with a very restricted distribution, found in only one location and with an extent of occurrence of less than 500 km². It is likely that the AOO is c. 10 km². There is no regeneration and therefore, the population consisting of only 300 mature individuals will continue to decrease. However, they appear to be well conserved by local people.

Magnolia ventii (N.V.Tiep) V.S.Kumar

EN B1ab(iii); D

China

Magnolia ventii is considered to be Endangered as it occurs at five locations in Yunnan and has a very small population, estimated to be c. 100 mature individuals. Its extent of occurrence is estimated to be less than 5,000 km², and its habitat is continuing to decline in area and quality.



Magnolia ventii (Zeng Qing-Wen)

Magnolia viridipetala (Y.W.Law,

R.Z.Zhou & Q.F.Yi) C.B.Callaghan & Png

EN D

China

Magnolia viridipetala is a small tree found only in Yunnan, China. The population is estimated to be fewer than 100 mature individuals, and the species is only known from the type locality. The population trends and any possible threats are not known. There are no known *in situ* conservation actions for this species, but there are five specimens growing in the South China Botanical Garden.

Magnolia virolinensis (Lozano)

Govaerts

CR B1ab(iii,v)

Colombia

Magnolia virolinensis remains in a single location in Colombia (EOO of less than 100 km²) where it is restricted to forests on slopes and summits with lower level forests having already been converted to agriculture.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia vovidesii A.Vázquez,

Domínguez-Yescas & L. Carvajal

EN B1ab(iii,v)

Mexico

Magnolia vovidesii is a large tree found in Veracruz, Mexico. It is a very range restricted species, with an extent of occurrence (EOO) of 85 km² at three locations. This species is threatened by severe habitat fragmentation and continuing decline in extent and quality of its habitat by an increase of pasture lands, firewood extraction, coffee plantations and human settlements. This species is listed as Endangered. However, very little is known about this species and more research is necessary.

Magnolia wendtii A.Vázquez

CR B1ab(iii)

Mexico

Magnolia wendtii is only known from a single collection at the type locality in Veracruz, Mexico. It is extremely rare and despite intensive explorations in the Uxpanapa and Chimalapa region, no additional records of this species have been made since it was first found in 1982. The extent of occurrence (EOO) is estimated to be less than 100 km² and the area is currently undergoing severe deforestation for conversion to pasture lands. This species is listed as Critically Endangered.

Assessors: Rivers, M.C., Samain, M.S. & Martínez Salas, E.

Magnolia wetteri A.Vázquez

EN B1ab(iii)

Costa Rica

Magnolia wetteri is a large tree restricted to the southern part of Costa Rica where it is only known from the Osa peninsula. Its estimated extent of occurrence (EOO) is between 40 and 1,600 km² and it is thought to occur in fewer than five locations. Logging has been recorded in the area where this species is found, which is thought to be causing a continuing decline in the area and quality of habitat for this species. Therefore, *Magnolia wetteri* is assessed as Endangered.

Magnolia wolfii (Lozano) Govaerts

CR B1ab(iii)+2ab(iii); D

Colombia

With only a single population of three mature trees and no regeneration observed in 2006, *Magnolia wolfii* is Critically Endangered due to habitat loss for coffee cultivation. The population is located in an isolated forest fragment within extensive agriculture plantations. Its potential area of occupancy (AOO) and extent of occurrence (EOO) are both 0.2 km², within a single location. A survey is necessary to see if the three trees still exist, but it is likely that this species may now be extinct in the wild. More *ex situ* collections are required.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M. & Garcia, N.

Magnolia xanthantha (C.Y.Wu ex

Y.W.Law & Y.F.Wu) Figlar

EN B1ab(iii)

China

Magnolia xanthantha is classified as Endangered as the extent of occurrence is less than 5,000 km² and it is only known from a single location in Xishuangbanna, Yunnan where it is threatened by habitat loss and urbanisation.

Magnolia yantzazana F.Arroyo

EN B1ab(iii)

Ecuador

Magnolia yantzazana is only known from the province of Zamora Chinchipe, Ecuador. It is a range-restricted species with an extent of occurrence (EOO) of less than 400 km² and fewer than five locations. There are mining operations and agricultural activities resulting in a decline in the quality and extent of habitat. It is therefore listed as Endangered. More research is needed into the population size and declines of this species.

Assessors: Rivers, M.C. & Pérez Castañeda, Á.

*Magnolia yantzazana* (Alvaro Perez)***Magnolia yarumalensis*** (Lozano)

Govaerts

EN A2acd; B2ab(iii,v)

Colombia

The population of *Magnolia yarumalensis* has suffered a drastic reduction of over 50% within the last three generations due to it being under both direct pressure, targeted for its timber, and indirect pressure with its habitat being converted to meet agricultural demands. The area of occupancy (AOO) is less than 500 km² and the habitat is degraded and continues to decline. It is found in more than ten locations but the population is severely fragmented. This species is listed as Endangered.

Assessors: Calderon, E., Cogollo, A., Velasquez-Rua, C., Serna-Gonzalez, M., Garcia, N & Rivers, M.C.

*Magnolia yarumalensis* (Marcela Serna)***Magnolia yoroconte*** Dandy

VU A2c

Belize, Guatemala, Honduras, Mexico?

Magnolia yoroconte is found in Central America. It has an area of occupancy (AOO) of 9,264 km² which is decreasing. It is threatened by deforestation, habitat loss and exploitation for its wood. It is particularly threatened in Honduras and subpopulations here should be monitored. This species is also of conservation concern in Guatemala. The forests where it grows are severely degraded and this species is known to be declining. A 30% population decline is suspected based on a 30% range decline. It is listed here as Vulnerable.

Assessors: Rivers, M.C., Samain, M.S. & Martínez Salas, E.

Magnolia zenii W.C.Cheng

CR D

China

Magnolia zenii is classified as Critically Endangered as only a single population exists containing 18 individuals at the type locality on the north slopes of Mount Baohua. This location is a provincial reserve, but no specific protection is given to these trees. No natural regeneration has been observed. It exists in *ex situ* collections so has the potential to be propagated.

*Magnolia zenii*

MAGNOLIACEAE SPECIES EVALUATED AS NEAR THREATENED

Liriodendron chinense (Hemsl.) Sarg.
China

Magnolia borneensis Noot.
Indonesia, Malaysia, Philippines

Magnolia dealbata Zucc.
Mexico

Magnolia elliptigemmata C.L.Guo &
L.L.Huang
China

Magnolia figlarii V.S.Kumar
China

Magnolia flaviflora (Y.W.Law & Y.F.Wu)
Figlar
China, Vietnam

Magnolia fujianensis (Q.F.Zheng) Figlar
China

Magnolia guangxiensis (Y.W.Law &
R.Z.Zhou) Sima
China

Magnolia obovalifolia (C.Y.Wu &
Y.W.Law) V.S.Kumar
China

Magnolia poasana (Pittier) Dandy
Costa Rica, Panama

Magnolia sambuensis (Pittier)
Govaerts
Colombia, Panama

Magnolia sororum Seibert
Costa Rica, Nicaragua, Panama

Magnolia wilsonii (Finet & Gagnep.)
Rehder
China



Magnolia dealbata (James Gaither)



Magnolia sambuensis (Marcela Serna)



Magnolia wilsonii (Yang Keming)

MAGNOLIACEAE SPECIES EVALUATED AS DATA DEFICIENT

Magnolia angatensis Blanco
Indonesia, Philippines

Magnolia ashtonii Dandy ex Noot.
Brunei Darussalam, Indonesia, Malaysia

Magnolia atlantida A.Vázquez
Honduras

Magnolia azulensis F.Arroyo
Peru

Magnolia balansae Aug.DC.
China, Vietnam

Magnolia banghamii (Noot.) Figlar & Noot.
Indonesia

Magnolia bawangensis Y.W.Law,
R.Z.Zhou & D.M.Liu
China

Magnolia beccarii (Ridl.) ined.
Indonesia, Malaysia

Magnolia bintuluensis (A.Agostini)
Noot.
Indonesia, Malaysia

Magnolia braianensis (Gagnep.) Figlar
Vietnam

Magnolia calophylloides Figlar & Noot.
Indonesia

Magnolia caveana (Hook.f. & Thomson) D.C.S.Raju & M.P.Nayar
China, India, Myanmar

Magnolia championii Benth.
China, Hong Kong, Vietnam

Magnolia changhungtana Noot.
China

Magnolia chevalieri (Dandy) V.S.Kumar
China, Lao People's Democratic Republic, Vietnam

Magnolia chiriquiensis A.Vázquez
Panama

Magnolia clemensiorum Dandy
Vietnam

Magnolia coco (Lour.) DC.
China, Taiwan, Province of China, Vietnam

Magnolia compressa Maxim.
China, Japan, Philippines, Taiwan, Province of China

Magnolia doltsopa (Buch.-Ham. ex DC.) Figlar
Bhutan, China, India, Myanmar, Nepal



Magnolia doltsopa (Caerhays Estate)

Magnolia duclouxii (Finet & Gagnep.)
Hu
China, Vietnam

Magnolia duperreana Pierre
Cambodia, Lao People's Democratic Republic, Thailand, Vietnam

Magnolia elegans (Blume) H.Keng
Indonesia, Malaysia, Thailand

Magnolia elegantifolia Noot.
China

Magnolia elfina A.Vázquez
Peru

Magnolia ernestii Figlar
China



Magnolia ernestii (John Marston)

Magnolia fistulosa (Finet & Gagnep.)
Dandy
China, Vietnam

Magnolia floribunda (Finet & Gagnep.)
Figlar
Cambodia, China, Lao People's Democratic Republic, Myanmar, Thailand, Vietnam



Magnolia fulva (Zeng Qingwen)

Magnolia fulva (Hung T.Chang & B.L.Chen) Figlar
China, Vietnam

Magnolia garrettii (Craib) V.S.Kumar
Cambodia, China, Lao People's Democratic Republic, Thailand, Vietnam

Magnolia gigantifolia (Miq.) Noot.
Indonesia, Malaysia

Magnolia gloriensis (Pittier) Govaerts
Costa Rica, Nicaragua, Panama

Magnolia griffithii Hook.f. & Thomson
Bangladesh, India, Myanmar

Magnolia guangdongensis (Y.H.Yan, Q.W.Zeng & F.W.Xing) Noot.
China

Magnolia guangzhouensis (A.Q.Dong, Q.W.Zeng & F.W.Xing) C.B.Callaghan & Png
China

Magnolia henryi Dunn
China, Lao People's Democratic Republic, Myanmar, Thailand

Magnolia hookeri (Cubitt & W.W.Sm.) D.C.S.Raju & M.P.Nayar
China, India, Myanmar, Thailand

Magnolia hypolampra (Dandy) Figlar
China, Vietnam

Magnolia iteophylla (C.Y.Wu ex Y.W.Law & Y.F.Wu) Noot.
China

Magnolia kaifui (Q.W.Zeng & X.M.Hu) C.B.Callaghan & Png
China

Magnolia kingii (Dandy) Figlar
Bangladesh, India

Magnolia kisopa (Buch.-Ham. ex DC.) Figlar
Bhutan, China, India, Nepal

Magnolia kobus DC.
China, Japan, Republic of Korea



Magnolia kobus

Magnolia koordersiana (Noot.) Figlar
Indonesia, Malaysia, Thailand, China

Magnolia laevifolia (Y.W.Law & Y.F.Wu) Noot.
China



Magnolia laevifolia (Jiu Xiang)

Magnolia lanuginosa (Wall.) Figlar & Noot.
Bhutan, China, India, Nepal

Magnolia lanuginosoides Figlar & Noot.
Cambodia, Indonesia, Lao People's Democratic Republic, Thailand

Magnolia lasia Noot.
Indonesia, Malaysia

Magnolia lawii (N.H.Xia & W.F.Liao) C.B.Callaghan & Png
China

Magnolia leveilleana (Dandy) Figlar
China

Magnolia liliiflora Desr.
China



Magnolia liliiflora
(Asta Malakauskiene, VDU Kaunas Botanical Garden)

Magnolia lopezobradorii A.Vázquez
Mexico

Magnolia lozanoi A.Vázquez & Castro-Arce
Ecuador

Magnolia macklottii (Korth.) Dandy
Indonesia, Malaysia

Magnolia macrocarpa (Zucc.) A.Vázquez & Castro-Arce
Mexico

Magnolia mariusjacobsia Noot.
Malaysia

Magnolia masticata (Dandy) Figlar
China, Vietnam

Magnolia mirifolia (D.L.Fu, T.B.Chao & Zhi X.Chen) Noot.
China

Magnolia montana (Blume) Figlar
Indonesia, Malaysia

Magnolia opipara (Hung T.Chang & B.L.Chen) Sima
China

Magnolia pahangensis Noot.
Malaysia

Magnolia paranaensis A.Vázquez
Brazil

Magnolia peruviana A.Vázquez
Peru

Magnolia philippinensis P.Parm.
Philippines, Thailand

Magnolia platyphylla (Merr.) Figlar & Noot.
Philippines

Magnolia praecalva (Dandy) Figlar & Noot.
Cambodia, China, Indonesia, Lao People's Democratic Republic, Malaysia, Thailand, Vietnam

Magnolia ptaritepuiana Steyerl.
Venezuela, Bolivarian Republic of

Magnolia pterocarpa Roxb.
Bhutan, India, Myanmar, Nepal, Thailand

Magnolia pubescens (Merr.) Figlar & Noot.
Philippines

Magnolia punduana (Hook.f. & Thomson) Figlar
Bangladesh, Bhutan, India

Magnolia rabaniana (Hook.f. & Thomson) D.C.S.Raju & M.P.Nayar
India, Myanmar

Magnolia sarawakensis (A.Agostini) Noot.
Indonesia, Malaysia

Magnolia savegrensis A.Vázquez
Costa Rica

Magnolia scortechinii (King) Figlar & Noot.
Indonesia, Malaysia

Magnolia sellowiana (A.St.-Hil.) Govaerts
Brazil

Magnolia sinacacolinii A.Vázquez
Mexico

Magnolia singaporensis (Ridl.) H.Keng
Indonesia, Malaysia, Singapore

Magnolia sphaerantha (C.Y.Wu ex Y.W.Law & Y.F.Wu) Sima
China

Magnolia steyermarkii A.Vázquez
Guatemala

Magnolia sumatrae (Dandy) Figlar & Noot.
Indonesia

Magnolia tarahumara (A.Vázquez) A.Vázquez
Mexico

Magnolia tsiampacca (L.) Figlar & Noot.
Indonesia, Papua New Guinea

Magnolia utilis (Dandy) V.S.Kumar
Malaysia, Myanmar, Thailand

Magnolia vargasiana A.Vázquez & D.A.Neill
Ecuador



Magnolia vargasiana (Lou Jost)

Magnolia venezuelensis (Lozano) Govaerts
Venezuela, Bolivarian Republic of

Magnolia villosa (Miq.) H.Keng
Indonesia, Malaysia, Singapore

Magnolia vrieseana (Miq.) Baill. ex Pierre
Indonesia

Magnolia xiana Noot.
China

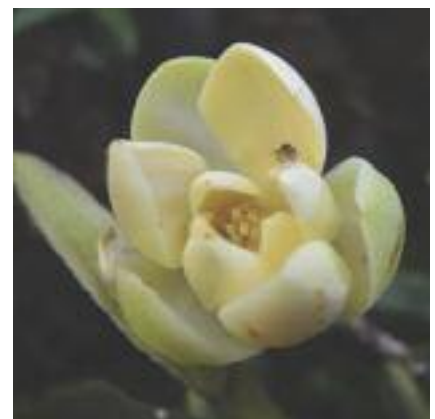
Magnolia xianianhei (Q.N.Vu) C.B.Callaghan & Png
Vietnam

Magnolia xinganensis Noot.
China

Magnolia yunnanensis (Hu) Noot.
China, Myanmar

Magnolia yuyuanensis (Y.W.Law) V.S.Kumar
China

Magnolia zamorana F.Arroyo
Ecuador



Magnolia zamorana

Magnolia zamudioi A.Vázquez
Mexico

MAGNOLIACEAE SPECIES EVALUATED AS LEAST CONCERN

Liriodendron tulipifera L.

Canada, United States



Liriodendron tulipifera (Kew Gardens)

Magnolia acuminata (L.) L.

Canada, United States



Magnolia acuminata (Arboretum Wespelaar)

Magnolia amazonica (Ducke) Govaerts
Bolivia, Brazil, Ecuador, Peru

Magnolia baillonii Pierre
Cambodia, China, India, Myanmar,
Thailand, Vietnam

Magnolia betongensis (Craib) H.Keng
Bhutan, China, India, Indonesia,
Malaysia, Nepal, Thailand

Magnolia biondii Pamp.
China



Magnolia biondii (Arboretum Wespelaar)

Magnolia campbellii Hook.f. &
Thomson

Bhutan, China, India, Myanmar, Nepal



Magnolia campbellii (Arboretum Wespelaar)

Magnolia carsonii Dandy ex Noot.
Indonesia, Malaysia, Thailand

Magnolia cathcartii (Hook.f. &
Thomson) Noot.
Bhutan, China, India, Myanmar,
Thailand, Vietnam

Magnolia cavaleriei (Finet & Gagnep.)
Figlar
China

Magnolia champaca (L.) Baill. ex Pierre
Bangladesh, Cambodia, China, India,
Indonesia, Lao People's Democratic
Republic, Malaysia, Myanmar, Nepal,
Thailand, Vietnam

Magnolia chapensis (Dandy) Sima
China, Vietnam

Magnolia citrata Noot. & Chalermglin
Thailand, Vietnam

Magnolia conifera (Dandy) V.S.Kumar
China, Vietnam

Magnolia dandyi Gagnep.
China, Lao People's Democratic
Republic, Vietnam



Magnolia dandyi (Weibang Sun)

Magnolia delavayi Franch.
China



Magnolia delavayi

Magnolia denudata Desr.
China



Magnolia denudata (Arboretum Wespelaar)

Magnolia equatorialis A.Vázquez
Ecuador, Peru



Magnolia equatorialis (Alvaro Perez)

Magnolia figo (Lour.) DC.
China, Republic of Korea



Magnolia figo (Arboretum Wespelaar)

Magnolia fordiana (Oliv.) Hu
China, Vietnam

Magnolia foveolata (Merr. ex Dandy)
Figlar
China, Vietnam

Magnolia fraseri Walter
United States



Magnolia fraseri (Arboretum Wespelaar)

Magnolia globosa Hook.f. & Thomson
Bhutan, China, India, Myanmar, Nepal



Magnolia globosa (Arboretum Wespelaar)

Magnolia grandiflora L.
United States



Magnolia grandiflora (Arboretum Wespelaar)

Magnolia guatemalensis Donn.Sm.
El Salvador, Guatemala, Honduras

Magnolia hodgsonii (Hook.f. &
Thomson) H.Keng
Bhutan, China, India, Myanmar, Nepal,
Thailand

Magnolia insignis Wall.
Cambodia, China, India, Lao People's
Democratic Republic, Myanmar, Nepal,
Thailand, Vietnam



Magnolia insignis (Philippe de Spoelberch)

Magnolia liliifera (L.) Baill.
Cambodia, China, India, Indonesia, Lao
People's Democratic Republic,
Malaysia, Papua New Guinea,
Philippines, Singapore, Thailand,
Vietnam

Magnolia macclurei (Dandy) Figlar
China, Vietnam

Magnolia macrophylla Michx.
United States



Magnolia macrophylla (Arboretum Wespelaar)

Magnolia martinii H.Lév.
China, Vietnam

Magnolia maudiae (Dunn) Figlar
China

Magnolia mediocris (Dandy) Figlar
Cambodia, China, Lao People's
Democratic Republic, Thailand, Vietnam

Magnolia oblonga (Wall. ex Hook.f. &
Thomson) Figlar
Bangladesh, India

Magnolia obovata Thunb.
Japan, Republic of Korea



Magnolia obovata (Arboretum Wespelaar)

Magnolia ovata (A.St.-Hil.) Spreng.
Brazil

Magnolia panamensis H.H.Iltis &
A.Vázquez
Costa Rica, Panama

Magnolia persuaveolens Dandy
Malaysia

Magnolia rimachii (Lozano) Govaerts
Bolivia, Brazil, Ecuador, Peru

Magnolia sabahensis (Dandy ex Noot.)
Figlar & Noot.
Malaysia

Magnolia salicifolia (Siebold & Zucc.)
Maxim.
Japan



Magnolia salicifolia (Arboretum Wespelaar)

Magnolia siamensis (Dandy) H.Keng
Malaysia, Thailand



Magnolia siamensis (Plyu Chalermglin)

Magnolia sieboldii K.Koch
China, Japan, Democratic People's
Republic of Korea, Republic of Korea



Magnolia sieboldii (Arboretum Wespelaar)

Magnolia sprengeri Pamp.
China



Magnolia sprengeri (Arboretum Wespelaar)

Magnolia sumatrana (Miq.) Figlar &
Noot.
Indonesia

Magnolia tripetala (L.) L.
United States



Magnolia tripetala (Arboretum Wespelaar)

Magnolia virginiana L.
Cuba, United States



Magnolia virginiana (Arboretum Wespelaar)

APPENDIX 1

Full list of evaluated Magnoliaceae species and the number of *ex situ* collections

Taxon Names	Authors	Red List Category	Red List Criteria	<i>Ex situ</i> Collections
<i>Liriodendron chinense</i>	(Hemsl.) Sarg.	NT		134
<i>Liriodendron tulipifera</i>	L.	LC		255
<i>Magnolia acuminata</i>	(L.) L.	LC		157
<i>Magnolia albosericata</i>	Chun & C.H.Tsoong	VU	D1+2	1
<i>Magnolia allenii</i>	Standl.	EN	B1ab(iii)	0
<i>Magnolia amazonica</i>	(Ducke) Govaerts	LC		0
<i>Magnolia amoena</i>	W.C.Cheng	VU	B1ab(iii,iv)	45
<i>Magnolia angatensis</i>	Blanco	DD		0
<i>Magnolia angustiblonga</i>	(Y.W.Law & Y.F.Wu) Figlar	EN	D	2
<i>Magnolia annamensis</i>	Dandy	VU	B1ab(iii,v)	0
<i>Magnolia arcuata</i>	(Lozano) Govaerts	EN	B1ab(ii,iii,v)	0
<i>Magnolia argyrorhiza</i>	(Lozano) Govaerts	EN	B1ab(i,ii,iii,v)+2ab(i,ii,iii,v)	0
<i>Magnolia aromatica</i>	(Dandy) V.S.Kumar	EN	C2a(i)	18
<i>Magnolia ashtonii</i>	Dandy ex Noot.	DD		0
<i>Magnolia atlantida</i>	A.Vázquez	DD		0
<i>Magnolia azulensis</i>	F.Arroyo	DD		0
<i>Magnolia baillonii</i>	Pierre	LC		10
<i>Magnolia balansae</i>	Aug.DC.	DD		10
<i>Magnolia banghamii</i>	(Noot.) Figlar & Noot.	DD		0
<i>Magnolia bankardiorum</i>	M.O.Dillon & Sánchez Vega	VU	B1ab(iii)	0
<i>Magnolia bawangensis</i>	Y.W.Law, R.Z.Zhou & D.M.Liu	DD		0
<i>Magnolia beccarii</i>	(Ridl.) ined.	DD		0
<i>Magnolia betongensis</i>	(Craib) H.Keng	LC		2
<i>Magnolia bidoupensis</i>	Q.N.Vu	EN	B1ab(iii)	0
<i>Magnolia bintuluensis</i>	(A.Agostini) Noot.	DD		0
<i>Magnolia biondii</i>	Pamp.	LC		58
<i>Magnolia blaoensis</i>	(Gagnep.) Dandy	VU	B1ab(iii)	0
<i>Magnolia boliviana</i>	(M.Nee) Govaerts	EN	B2ab(iii)	0
<i>Magnolia borneensis</i>	Noot.	NT		0
<i>Magnolia braianensis</i>	(Gagnep.) Figlar	DD		0
<i>Magnolia calimaensis</i>	(Lozano) Govaerts	CR	B1ab(i,ii,iii,v)	0
<i>Magnolia calophylla</i>	(Lozano) Govaerts	EN	B1ab(iii,v)	0
<i>Magnolia calophylloides</i>	Figlar & Noot.	DD		1
<i>Magnolia campbellii</i>	Hook.f. & Thomson	LC		103
<i>Magnolia canadeana</i>	F.Arroyo	CR	B1ab(iii)	0
<i>Magnolia cararensis</i>	(Lozano) Govaerts	CR	B1ab(iii,v)+2ab(iii,v)	0
<i>Magnolia caricifragrans</i>	(Lozano) Govaerts	EN	A2acd+4acd	1
<i>Magnolia carsonii</i>	Dandy ex Noot.	LC		0
<i>Magnolia cathcartii</i>	(Hook.f. & Thomson) Noot.	LC		9
<i>Magnolia cattienensis</i>	Q.N.Vu	EN	B1ab(iii); D	0
<i>Magnolia chevalieri</i>	(Finet & Gagnep.) Figlar	LC		20
<i>Magnolia caveana</i>	(Hook.f. & Thomson) D.C.S.Raju & M.P.Nayar	DD		2
<i>Magnolia cespidesii</i>	(Triana & Planch.) Govaerts	CR	B1ab(iii,v)	0
<i>Magnolia champaca</i>	(L.) Baill. ex Pierre	LC		65

Taxon Names	Authors	Red List Category	Red List Criteria	<i>Ex situ</i> Collections
<i>Magnolia championii</i>	Benth.	DD		4
<i>Magnolia changhungtana</i>	Noot.	DD		9
<i>Magnolia chapensis</i>	(Dandy) Sima	LC		26
<i>Magnolia chevalieri</i>	(Dandy) V.S.Kumar	DD		7
<i>Magnolia chimantensis</i>	Steyerm. & Maguire	CR	C2a(i); D	0
<i>Magnolia chiriquiensis</i>	A.Vázquez	DD		0
<i>Magnolia chocoensis</i>	(Lozano) Govaerts	EN	B1ab(iii,v)	0
<i>Magnolia citrata</i>	Noot. & Chalermglin	LC		0
<i>Magnolia clemensiorum</i>	Dandy	DD		0
<i>Magnolia cochranii</i>	A.Vázquez	EN	B1ab(iii)	0
<i>Magnolia coco</i>	(Lour.) DC.	DD		27
<i>Magnolia colombiana</i>	(Little) Govaerts	CR	B1ab(iii,v)	1
<i>Magnolia compressa</i>	Maxim.	DD		38
<i>Magnolia conifera</i>	(Dandy) V.S.Kumar	LC		17
<i>Magnolia coriacea</i>	(Hung T.Chang & B.L.Chen) Figlar	EN	B1ab(iii,v)	7
<i>Magnolia coronata</i>	M.Serna, C.Velásquez & Cogollo	CR	A2acd	0
<i>Magnolia costaricensis</i>	A.Vázquez	VU	B1ab(iii)	0
<i>Magnolia crassifolia</i>	F.Arroyo & Á.J.Pérez	CR	B1ab(iii)+2ab(iii); D	1
<i>Magnolia crassipes</i>	(Y.W.Law) V.S.Kumar	EN	B2ab(iii,v); C2a(ii)	6
<i>Magnolia cristalensis</i>	Bisse	EN	B1ab(iii,v)+2ab(iii,v)	0
<i>Magnolia cubensis</i>	Urb.	VU	B2ab(iii,v)	1
<i>Magnolia cylindrica</i>	E.H.Wilson	VU	B2ab(iii)	92
<i>Magnolia dandyi</i>	Gagnep.	LC		15
<i>Magnolia dawsoniana</i>	Rehder & E.H.Wilson	EN	B2ab(iii)	37
<i>Magnolia dealbata</i>	Zucc.	NT		25
<i>Magnolia decastroi</i>	A.Vázquez & Muñiz-Castro	EN	B1ab(iii)	0
<i>Magnolia decidua</i>	(Q.Y.Zheng) V.S.Kumar	EN	B1ab(iii,v)+2ab(iii,v); C2a(ii)	11
<i>Magnolia delavayi</i>	Franch.	LC		74
<i>Magnolia denudata</i>	Desr.	LC		145
<i>Magnolia dixonii</i>	(Little) Govaerts	CR	B1ab(iii,v)	0
<i>Magnolia dodecapetala</i>	(Lam.) Govaerts	VU	B1ab(iii)	0
<i>Magnolia doltsopa</i>	(Buch.-Ham. ex DC.) Figlar	DD		55
<i>Magnolia domingensis</i>	Urb.	CR	A2ac	0
<i>Magnolia duclouxii</i>	(Finet & Gagnep.) Hu	DD		5
<i>Magnolia duperreana</i>	Pierre	DD		1
<i>Magnolia ekmanii</i>	Urb.	CR	A2ac	0
<i>Magnolia elegans</i>	(Blume) H.Keng	DD		1
<i>Magnolia elegantifolia</i>	Noot.	DD		1
<i>Magnolia elfina</i>	A.Vázquez	DD		0
<i>Magnolia elliptigemma</i>	C.L.Guo & L.L.Huang	NT		0
<i>Magnolia emarginata</i>	Urb. & Ekman	CR	A2ac	0
<i>Magnolia equatorialis</i>	A.Vázquez	LC		0
<i>Magnolia ernestii</i>	Figlar	DD		37
<i>Magnolia espinalii</i>	(Lozano) Govaerts	CR	C2a(i); D	2
<i>Magnolia fansipanensis</i>	C.B.Callaghan & Png	CR	D	1

Taxon Names	Authors	Red List Category	Red List Criteria	Ex situ Collections
<i>Magnolia faustinomirandae</i>	A.Vázquez	CR	B1ab(iii)	0
<i>Magnolia tigrarii</i>	V.S.Kumar	NT		5
<i>Magnolia tigo</i>	(Lour.) DC.	LC		103
<i>Magnolia fistulosa</i>	(Finet & Gagnep.) Dandy	DD		2
<i>Magnolia flaviflora</i>	(Y.W.Law & Y.F.Wu) Figlar	NT		0
<i>Magnolia floribunda</i>	(Finet & Gagnep.) Figlar	DD		25
<i>Magnolia fordiana</i>	(Oliv.) Hu	LC		34
<i>Magnolia foveolata</i>	(Merr. ex Dandy) Figlar	LC		38
<i>Magnolia fraseri</i>	Walter	LC		53
<i>Magnolia fujianensis</i>	(Q.F.Zheng) Figlar	NT		1
<i>Magnolia fulva</i>	(Hung T.Chang & B.L.Chen) Figlar	DD		5
<i>Magnolia garrettii</i>	(Craib) V.S.Kumar	DD		12
<i>Magnolia gentryi</i>	A.Vázquez	EN	B1ab(iii); D	0
<i>Magnolia georgii</i>	(Lozano) Govaerts	EN	B1ab(ii,v)	0
<i>Magnolia gigantifolia</i>	(Miq.) Noot.	DD		2
<i>Magnolia gilbertoi</i>	(Lozano) Govaerts	EN	B1ab(ii,v)	2
<i>Magnolia globosa</i>	Hook.f. & Thomson	LC		26
<i>Magnolia gloriensis</i>	(Pittier) Govaerts	DD		0
<i>Magnolia grandiflora</i>	L.	LC		225
<i>Magnolia grandis</i>	(Hu & W.C.Cheng) V.S.Kumar	CR	B2ab(i,ii,iii,v); D	16
<i>Magnolia griffithii</i>	Hook.f. & Thomson	DD		0
<i>Magnolia guanacastensis</i>	A.Vázquez	EN	B1ab(iii)	0
<i>Magnolia guangdongensis</i>	(Y.H.Yan, Q.W.Zeng & F.W.Xing) Noot.	DD		3
<i>Magnolia guangxiensis</i>	(Y.W.Law & R.Z.Zhou) Sima	NT		5
<i>Magnolia guangzhouensis</i>	(A.Q.Dong, Q.W.Zeng & F.W.Xing) C.B.Callaghan & Png	DD		1
<i>Magnolia guatapensis</i>	(Lozano) Govaerts	EN	B1ab(ii,v)	0
<i>Magnolia guatemalensis</i>	Donn.Sm.	LC		8
<i>Magnolia guerrerensis</i>	J.Jiménez Ram., K.Vega & Cruz Durán	EN	B1ab(iii)	0
<i>Magnolia gustavii</i>	King	CR	C2a(i)	0
<i>Magnolia hamorii</i>	Howard	EN	B1ab(i,iii)	0
<i>Magnolia henaoui</i>	(Lozano) Govaerts	EN	B1ab(ii,v)+2ab(iii,v)	1
<i>Magnolia henryi</i>	Dunn	DD		7
<i>Magnolia hernandezii</i>	(Lozano) Govaerts	EN	A2cd	4
<i>Magnolia hodgsonii</i>	(Hook.f. & Thomson) H.Keng	LC		15
<i>Magnolia hongheensis</i>	(Y.M.Shui & W.H.Chen) V.S.Kumar	VU	B1ab(iii)	0
<i>Magnolia hookeri</i>	(Cubitt & W.W.Sm.) D.C.S.Raju & M.P.Nayar	DD		6
<i>Magnolia hypolampra</i>	(Dandy) Figlar	DD		7
<i>Magnolia itisiana</i>	A.Vázquez	VU	B1ab(ii,v)	0
<i>Magnolia inbioana</i>	A.Vázquez	EN	B1ab(iii)	0
<i>Magnolia insignis</i>	Wall.	LC		78
<i>Magnolia irwiniana</i>	(Lozano) Govaerts	EN	B1ab(iii)	0
<i>Magnolia iteophylla</i>	(C.Y.Wu ex Y.W.Law & Y.F.Wu) Noot	DD		0
<i>Magnolia jaenensis</i>	Marcelo-Peña	EN	B1ab(ii,v)	0
<i>Magnolia jaliscana</i>	A.Vázquez & R.Guzmán	EN	B1ab(ii,v)	0
<i>Magnolia jardinensis</i>	M.Serna, C.Velásquez & Cogollo	CR	C2a(i), D	1
<i>Magnolia juninensis</i>	F.Arroyo	EN	B1ab(ii,v)	0
<i>Magnolia kachirachirai</i>	(Kaneh. & Yamam.) Dandy	EN	B1ab(i,iii)	4

Taxon Names	Authors	Red List Category	Red List Criteria	Ex situ Collections
<i>Magnolia kaitui</i>	(Q.W.Zeng & X.M.Hu) C.B.Callaghan & Png	DD		0
<i>Magnolia katiorum</i>	(Lozano) Govaerts	CR	B1ab(iii,v)	1
<i>Magnolia kichuana</i>	A.Vázquez	EN	B1ab(iii)	0
<i>Magnolia kingii</i>	(Dandy) Figlar	DD		0
<i>Magnolia kisopa</i>	(Buch.-Ham. ex DC.) Figlar	DD		2
<i>Magnolia kobus</i>	DC.	DD		211
<i>Magnolia koordersiana</i>	(Noot.) Figlar	DD		0
<i>Magnolia krusei</i>	J.Jiménez Ram. & Cruz Durán	EN	B2ab(i,ii,iii)	0
<i>Magnolia kwangsiensis</i>	Figlar & Noot.	VU	B2ab(v)	4
<i>Magnolia kwangtungensis</i>	Merr.	DD		14
<i>Magnolia lacandonica</i>	A.Vázquez, Pérez-Farr. & Mart.-Camilo	CR	C2a(i)	0
<i>Magnolia lacei</i>	(W.W.Sm.) Figlar	EN	D	5
<i>Magnolia laevifolia</i>	(Y.W.Law & Y.F.Wu) Noot.	DD		67
<i>Magnolia lanuginosa</i>	(Wall.) Figlar & Noot.	DD		13
<i>Magnolia lanuginosoides</i>	Figlar & Noot.	DD		0
<i>Magnolia lasia</i>	Noot.	DD		0
<i>Magnolia lawii</i>	(N.H.Xia & W.F.Liao) C.B.Callaghan & Png	DD		0
<i>Magnolia lenticellata</i>	(Lozano) Govaerts	EN	B1ab(ii,v)	1
<i>Magnolia leveilleana</i>	(Dandy) Figlar	DD		2
<i>Magnolia liliifera</i>	(L.) Baill.	LC		20
<i>Magnolia liliiflora</i>	Desc.	DD		76
<i>Magnolia longipedunculata</i>	(Q.W.Zeng & Y.W.Law) V.S.Kumar	CR	D	1
<i>Magnolia lopezobradorii</i>	A.Vázquez	DD		0
<i>Magnolia lotungensis</i>	Chun & C.H.Tsoong	EN	A2a; C1	44
<i>Magnolia lozanoi</i>	A.Vázquez & Castro-Arce	DD		0
<i>Magnolia lucida</i>	(B.L.Chen & S.C.Yang) V.S.Kumar	EN	B1ab(iii)	2



Magnolia doltsopa (James Gaither)

Taxon Names	Authors	Red List Category	Red List Criteria	Ex situ Collections
<i>Magnolia macclurei</i>	(Dandy) Figlar	LC		20
<i>Magnolia macklottii</i>	(Korth.) Dandy	DD		0
<i>Magnolia macrocarpa</i>	(Zucc.) A.Vázquez & Castro-Arce	DD		0
<i>Magnolia macrophylla</i>	Michx.	LC		121
<i>Magnolia madiensis</i>	A.Vázquez	EN	B1ab(iii)	0
<i>Magnolia mahechae</i>	(Lozano) Govaerts	EN	B1ab(ii,v)	1
<i>Magnolia manguillo</i>	Marcelo-Peña & F.Arroyo	CR	B1ab(ii)+2ab(ii)	0
<i>Magnolia mannii</i>	(King) Figlar	VU	B1ab(i,iii)	0
<i>Magnolia mariusjacobsia</i>	Noot.	DD		0
<i>Magnolia martinii</i>	H.Lév.	LC		21
<i>Magnolia masticata</i>	(Dandy) Figlar	DD		0
<i>Magnolia maudiae</i>	(Dunn) Figlar	LC		52
<i>Magnolia mayae</i>	A.Vázquez & Pérez-Farr.	CR	C2a(i); D	0
<i>Magnolia mediocris</i>	(Dandy) Figlar	LC		3
<i>Magnolia mexicana</i>	DC.	VU	B1ab(ii,v)	3
<i>Magnolia minor</i>	(Urb.) Govaerts	VU	B1ab(ii,v)	0
<i>Magnolia mirifolia</i>	(D.L.Fu, T.B.Chao & Zhi X.Chen) Noot.	DD		0
<i>Magnolia montana</i>	(Blume) Figlar	DD		1
<i>Magnolia morii</i>	(Lozano) Govaerts	EN	B1ab(iii)	0
<i>Magnolia multinervia</i>	A.Vázquez	VU	D2	0
<i>Magnolia nana</i>	Dandy	EN	B1ab(iii)	0
<i>Magnolia narinensis</i>	(Lozano) Govaerts	CR	B1ab(i,iii)	0
<i>Magnolia neillii</i>	(Lozano) Govaerts	EN	B2ab(iii)	0
<i>Magnolia neomagnifolia</i>	I.M.Turner	EN	B1ab(ii,v)	0
<i>Magnolia nilagirica</i>	(Zenker) Figlar	VU	A2cd	1
<i>Magnolia nitida</i>	W.W.Sm.	VU	A2cd	32
<i>Magnolia nuevoleonensis</i>	A.Vázquez & Domínguez-Yescas	EN	B1ab(ii,iii)+2ab(ii,iii)	0
<i>Magnolia oaxacensis</i>	A.Vázquez	EN	B1ab(v)	0



Magnolia sargentiana (Arboretum Wespelaar)

Taxon Names	Authors	Red List Category	Red List Criteria	Ex situ Collections
<i>Magnolia oblonga</i>	(Wall. ex Hook.f. & Thomson) Figlar	LC		0
<i>Magnolia obovatifolia</i>	(C.Y.Wu & Y.W.Law) V.S.Kumar	NT		0
<i>Magnolia obovata</i>	Thunb.	LC	C1	137
<i>Magnolia odora</i>	(Chun) Figlar & Noot.	VU	D	20
<i>Magnolia odoratissima</i>	Y.W.Law & R.Z.Zhou	EN	B1ab(iii)	1
<i>Magnolia ofeliae</i>	A.Vázquez & Cuevas	CR	A2bd	0
<i>Magnolia officinalis</i>	Rehder & E.H.Wilson	EN	C2a(i)	78
<i>Magnolia omeiensis</i>	(W.C.Cheng) Dandy	CR		5
<i>Magnolia opipara</i>	(Hung T.Chang & B.L.Chen) Sima	DD		7
<i>Magnolia ovata</i>	(A.St.-Hil.) Spreng.	LC		2
<i>Magnolia ovoidea</i>	(Hung T.Chang & B.L.Chen) V.S.Kumar	CR	D	7
<i>Magnolia pacifica</i>	A.Vázquez	EN	B1ab(iii)	1
<i>Magnolia pahangensis</i>	Noot.	DD		0
<i>Magnolia palandana</i>	F.Arroyo	EN	B1ab(iii)	0
<i>Magnolia pallascens</i>	Urb. & Ekman	EN	B1ab(i,iii)+2ab(i,iii)	1
<i>Magnolia panamensis</i>	H.H.Iltis & A.Vázquez	LC		0
<i>Magnolia paranaensis</i>	A.Vázquez	DD		0
<i>Magnolia pastazaensis</i>	F.Arroyo & Á.J.Pérez	EN	B1ab(iii)	0
<i>Magnolia patungensis</i>	(Hu) Noot.	EN	C2a(i)	9
<i>Magnolia pealiana</i>	King	EN	B1ab(iii)	0
<i>Magnolia pedrazae</i>	A.Vázquez	EN	B1ab(iii)	0
<i>Magnolia perezfarrae</i>	A.Vázquez & Gómez-Domínguez	EN	B1ab(iii)	0
<i>Magnolia persuaveolens</i>	Dandy	LC		1
<i>Magnolia peruviana</i>	A.Vázquez	DD		0
<i>Magnolia philippinensis</i>	P.Parm.	DD		0
<i>Magnolia platyphylla</i>	(Merr.) Figlar & Noot.	DD		1
<i>Magnolia pleiocarpa</i>	(Dandy) Figlar & Noot.	CR	B1ab(i,iii)	0
<i>Magnolia poasana</i>	(Pittier) Dandy	NT		0
<i>Magnolia polyhypsophylla</i>	(Lozano) Govaerts	CR	B1ab(iii,v); C2a(i,ii); D	2
<i>Magnolia portoricensis</i>	Bello	EN	B1ab(iii,v)	0
<i>Magnolia praecalva</i>	(Dandy) Figlar & Noot.	DD		0
<i>Magnolia ptaritepuiana</i>	Steyerf.	DD		0
<i>Magnolia pterocarpa</i>	Roxb.	DD		1
<i>Magnolia pubescens</i>	(Merr.) Figlar & Noot.	DD		0
<i>Magnolia pugana</i>	(Iltis & A.Vázquez) A.Vázquez & Carvajal	EN	B1ab(iii)+2ab(iii)	1
<i>Magnolia punduana</i>	(Hook.f. & Thomson) Figlar	DD		0
<i>Magnolia quetzal</i>	A.Vázquez, Véliz & Tribouill.	EN	B1ab(iii,v)+2ab(iii,v)	0
<i>Magnolia rabaniana</i>	(Hook.f. & Thomson) D.C.S.Raju & M.P.Nayar	DD		1
<i>Magnolia rajaniana</i>	(Craib) Figlar	VU	B1ab(iii,v)	1
<i>Magnolia rimachii</i>	(Lozano) Govaerts	LC		0
<i>Magnolia rostrata</i>	W.W.Sm.	EN	B2ab(v)	25
<i>Magnolia rufibarbata</i>	(Dandy) V.S.Kumar	EN	B2ab(iii)	3
<i>Magnolia rzedowskiana</i>	A. Vázquez, Domínguez-Yescas & R. Pedraza	EN	B1ab(v)	0
<i>Magnolia sabahensis</i>	(Dandy ex Noot.) Figlar & Noot.	LC		1
<i>Magnolia salicifolia</i>	(Siebold & Zucc.) Maxim.	LC		94
<i>Magnolia sambuensis</i>	(Pittier) Govaerts	NT		9

Taxon Names	Authors	Red List Category	Red List Criteria	Ex situ Collections
<i>Magnolia sanchez-vegae</i>	Marcelo-Peña	CR	B1ab(iii)	0
<i>Magnolia santanderiana</i>	(Lozano) Govaerts	EN	B1ab(iii)	0
<i>Magnolia sapaensis</i>	(N.H.Xia & Q.N.Vu) Grimshaw & Macer	VU	D2	12
<i>Magnolia sarawakensis</i>	(A.Agostini) Noot.	DD		0
<i>Magnolia sargentiana</i>	Rehder & E.H.Wilson	VU	B2ab(ii,v)	66
<i>Magnolia savegrensis</i>	A.Vázquez	DD		0
<i>Magnolia schiedeana</i>	Schittl.	VU	B1ab(iii)	3
<i>Magnolia scortechinii</i>	(King) Figlar & Noot.	DD		0
<i>Magnolia sellowiana</i>	(A.St.-Hil.) Govaerts	DD		0
<i>Magnolia sharpii</i>	V.V.Miranda	EN	B1ab(ii,v)	7
<i>Magnolia shiluensis</i>	(Chun & Y.F.Wu) Figlar	EN	A2ac; B1ab(iii,v)	7
<i>Magnolia shuarorum</i>	F.Arroyo & A.Vázquez	EN	B1ab(ii)+2ab(iii)	0
<i>Magnolia siamensis</i>	(Dandy) H.Keng	LC		1
<i>Magnolia sieboldii</i>	K.Koch	LC		148
<i>Magnolia silvioi</i>	(Lozano) Govaerts	EN	B1ab(ii,v)	9
<i>Magnolia sinacacolinii</i>	A.Vázquez	DD		0
<i>Magnolia singaporensis</i>	(Ridl.) H.Keng	DD		0
<i>Magnolia sinica</i>	(Y.W.Law) Noot.	CR	D	9
<i>Magnolia sinostellata</i>	P.L.Chiu & Z.H.Chen	EN	B1ab(ii,v)	4
<i>Magnolia sirindhorniae</i>	Noot. & Chalermglin	EN	B2ab(iii)	3
<i>Magnolia sororum</i>	Seibert	NT		0
<i>Magnolia sphaerantha</i>	(C.Y.Wu ex Y.W.Law & Y.F.Wu) Sima	DD		12
<i>Magnolia splendens</i>	Urb.	EN	B1ab(ii,v)+2ab(iii,v)	0
<i>Magnolia sprengeri</i>	Pamp.	LC		75
<i>Magnolia stellata</i>	(Siebold & Zucc.) Maxim.	EN	B1ab(ii,v)	206
<i>Magnolia steyermarkii</i>	A.Vázquez	DD		0
<i>Magnolia striatifolia</i>	Little	EN	B1ab(ii,v)	1
<i>Magnolia sulawesiana</i>	Brambach, Noot. & Culmsee	EN	B1ab(iii)	0
<i>Magnolia sumatrae</i>	(Dandy) Figlar & Noot.	DD		0
<i>Magnolia sumatrana</i>	(Miq.) Figlar & Noot.	LC		7
<i>Magnolia talamancana</i>	A.Vázquez	VU	D2	0
<i>Magnolia tamaulipana</i>	A.Vázquez	EN	B1ab(iii)	15
<i>Magnolia tarahumara</i>	(A.Vázquez) A.Vázquez	DD		0
<i>Magnolia thailandica</i>	Noot. & Chalermglin	VU	B1ab(ii,v)	0
<i>Magnolia tiepii</i>	V.T.Tran & Duy	CR	B1ab(iii)	0
<i>Magnolia tripetala</i>	(L.) L.	LC		159
<i>Magnolia tsiampacca</i>	(L.) Figlar & Noot.	DD		0
<i>Magnolia urraoensis</i>	(Lozano) Govaerts	EN	B1ab(ii,v)+2ab(iii,v)	1
<i>Magnolia utilis</i>	(Dandy) V.S.Kumar	DD		1
<i>Magnolia vallartensis</i>	A.Vázquez & Muñiz-Castro	CR	B1ab(iii)	0
<i>Magnolia vargasiana</i>	A.Vázquez & D.A.Neill	DD		0
<i>Magnolia vazquezii</i>	Cruz Durán & K.Vega	EN	B1ab(iii)	0
<i>Magnolia venezuelensis</i>	(Lozano) Govaerts	DD		0
<i>Magnolia ventii</i>	(N.V.Tiep) V.S.Kumar	EN	B1ab(iii); D	2
<i>Magnolia villosa</i>	(Miq.) H.Keng	DD		0
<i>Magnolia virginiana</i>	L.	LC		152
<i>Magnolia viridipetala</i>	(Y.W.Law, R.Z.Zhou & Q.F.Yi) C.B.Callaghan & Png	EN	D	0
<i>Magnolia virolinensis</i>	(Lozano) Govaerts	CR	B1ab(ii,v)	0

Taxon Names	Authors	Red List Category	Red List Criteria	Ex situ Collections
<i>Magnolia vovidesii</i>	A.Vázquez, Domínguez-Yescas & L. Carvajal	EN	B1ab(iii,v)	0
<i>Magnolia vrieseana</i>	(Miq.) Baill. ex Pierre	DD		1
<i>Magnolia wendtii</i>	A.Vázquez	CR	B1ab(iii)	0
<i>Magnolia wetteri</i>	A.Vázquez	EN	B1ab(iii)	0
<i>Magnolia wilsonii</i>	(Finet & Gagnep.) Rehder	NT		111
<i>Magnolia wolfii</i>	(Lozano) Govaerts	CR	B1ab(iii)+2ab(iii); D	2
<i>Magnolia xanthantha</i>	(C.Y.Wu ex Y.W.Law & Y.F.Wu) Figlar	EN	B1ab(iii)	4
<i>Magnolia xiana</i>	Noot.	DD		0
<i>Magnolia xianianhei</i>	(Q.N.Vu) C.B.Callaghan & Png	DD		0
<i>Magnolia xinganensis</i>	Noot.	DD		2
<i>Magnolia yantzazana</i>	F.Arroyo	EN	B1ab(iii)	0
<i>Magnolia yarumalensis</i>	(Lozano) Govaerts	EN	A2acd; B2ab(ii,v)	2
<i>Magnolia yoroconite</i>	Dandy	VU	A2c	0
<i>Magnolia yunnanensis</i>	(Hu) Noot.	DD		28
<i>Magnolia yuyuanensis</i>	(Y.W.Law) V.S.Kumar	DD		17
<i>Magnolia zamorana</i>	F.Arroyo	DD		0
<i>Magnolia zamudioi</i>	A.Vázquez	DD		0
<i>Magnolia zenii</i>	W.C.Cheng	CR	D	61
<i>Magnolia zhengyiana</i>	(N.H. Xia) Noot.	DD		0
<i>Magnolia zoquepopolucae</i>	A.Vázquez	DD		0



Magnolia fraseri (Arboretum Wespelaar)

APPENDIX 2

Magnoliaceae species richness per country

Country	CR	EN	VU	NT	DD	LC	Total
Bangladesh					3	2	5
Belize			1				1
Bhutan					5	5	10
Bolivia		2				2	4
Brazil		1			2	3	6
Brunei Darussalam					1		1
Cambodia					5	5	10
Canada						2	2
China	6	19	8	8	42	25	108
Colombia	13	19		1			33
Costa Rica		3	3	2	2	1	11
Cuba		1	2				3
Dominica			1				1
Dominican Republic	1	2					3
Ecuador	3	8	1		3	3	18
El Salvador						1	1
Guadeloupe			1				1
Guatemala	1	2	1		1	1	6
Haiti	3						3
Honduras		1	1		1	1	4
Hong Kong					1		1
India	2	1	2		10	10	25
Indonesia		1		1	21	5	28
Japan		1			2	3	6
Korea, Democratic People's Republic of						1	1
Korea, Republic of					1	3	4
Lao People's Democratic Republic			1		7	5	13
Malaysia				1	17	7	25
Martinique			1				1
Mexico	6	13	4	1	6		30
Myanmar	1	1	1		10	7	20
Nepal					4	6	10
Nicaragua				1	1		2
Panama		2		3	2	1	8
Papua New Guinea					1	1	2
Peru	2	4	1		3	3	13
Philippines				1	5	1	7
Puerto Rico		2					2
Saint Vincent and the Grenadines			1				1
Singapore					2	1	3
Sri Lanka			1				1
Taiwan		1			2		3
Thailand	1	1	2		12	11	27
Trinidad and Tobago			1				1
United States						7	7
Venezuela	1				2		3
Vietnam	2	7	5	1	16	14	45
Total	42	92	39	20	190	137	520

APPENDIX 3

Additional Magnoliaceae taxa (not included in analysis)

A) Intraspecific taxa

<i>Magnolia carsonii</i> var. <i>carsonii</i>	LC	
<i>Magnolia cubensis</i> ssp. <i>acunae</i>	CR	C2a(i)
<i>Magnolia cubensis</i> ssp. <i>cacuminicola</i>	EN	B1ab(ii,iii,v)+2ab(ii,iii,v)
<i>Magnolia cubensis</i> ssp. <i>cubensis</i>	EN	B1ab(iii,v)+2ab(iii,v); C2a(i); D
<i>Magnolia cubensis</i> ssp. <i>turquinensis</i>	EN	B1ab(iii,v)+2ab(iii,v)
<i>Magnolia guatemalensis</i> ssp. <i>guatemalensis</i>	VU	B1ab(iii)
<i>Magnolia guatemalensis</i> ssp. <i>hondurensis</i>	VU	B1ab(iii,v)+2ab(iii,v)
<i>Magnolia persuaveolens</i> ssp. <i>rigida</i>	LC	
<i>Magnolia sororum</i> ssp. <i>lutea</i>	VU	B1ab(iii)
<i>Magnolia sororum</i> ssp. <i>sorum</i>	VU	B1ab(iii)+2ab(iii)
<i>Magnolia virginiana</i> ssp. <i>oviedoae</i>	CR	B1ab(iii)

B) Not evaluated species

<i>Magnolia carnosae</i> (D.L.Fu & D.L.Zhang) C.B.Callaghan & Png
<i>Magnolia dabieshanensis</i> (T.B.Chao, Z.X.Chen & H.T.Dai) C.B.Callaghan & Png
<i>Magnolia dimorpha</i> (T.B.Chao & Z.X.Chen) C.B.Callaghan & Png
<i>Magnolia fragarigynandria</i> (T.B.Chao, Z.X.Chen & H.T.Dai) C.B.Callaghan & Png
<i>Magnolia jianfenglingensis</i> (G.A.Fu & Kun Pan) C.B.Callaghan & Png
<i>Magnolia shirenschanensis</i> (D.L.Fu & T.B.Chao) C.B.Callaghan & Png
<i>Magnolia shizhenii</i> (D.L.Fu & F.W.Li) C.B.Callaghan & Png
<i>Magnolia wuzhishangensis</i> (G.A.Fu & Kun Pan) C.B.Callaghan & Png
<i>Magnolia xinyangensis</i> (T.B.Chao, Z.X.Chen & H.T.Dai) C.B.Callaghan & Png
<i>Magnolia lamdongensis</i> V.T.Tran, Duy & N.H.Xia

APPENDIX 4

Participating institutions

Adkins Arboretum; Amani Botanical Garden; Annapolis Royal Historic Gardens; Antony; Antony Woodland Garden; Arboreto di Arco - Parco Arciduciale; Arboretum at Kutztown University; Arboretum at Penn State, The; Arboretum at the University of California, Santa Cruz; Arboretum Freiburg-Günterstal; Arboretum Groenendaal - Flemish Forest Department - Houtvesterij Groenendaal; Arboretum Kirchberg; Arboretum Mustila; Arboretum of Guizhou Institute of Forestry Science; Arboretum of Jiangxi Institute of Forestry Science; Arboretum of Nanjing Forestry University; Arboretum of The Barnes Foundation; Arboretum of Wuhan University; Arboretum Oudenbosch; Arboretum Střední lesnické školy; Arboretum Waasland; Arboretum Wespelaar; Arnold Arboretum of Harvard University, The; Asociación Jardín Botánico La Laguna; Atlanta Botanical Garden; Auckland Botanic Gardens; Aullwood Garden MetroPark; Baker Arboretum; Bamboo Brook Outdoor Education Center; Bangladesh Agricultural University Botanic Garden; Baoji Botanical Garden (Shaanxi); Barrington Court; Bartlett Tree Research Laboratories Arboretum; Batsford Arboretum; Batumi Botanical Garden; Bayard Cutting Arboretum; Bedgebury National Pinetum & Forest; Beijing Medicinal Garden; Belmonte Arboretum; Belton House; Bendigo Botanic Gardens, White Hills; Benmore Botanic Garden; Berkshire Botanical Garden; Berrington Hall; Bibliotheque Centrale; Bickelhaupt Arboretum; Birmingham Botanical Gardens and Glasshouses; Birr Castle Demesne; Bishop Museum - Checklist of Cultivated Plants of Hawai'i; Blickling Hall; Blue Mountains Botanic Garden, Mount Tomah; Bok Tower Gardens; Bokrijk Arboretum; Boone County Arboretum; Botanic Garden Meise; Botanic Garden of Poltava National Pedagogical University; Botanic Garden of Rostock University; Botanic Garden of Smith College, The; Botanic Garden, Delft University of Technology; Botanic Gardens of Adelaide; Botanical Garden - Center of Ecological and Astronomy Education of SBPEI Vorobiev Gory; Botanical Garden - Institute of the Volga State Technological University; Botanical Garden of Pyatigorsk State Pharmaceutical Academy; Botanical Garden of Tartu University; Botanical Garden of the Anhui Institute of Biology; Botanical Garden of the V.L. Komarov Botanical Institute; Botanical Garden of Vilnius University; Botanical Garden University of Duesseldorf; Botanical Garden, Natural History Museum of Denmark; Botanical Garden-Institute, Ufa Research Center; Botanical Gardens and Museum of Oulu University; Botanische Gärten der Universität Bonn; Botanische Tuin Groningen Domies Toen; Botanischer Garten der Carl von Ossietzky-Universität Oldenburg; Botanischer Garten der Friedrich-Schiller-Universität; Botanischer Garten der J.W. Goethe-Universität; Botanischer Garten der Justus-Liebig Universität Giessen; Botanischer Garten der Philipps-Universität Marburg; Botanischer Garten der Ruhr-Universität Bochum; Botanischer Garten der Technischen Universität Darmstadt; Botanischer Garten der Technischen Universität Dresden; Botanischer Garten der Universität des Saarlandes; Botanischer Garten der Universität Freiburg; Botanischer Garten der Universität Kiel; Botanischer Garten der Universität Osnabrück; Botanischer Garten der Universität Ulm; Botanischer Garten und Botanisches Museum Berlin-Dahlem; Botanischer Versuchs- und Lehrgarten; Bowman's Hill Wildflower Preserve; Brenton Arboretum, The; Brisbane Botanic Gardens; Brooklyn Botanic Garden; Brookside Gardens; Buckland Abbey; Bukavu Arboretum/Garden; Bundaberg Botanic Gardens; C. M. Goethe Arboretum; Caerhays Castle National Collection; Cambridge University Botanic Garden; Cape Fear Botanical Garden; Castle Drogo; Catalogue of Medicinal Plants of Ukrainian Botanic Gardens and Parks; Catalogue of Rare Plants of Bogor Botanic Gardens; Center for Plant Conservation (USA); Chanticleer Foundation; Charles R. Keith Arboretum, The; Chester M. Alter Arboretum; Chicago Botanic Garden; Cincinnati Zoo and Botanical Gardens; City of Leeds Botanic Gardens; City of Liverpool Botanic Gardens; Cleveland Botanical Garden; Coastal Maine Botanical Gardens; Columbus Botanical

Garden; Connecticut College Arboretum; Conservatoire Botanique National du Brest; Conservatoire Botanique Pierre Fabre; Conservatoire et Jardins botaniques de la Ville de Genève; Conservatoire et Jardins Botaniques de Nancy; Cooktown Botanic Gardens; Core Facility Botanical Garden; Cornell Plantations; Cotehele; Crosby Arboretum, The; Cuc Phuong Botanic Garden; Dartington Hall; Darwin Botanic Gardens; Dashushan Botanical Garden; Davidson College Arboretum; Dawes Arboretum, The; Dawyck Botanic Garden; Dendrological garden of the Silva Tarouca Research Institute for Landscape and Ornamental Gardening; Denver Botanic Gardens; Dinghushan National Nature Reserve; Dixon Gallery and Gardens, The; Dokmai Botanical Garden; Dominion Arboretum and Central Experimental Farm; Donald E. Davis Arboretum; Dongfeng Forest Farm (Guizhou); Dow Gardens; Dr. P. Font i Quer Arboretum of Lleida Botanic Garden; Dr. Sun Yat-Sen Classical Chinese Garden; Duke Farms; Dunedin Botanic Garden; Dunster Castle; DuPage Forest: Forest Preserve District of DuPage County; Dyffryn Gardens; Dyrham Park; Ecojardin del CIEco; Eden Project, The; Edison and Ford Winter Estates; EEB Plant Growth Facilities; Elisabeth C. Miller Botanical Garden; Emeishan Botanical Garden; Emmetts Garden; Eötvös Loránd University Botanic Garden; Fairchild Tropical Botanic Garden; Fellows Riverside Gardens; Fernwood Botanical Garden and Nature Preserve; Florida Botanical Gardens; Foellinger-Freimann Botanical Conservatory; Forstbotanischer Garten der Technischen Universität Dresden; Forstbotanischer Garten Eberswalde; Forstbotanischer Garten und Arboretum; Fort Worth Botanic Garden; Fossil Plants; FossilPlants; Frederik Meijer Gardens & Sculpture Park; Frelinghuysen Arboretum; Fruit Spirit Botanical Garden; Gainesway Farm; Ganna Walska Lotusland; Gannan Arboretum of Jiangxi; Gardens at SIUE, The; Gardens of Fanshawe College and A.M. Cuddy Gardens; Gardens of the Big Bend: Magnolia Garden; Garvan Woodland Gardens; Ghent University Botanic Garden; Giardino Botanico Friuli Cormor; Gibraltar Botanic Gardens; Glasgow Botanic Gardens; Glendurgan Garden; Gore Public Gardens; Government College (Lahore) University Botanic Garden (GCBG); Gradina Agrobotanica din Cluj-Napoca; Grapevine Botanical Gardens at Heritage Park; Green Bay Botanical Garden; Green Spring Gardens; Greenway; Greenwood Gardens; Grugapark und Botanischer Garten der Stadt Essen; Guangxi Botanical Garden of Medicinal Plants; Guangxi Institute of Botany; Guilin Botanical Garden; Hangzhou Botanical Garden; Helsinki University Botanic Garden; Henry Foundation for Botanical Research, The; Henry Schmieler Arboretum; Hershey Gardens; Hidcote Manor Garden; Hidden Lake Gardens; Hinton Arboretum; Historische Tuin Aalsmeer; Hof ter Saksen Arboretum; Holden Arboretum, The; Honolulu Botanical Gardens System; Hortus Botanicus Amsterdam; Hortus Botanicus Reykjavikensis; Hoyt Arboretum; Huay Kaew Arboretum; Hunan Forest Botanical Garden; Hunan Nanyue Arboretum; Huntington Botanical Gardens; Huntington Botanical Gardens - Seed Bank; Huntsville Botanical Garden; Incheon Arboretum; Institute of Botany, Chinese Academy of Sciences; Istituto e Orto Botanico dell'Università di Pavia; Jade Garden Natural Arboretum; Jangheung Natural Arboretum; Jardí Botànic de la Universitat de València; Jardí Botànic de Soller; Jardim Botânico da Ajuda; Jardim Botânico da Madeira; Jardim Botânico da Universidade de Coimbra; Jardim Botânico da Universidade de Lisboa; Jardim Botânico da Universidade de Trás-os-Montes e Alto Douro; Jardim Botânico da Universidade do Porto; Jardim Botânico Tropical; Jardín Botánico Atlántico de Gijón; Jardín Botánico Benjamin F. Johnston; Jardín Botánico Carlos Thays; Jardín Botánico Cecon; Jardín Botánico Culiacán; Jardín Botánico de Bahía Blanca; Jardín Botánico de la Facultad de Estudios Superiores; Jardín Botánico de Medellín; Jardín Botánico de Quindío; Jardín Botánico del Instituto de Biología (UNAM); Jardín Botánico Dr. Faustino Miranda; Jardín Botánico Eloy Valenzuela; Jardín Botánico Francisco Javier Clavijero; Jardín Botánico Guillermo Piñeres; Jardín Botánico Joaquín Antonio Uribe;

Jardín Botánico José Celestino Mutis; Jardín Botánico Juan María Cespedes; Jardín Botánico Lucien Hauman; Jardín Botánico Nacional; Jardín Botánico Universidad de Caldas; Jardín Botánico Universidad Tecnológica de Pereira; Jardín Botanique Camifolia; Jardín Botanique Alpin de la Jaÿsinia; Jardín Botanique de la Ville de Caen; Jardín Botanique de la Ville de Lyon; Jardín Botanique de l'Université de Strasbourg; Jardín Botanique de Marnay sur Seine; Jardín botanique de Paris; Jardín Botanique et Arboretum Henri Gaussien; Jardín Botanique Exotique Val Rahmeh; Jardín Botanique Yves Rocher; Jardín des Plantes de Paris et Arboretum de Chevreloup; Jardín Etnobotánico - Francisco Pelaez R.; Jardín Hidrobotánico Jose Ignacio Hernández Camacho; Jardín des Plantes de l'Université; JC Raulston Arboretum; Jeju Botanical Garden, Yeomiji; Jerusalem Botanical Gardens; John C. Gifford Arboretum; Kalmthout Arboretum; Keum Kang Arboretum; Killerton; Kings Park and Botanic Garden; Knightsayes; Korea Botanic Garden; Kunming Botanical Garden; Kurpark Bad Bellingen; Landis Arboretum; Lanhydrock; Lauritzen Gardens; Les Jardins Suspendus; Leuven Botanic Garden; Lewis Ginter Botanical Garden; Limbe Botanic Garden; Lincoln Park Conservatory; Living Desert Zoo and Gardens; Ljubljana University Botanic Garden; Logan Botanic Garden; Longwood Gardens; Los Angeles County Arboretum and Botanic Garden; Lushan Botanical Garden; M.M. Gryshko National Botanical Garden; Magnolia Multi-site Collection - North American Plant Collections Consortium (NAPCC); Magnolian Grove Arboretum; Maijishan Arboretum (Gansu); Main Botanical Garden, Russian Academy of Sciences; Malabar Botanical Garden and Institute of Plant Sciences; Maribor University Botanic Garden; Marie Selby Botanical Gardens; Marjorie McNeely Conservatory at Como Park; Matthaei Botanical Gardens & Nichols Arboretum; Maymont Foundation; Mead Botanical Garden; Meadowlark Botanical Gardens; Memorial University Botanical Garden; Memphis Botanic Garden; Mendocino Coast Botanical Gardens; Mercer Botanic Gardens; Millennium Seed Bank; Milner Gardens and Woodland; Minnesota Landscape Arboretum; Missouri Botanical Garden; Missouri State Arboretum; Mitchell Park Horticultural Conservatory (The Domes); Mly?any Arboretum SAS; Montreal Botanical Garden / Jardín botanique de Montréal; Moore Farms Botanical Garden; Morris Arboretum, The; Morton Arboretum, The; Moscow State University Botanical Garden; Mount Auburn Cemetery; Mount Lofty Botanic Garden; Mount Usher Gardens; Mountain Top Arboretum; Mt. Cuba Center; Museo Orto Botanico di Roma; Museum of Life + Science Magic Wings Butterfly House; Nanjing Botanical Garden Mem. Sun Yat-sen; Nanjing Botanical Garden of Medicinal Plants; Naples Botanical Garden; National Arboretum Canberra; National Botanic Garden of Latvia; National Botanic Garden of Wales; National Botanic Gardens, Glasnevin; National Kandawgyi Botanical Gardens (Maymyo Botanical Garden); National Plant Germplasm System - USDA-ARS-NGRL; National Rhododendron Garden; National Tropical Botanical Garden; Nebraska Statewide Arboretum; Neuer Botanischer Garten der Universität Göttingen; New Brunswick Botanical Garden; New England Wild Flower Society - Garden in the Woods; New York Botanical Garden, The; Niagara Parks Botanical Gardens and School of Horticulture, The; Norfolk Botanical Garden; North Carolina Arboretum, The; North Carolina Botanical Garden; Northwestern University Ecotourism Park and Botanic Gardens; Novosibirsk Dendropark; Nymans; Nyugat-Magyarországi Egyetem, Botanikus Kert; Oekologisch-Botanischer Garten Universitaet Bayreuth; Oklahoma City Zoo and Botanical Gardens; Orto Botanico - Università degli Studi di Catania; Orto Botanico "Carmela Cortini" - Università di Camerino; Orto Botanico dell'Università di Ferrara; Orto Botanico di Bergamo Lorenzo Rota; Orto Botanico di Perugia; Orto Botanico Giardino dei Semplici; Orto Botanico Università degli Studi di Padova; Oxford University Botanic Garden; Paignton Zoo Environmental Park; Palacky University Botanic Garden; Palmengarten der Stadt Frankfurt am Main; Parco Botanico del Cantone

Ticino.; Parque Botânico da Tapada da Ajuda; Patterson Garden Arboretum; Penrhyn Castle; Plas Newydd; Polly Hill Arboretum, The; Pukeiti Garden; Pukekura Park; Purdue Arboretum, The; Pyunggang Botanical Garden; Quarryhill Botanical Garden; Queens Botanical Garden; Reading Public Museum and Arboretum, The; Real Jardín Botánico Juan Carlos I; Red Butte Garden and Arboretum; Reiman Gardens; Research Institute of Subtropical Forestry (Zhejiang); Reserva Natural El Refugio; Rimba Ilmu Botanic Garden; Ringve Botanical Garden; Rio Grande Botanic Garden; Riverview Horticultural Centre Society, The; Rogów Arboretum of Warsaw University of Life Sciences; Rotterdam Zoological and Botanical Gardens; Rowallane Garden; Royal Botanic Garden Edinburgh; Royal Botanic Gardens Kew (Wakehurst); Royal Botanic Gardens Sydney; Royal Botanic Gardens, Kew; Royal Botanic Gardens, Victoria - Melbourne Gardens; Royal Botanical Gardens, Ontario; Royal Horticultural Society's Garden, Harlow Carr; Royal Horticultural Society's Garden, Hyde Hall; Royal Horticultural Society's Garden, Rosemoor; Royal Horticultural Society's Garden, Wisley; Royal Roads University Botanical Gardens; Royal Tasmanian Botanical Gardens; Royal Veterinary and Agricultural University Arboretum; Sakhalin Botanical Garden; Saltram; San Diego Botanic Garden; San Diego Zoo Botanical Gardens; San Francisco Botanical Garden; Sarah P. Duke Gardens; Sarius Palmetum and Botanical Garden; Scotney Castle; Scott Arboretum of Swarthmore College, The; Seeds of Success (SOS); Sentier de Decouverte; Shanghai Botanical Garden; Shanghai Chenshan Botanical Garden; Sheffield Botanical Gardens; Shenzhen Fairy Lake Botanical Garden; Sherwood; Sherwood Fox Arboretum; Singapore Botanic Gardens; Sissinghurst Castle Garden; Sister Mary Grace Burns Arboretum; Smith-Gilbert Gardens; Smithsonian National Zoological Park; South China Botanical Garden, CAS; Spartanburg Community College Arboretum; Spring Grove Cemetery and Arboretum; St. Andrews Botanic Garden; St. Kilda Botanic Garden; State Arboretum of Virginia (Orland E. White Arboretum); State Botanical Garden of Georgia, The; Stavanger Botanic Garden; Stellenbosch University Botanical Garden; Stichting Botanische Tuin Kerkrade; Stourhead; Swansea Botanical Complex; Taltree Arboretum & Gardens; Tasmanian Arboretum Inc; Tatton Garden Society/Quinta Arboretum; Tatton Park; The B.M. Kozo-Polyansky Botanical Garden of Voronezh State University; The Cairns Botanic Gardens; The Sir Harold Hillier Gardens; The Tree Register of the British Isles; The University of Guelph Arboretum; Timaru Botanic Garden; Toledo Botanical Garden; Toronto Botanical Garden; Toronto Zoo; Townsville Botanic Gardens; Trees Atlanta; Tregothnan Estate; Treilissick Garden; Trompenburg Gardens & Arboretum; Trsteno Arboretum; Tyler Arboretum; Tyntesfield; UC Davis Arboretum; Ukrainian National Forestry University Botanic Garden; United States Botanic Garden; United States National Arboretum; University of British Columbia Botanical Garden; University of California Botanical Garden at Berkeley; University of Delaware Botanic Gardens; University of Dundee Botanic Garden; University of Idaho Arboretum & Botanical Garden; University of Oslo Botanic Garden; University of Uppsala Botanic Garden; University of Washington Botanic Gardens; Utrecht University Botanic Gardens; Vanderbilt University Arboretum; VanDusen Botanical Garden; W. J. Beal Botanical Garden; Waimea Valley Arboretum and Botanical Garden; Wallington; Wellington Botanic Garden; Wentworth Castle Gardens; Westonbirt, The National Arboretum; Willowood Arboretum; Winkworth Arboretum; Wuhan Botanical Garden; Xiamen Botanical Garden; Xi'an Botanical Garden; Xiashi Arboretum; Xishuangbanna Tropical Botanical Garden, CAS; Yew Dell Botanical Gardens; Zoological and Botanical Garden of the Plzen Town (Zoologicka a Botanicka zahrada mesta Plzne).

ANNEX 5

IUCN RED LIST CATEGORIES AND CRITERIA

EXTINCT (EX)

A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time-frame appropriate to the taxon's life cycle and life form.

EXTINCT IN THE WILD (EW)

A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time-frame appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.

ENDANGERED (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.

VULNERABLE (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild.

NEAR THREATENED (NT)

A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

LEAST CONCERN (LC)

A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

DATA DEFICIENT (DD)

A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

NOT EVALUATED (NE)

A taxon is Not Evaluated when it has not yet been evaluated against the criteria.

THE CRITERIA FOR CRITICALLY ENDANGERED, ENDANGERED AND VULNERABLE

CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing an extremely high risk of extinction in the wild:

- A. Reduction in population size based on any of the following:
 1. An observed, estimated, inferred or suspected population size reduction of $\geq 90\%$ over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
 - (a) direct observation
 - (b) an index of abundance appropriate to the taxon
 - (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
 - (d) actual or potential levels of exploitation
 - (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.
 2. An observed, estimated, inferred or suspected population size reduction of $\geq 80\%$ over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may

not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

3. A population size reduction of $\geq 80\%$, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
4. An observed, estimated, inferred, projected or suspected population size reduction of $\geq 80\%$ over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 100 km², and estimates indicating at least two of a-c:
 - a. Severely fragmented or known to exist at only a single location.
 - b. Continuing decline, observed, inferred or projected, in any of the following:
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) area, extent and/or quality of habitat
 - (iv) number of locations or subpopulations
 - (v) number of mature individuals.
 - c. Extreme fluctuations in any of the following:
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) number of locations or subpopulations
 - (iv) number of mature individuals.
2. Area of occupancy estimated to be less than 10 km², and estimates indicating at least two of a-c:
 - a. Severely fragmented or known to exist at only a single location.
 - b. Continuing decline, observed, inferred or projected, in any of the following:
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) area, extent and/or quality of habitat
 - (iv) number of locations or subpopulations
 - (v) number of mature individuals.

- c. Extreme fluctuations in any of the following:
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) number of locations or subpopulations
 - (iv) number of mature individuals.

C. Population size estimated to number fewer than 250 mature individuals and either:

1. An estimated continuing decline of at least 25% within three years or one generation, whichever is longer, (up to a maximum of 100 years in the future) OR
2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):
 - (a) Population structure in the form of one of the following:
 - (i) no subpopulation estimated to contain more than 50 mature individuals, OR
 - (ii) at least 90% of mature individuals in one subpopulation.
 - (b) Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 50 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or three generations, whichever is the longer (up to a maximum of 100 years).

ENDANGERED (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a very high risk of extinction in the wild:

- A. Reduction in population size based on any of the following:
 1. An observed, estimated, inferred or suspected population size reduction of $\geq 70\%$ over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
 - (a) direct observation
 - (b) an index of abundance appropriate to the taxon
 - (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
 - (d) actual or potential levels of exploitation
 - (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2. An observed, estimated, inferred or suspected population size reduction of $\geq 50\%$ over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
 - (ii) area of occupancy
 - (iii) area, extent and/or quality of habitat
 - (iv) number of locations or subpopulations
 - (v) number of mature individuals.
 3. A population size reduction of $\geq 50\%$, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) number of locations or subpopulations
 - (iv) number of mature individuals.
 4. An observed, estimated, inferred, projected or suspected population size reduction of $\geq 50\%$ over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, AND where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) number of locations or subpopulations
 - (iv) number of mature individuals.
- B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:
1. Extent of occurrence estimated to be less than 5000 km², and estimates indicating at least two of a-c:
 - a. Severely fragmented or known to exist at no more than five locations.
 - b. Continuing decline, observed, inferred or projected, in any of the following:
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) area, extent and/or quality of habitat
 - (iv) number of locations or subpopulations
 - (v) number of mature individuals.
 - c. Extreme fluctuations in any of the following:
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) number of locations or subpopulations
 - (iv) number of mature individuals.
 2. Area of occupancy estimated to be less than 500 km², and estimates indicating at least two of a-c:
 - a. Severely fragmented or known to exist at no more than five locations.
 - b. Continuing decline, observed, inferred or projected, in any of the following:
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) number of locations or subpopulations
 - (iv) number of mature individuals.
- C. Population size estimated to number fewer than 2500 mature individuals and either:
1. An estimated continuing decline of at least 20% within five years or two generations, whichever is longer, (up to a maximum of 100 years in the future) OR
 2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):
 - (a) Population structure in the form of one of the following:
 - (i) no subpopulation estimated to contain more than 250 mature individuals, OR
 - (ii) at least 95% of mature individuals in one subpopulation.
 - (b) Extreme fluctuations in number of mature individuals.
- D. Population size estimated to number fewer than 250 mature individuals.
- E. Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or five generations, whichever is the longer (up to a maximum of 100 years).
- VULNERABLE (VU)**
- A taxon is Vulnerable when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a high risk of extinction in the wild:
- A. Reduction in population size based on any of the following:
1. An observed, estimated, inferred or suspected population size reduction of $\geq 50\%$ over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are: clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
 - (a) direct observation
 - (b) an index of abundance appropriate to the taxon
 - (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

- (d) actual or potential levels of exploitation
 - (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.
2. An observed, estimated, inferred or suspected population size reduction of $\geq 30\%$ over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
 3. A population size reduction of $\geq 30\%$, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
 4. An observed, estimated, inferred, projected or suspected population size reduction of $\geq 30\%$ over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, AND where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
- B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:
1. Extent of occurrence estimated to be less than 20,000 km², and estimates indicating at least two of a-c:
 - a. Severely fragmented or known to exist at no more than 10 locations.
 - b. Continuing decline, observed, inferred or projected, in any of the following:
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) area, extent and/or quality of habitat
 - (iv) number of locations or subpopulations
 - (v) number of mature individuals.
 - c. Extreme fluctuations in any of the following:
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) number of locations or subpopulations
 - (iv) number of mature individuals.
 2. Area of occupancy estimated to be less than 2000 km², and estimates indicating at least two of a-c:
 - a. Severely fragmented or known to exist at no more than 10 locations.
- b. Continuing decline, observed, inferred or projected, in any of the following:
- (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) area, extent and/or quality of habitat
 - (iv) number of locations or subpopulations
 - (v) number of mature individuals.
- c. Extreme fluctuations in any of the following:
- (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) number of locations or subpopulations
 - (iv) number of mature individuals.
- C. Population size estimated to number fewer than 10,000 mature individuals and either:
1. An estimated continuing decline of at least 10% within 10 years or three generations, whichever is longer, (up to a maximum of 100 years in the future) OR
 2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):
 - (a) Population structure in the form of one of the following:
 - (i) no subpopulation estimated to contain more than 1000 mature individuals, OR
 - (ii) all mature individuals are in one subpopulation.
 - (b) Extreme fluctuations in number of mature individuals.
- D. Population very small or restricted in the form of either of the following:
1. Population size estimated to number fewer than 1000 mature individuals.
 2. Population with a very restricted area of occupancy (typically less than 20 km²) or number of locations (typically five or fewer) such that it is prone to the effects of human activities or stochastic events within a very short time period in an uncertain future, and is thus capable of becoming Critically Endangered or even Extinct in a very short time period.
- E. Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 years.

Source: IUCN (2001)



The Red List of Magnoliaceae

revised and extended

For further information please contact:

BGCI

Descanso House
199 Kew Road, Richmond
Surrey, TW9 3BW
United Kingdom
Tel: +44 (0)20 8332 5953
Fax: +44 (0)20 8332 5956
E-mail: info@bgci.org
Web: www.bgci.org

Fauna & Flora International

The David Attenborough Building,
Pembroke Street, Cambridge,
CB2 3QZ United Kingdom
Tel: + 44 (0) 1223 571000
Fax: + 44 (0) 1223 461481
E-mail: info@fauna-flora.org
Web: www.fauna-flora.org
www.globaltrees.org