Action Plan for North America

Sustainable Trade in Timber

Commission for Environmental Cooperation

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Sustainable Trade in **Timber**

Rosewood (*Dalbergia granadillo*)

Forest and Kim Starr

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List of Abbreviations and Acronyms

APHIS	Animal and Plant Health Inspection Service (of United States Department of Agriculture—USDA)
CBSA	Canada Border Services Agency
CEC	Commission for Environmental Cooperation
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
Conabio	*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad* (National Commission for the Knowledge and Use of Biodiversity; Mexico)
Conafor	*Comisión Nacional Forestal* (National Forestry Commission; Mexico)
Conanp	*Comisión Nacional de Áreas Naturales Protegidas* (National Commission of Natural Protected Areas; Mexico)
CoP	Conference of the Parties (CITES)
DGVS	*Direccion General de Vida Silvestre* (General Directorate for Wildlife; Mexico)
ECCC	Environment and Climate Change Canada (formerly Environment Canada)
ESA	Endangered Species Act (United States)
FSC	Forest Stewardship Council
ILDIS	International Legume Database and Information Service
IUCN	International Union for Conservation of Nature
LGDFS	*Ley General de Desarrollo Forestal Sustentable* (General Law of Sustainable Forest Development; Mexico)
LGVS	*Ley General de Vida Silvestre* (General Wildlife Law; Mexico)
NAWEG	North American Wildlife Enforcement Working Group
NDF	non-detriment finding
NOM-059	Mexican Official Standard NOM059-SEMARNAT-2010 (Mexico)
PEP	*Program de Especies Prioritarias* (Priority Species Program of Conanp; Mexico)
PNIDTF	*Programa Nacional de Investigación y Desarrollo Tecnológico Forestal* (National Program for Forest Research and Technological Development; Mexico)
Profepa	*Procuraduría Federal de Protección al Ambiente* (Office of the Federal Attorney for Environmental Protection; Mexico)
ROAVIS	*Red de Observancia y Aplicación de la Normativa de Vida Silvestre de Centroamérica y República Dominicana* (Central American and Dominican Republic Wildlife Enforcement Network)
Semarnat	*Secretaría de Medio Ambiente y Recursos Naturales* (Secretariat of Environment and Natural Resources, Mexico)
SUMA	*Sistema Nacional de Unidades de Manejo para la Conservación de la Vida Silvestre* (National System of Management Units for the Conservation of Wildlife; Mexico)
UMA	*Unidades de Manejo y Aprovechamiento Sustentable de Vida Silvestre* (Units for Management and Sustainable Exploitation of Wildlife; Mexico)
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre
US	United States
USFWS	United States Fish and Wildlife Service
WAPPRIITA	Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (Canada)
WAPTR	Wild Animal and Plant Trade Regulations (Canada)
WED	Wildlife Enforcement Directorate (of ECCC)

Abstract

This document is one of a set of five action plans that were prepared as part of a project by the Commission for Environmental Cooperation (CEC) to promote legal, sustainable and traceable trade in selected North American species that are listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The five action plans were produced under the guidance of the CITES Authorities of Canada, Mexico and the United States.

Four genera, two of cacti and two of trees, were selected as comprising the "priority timber species" and are the subject of this action plan. Information was compiled for the taxa as a group, including: the impact of trade on conservation and livelihoods; making CITES non-detriment findings (NDFs); and identification challenges for CITES enforcement. The taxa comprised were also assessed as to their distribution, conservation status, trade and commercial value. A total of 17 recommended actions are proposed, to: improve cooperation among North American stakeholders; support field and trade research; build enforcement capacity; improve community awareness; review and establish government policy; and increase sustainable production of wood in Mexico. These actions were developed based on the information compiled for this document and from consultation with stakeholders. Consultation included a stakeholder workshop held on 25–26 October 2016 in Mexico City.

Executive Summary

This action plan presents 17 recommended actions for promoting sustainable trade in the priority timber species and provides an overview of the species' distribution, conservation status, and trade, and information relevant to the species' management. These actions focus on improving cooperation among North American stakeholders; field research and analysis; sustainable production of *Dalbergia* and *Swietenia* in Mexico; community awareness of forest conservation in Mexico; regulations, policies and guidelines that support and promote sustainable harvest and trade; and building enforcement capacity. The information found in this action plan was compiled via literature review, data analysis and consultation with experts and stakeholders from Canada, Mexico and the United States. A stakeholder workshop was held in Mexico City on 25–26 October 2016.

This action plan is one of a set of five action plans that were prepared as part of a project by the Commission for Environmental Cooperation (CEC) to promote legal, sustainable and traceable trade in selected North American species that are listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The five action plans were produced under the guidance of the CITES Authorities of Canada, Mexico and the United States.

Priority Species

Four genera of wood-producing plants were selected for this project. The priority timber species in these genera include four species of cacti (*Carnegiea gigantea, Cylindropuntia cholla, C. fulgida and C. imbricata*) and six species of trees (*Dalbergia granadillo, D. retusa*, *D. stevensonii*, *Swietenia humilis*, *S. macrophylla* and *S. mahagoni*).

All the priority cactus species occur in Mexico, as do the tree species *D. granadillo, D. stevensonii*, *S. humilis* and *S. macrophylla*. *Dalbergia retusa* is found in Mexico, but is believed to be an introduced species. *Carnegiea gigantea, C. fulgida*, *C. imbricata* and *S. mahagoni* are native to the United States. None of the priority timber species occurs in Canada.

The International Union for Conservation of Nature (IUCN) has assessed *S. mahagoni* as Endangered and *D. retusa*, *S. humilis* and *S. macrophylla* as Vulnerable. However, the status of these species has not been updated since 1998. Whether the IUCN rankings reflect their current conservation status is not clear. *Dalbergia granadillo* and *D. stevensonii* have not been assessed by the IUCN, and each of the cactus species has been assessed as Least Concern.

In Mexico, *C. gigantea* is considered Threatened and *D. granadillo* is Endangered. In the United States, harvest of *C. gigantea* on National Park Service lands is illegal and the species is protected in the state of Arizona. *Swietenia mahagoni* is protected in the State of Florida.

Trade Overview

In Canada and the United States, *Cylindropuntia* wood is sold primarily for use in aquariums and terrariums. In most cases, *Cylindropuntia* is sold simply as "cholla wood," with no indication of the species. There is no significant market for *Cylindropuntia* wood in Mexico.

The woody ribs of *C. gigantea* are used to build fencing, roofs, and parts of furniture in the United States and Mexico. The US market for *C. gigantea* wood is small and there is no significant Canadian market for the species. In Mexico, the high demand for *C. gigantea* wood encourages the over-harvest and illegal harvest of the species. The impact of illegal harvest is exacerbated by loss of habitat due to agricultural, mining and tourism activities.

Dalbergia wood is used to manufacture fine furniture, musical instruments and other specialty objects. The Canadian and US markets for *Dalbergia* are small and specialized. Wood from *D. retusa*, *D. stevensonii* and *S. macrophylla* is available for sale in Canada and the United States. The wood from these species is less common in Canada, and *D. stevensonii* is especially rare. Lumber from *S. mahagoni* is not readily available for sale in North America. *Swietenia humilis* lumber is not commonly sold in Canada or the United States, and is not readily available in international trade. The availability of *S. humilis* wood in Mexico is unclear, as most sellers offer "caoba" (*Swietenia*) wood for sale, but do not provide the species.

Swietenia macrophylla wood is the most economically important product of any of the priority timber species. A review of the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) CITES Trade Database found that during 2009–2014, the United States imported 87,048.39 cubic meters (m^3) of *S. macrophylla* wood, which accounted for more than 99% of the priority species wood imported to the United States in those years. In those years, Canada imported 23.35 m^3 of *S. macrophylla* wood, which, although a fraction of the volume imported into the United States, accounted for more than 99% of the priority species wood imported into Canada. During 2009–2014, Mexico exported 8,700.28 m^3 of *S. macrophylla* wood, which accounted for 93% of the priority species wood exported from Mexico in those years.

Border enforcement officers must identify the wood from the species listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and distinguish it from the wood of upwards of 100 different non-CITES species that is in international trade. However, visual examination does not typically allow an officer to identify wood below the genus level. An additional challenge is that many different trade names may be used for the same species and these various names may be the ones used on official documentation—and may be in multiple languages. There is a fair amount published on the identification of tree wood, but there are no resources available in print or on the Internet for identifying cactus wood. The only regional training on wood identification provided to enforcement officers was during a trinational workshop on trade in plants in 2002.

Recommended Actions

The following table provides a summary of the actions recommended for promoting the conservation and sustainable production of priority timber species in Mexico, and their legal, sustainable trade throughout North America. Completion of the recommended actions is subject to available funding.

No.	Goals	Actions
1	Ensure that progress on the recommendations in this action plan is reported and measurable.	**Measuring progress**: The governments of Canada, Mexico and the United States should develop and implement a process for tracking and reporting on efforts to fulfill the recommendations of this action plan, such as a dedicated website or other method.
2	Support collaborative North American efforts directed at promoting sustainable, traceable trade and conservation of priority CITES Appendix II species.	(a) **Trinational collaboration**: The governments of Canada, Mexico and the United States should support and monitor collaborative efforts to promote sustainable, traceable trade and conservation of native species deemed to be of priority concern—including CITES Appendix II timber species. (b) **Funding strategy**: The governments of Canada, Mexico and the United States (to the extent possible, and in consideration of domestic priorities) should develop a long-term strategy for funding this action plan, emphasizing realization of the high-priority actions.
3	Support the sustainable trade and conservation of priority timber species through field research and analysis.	(a) ***Cylindropuntia* and *Carnegiea* field studies**: CITES and other relevant authorities in Mexico and the United States, in collaboration with academia and nongovernmental organizations, should support research on the population ecology, reproductive biology, and conservation of *Cylindropuntia* and *Carnegiea*, to establish sustainable use rates for wild populations. (b) **NDF protocols for *D. stevensonii* and *D. granadillo***: Mexican CITES and forestry authorities, in collaboration with academia and nongovernmental organizations and the forestry sector, with assistance from US experts, should support research on the population dynamics, reproductive biology and conservation of *D. stevensonii* and *D. granadillo*, to establish protocols for preparing non-detrimental findings for exports of these species.
4	Increase the sustainable production of *Dalbergia* species and *Swietenia* in Mexico.	(a) **Mixed plantation assessment**: Mexican forestry authorities, in collaboration with academia, nongovernmental organizations and the forestry sector, should establish a strategy for increasing commercial production of *S. macrophylla* and species of *Dalbergia* through planting in natural forests and/or mixed plantations with multiple species. (b) **Forestry certification**: Mexican CITES and forestry authorities should actively support forestry sector efforts to seek third-party certification of forestry operations that target *S. macrophylla* and species of *Dalbergia*. This could entail certification by FSC or other international certification mechanisms that meet the legality standards for trade with Canada and the United States.
5	Improve community awareness of forest conservation and value in support of sustainable timber harvest and trade in Mexico.	**Mexican national outreach strategy**: Mexican CITES and forestry authorities, in collaboration with academia, nongovernmental organizations and the forestry sector, should develop a national outreach strategy for increasing awareness of the conservation and economic value of *Dalbergia* and *Swietenia* forests to communities in their range of distribution.

	Goals	Actions
6	Provide enforcement officers with the information and resources necessary to identify wood specimens and enforce the laws that regulate timber trade.	(a) **Enforcement support**: The Government of Mexico should increase funding for and prioritize enforcement activities, in collaboration with Canadian and US enforcement experts, to stop the illegal trade of wood, especially from high-value species such as *Dalbergia*, *Swietenia macrophylla*, and *Carnegiea gigantea*. (b) **Collaboration between North and Central America**: CITES and forestry enforcement authorities in Canada, Mexico and the United States, via the CEC North American Wildlife Enforcement Group (NAWEG), should establish a collaborative working relationship with the Central American and Dominican Republic Wildlife Enforcement Network (*Red de Observancia y Aplicación de la Normativa de Vida Silvestre de Centroamérica y República Dominicana*—ROAVIS), to share information and expertise, coordinate enforcement activities, and facilitate cooperation between Mexico and Central America on issues linked to the trade in *Dalbergia* and *Swietenia* timber. (c) **Cactus identification**: CITES and other relevant authorities in Canada, Mexico and the United States, via the CEC, and in collaboration with academia and nongovernmental organizations, should fund and support the development of morphological, chemical and molecular methodologies for distinguishing *Cylindropuntia* and *Carnegiea* wood by species. (d) **Regional timber trade workshop**: CITES and forestry authorities in Canada, Mexico and the United States, via the CEC, and in collaboration with Central American authorities, should host a regional workshop on trade and identification of wood. The workshop should bring together experts and enforcement staff; provide training on identification of wood from CITES-listed species; discuss trade in hardwoods from Mexico and Central America; build links between the different regional authorities; and stimulate collaborative actions to combat illegal trade. Copies of the Identification of Central American Woods, by Wiedenhoeft, should be provided to the attendees.
7	Establish regulations, policies and guidelines that support and promote sustainable harvest and trade of priority timber species in North America.	(a) **Regulatory review**: The Government of Mexico, in collaboration with the CEC and the forestry sector, should review and streamline the regulations and procedures for exporting timber. (b) **Commercial plantation guidelines**: Mexican forestry authorities, in collaboration with academia, nongovernmental organizations and the forestry sector, should develop guidelines for establishing commercial plantations of *D. stevensonii* in Chiapas, Mexico, and of *D. granadillo* in Oaxaca, Mexico. (c) **Cactus-wood collection policy**: Mexican CITES and forestry authorities, in collaboration with academia, nongovernmental organizations and the forestry sector, should establish policy and procedures for the sustainable, legal and traceable commercial collection of wood from *Carnegiea* and *Cylindropuntia*, and implement an active monitoring program linked to increased enforcement efforts to combat poaching and trafficking of these cacti. (d) **Defining "artificially propagated"**: CITES and forestry authorities in Canada, Mexico and the United States should jointly review the implications of amending the definition of "artificially propagated" provided by Resolution Conf. 10.13 (Rev. CoP15) (Implementation of the Convention for timber species) to include wood from mixed-species plantations. If such an amendment can be justified, then a discussion paper should be presented at a meeting of the CITES Plants Committee.
8	Support sustainable harvest and trade in priority cactus species, through improved collection and analysis of species and trade data.	***Cylindropuntia* trade study**: CITES and relevant authorities in Mexico and the United States, in collaboration with academia and nongovernmental organizations, should fund a joint study of trade in *Cylindropuntia* wood—to determine the species utilized, supply and value chains, and existing (or potential) certification and traceability protocols.

Figure 1. **Wood examples**

a

Maxually

b

Gabriel Arroyo-Cosultchi

Note: F**igure 1 (a)** shows a side view of the trunk of a dead *Cylindropuntia* cactus exhibiting the convoluted, porous structure characteristic of wood from the genus. **Figure 1 (b)** shows lateral and cross-section of the trunk of a *Dalbergia* tree, exhibiting the dark heartwood and the lighter colored outer sapwood.

Background

In 2015, the governments of Canada, Mexico and the United States initiated a collaborative project through the Commission for Environmental Cooperation (CEC) to strengthen the conservation and sustainable trade of 56 North American taxa that are included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The project, aligned with the CEC strategic priority on sustainable consumption and production, aims to provide guidance in the form of five action plans for reducing illegal and/or unsustainable harvest and trade; improving biological knowledge to allow science-based management decisions; and promoting traceability, species conservation, and livelihoods of stakeholders, throughout trade.

CITES came into force in 1975 and calls on the cooperation of the signatory countries to ensure that international trade does not threaten vulnerable specimens of wild animals and plants with extinction, and that trade is regulated and maintained at sustainable levels. To implement CITES, each Party to the Convention must designate one or more Management Authorities in charge of administering the permitting system, and one or more Scientific Authorities to advise them on the effects of trade on the conservation of species. Appendix II of CITES includes more than 34,000 species for which international trade is regulated to avoid over-exploitation and ensure their survival.

Process for Developing this Action Plan

The initial step in developing this action plan was a review of North American species listed in Appendix II of CITES, by the CEC project's Steering Committee, comprising CITES Authorities of Canada, Mexico and the United States. In total, 55 species and one genus were selected as "priority species" for the project. These species were selected because they are all native to North America and traded by more than one of the three North America countries. Furthermore, the Steering Committee determined that regional information exchange and collaboration would facilitate species conservation, CITES implementation, and trade legality, traceability and sustainability. These 56 taxa were organized into five groups: parrots, sharks, tarantulas, timber species (specific cacti and tropical hardwoods), and turtles and tortoises.

Then, a comprehensive review of the 56 taxa was developed to compile information on each species' conservation status, trade dynamics and commercial value. In addition, sustainable-use practices were documented, as was the impact of the species' trade on conservation, and the information needed for making CITES non-detriment findings (NDFs).[1] Species-identification challenges for CITES enforcement were reviewed and opportunities for promoting sustainable trade and conservation were discussed.

On 25–26 October 2016, a stakeholder consultation was held in Mexico City to gather information and recommendations for actions to promote sustainable trade and conservation of the priority timber species. This document draws on the information from the comprehensive review, at the stakeholder consultation, and consultations with CITES Authorities of Canada, Mexico and the United States.

This action plan includes information on ten plant taxa, comprising species from two genera of cacti and two genera of trees. The information was compiled for the taxa as a group, and included: the impact of trade on conservation and livelihoods; making NDFs; and identification c hallenges for CITES enforcement. Information on the distribution, conservation status, trade and commercial value of the ten taxa was also collected. A total of 17 recommended actions are proposed, to: improve cooperation among North American stakeholders; support field and trade research; build enforcement capacity; improve community awareness; review and establish government policy; and increase sustainable production of wood in Mexico. These actions were developed based on the information compiled for this document and from consultation with stakeholders.

1. Articles III and IV of the Convention text state that export permits for species listed in Appendices I and II may only be issued after the Scientific Authority of the exporting country has concluded that the export will not be detrimental to the survival of the species. Such a result from the evaluation process is known as a "non-detriment finding." Resolution Conference 10.3 outlines the role of the Scientific Authority, and Resolution Conference 16.7 provides recommendations for the process of making non-detriment findings (CITES 1973, 1997, 2013c).

Overview of the Priority Timber Species

Ten plant taxa that are harvested to produce wood were selected for this study, and are herein referred to as the "priority timber species." These taxa may be subdivided into two groups: cacti and trees. Detailed species accounts, which include information on appearance, distribution, conservation status and trade, are provided in the *Priority Timber Species* section.

The botanical definition of wood is "secondary xylem," which is xylem derived from the vascular cambium.[2] From the standpoint of the wood anatomists, the wood produced by cacti is as "woody" as that produced by trees (Bárcenas Luna, and Wiedenhoeft, in litt.). Conversely, the term "timber" generally refers to long pieces of wood that are mass-produced for the construction of buildings, ships and other structures. The wood from cacti is generally not suitable for large industrial projects and would not accurately be referred to as timber, strictly speaking (Bárcenas Luna, in litt.). However, the words "wood" and "timber" are often used interchangeably, causing some misunderstanding when referencing the industrial and the botanical meanings of the word "wood." The distinction between wood and timber is not clearly made in references to trade in species listed on the Appendices of CITES. Hence, the cactus and tree species that are the subject of this document were grouped together as "timber species" in the broadest sense, indicating that the wood from each species is harvested and traded internationally.

Cacti

Two cactus taxa were originally selected for this project: *Carnegiea gigantea*, and species in the genus *Opuntia*. The genus *Opuntia* includes many species, and all are listed in the Appendices of CITES. In 2009–2014, only two species were recorded in trade as timber or timber pieces: *O. cholla* and *O. imbricata* (CITES 2016a). In addition, Floyd (1998) discusses the trade of *O. fulgida* wood. Unfortunately, although substantial volumes of *Opuntia*, recorded as timber pieces, were imported into the United States during 2005–2007, most were not identified to species (CITES 2016a). It is, therefore, unclear how many and which species are used for their wood. This study, therefore, focused on the three species that have been reported as being traded as wood: *O. cholla*, *O. imbricata* and *O. fulgida*. However, these names are no longer considered valid. All three species are now included in the genus *Cylindropuntia* (Hernández et al. 2013; Pinkava et al. 2013a). *Cylindropuntia cholla*, *C. imbricata* and *C. fulgida* are, therefore, the scientific names used throughout this report.

Carnegiea gigantea, *Cylindropuntia fulgida* and *C. imbricata* are native to both Mexico and the United States (Burquez Montijo et al. 2013; Hernández et al. 2013). *C. cholla* is endemic to Mexico (Pinkava et al. 2013a). None of these species is native to Canada.

Trees

Six tree species were originally selected for this project: three species of *Dalbergia* (*D. granadillo*, *D. retusa* and *D. stevensonii*) and three species of *Swietenia* (*S. humilis*, *S. macrophylla* and *S. mahagoni*).

Until recently, all of these species have been recorded as being native to Mexico except *S. mahagoni* (ARW 1998a, b; CITES 2007, 2013a; WCMC 1998a). However, in 2015, Conabio held a workshop to evaluate the extinction risk of *Dalbergia* timber species in Mexico. The workshop participants concluded that *D. retusa* is not native to Mexico, and that the in-country records of the species are of introduced specimens (CITES 2015).

None of these species is native to Canada, and only *S. mahagoni* naturally occurs in the United States.

2. Xylem is a vascular tissue that transports water and nutrients from the roots to the rest of the plant. The vascular cambium, from which "secondary xylem" is derived, is another type of plant tissue and does not transport water and nutrients.

North American Government Authorities and Legislation

This section provides a short overview of the national laws and regulations that are specifically referenced in this document; along with a review of the government agencies or departments that are charged with their implementation.

Canada

Under Canada's Constitution, the provinces and territories have jurisdiction over wildlife (including timber species) within their borders, and the federal government has jurisdiction over coastal and inland fisheries, wildlife (including timber species) on federal land, and migratory birds. The federal government also has jurisdiction over international and interprovincial trade (Canada 1867). Hence, most of Canada's forests are managed and conserved by the provinces and territories. CITES implementation is, however, the responsibility of the federal government.

Environment and Climate Change Canada (ECCC) is the lead federal department for implementing CITES in Canada—including issuing permits, making non-detriment (and other) findings, and enforcement.

The Canadian Forest Service (CFS) provides science and policy advice to the provinces and territories regarding forestry issues, and to ECCC in CITES implementation.[3] The CFS has limited regulatory responsibility and, on enforcement matters, only advises.

Border enforcement of CITES is the responsibility of the Wildlife Enforcement Directorate (WED) of ECCC, under the authority of the Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA) and the Wild Animal and Plant Trade Regulations (WAPTR). WED works in collaboration with the Canada Border Services Agency (CBSA).

The purpose of WAPPRIITA is to protect species of animals and plants by implementing CITES and regulating the species' international and interprovincial trade, responsibilities which include the following (Canada 1992):

- Prohibition of the import and export of CITES specimens except with a permit or where permitted by the regulations.
- Prohibition of the importation of an animal or plant that was taken in contravention of any foreign law.
- Prohibition of the possession of specimens which have been imported in contravention of the legislation.

WAPTR provides specific definitions, interpretations and exceptions that are necessary for implementing WAPPRIITA (Environment Canada 2003). The species of animals and plants that are listed on the Appendices of CITES are compiled in Schedule 1 of WAPTR (Canada 1996). Schedule 1 must be amended after any change to the CITES Appendices in order for the provisions of WAPPRITTA to apply to the change.

Mexico

The Secretariat of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales*—Semarnat) is responsible for protecting, restoring, and conserving the ecosystems, natural resources and assets of Mexico; and for promoting sustainable development. Semarnat is ultimately responsible for conserving native species and for implementing CITES (Reuter, in litt.; Semarnat 2017).

Semarnat meets its mandate through the activities of a number of sub-entities within the Secretariat, including the following (Reuter, in litt.):

3. CFS is a division of Natural Resources Canada, which is the department of the federal government responsible for natural resources, energy, minerals and metals, forests, and earth sciences (NRC 2016).

- The General Directorate for Wildlife (*Dirección General de Vida Silvestre*—DGVS).
- The National Commission for the Knowledge and Use of Biodiversity (*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad*—Conabio).
- The Office of the Federal Attorney for Environmental Protection (*La Procuraduría Federal de Protección al Ambiente*—Profepa).
- The National Commission of Natural Protected Areas (*Comisión Nacional de Áreas Naturales Protegidas*—Conanp).
- The National Forestry Commission (*Comisión Nacional Forestal*—Conafor).

DGVS is responsible for the management of wildlife in the country and the implementation of the General Wildlife Law (*Ley General de Vida Silvestre*—LGVS) In addition, DGVS acts as the CITES Management Authority in Mexico and is responsible for issuing permits, keeping records and liaising with the CITES Secretariat. DGVS also manages the National System of Management Units for the Conservation of Wildlife (*Sistema Nacional de Unidades de Manejo para la Conservación de la Vida Silvestre*—SUMA), which includes the approval of plans for the Units of Management and Sustainable Exploitation of Wildlife (*Unidades de Manejo y Aprovechamiento Sustentable de Vida Silvestre*—UMA). The purposes of UMA are the restoration, protection, maintenance, recovery, reproduction, repopulation, reintroduction, and rehabilitation of wildlife; its sustainable use, recreational use and exhibition; and environmental education of the public (DOF 2000). Furthermore, DGVS can authorize the release of wildlife back into the wild, when appropriate. (Camarena Osorno, and Reuter, in litt.).

Conabio is responsible for promoting, coordinating, supporting and implementing activities to improve the knowledge of biological diversity, its conservation and its sustainable use. Conabio serves as the CITES Scientific Authority in Mexico and is responsible for making non-detriment findings (NDFs) (Camarena Osorno, and Reuter, in litt.).

Profepa is a decentralized administrative body of Semarnat that has technical and operational autonomy. Profepa was created to respond to and control environmental deterioration. One of Profepa's primary tasks is to enforce compliance with environmental regulations. It is also responsible for enforcing CITES in Mexico under the authority of the LGVS (Camarena Osorno, and Reuter, in litt.).

Conanp is responsible for conserving species considered at risk under its Priority Species Program (*Program de Especies Prioritarias*—PEP) (Reuter, in litt.), and for managing 176 federally protected natural areas—including national parks, biosphere reserves, nature sanctuaries and natural monuments (Semarnat 2012).

Conafor is a decentralized administrative body of Semarnat that is responsible for implementing the General Law of Sustainable Forest Development (*Ley General de Desarrollo Forestal Sustentable*—LGDFS) (DOF 2003). The LGDFS regulates the conservation, protection, restoration and management of Mexico's forests, with the goal of securing sustainable forest development.

Conafor also coordinates the National Program for Forest Research and Technological Development (*Programa Nacional de Investigación y Desarrollo Tecnológico Forestal*—PNIDTF) and develops and implements national policy on sustainable forest development (LSE 2017).

In 2014, Mexico adopted the National Forestry Programme 2014–2018, which encompasses the following five key objectives (LSE 2017):

- Increasing the sustainable production and productivity of forests.
- Promoting the conservation and restoration of forest ecosystems.
- Protecting forest ecosystems from threats such as forest fires and illegal logging.
- Promoting and strengthening forest governance.
- Promoting and fostering a facilitative institutional framework for sustainable forest development.

The LGVS regulates the sustainable use, conservation and management of native wild animals and plants. It regulates the protection of species or populations that are at risk, including both terrestrial and aquatic species (DOF 2000; Linder and Kaplan 1952; DOF 2016). The LGVS establishes the national policy for wildlife protection and sustainable use via the SUMA program and the Official Mexican Standard NOM059-SEMARNAT-2010 (NOM-059) on Mexican species at risk (see below). In addition, the LGVS regulates the creation of UMAs.

Article 55 of the LGVS implements CITES in Mexico. The LGVS also includes some provisions that are stricter than are required by the Convention.

The Regulations of the LGVS (*Reglamento de la Ley General de Vida Silvestre*—RLGVS) enable and implement the LGVS and provide the essential requirements for the integration of SUMA and the inclusion, establishment, management and operation of the UMAs (DOF 2014).

NOM-059 is the "reference instrument" of the LGVS. It defines what are species at risk, provides the criteria for reviewing the conservation status of native Mexican terrestrial and aquatic species of animals and plants, and categorizes those species that require special protection (DOF 2010). The exploitation of NOM-059 species is allowed only under a UMA framework, and hence a management plan approved by DGVS (Camarena Osorno, in litt.).

NOM-059 establishes four risk categories: Probably Extinct (in the wild), Endangered, Threatened, and Subject to Special Protection (DOF 2010). These categories are defined in Appendix A of this report.

United States

The United States implements CITES via section 8A of the Endangered Species Act of 1973 (ESA) (USA 1973). The goal of the ESA is to conserve endangered or threatened species throughout all (or a significant portion) of their range. This includes the conservation of the ecosystems on which these species depend (NOAA 2015). Under the ESA, species listed as Endangered (with limited exceptions) may not be imported or exported, possessed, sold or transported. They may not be taken within the United States or on the high seas (USA 1973). Generally, these same prohibitions and exceptions also apply to species listed as Threatened. However, for some threatened species a special rule may be implemented which provides prohibitions and exceptions that are tailored to the conservation needs of the particular species (USA 1971). Not all CITES-listed species are also ESA-listed, and not all ESA-listed species are afforded protection under CITES.

The responsibility for implementing CITES as it applies to trade in plants is shared between the US Fish and Wildlife Service (USFWS) and the United States Department of Agriculture (USDA). The USFWS issues export and re-export permits for US exports of plants listed in the Appendices of CITES or under the ESA, and import permits for imports of CITES Appendix I species. The USDA Animal and Plant Health Inspection Service (APHIS) enforces CITES as it applies to imports and exports of plants (USDA 2016). However, the Customs and Border Protection (CBP) unit of the US Department of Homeland Security (DHS) is responsible for inspecting imports of lumber and other nonliving products (USDA 2006).

In addition to the ESA, the Lacey Act makes it illegal to import, export, transport, sell, receive, acquire, or purchase, in interstate or foreign commerce, any fish or wildlife that was taken, possessed, transported, or sold in violation of any foreign law. The Lacey Act also prohibits the import, export, transport, sale, receipt, acquisition or purchase, in interstate or foreign commerce, of any plant taken, possessed, transported or sold in violation of any foreign law that protects plants or that regulates certain activities associated with those plants (Cornell 2017). Importing wood into the United States that was taken or exported in violation of a foreign law would be a violation of the Lacey Act (USA 1900, 1981; USFWS 2015).

Saguaro (*Carnegiea gigantea*)

Imagini Venske

Trade in Priority Timber Species

This section provides an overview of the impact of trade in priority timber species on conservation and livelihoods. This discussion focuses entirely on the trade in the wood from these species. Although parts of and products from cacti other than wood may be in trade, from the tree species only the wood is commercially valuable.

Trade and Conservation

Cacti

Most, if not all, of the trade in *Cylindropuntia* wood appears to consist of material collected in the wild from dead specimens. If that is the case, then the impact of trade on conservation would seem to be minimal, especially considering the species involved are common and widespread.

Similarly, the collection of dead *C. gigantea* wood could be sustainable. Burquez Montijo et al. (2013), however, note that the high demand for *C. gigantea* wood encourages the over-harvest of the species in Mexico. In at least some cases, live large *C. gigantea* specimens (over 6 meters tall) are illegally targeted as a source of wood (Burquez Montijo and Ortega Bustamante Enriquena n.d.). Poachers will inject diesel fuel into specimens and then return after they have died to harvest the bases of the plants for furniture and decorations (Bárcenas Luna, in litt.). The impact of poaching is exacerbated by loss of habitat due to agricultural, mining and tourism activities (Burquez Montijo and Ortega Bustamante Enriquena n.d.).

Trees

Stands of *S. mahagoni* were first logged hundreds of years ago, and the wood from this species was the first mahogany to be available in Europe. Today, natural stands of *S. mahagoni* are rare and consist of weedy trees or bushes (ARW 1998a). Brown (2012) reports that the species is readily available in South Florida native plant nurseries, and that it is frequently planted in gardens and landscapes. Apparently, it is one of the most common urban hardwood landscape trees in South Florida. The survival of the species seems secure, but not in stands that would support commercial harvest.

Swietenia humilis does not seem to be significantly threatened by trade, as the wood from the species is of limited commercial value and does not appear to be common in trade (WCMC 1998a; Attridge, pers. comm.).

Swietenia macrophylla is the most commercially valuable of the priority timber species. The species has had a long history of over-exploitation. Large-scale commercial logging, both legal and illegal, started in the 1970s and led to populations being depleted throughout its range in Brazil, Bolivia, Peru and Central America (Grogan and Schulze 2008; Mejía et al. 2008).

Dalbergia retusa and *D. stevensonii* were listed in the CITES Appendices to ensure that unsustainable logging and trade did not threaten the survival of the species (CITES 2013a, b). The proposal to list *D. stevensonii* in Appendix II, submitted by the European Union to the 14th meeting of the Conference of the Parties to CITES in 2007, argued that the species is threatened not only by logging, but also by habitat loss to cattle ranching and slash-and-burn agriculture (CITES 2007). This may well be the case for other species of priority trees, and strongly suggests that the long-term survival of these species will depend on more than just trade controls.

Another concern regarding the trade in *Dalbergia* is that only the heartwood of these species yields high-quality timber. These species form their heartwood slowly, so logs lose much of their volume when the sapwood is removed (NAS 1979). The sapwood is usually of little value and is wasted (CITES 2007, 2013a).

Trade and Livelihoods

Cacti

The woody ribs of *C. gigantea* are used to build fencing, roofs and parts of furniture, in the United States and Mexico (Desert Museum 2016). The base of the plant is also used for decoration, table bases, and bed legs (Bárcenas Luna, in litt.).

The level of domestic trade in Mexico (legal or illegal) is unclear. In the United States *C. gigantea* wood appears to be of limited availability. Data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico exported *C. gigantea* wood to the United States in only two years: 2011 and 2012.

One US wood dealer noted that the US market for *C. gigantea* wood is small, but that it could be better if the wood imported from Mexico were less expensive (Hill, pers. comm.). *Carnegiea gigantea* wood does not appear to be available for sale in Canada, and there seems to be no significant Canadian market for the species.

There does not appear to be a significant Mexican market for *Cylindropuntia* wood (Bárcenas Luna, in litt.). *Cylindropuntia* cacti are common in much of the country, and the wood from the species is not perceived to be of particular value (Bárcenas Luna, pers. comm.).

In Canada and the United States *Cylindropuntia* wood is sold primarily by pet trade vendors for use in aquariums and terrariums. *Cylindropuntia* wood is readily available from US sellers on eBay. In most cases *Cylindropuntia* was sold simply as "cholla wood," with no indication of the species.

Trees

Dalbergia wood is used to manufacture fine furniture, musical instruments, and turned and other specialty wood objects (Meier 2014). *Dalbergia retusa* timber is particularly good for marine use, as it secretes compounds that are toxic to bacteria, fungi, algae, and many destructive insects (NAS 1979). The Canadian and US markets for *Dalbergia* are small and specialized, and are turning to alternative species that are more available and less expensive (Attridge, pers. comm.).

Swietenia macrophylla is in demand for production of products such as curved windows, high-end wooden doors, outdoor furniture, and high-end millwork. It is also used extensively in shipbuilding, in both large passenger vessels and small boats. One Canadian importer suggested that there will always be a demand for *S. macrophylla* wood (Attridge, pers. comm.).

Wood from *D. retusa*, *D. stevensonii* and *S. macrophylla* is available for sale in Canada and the United States, but not in large quantities. It is less common in Canada, and wood from *D. stevensonii* is especially rare. In August 2016, one Canadian importer noted that it had last imported *D. stevensonii* wood more than two years previously (Attridge, pers. comm.).

According to the UNEP-WCMC CITES Trade Database, no wood from the three priority *Dalbergia* species was exported to Canada from Mexico during 2009–2014, and only *D. retusa* was exported to the United States from Mexico during that same period. However, in 2015, the participants of a workshop to evaluate the *Dalbergia* timber species in Mexico concluded that *D. retusa* is not native to Mexico (CITES 2015). If that assessment is correct, then the Mexican wood imported into the United States was likely from a different species of *Dalbergia*.

Swietenia macrophylla wood is the most economically important product of any of the priority timber species. A review of the UNEP-WCMC CITES Trade Database found that during 2009–2014, the United States imported 87,048.39 cubic meters (m^3) of *S. macrophylla* wood, which accounted for more than 99% of the priority species wood imported to the United States in those years. During 2009–2014, Canada imported 23.35 m^3 of *S. macrophylla* wood. The Canadian imports were a fraction of the volume imported into the United States, but still accounted for more than 99% of the priority species wood imported into Canada. During 2009–2014, Mexico exported 8,700.28 m^3 of *S. macrophylla* wood, which accounted for 93% of the priority species wood exported from Mexico in those years.

Data compiled from the UNEP-WCMC CITES Trade Database found that during 2009–2014, *S. macrophylla* was exported from Mexico to Canada in all but one year (2012), and to the United States in each year.

Savagewoods

Rosewood (*Dalbergia retusa*)

Nonetheless, Central America is the primary source of the priority timber species exported to Canada and the United States (CITES 2016a; Attridge, pers. comm.). One Canadian importer reported that it is not easy to import lumber from Mexico. He noted that CITES documents and other paperwork are difficult to acquire, the wood exporters are not certified by the International Organization for Standardization (ISO), and that the processing of wood and the wood quality are inconsistent (Attridge, pers. comm.).[4]

Lumber from *S. mahagoni* is not readily available for sale in North America. According to ARW (1998a), small quantities of *S. mahagoni* are occasionally offered for sale on the international market, but one Canadian importer noted that he had not seen the species in trade for more than 20 years (Attridge, pers. comm.). US imports of *S. mahagoni* logs from plantations in Palau were recorded in the UNEP-WCMC CITES Trade Database in 2013 and/or 2014.[5] However, these imports were for relatively small quantities, and they may not have been destined for commercial resale.

Swietenia humilis lumber is also not commonly sold in Canada or the United States, and is not readily available in international trade (Attridge, pers. comm.). The availability of *S. humilis* wood in Mexico is unclear, as most sellers offer "caoba" (*Swietenia*) wood for sale, but do not provide the species (Molina Negrete, pers. obs.). According to the UNEP-WCMC CITES Trade Database, the United States imported small volumes of *S. humilis* wood from Guatemala during 2009–2011. This wood may not have been for commercial sale. *Swietenia humilis* trees do not grow to be as large as *S. mahagoni* or *S. macrophylla*, and they produce lumber of poorer quality, with many knots and an irregular grain (Meier 2016c). WCMC (1998a) reported that *S. humilis* is generally found as scattered and isolated trees, and that the species is of little commercial importance.

4. ISO standards are designed to ensure that products and services are safe, reliable and of good quality. They help companies access new markets and enable fair international trade (ISO 2016).
5. Note that *S. mahagoni* is not native to Palau.

Mexican mahogany
(*Swietenia humilis*)

Forest and Kim Starr

Challenges to CITES Implementation

Non-detriment Findings

Canada

None of the priority timber species that are the subject of this report naturally occurs in Canada. Any wood from these species that is exported out of Canada would require issuance of a CITES re-export certificate by the Canadian Management Authority. NDFs are not required for issuance of CITES re-export certificates (USA 1973).

United States

S. mahagoni has a restricted distribution in the United States. The species is not commercially logged, although it is possible that small amounts of native *S. mahagoni* wood could become available from naturally downed trees, or trees that are removed for some reason. In those cases, the source of the wood could be readily established and a NDF could be completed.

Exports of native *C. gigantea* would need to comply with Arizona and California state regulations and the making of NDFs would require consultation with state authorities. Exports of native *Cylindropuntia* would also require input from authorities in the states from which the wood was sourced. Given the wide distribution of the species in question, and assuming the wood was collected as dead material, the making of a NDF should not be difficult, if sufficient information is provided by the exporter.

NDFs are not required for re-exports of wood from the other priority timber species (which are not native to the United States) (USA 1973; Ford, in litt.).

Mexico

In 2006, the development of guidance for making NDFs for *S. macrophylla* was prioritized at the 16th meeting of the CITES Plants Committee, in Lima, Peru (CITES 2006). In 2007, Mexico subsequently organized an International Workshop of Experts on Non-Detriment Findings on Bigleaf Mahogany in Cancún, Mexico. The results of the workshop were submitted for consideration by the Parties at the 14th meeting of the Conference of the Parties (CoP14) of CITES, in 2007 (Mexico 2007). Mexico also presented a case study on *S. macrophylla*, at the 2008 International Expert Workshop on CITES Non-Detriment Findings, which was subsequently submitted to the 17th Meeting of the Plants Committee, in 2008 (CITES 2008).

At CoP14, the Parties adopted the "Action Plan for the Control of International Trade in Bigleaf Mahogany (*Swietenia macrophylla*)." This action plan provided two recommendations for facilitating making NDFs for the species (CITES 2008):

- The implementation of forest management plans at national and/or local levels, that include specific requirements for *S. macrophylla*.
- Completion of forest inventories for *S. macrophylla* in conjunction with a monitoring program to compile data on the distribution, populations and conservation status of the species.

Also at CoP14, the Parties adopted the "Action Plan for the Range States of *Cedrela odorata*, *Dalbergia retusa*, *Dalbergia granadillo* and *Dalbergia stevensonii*."[6] This action plan did not include any specific guidance for making NDFs for the species in question. Presumably the recommendations for *S. macrophylla* also apply to these species as well.

6. This action plan was subsequently revised at the 15th meeting of the Conference of the Parties (CoP15) (CITES 2010).

The Parties have not developed guidance specifically for making NDFs for *C. gigantea* or *Cylindropuntia* species. In the case of *Cylindropuntia*, the species used as wood are common and widely distributed. If *Cylindropuntia* wood is collected from naturally occurring dead specimens, then finding non-detriment for the exports would not seem to be difficult, if sufficient information is available. However, finding non-detriment for *C. gigantea* would likely be much more problematic. The species is threatened in Mexico, and killing living specimens for wood is a specific threat that has been identified. It would seem reasonable for Mexican authorities to find non-detriment only for exports of *C. gigantea* wood that was unquestionably sourced from naturally occurring dead specimens. This would ensure that trade in the species was sustainable, and would follow the precautionary principle.

Enforcement

Cacti

Carnegiea gigantea ribs and *Cylindropuntia* wood are easily recognizable, due to their distinctive structure. However, identification of *Cylindropuntia* wood to species may not be possible via visual examination. A systematic comparison of *Cylindropuntia* skeletons has probably not been done. If the different species cannot be distinguished morphologically, then it might be possible to identify them microscopically, based on the xylem cells and/or crystals that are common in the wood (Bárcenas Luna, in litt.).

There are no known resources in print or on the Internet for identifying cactus wood. The CITES Identification Wiki does not have identification sheets for any of the priority cactus species (CITES 2016b).

Trees

Visual examination does not typically allow an officer to identify wood below the genus level (Dormontt et al. 2015), as the characteristics of wood appear similar between species in the same genus. This would present a problem even if officers only needed to identify the wood from the priority species that are the subject of this report. But officers must identify the wood from all of the species listed in CITES, and also distinguish them from the wood of upwards of 100 different species of tropical and semi-tropical hardwoods that are in international trade but not listed by CITES (Cooper 2015b).

The colors and figure presented by wood may also differ between different specimens of the same species.[7] Even the wood of a single specimen has quite varying appearance, depending on where in the tree the wood originated and how it was cut (Cooper, and Sampson, pers. obs.). The more processed that a wood product is, the harder it is for an officer to identify. Raw logs and sawn lumber are the easiest wood products to identify, whereas plywood, veneers, manufactured wood products and furniture are increasingly difficult (Cooper, and Sampson, pers. obs.).

Identifying the woods from *D. granadillo*, *D. retusa* and *D. stevensonii* presents a special challenge for enforcement officers, due to their close structural similarities. The participants of the workshop to evaluate the *Dalbergia* timber species in Mexico noted that there is no reliable method to identify the species of the wood from *Dalbergia* specimens (CITES 2015). Espinoza et al. (2015) reported that the equivocal anatomical descriptions, absence of reference specimens, and results of chemical analyses suggest that *D. granadillo* may be synonymous with *D. retusa*. This opinion is shared by at least one major timber importer (Attridge, in litt.). On the other hand, the two species are

7. Figure is the appearance of wood when viewed from the side, and is a function of the grain, the structure, and the way the wood was cut.

taxonomically well characterized, each with a valid botanical author (Farr, in litt.). The International Legume Database and Information Service (ILDIS) and the Integrated Taxonomic Information System (ITIS) recognize both names as valid (ILDIS 2016; ITIS 2016a, b).

An additional challenge for enforcement officers is that many different trade names may be used for the same species, and these various names may be used on official documentation. These trade names may also be in multiple languages, which adds to the confusion (Cooper 2015a, b).

A fair amount has been published on the identification of tree wood. For example, in 2002, Environment Canada published an identification guide for CITES-listed tropical woods (Environment Canada 2002). The guide was specifically designed for enforcement officers and was produced in English, French and Spanish. Unfortunately, many additional wood-producing species have been listed in the CITES Appendices since the guide was originally published, and it has not been updated.

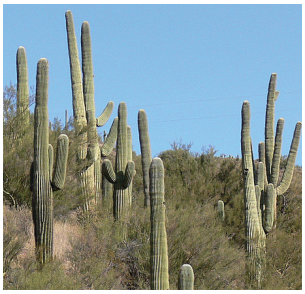
The best guide currently available for identifying wood from the priority timber species is *Identification of Central American Woods*, by Wiedenhoeft (2011), which was published in both English and Spanish. Unfortunately, this book is no longer available from the publisher.

Other identification guides have been published by different sources (ATIF n.d.; Conners 2011; Hoadley 1990; Horne 2013; Jones 2010). All of these materials are supplemented by publications in the primary literature, such as Gasson et al. (2011), MacLachlan and Gasson (2010) and Ogden (2008). The CITES Secretariat's Identification Wiki does not include identification sheets for any of the priority species (CITES 2016b).

Extensive and ongoing training is required for officers who are responsible for visually identifying wood in trade (Dormontt et al. 2015). In 2002, the North American Wildlife Enforcement Group (NAWEG) of the CEC hosted a trinational (Canada, Mexico, and the United States) workshop on trade in plants, which included an introduction to using Environment Canada's guide to identifying tropical woods (Cooper 2015a). This appears to be the only regional training provided on the topic.

Priority Timber Species

This section provides description, distribution, conservation status, and trade overview of each priority species. The International Union for Conservation of Nature (IUCN) Red List Categories, and categories for species at risk in Mexico and the United States are referenced in this section are defined in Appendix A.



Wars

Carnegiea gigantea (Engelm.) Britton & Rose

Common names

Saguaro, giant cactus (English)
Saguaro (French)
Sahuaro, saguaro (Spanish)

Description

Carnegiea gigantea is a tree-like cactus that grows up to 16 meters tall and 75 centimeters in diameter. The trunk is columnar and has one or more lateral, erect branches. The trunk has 12–30 prominent, vertical, ribs and has strong, thick spines. Flowers occur at the ends of branches and produce oblong, edible, seedy, red fruits (Kew 2016).

Distribution

Carnegiea gigantea occurs in the Mexican state of Sonora and the US states of Arizona and California (Burquez Montijo et al. 2013). In California, the species is restricted to the southeastern portion of the state, near the border with Arizona.

Conservation status

Carnegiea gigantea has been assessed as Least Concern on the IUCN Red List (Burquez Montijo et al. 2013). The species is listed as Threatened, in Mexico (DOF 2010). In the United States, *C. gigantea* is not listed under the ESA, but harvest on National Park Service lands is illegal (Ford, in litt.). The state of Arizona regulates the harvest or collection of the species, under the Arizona Native Plant Law (Arizona 2016).

Trade

C. gigantea wood is not available for sale in Canada, and no prices were available. *Carnegiea gigantea* wood is available for sale in the United States, but it is uncommon. In August 2016, a bundle of 40 six-foot-long pieces cost US$200 (Hill, pers. comm.).

Data downloaded from the UNEP-WCMC CITES Trade Database showed that Mexico exported 13.02 cubic meters (m^3) of *C. gigantea* wood to the United States in 2011, and 19.53 m^3 to the United States in 2014. Those were the only exports of *C. gigantea* reported by Mexico during 2009–2014. The United States did not report any exports of *C. gigantea* during 2009–2014 (CITES 2016a).

Amineah

Cylindropuntia cholla (F.A.C. Weber) F.M. Knuth

Common names

Cholla, chain-link cholla (English)
Cholla (French)
Cholla, choya, choya pelona (Spanish)

Description

Cylindropuntia cholla is a shrub-like cactus that is typically about one meter in height, although exceptional specimens may grow to over 4 meters tall. The green or greyish green stems are highly branched and form a series of long, oval lumps. The stems are armed with clumps of strong, whitish spines that may be up to 4 centimeters in length. The flowers are pink (Johnson and Hoagland 1999; Naturalista 2016).

Distribution

Cylindropuntia cholla is endemic to Mexico. The species occurs in the states of Baja California and Baja California Sur and may range into the State of Sonora (Pinkava et al. 2013a).

Conservation status

Cylindropuntia cholla has been assessed as Least Concern on the IUCN Red List (Pinkava et al. 2013a). The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the commercial harvest of native species without permits (DOF 2000, 2014).

Trade

Cylindropuntia wood is sold primarily by pet-trade vendors for use in aquariums and terrariums. *Cylindropuntia* wood was found to be readily available from US sellers on eBay, and limited amounts were available from retailers in Canada. In most cases *Cylindropuntia* was sold simply as "cholla wood," with no indication of the species. One Canadian pet shop reported that the *Cylindropuntia* wood it had for sale had been imported from a US vendor who collected the wood from his private property (Aquariums West, pers. comm.).

Data downloaded from the UNEP-WCMC CITES Trade Database found no records of trade in *Cylindropuntia* by Canada, Mexico or the United States during the years 2009–2014 (CITES 2016a). *Cylindropuntia* wood available for sale in the United States may have been imported prior to 2009, it may have been sourced domestically, or it may have been imported illegally. Alternatively, imports of *Cylindropuntia* wood may have been described as something other than wood products.

Cylindropuntia wood is rare in Mexico as there is not much of a market (Bárcenas Luna, in litt.).

The price for *Cylindropuntia* wood in the United States varied, depending on the size of a piece and whether it was branched or straight. In the United States, the prices for *Cylindropuntia* wood ranged from US$1.40 for a 3-inch-long piece, to US$139 for a 2-foot-tall branched "log" with multiple roots. *Cylindropuntia* wood is often offered for sale in lots of up to 100 pieces (Buy Pet Shrimp 2016; DiscoBee 2016; eBay 2016; Jungle Aquashrimp 2016; Pinkava et al. 2013a; Saveoncrafts 2016). Prices in Canada were slightly higher for pieces similar to those offered for sale in the United States. Canadian prices averaged approximately US$0.75 per inch for pieces ranging from 3-inches to 36-inches in length (AngelFins 2016; Aquariums West; Roger's Aquarium & Pet Supplies, pers. comm.).

Stan Shebs

Cylindropuntia fulgida (Engelm.) F.M. Knuth

Common names

Jumping cholla (English)
Cholla (French)
Choya (Spanish)

Description

Cylindropuntia fulgida is a very spiny, shrub-like cactus that grows to a height of 5 meters and a width of 2.5 meters. The stems consist of irregularly jointed branches covered with sharp barbed spines. *Cylindropuntia fulgida* is the largest of the "cholla" cacti. The flowers have pink and white petals streaked with lavender (DesertUSA 2017).

Distribution

Cylindropuntia fulgida is native to Mexico and the United States. The species occurs in the Mexican states of Sinaloa and Sonora and the US state of Arizona (Pinkava et al. 2013b).

Conservation status

Cylindropuntia fulgida has been assessed as Least Concern on the IUCN Red List (Pinkava et al. 2013b). The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the commercial harvest of native species without permits (DOF 2000, 2014).

Trade

See *Cylindropuntia cholla*.

Paul Asman and Jill Lenoble

Cylindropuntia imbricata (Haw.) F.M. Knuth

Common names

Tree cholla (English)
Cholla (French)
Cardenche, entraña, cardón, velas de coyote, xoconostle, coyonostli, tasajo macho, tuna joconoxtli (Spanish)

Description

Cylindropuntia imbricata is a shrub-like cactus that has a short, woody trunk and a number of upright candelabra-like branches. The species grows to a height of 3 meters and a width of over 1 meter. The trunk may be up to 25 centimeters in diameter. The stems consist of irregularly jointed branches that are covered with small rounded tubers or projections and many barbed spines that may be more than 4 centimeters in length. The flowers are magenta or purplish (Aggie Horticulture 2017).

Distribution

Cylindropuntia imbricata is native to Mexico and the United States and has a very wide distribution. In Mexico, the species occurs in the states of Aguascalientes, Chihuahua, Coahuila, Durango, México, Guanajuato, Hidalgo, Jalisco, Michoacán, Morelos, Nuevo León, Oaxaca, Puebla, Querétaro, San Luis Potosí, Sonora, Tamaulipas, Tlaxcala, Veracruz, and Zacatecas, and in the Distrito Federal. In the United States, the species is found in the states of Arizona, Colorado, New Mexico and Texas (Hernández et al. 2013).

Conservation status

Cylindropuntia imbricata has been assessed as Least Concern on the IUCN Red List (Hernández et al. 2013). The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the commercial harvest of native species without permits (DOF 2000, 2014).

Trade

See *Cylindropuntia cholla*.

Chaikom

Dalbergia granadillo (Pittier)

Common names

Cocobolo, rosewood (English)
Cocobolo Palissandre (French)
Granadillo mexicano, palo de rosa, cocobolo, cocobolo prieto, granadillo morado (Spanish)

Dalbergia granadillo wood is indistinguishable from that of *D. retusa*. Therefore, when discussing wood from these species the common names for both *D. granadillo* and *D. retusa* are interchangeable.

Description

Dalbergia granadillo is a deciduous tree that grows to a height of approximately 20 meters, with a trunk diameter of up to 40 centimeters. The trunk of the tree has inner heartwood and outer sapwood, both of which are hard and dense. The amount of sapwood will vary, depending on the age of the tree and its habitat (CITES 2013a). The heartwood exhibits a variety of colors, from yellow to orange, red, and shades of brown, with streaks of black or purple. The sapwood is typically a very pale yellow (Meier 2016a).

Distribution

Dalbergia granadillo is endemic to Mexico and occurs in the Mexican states of Chiapas, Guerrero, Jalisco, Michoacán, Nayarit and Oaxaca (Biodiversidad Mexicana 2017b, CITES 2015). Although it is possible to differentiate taxonomically *D. granadillo* from *D. retusa*, distinguishing between their wood is difficult. For this reason, experts at the Conabio workshop suspect that any mention of *D. granadillo* occurrence outside Mexico is likely to be *D. retusa* (CITES 2015).

Conservation status

Dalbergia granadillo has not been assessed by the IUCN. The species is considered Endangered in Mexico (DOF 2010).

Trade

Wood from *D. granadillo* is indistinguishable from that of *D. retusa* and in North America both species are sold under the name "cocobolo." Prices for *D. granadillo* for sale in North America would therefore be the same as for *D. retusa.*

Data downloaded from the UNEP-WCMC CITES Trade Database showed that in 2014, Mexico exported 15.01 cubic meters of *D. granadillo* sawn wood to China. This was the only export of *D. granadillo* from Mexico during 2009–2014. Neither Canada nor the United States reported imports of *D. granadillo* during 2009–2014 (CITES 2016a). As previously noted, Mexican authorities have concluded that *D. retusa* is not native to Mexico. The only known *D. retusa* specimens are in a plantation and were probably introduced from Honduras. To date, there have been no exports of wood sourced from the *D. retusa* plantation. Mexican exports of *D. retusa* during 2009–2014 most likely consisted of misidentified *D. granadillo* wood (Camarena Osorno, in litt.).

Manateere Real Estate

Dalbergia retusa (Hemsl.)

Common names

Cocobolo, rosewood (English)
Cocobolo Palissandre (French)
Granadillo, palo de rosa, cocobolo, cocobolo prieto, granadillo morado (Spanish)

Distinguishing *Dalbergia retusa* wood from that of *D. granadillo* is extremely difficult. Therefore, when discussing wood from these species, the common names for both *D. retusa* and *D. granadillo* can be considered interchangeable.

Description

Dalbergia retusa is a deciduous tree that grows to a height of approximately 20 meters, with a trunk diameter of up to 40 centimeters. The trunk of the tree has inner heartwood and outer sapwood, both of which are hard and dense. The amount of sapwood will vary, depending on the age of the tree and its habitat (CITES 2013a). The heartwood exhibits a variety of colors, from yellow to orange, red, and shades of brown, with streaks of black or purple. The sapwood is typically a very pale yellow (Meier 2016a).

Distribution

Dalbergia retusa occurs on the Pacific side of Central America. Many sources report that *D. retusa* is native to Mexico (for example, CITES 2013a; ARW 1998b). However, in 2015, Conabio held a workshop to evaluate the extinction risk of the *Dalbergia* timber species in Mexico. The workshop participants concluded that *D. retusa* is not native to Mexico, and that records of the species in the country are for introduced specimens (CITES 2015).

Conservation status

The IUCN has assessed *D. retusa* as Vulnerable (ARW 1998b). This status has not been updated since 1998 and may not reflect the current conservation status of the species. *Dalbergia retusa* has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico, and may not be a native species (CITES 2015).

Trade

Dalbergia retusa is commercially traded exclusively as wood, including logs, sawn wood, and finished products such as fine furniture and musical instruments. *Dalbergia retusa* is one of the most prized lumbers, because of its outstanding color and figure (Meier 2016a).

Dalbergia retusa lumber sells for US$27–$70 per board foot in Canada and the United States, depending on the dimensions and quality of the wood (A & M 2016; Advantage Lumber 2016; BellForest 2016; C.R. Muterspaw 2016; ExoticWoods 2016; Griffin 2016; Halifax Specialty Hardwoods 2016; Hearne Hardwoods 2016; Tropical Exotic Hardwoods 2016; West Wind 2016; Woodworkers Source 2016). Some vendors in the United States offer *Dalbergia* woods for sale as single boards, rather than by the board foot. These boards are priced according to the dimensions, quality, and country source of the piece, with photographs of each board posted on the vendors' websites (BellForest 2016; Griffin 2016). Select *D. retusa* wood may be offered for sale at up to US$350 for a single board (Tropical Exotic Hardwoods 2016).

Data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico exported a total of 632.33 cubic meters (m^3) of *D. retusa* sawn wood and 58.15 m^3 of *D. retusa* logs, to China, Taiwan and the United States. As previously noted, some Mexican authorities have concluded that *D. retusa* is not native to Mexico. Therefore, the Mexican exports may have been wood from different species of *Dalbergia*. During 2009–2014, the United States imported *D. retusa* wood from Guatemala, Mexico and Nicaragua. Canada did not record any imports of *D. retusa* wood during 2009–2014 (CITES 2016a).

Mauro Guanandi

Dalbergia stevensonii (Standl.)

Common names

Honduras rosewood, rosewood (English)
Palissandre du Honduras (French)
Palisandro de Honduras, rosul (Spanish)

Description

Dalbergia stevensonii is a medium-size deciduous tree that grows to a height of 15–30 meters (CITES 2013b). The trunk of the tree has both inner heartwood and outer sapwood. The heartwood ranges in color from brownish-purple to light-brown and the sapwood is a pale yellow (Meier 2016b).

Distribution

Dalbergia stevensonii is native to Mexico and other Central American countries. In Mexico, the species occurs in the State of Chiapas (Biodiversidad Mexicana 2017a).

Conservation status

Dalbergia stevensonii has not been assessed by the IUCN. The species has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. Currently, the species is not listed under the Mexican Species Red List (NOM-059-SEMARNAT-2010). However, the LGVS prohibits the commercial harvest of native species without permits. Furthermore, the preliminary assessment derived from the 2015 workshop on the extinction risk assessment of Mexican timber species of *Dalbergia* suggests that the species might warrant listing under the "Endangered" category of the national legislation (CITES 2015).

Trade

Dalbergia stevensonii is commercially traded exclusively as wood, including logs, sawn wood, veneers, and finished products such as fine furniture and musical instruments (Meier 2016b).

Dalbergia stevensonii lumber sells for US$23–$40 per board foot in Canada and the United States, depending on the dimensions and quality of the wood (A & M 2016; Advantage Lumber 2016; BellForest 2016; C.R. Muterspaw 2016; ExoticWoods

2016; Griffin 2016; Halifax Specialty Hardwoods 2016; Hearne Hardwoods 2016; Tropical Exotic Hardwoods 2016; West Wind 2016; Woodworkers Source 2016). Some vendors in the United States offer *Dalbergia* wood for sale as single boards, rather than by the board foot. These boards are priced according to the dimensions, quality, and country source of the piece, with photographs of each board posted on the vendors' websites (BellForest 2016; Griffin 2016).

A review of the UNEP-WCMC CITES Trade Database found no records for commercial exports of *D. stevensonii* from Mexico during 2009–2014. The United States imported 130.98 cubic meters (m^3) of *D. stevensonii* wood from Guatemala and Germany during 2009–2014. Canada reported imports of 0.85 m^3 of *D. stevensonii* wood from Germany during 2009–2014 (CITES 2016a).

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Swietenia humilis (Zucc.)

Common names

Honduras mahogany, Mexican mahogany, Pacific Coast mahogany (English)
Acajou de la côte pacifique (French)
Caoba, caoba de Honduras, caoba de Pacífico, coabilla, cóbano, gateado, venadillo, zapatón, zopilote (Spanish)

Description

Swietenia humilis is a small to medium-size deciduous tree that grows 15–20 meters tall and 30–50 centimeters in diameter (Orwa et al. 2009). It is the smallest of the three *Swietenia* species and produces lumber of poorer quality due to the numerous knots, irregular grain and smaller pieces. *Swietenia* wood varies in color and density, depending on the growing conditions and age of the tree (Meier 2016c).

Distribution

Swietenia humilis ranges from Mexico south through Central America (WCMC 1998a).

Conservation status

The IUCN has assessed *S. humilis* as Vulnerable (WCMC 1998a). This status has not been updated since 1998 and may not reflect the current conservation status of the species. *Swietenia humilis* has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the commercial harvest of native species without permits (DOF 2000, 2014).

Trade

Swietenia humilis lumber is not readily available in trade and the species is of little commercial importance (Attridge, pers. comm.; WCMC 1998a). It is not advertised for sale in Canada or the United States. Mahogany wood in Mexico (marketed as "caoba") sells for US$3–$9 per board foot, depending on the dimensions. This wood may be identified as *Swietenia*, but not by which species (Molina Negrete, pers. obs.). It is likely that most product is *S. macrophylla*, but a portion may be *S. humilis* or possibly wood from other genera.

A review of the UNEP-WCMC CITES Trade Database found no records for commercial exports of *S. humilis* from Mexico during 2009–2014. The United States imported 222.92 cubic meters of *S. humilis* wood from Guatemala during 2009–2014. This wood may not have been for commercial sale. Canada did not report any imports of *S. humilis* during 2009–2014.

Mauro Guanandi

Swietenia macrophylla (King)

Common names

Big leaf (big-leaf/bigleaf) mahogany, large-leaved mahogany, Brazilian mahogany, Honduras mahogany (English)
Acajou du Honduras, Acajou à grandes feuilles (French)
Caoba, caobo, cóbano, mara (Spanish)

Description

Swietenia macrophylla is a large deciduous tree with a rounded crown and a trunk with few branches. The species grows up to 70 meters in height, and up to 3.5 meters in diameter (Biodiversidad Mexicana 2017c). *Swietenia* wood varies in color and density, depending on the growing conditions and age of the tree (Meier 2016c).

Distribution

Swietenia macrophylla ranges from southern Mexico, south through Central America and to several countries in South America (WCMC 1998b).

Conservation status

The IUCN has assessed *S. macrophyla* as Vulnerable (WCMC 1998b). This status has not been updated since 1998 and may not reflect the current conservation status of the species. *Swietenia macrophylla* has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the commercial harvest of native species without permits (DOF 2000, 2014).

Trade

Swietenia macrophylla is the most commercially valuable of the *Swietenia* species, and is subject to significant levels of international trade (WCMC 1998b).

Swietenia macrophylla lumber sells for US$8–$30 per board foot in Canada and the United States, depending on the dimensions and quality of the wood (A & M 2016; Advantage Lumber 2016; BellForest 2016; C.R. Muterspaw 2016; ExoticWoods 2016; Griffin 2016; Halifax Specialty Hardwoods 2016; Hearne Hardwoods 2016; Tropical Exotic Hardwoods 2016; West Wind 2016; Woodworkers Source 2016). Mahogany wood in Mexico (marketed as "caoba") sells for US$3–$9 per board foot, depending on the dimensions. This wood may be identified as *Swietenia*, but not as to which species (D. Molina Negrete, pers. obs.). It is likely that most is *S. macrophylla*, but some may be *S. humilis* or possibly wood from other genera.

Data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, Mexico exported a total of 8,700.28 cubic meters (m^3) of *S. macrophylla* sawn wood and 2,999.81 m^3 of *S. macrophylla* logs. Mexico exported *S. macrophylla* wood to eight different countries, but 90% was exported to the United States. Mexico also imported 589.36 m^3 of *S. macrophylla* wood during 2009–2014 (CITES 2016a).

In 2009–2014, Canada imported 1,711.99 m^3 of *S. macrophylla* sawn wood, and the United States imported 87,048.39 m^3 of *S. macrophylla* sawn wood. More than 99% of the wood from priority timber species imported into Canada, Mexico and the United States was *S. macrophylla* (CITES 2016a).

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Swietenia mahagoni (L.) Jacq.

Common names

American mahogany, Cuban mahogany, small-leaved mahogany, West Indian mahogany (English)
Acajou d'Amérique, Acajou des Antilles, Acajou de Cuba (French)
Caoba española, caobilla (Spanish)

Description

Swietenia mahagoni is a tall deciduous tree that grows up to 30 meters high, with a short, buttressing base that may be up to 1 meter in diameter. The species has a large, spherical crown (Orwa et al. 2009).

Distribution

Swietenia mahagoni occurs on many Caribbean islands, and in the State of Florida in the United States. Natural stands of *S. mahagoni* were heavily over-exploited and exhausted in the past, and the species has been widely cultivated. Its original natural distribution is therefore unclear (ARW 1998a).

Conservation status

The IUCN has assessed *S. mahagoni* as Endangered (ARW 1998a). This status has not been updated since 1998 and may not reflect the current conservation status of the species. *Swietenia mahagoni* has not been assessed as Endangered, Threatened, or Subject to Special Protection in Mexico. However, the LGVS prohibits the commercial harvest of native species without permits (DOF 2000, 2014). *Swietenia mahagoni* is protected under Florida State law in the United States (Brown 2012).

Trade

Lumber from *S. mahagoni* is not commercially available in North America. According to ARW (1998a), small quantities of *S. mahagoni* are occasionally offered for sale on the international market, but one prominent Canadian importer noted that he had not seen the species in trade for more than 20 years (Attridge, pers. comm.). Data downloaded from the UNEP-WCMC CITES Trade Database showed that during 2009–2014, the United States imported 277.88 cubic meters of *S. mahagoni* logs from Palau. Apparently, these logs were from a unique harvest of trees that had been planted decades ago (Ford, in litt.). These imports were for relatively small quantities.

Recommended Actions

The following actions are recommended for promoting the conservation and legal, sustainable trade of priority timber species in North America. Completion of the recommended actions is subject to available funding. If the cost of an action can reasonably be considered to be part of normal government spending, then the cost is listed as n/a. If the cost will likely require additional and possibly external funding, then a very rough estimate of the cost is provided.

Measuring, reporting and following up on the recommendations provided in this action plan will be the responsibility of the governments of Canada, Mexico and the United States, in collaboration with academic institutions, nongovernmental organizations and/or individual experts. The majority of the species that are the subject of this report are native to Mexico, the government of Mexico will, therefore, have special interest in tracking and reporting on progress.

No.	Goals	Actions	Cost (US$)	Timeline	Priority
1	Ensure that progress on the recommendations in this action plan is reported and measurable.	**Measuring progress**: The governments of Canada, Mexico and the United States should develop and implement a process for tracking and reporting on efforts to fulfill the recommendations of this action plan, such as a dedicated website or other method.	n/a	2017 (ongoing)	High
2	Support collaborative North American efforts directed at promoting sustainable, traceable trade and conservation of priority CITES Appendix II species.	(a) **Trinational collaboration**: The governments of Canada, Mexico and the United States should support and monitor collaborative efforts to promote sustainable, traceable trade and conservation of native species deemed to be of priority concern—including CITES Appendix II timber species.	n/a	2017 (ongoing)	High
		(b) **Funding strategy**: The governments of Canada, Mexico and the United States (to the extent possible, and in consideration of domestic priorities) should develop a long-term strategy for funding this action plan, emphasizing realization of the high-priority actions.	n/a	2018	High
3	Support the sustainable trade and conservation of priority timber species through field research and analysis.	(a) ***Cylindropuntia* and *Carnegiea* field studies**: CITES and other relevant authorities in Mexico and the United States, in collaboration with academia and nongovernmental organizations, should support research on the population ecology, reproductive biology, and conservation of *Cylindropuntia* and *Carnegiea*, to establish sustainable use rates for wild populations.	60,000 (per country)	2020	Medium
		(b) **NDF protocols for *D. stevensonii* and *D. granadillo***: Mexican CITES and forestry authorities, in collaboration with academia and nongovernmental organizations and the forestry sector, with assistance from US experts, should support research on the population dynamics, reproductive biology and conservation of *D. stevensonii* and *D. granadillo*, to establish protocols for preparing non-detrimental findings for exports of these species.	60,000	2020	High

No.	Goals	Actions	Cost (US$)	Timeline	Priority
4	Increase the sustainable production of *Dalbergia* species and *Swietenia* in Mexico.	(a) **Mixed-plantation assessment**: Mexican forestry authorities, in collaboration with academia, nongovernmental organizations and the forestry sector, should establish a strategy for increasing commercial production of *S. macrophylla* and species of *Dalbergia* through planting in natural forests and/or mixed plantations with multiple species.	60,000	2018	Medium
		(b) **Forestry certification**: Mexican CITES and forestry authorities should actively support forestry-sector efforts to seek third-party certification of forestry operations that target *S. macrophylla* and species of *Dalbergia*. This could entail certification by FSC or other international certification mechanisms that meet the legality standards for trade with Canada and the United States.	n/a	2017 (ongoing)	High
5	Improve community awareness of forest conservation and value in support of sustainable timber harvest and trade in Mexico.	**Mexican national outreach strategy**: Mexican CITES and forestry authorities, in collaboration with academia, nongovernmental organizations and the forestry sector, should develop a national outreach strategy for increasing awareness of the conservation and economic value of *Dalbergia* and *Swietenia* forests to communities in their range of distribution.	20,000	2018	Low
6	Provide enforcement officers with the information and resources necessary to identify wood specimens and enforce the laws that regulate timber trade.	(a) **Enforcement support**: The Government of Mexico should increase funding for and prioritize enforcement activities, in collaboration with Canadian and US enforcement experts, to stop the illegal trade of wood, especially from high-value species such as *Dalbergia*, *Swietenia macrophylla*, and *Carnegiea gigantea*.	100,000	2018 (ongoing)	High
		(b) **Collaboration between North and Central America**: CITES and forestry enforcement authorities in Canada, Mexico and the United States, via the CEC North American Wildlife Enforcement Group (NAWEG), should establish a collaborative working relationship with the Central American and Dominican Republic Wildlife Enforcement Network (*Red de Observancia y Aplicación de la Normativa de Vida Silvestre de Centroamérica y República Dominicana*—ROAVIS) to share information and expertise; coordinate enforcement activities, and facilitate cooperation between Mexico and Central America on issues linked to the trade in *Dalbergia* and *Swietenia* timber.	n/a	2018 (ongoing)	Medium
		(c) **Cactus identification**: CITES and other relevant authorities in Canada, Mexico and the United States, via the CEC, and in collaboration with academia and nongovernmental organizations, should fund and support the development of morphological, chemical and molecular methodologies for distinguishing *Cylindropuntia* and *Carnegiea* wood by species.	50,000	2020	Medium
		d) **Regional timber trade workshop**: CITES and forestry authorities in Canada, Mexico and the United States, via the CEC, and in collaboration with Central American authorities, should host a regional workshop on trade and identification of wood. The workshop should bring together experts and enforcement staff; provide training on identification of wood from CITES-listed species; discuss trade in hardwoods from Mexico and Central America; build links between the different regional authorities; and stimulate collaborative actions to combat illegal trade. Copies of *The Identification of Central American Woods*, by Wiedenhoeft, should be provided to the attendees.	75,000	2018	High

No.	Goals	Actions	Cost (US$)	Timeline	Priority
7	Establish regulations, policies and guidelines that support and promote sustainable harvest and trade of priority timber species in North America.	(a) **Regulatory review**: The Government of Mexico, in collaboration with the CEC and the forestry sector, should review and streamline the regulations and procedures for exporting timber.	n/a	2018	High
		(b) **Commercial plantation guidelines**: Mexican forestry authorities, in collaboration with academia, nongovernmental organizations and the forestry sector, should develop guidelines for establishing commercial plantations of *D. stevensonii* in Chiapas, Mexico, and of *D. granadillo* in Oaxaca, Mexico.	60,000	2020	High
		(c) **Cactus-wood collection policy**: Mexican CITES and forestry authorities, in collaboration with academia, nongovernmental organizations and the forestry sector, should establish policy and procedures for the sustainable, legal and traceable commercial collection of wood from *Carnegiea* and *Cylindropuntia*; and implement an active monitoring program linked to increased enforcement efforts to combat poaching and trafficking of these cacti.	10,000	2020	High
		(d) **Defining "artificially propagated"**: CITES and forestry authorities in Canada, Mexico and the United States should jointly review the implications of amending the definition of "artificially propagated" provided by Resolution Conf. 10.13 (Rev. CoP15) (Implementation of the Convention for timber species) to include wood from mixed-species plantations. If such an amendment can be justified, then a discussion paper should be presented at a meeting of the CITES Plants Committee.	n/a	2019	Low
8	Support sustainable harvest and trade in priority cactus species, through improved collection and analysis of species and trade data.	***Cylindropuntia* trade study**: CITES and relevant authorities in Mexico and the United States, in collaboration with academia and nongovernmental organizations, should fund a joint study of trade in *Cylindropuntia* wood—to determine the species utilized, supply and value chains, and existing (or potential) certification and traceability protocols.	40,000	2019	Medium

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Bibliography

A & M. 2016. Wood Gallery. A & M Wood Specialty, Cambridge Ontario. <http://www.amwoodinc.com/contact_us>.

Advantage Lumber. 2016. Exotic Hardwood Lumber. Advantage Lumber, NY. <http://www.advantagelumber.com/exotic.htm>.

Aggie Horticulture. 2017. Cholla, Walking Stick Cholla, Cane Cholla, Tree Cholla, Tree Cactus, Candalabrum Cactus, Devils Rope, Coyote Prickly Pear, Tuna Juell, Velas de Coyote. Department of Horticultural Sciences Administration. Texas A & M University. <http://aggie-horticulture.tamu.edu/ornamentals/nativeshrubs/opuntiaimbricat.htm>.

AngelFins. 2016. Cholla Wood. AngelFins Quality Aquarium Supplies. <http://angelfins.ca/index.php?main_page=product_info&products_id=1000>.

Arizona. 2016. Protected Arizona Native Plants. Arizona Department of Agriculture. <https://agriculture.az.gov/protected-arizona-native-plants>.

ARW (Americas Regional Workshop). 1998a. Americas Regional Workshop (Conservation & Sustainable Management of Trees, Costa Rica, November 1996): *Swietenia mahagoni*. The IUCN Red List of Threatened Species 1998: e.T32519A9712452. <http://dx.doi.org/10.2305/IUCN.UK.1998.RLTS.T32519A9712452.en>.

———. 1998b. Americas Regional Workshop (Conservation & Sustainable Management of Trees, Costa Rica, November 1996: Dalbergia retusa. The IUCN Red List of Threatened Species 1998: e.T32957A9737916. <http://dx.doi.org/10.2305/IUCN.UK.1998.RLTS.T32957A9737916.en>.

ATIF (Australian Timber Importers Federation). n.d. *Timber User's Guide 3: Imported Timber Species*. Potts Point, Australia: Australian Timber Importers Federation.

BellForest. 2016. Exotic Wood. BellForest Figured Products Inc., Ishpeming, MI. <http://www.bellforestproducts.com/exotic-wood/>.

Biodiversidad Mexicana. 2017a. *Dalbergia stevensonii*. CONABIO Biodiversitas. Mexico City. <http://bios.conabio.gob.mx/especies/6052805>.

———. 2017b. Granadillo (*Dalbergia granadillo*). CONABIO Biodiversitas. Mexico City. <http://bios.conabio.gob.mx/especies/6050878>.

———. 2017c. *Swietenia macrophylla*. CONABIO Biodiversitas. Mexico City. <http://www.conabio.gob.mx/conocimiento/info_especies/arboles/doctos/37-melia5m.pdf>.

Brown, S.H. 2012. Mahogany: *Swietenia mahagoni*. University of Florida, Gainesville.

Burquez Montijo, A., C. Butterworth, M. Baker, and R.S. Felger. 2013. *Carnegiea gigantea*. The IUCN Red List of Threatened Species 2013: e.T152495A643340. <http://dx.doi.org/10.2305/IUCN.UK.2013-1.RLTS.T152495A643340.en.>.

Burquez Montijo A., and M.C. Ortega Bustamante Enriquena. n.d. Evaluación del Riesgo de Extinción de *Carnegiea Gigantea* de Acuerdo al Numeral 5.7 de la Nom-059- Semarnat-2001. Conabio. Mexico City. <http://www.conabio.gob.mx/institucion/proyectos/resultados/ES008_ApVI_MER_propuesta_sahuaroNOM059.pdf>.

Buy Pet Shrimp. 2016. 6 Inch Cholla Wood. Buy Pet Shrimp, Calif. <http://buypetshrimp.com/6-inch-cholla-wood-3-pieces/>.

C.R. Muterspaw. 2016. Exotic Woods and Exotic Wood Prices. C.R. Muterspaw Lumber Co., Ohio. <http://crlumber.com/exotic-wood-prices/>.

Canada. 1992. Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (1992, c. 52). Government of Canada, Ottawa.

———. 1996. Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act—Wild Animal and Plant Trade Regulations. Government of Canada, Ottawa.

CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora). 1973. Convention on International Trade in Endangered Species of Wild Fauna and Flora (amended 1979): Article III. CITES Secretariat, Geneva.

———. 1997. Resolution Conf. 10.3: Designation and Role of the Scientific Authorities. CITES Secretariat, Geneva. <https://cites.org/sites/default/files/document/E-Res-10-03.pdf>.

———. 2006. *Summary Record: Sixteenth Meeting of the Plants Committee*. CITES Secretariat: Geneva.

———. 2007. CoP14 Prop. 32: *Dalbergia stevensonii*. CITES Secretariat, Geneva.

———. 2008. PC17 Doc. 16.1.2: Timber issues, Bigleaf Mahogany. CITES Secretariat, Geneva.

———. 2010. CoP15 Doc. 57: *Cedrela odorata*, *Dalbergia retusa*, *Dalbergia granadillo* and *Dalbergia stevensonii*. CITES Secretariat, Geneva.

———. 2013a. CoP16 Prop. 61: *Dalbergia retusa* and *Dalbergia granadillo*. CITES Secretariat, Geneva.

———. 2013b. CoP16 Prop. 62: *Dalbergia stevensonii* is proposed for listing in Appendix II of CITES in accordance with Article II, paragraph 2(a), of the Convention and Resolution Conf. 9.24 (Rev. CoP15) Annex 2 (a), Paragraph B. CITES Secretariat, Geneva.

———. 2013c. Resolution Conf. 16.7 Non-detriment findings. CITES Secretariat, Geneva.

———. 2015. PC22 Doc. 22.4: Risk Assessment for the Tree Species of the Genus *Dalbergia* in Mexico. CITES Secretariat, Geneva.

———. 2016a. CITES Trade Database. CITES Secretariat, Geneva.

———. 2016b. CITES Wiki Identification Manual. CITES Secretariat, Geneva. <http://citeswiki.unep-wcmc.org/IdentificationManual/tabid/56/language/en-US/Default.aspx>.

Conners, T. 2011. The Basics of Wood Identification. *Kentucky Woodlands Magazine* Vol. 6, Issue 1.

Cooper, E.W.T. 2015a. *Crooked Timber: Recommendations for Canadian Enforcement Response to Imports of Illegal Wood Products*. Canadian Forest Service, Ottawa, Canada.

———. 2015b. *Knotty Problem: Trade in Illegal Forest Products*. Canadian Forest Service, Ottawa, Canada.

Desert Museum. 2016. Plant Fact Sheet: Saguaro Cactus. Arizona-Sonora Desert Museum. Tucson. <https://www.desertmuseum.org/kids/oz/long-fact-sheets/Saguaro%20Cactus.php>.

DesertUSA. 2017. Jumping Cholla. DesertUSA.com. <http://www.desertusa.com/cactus/chain-fruit-cholla.html>.

DiscoBee. 2016. Cholla Wood. DiscoBee. <https://www.discobee.com/products/cholla-wood>.

DOF. 2000. Ley General de Vida Silvestre. *Diario Oficial de la Federación* 3 July 2000. <http://www.diputados.gob.mx/LeyesBiblio/ref/lgvs/LGVS_orig_03jul00.pdf>.

———. 2003. Ley General de Desarrollo Forestal Sustentable. *Diario Oficial de la Federación* 25 February 2003. <http://www.profepa.gob.mx/innovaportal/file/3264/1/ley_general_de_desarrollo_forestal_sustentable.pdf>.

———. 2010. Norma Oficial Mexicana NOM-059-SEMARNAT-2010, Protección ambiental-Especies nativas de México de flora y fauna silvestres—Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio—Lista de especies en riesgo. *Diario Oficial de la Federación* 30 Dec. 2012.

———. 2014. Reglamento de la Ley General de Vida Silvestre. *Diario Oficial de la Federación* 19 March 2014. Mexico, D.F.

———. 2016. General Wildlife Law. Government of Mexico. *Diario Oficial de la Federación.* Mexico, DF.

Dormontt, E.E., M. Bonerb, B. Braunc, G. Breulmannd, B. Degene, E. Espinoza, S. Gardnerg, P. Guilleryh, J.C. Hermansoni, G. Kochj, S.L. Leek, M. Kanashirol, A. Rimbawantom, T. Thomasn, A.C. Wiedenhoefto, Y. Yinp, J. Zahnenq, and A.J. Lowea. 2015. Forensic timber identification: It's time to integrate disciplines to combat illegal logging. *Biological Conservation*. <http://dx.doi.org/10.1016/j.biocon.2015.06.038>.

eBay. 2016. Cholla. eBay Inc. <www.ebay.ca/sch/i.html?_from=R40&_sacat=0&_nkw=cholla&_sop=3>. Viewed 5 August 2016.

Environment Canada. 2002. *CITES Identification Guide—Tropical Woods Guide to the Identification of Tropical Woods Controlled under the Convention on International Trade in Endangered Species of Wild Fauna and Flora*. Ottawa: Government of Canada.

———. 2003. *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act 2001 Report*. Ottawa: Government of Canada.

Espinoza, E.O., M.C. Wiemann, J. Barajas-Morales, G.D. Chavarria, and P.J. McClure. 2015. Forensic Analysis of Cites-Protected *Dalbergia* Timber from the Americas. *IAWA Journal* 36(3): 311–325.

ExoticWoods. 2016. Bulk Lumber. Exotic Woods Company, Inc., New Jersey. <http://www.exoticwoods.com/home.php?cat=31>.

Floyd, J.P. 1998. *Legal and Illegal Trade between Mexico and the U.S. in Plants and Plant Products Listed Under CITES*. USDA Forest Service Proceedings RMRS-P-5.

Gasson, P., P. Baas, and E. Wheeler. 2011. Wood anatomy of CITES-listed tree species. *IAWA Journal* 32(2): 155–197.

Griffin. 2016. Cocobolo. Griffin Exotic Wood, LLC. <http://www.exoticwood.biz/cocobolo.htm>.

Grogan, J., and M. Schulze. 2008. Estimating the number of trees and forest area necessary to supply internationally traded volumes of big-leaf mahogany (*Swietenia macrophylla*) in Amazonia. *Environmental Conservation* 35: 26–35.

Halifax Specialty Hardwoods. 2016. Our Hardwoods. Halifax Specialty Hardwoods, Ltd. Halifax, NS. <http://www.halifaxspecialtyhardwoods.com/Hardwoods.asp>.

Hearne Hardwoods. 2016. Price List July 2016. Hearne Hardwoods Inc. Oxford, PA. <http://www.hearnehardwoods.com/hardwoods/pricelist/pricelist.html>.

Hernández, H.M., M. Cházaro, and C. Gómez-Hinostrosa. 2013. *Cylindropuntia imbricata*. The IUCN Red List of Threatened Species 2013: e.T152144A602262. <http://dx.doi.org/10.2305/IUCN.UK.2013-1.RLTS.T152144A602262.en>.

Hoadley, R.B. 1990. Identifying Wood: Accurate Results With Simple Tools. Taunton Press. Newtown Connecticut.

Horne, J. 2013. *A Guide to Lesser Known Tropical Timber Species*. Gland, Switzerland: WWF International.

ILDIS (International Legume Database & Information Service). 2016. International Legume Database & Information Service. Centre for Plant Diversity & Systematics. University of Reading. <http://www.ildis.org/>.

ISO (International Organization for Standardization). 2016. Standards. International Organization for Standardization. Geneva. <http://www.iso.org/iso/home/standards.htm>.

ITIS (Integrated Taxonomic Information System). 2016a. *Dalbergia granadillo* Pittier. Integrated Taxonomic Information System online database. <http://www.itis.gov>.

———. 2016b. *Dalbergia retusa* Hemsl. Integrated Taxonomic Information System on-line database. <http://www.itis.gov>.

IUCN. 2012. *IUCN Red List Categories and Criteria: Version 3.1*. Second edition. Gland, Switzerland, and Cambridge, UK: International Union for Conservation of Nature. iv + 32pp.

Johnson, F.L., and B.W. Hoagland. 1999. Catalog of the Woody Plants of Oklahoma: Descriptions and Range Maps. Oklahoma Biological Survey. University of Oklahoma, Norman, Oklahoma. <http://www.biosurvey.ou.edu/shrub/opim.htm>.

Jones, P.D. 2010. *Basic Guide to Identification of Hardwoods and Softwoods Using Anatomical Characteristics*. Starkville, Mississippi: Mississippi State University.

Jungle Aquashrimp. 2016. Aquarium Cholla Wood. Jungle Aquashrimp. <http://jungleaquashrimp.com/aquarium-cholla-wood-for-fish-pleco-shrimp-tanks-hermit-crabs/>.

Kew. 2016. *Carnegiea gigantea* (saguaro cactus). Kew Royal Botanical Gardens. Richmond, Surrey, UK. <http://www.kew.org/science-conservation/plants-fungi/carnegiea-gigantea-saguaro-cactus>.

Linder, M.J., and R. Kaplan. 1952. *Translation of Mexican Game Law*. Paper 70. Other Publications in Wildlife Management. <http://digitalcommons.unl.edu/icwdmother/70>.

LSE. 2017. General Law for Sustainable Forest Development. London School of Economics and Political Science. London, UK. <http://www.lse.ac.uk/GranthamInstitute/law/general-law-for-sustainable-forest-development/>.

MacLachlan, I., and P. Gasson. 2010. Quantitative wood anatomy using multivariate principal components analysis for identification of the CITES listed *Pterocarpus santalinus* (Dalbergioideae, Papilionoideae, Leguminosae). *IAWA Journal* 31(2): 121–138.

Meier, E. 2014. The Wood Database. <http://www.wood-database.com/.

———. 2016a. Cocobolo. The Wood Database. <http://www.wood-database.com/cocobolo/>.

———. 2016b. Honduran Rosewood. The Wood Database. <http://www.wood-database.com/honduran-rosewood/>.

———. 2016c. Mahogany Mixups: The Lowdown. The Wood Database. <http://www.wood-database.com/wood-articles/mahogany-mixups-the-lowdown/>.

Mejía, E., X. Buitrón, M. Peña-Claros, and J. Grogan. 2008. Big-Leaf Mahogany (*Swietenia macrophylla*) in Peru, Bolivia and Brazil. *Proceedings of the CITES NDF Workshop. Cancún, Mexico*. Case Studies. WG 1 – Trees, Case Study 4.

Merriam-Webster. 2016. Merriam-Webster Online Dictionary. Merriam-Webster Inc. Springfield. <www.merriam-webster.com/dictionary>.

Mexico. 2007. CoP14 Inf. 24: International Workshop of Experts on Non-Detriment Findings on Bigleaf Mahogany (*Swietenia Macrophylla*). *Government of Mexico.* Mexico, D.F.

Mexico. 2016. Ley General de Vida Silvestre (Revised). *Official Journal of the Federation.* Mexico DF.

NAS (National Academy of Sciences). 1979. *Tropical Legumes: Resources for the Future*. Washington, DC: National Academy of Sciences.

Naturalista. 2016. Choya pelona (*Cylindropuntia cholla)*. Naturalista. <http://www.naturalista.mx/taxa/274276-Cylindropuntia-cholla>.

NOAA (National Oceanic and Atmospheric Administration). 2015. Endangered Species Act (ESA). National Oceanic and Atmospheric Administration. <http://www.nmfs.noaa.gov/pr/laws/esa/>.

NRC (Natural Resources Canada). 2016. About Us. Ottawa. <https://www.nrcan.gc.ca/department>.

Ogden, R., H.N. McGough, R.S. Cowan, L. Chua, M. Groves, and R. McEwing. 2008. SNP-based method for the genetic identification of ramin Gonystylus spp. timber and products: Applied research meeting CITES enforcement needs. *Endang. Species Res.* 9:255–261.

Orwa, C., A. Mutua, R. Kindt, R. Jamnadass, A Simons. 2009. Agroforestree Database: A tree reference and selection guide, version 4.0. World Agroforestry Centre. Kenya. http://www.worldagroforestry.org/output/agroforestree-database.

Pinkava, D.J., M. Baker, and R. Puente. 2013a. *Cylindropuntia cholla*. The IUCN Red List of Threatened Species 2013: e.T151827A565796. <http://dx.doi.org/10.2305/IUCN.UK.2013-1.RLTS.T151827A565796.en>.

Pinkava, D.J., M. Baker, R Puente. 2013b. *Cylindropuntia fulgida*. The IUCN Red List of Threatened Species 2013: e.T152447A637962. <http://dx.doi.org/10.2305/IUCN.UK.2013-1.RLTS.T152447A637962.en>.

Saveoncrafts. 2016. Cholla Branch 15in. Save-On-Crafts. <http://www.save-on-crafts.com/cholla.html>.

Semarnat. 2012. Áreas Naturales Protegidas. Comisión Nacional de Áreas Naturales Protegidas. México, DF. <http://www.conanp.gob.mx/regionales/>.

Tropical Exotic Hardwoods. 2016. Pricelist. Tropical Exotic Hardwoods. California. <http://www.tehwoods.com/price-list>.

USA (United States of America). 1900. Lacey Act of May 25, 1900. Ch. 553, 31 Stat. 187. Government of the United States of America. Government of the United States of America. Washington, DC.

———. 1971. Title 50 Code of Federal Regulations, Wildlife & Fisheries: Prohibitions. Washington, DC.

———. 1973. Endangered Species Act of 1973. Pub. L. 93-205, Dec. 28, 1973, 87 Stat. 884 (16 U.S.C. 1531 et seq.). Government of the United States of America. Washington, DC.

———. 1981. Lacey Act Amendments of 1981. Pub. L. 97-79, Nov. 16, 1981, 95 Stat. 1073 (16 U.S. C. 3371 et seq.). Government of the United States of America. Washington, DC.

USDA (United States Department of Agriculture). 2006. APHIS Factsheet: The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). United States Department of Agriculture. Washington, DC.

———. 2016. CITES (Endangered Plant Species). United States Department of Agriculture. Washington, DC. <https://www.aphis.usda.gov/aphis/ourfocus/planthealth/import-information/permits/plants-and-plant-products-permits/cites/ct_cites_endangered_plants>.

USFWS. 2015. Lacey Act. US Fish & Wildlife Service, Falls Church, Virginia. <http://goo.gl/0pGxXT>.

WCMC (WorldConservation Monitoring Centre). 1998a. *Swietenia humilis*. The IUCN Red List of Threatened Species 1998: e.T32954A9744772. <http://dx.doi.org/10.2305/IUCN.UK.1998.RLTS.T32954A9744772.en>.

———. 1998b. *Swietenia macrophylla*. The IUCN Red List of Threatened Species 1998: e.T32293A9688025. <http://dx.doi.org/10.2305/IUCN.UK.1998.RLTS.T32293A9688025.en>.

West Wind. 2016. Hardwoods. West Wind Hardwoods Inc. Sydney, BC. <http://www.westwindhardwood.com/product-category/hardwoods/>.

Wiedenhoeft, A.C. 2011. *Identification of Central American Woods*. Madison, WI: Forest Products Society.

Woodworkers Source. 2016. Latin American Woods. Woodsourcing.com. <http://www.woodworkerssource.com/shop/category/2_latin.html>.

Personal Communications

Attridge, B., Owner, Genwood Industries Ltd., personal communication with E. Cooper, August 2016.

Attridge, B., via S. Matheson, East Coast Specialty Hardwoods Ltd., email correspondence with L. Sampson, August 2016.

Bárcenas Luna, R.T., Professor, *Universidad Autónoma de Querétaro*, email correspondence with E. Cooper, August 2016.

Bárcenas Luna, R.T., Professor, *Universidad Autónoma de Querétaro*, email correspondence with E. Cooper, February 2017.

Camarena Osorno, I., CITES Flora Specialist, Conabio, online "chat" correspondence with E. Cooper, February 2017.

Camarena Osorno, I., CITES Flora Specialist, Conabio, email correspondence with E. Cooper, September 2016.

Farr, K., Manager–Science Integration and CITES Scientific Authority, Canadian Forest Service, email correspondence with E. Cooper, August 2016.

Ford, P., Botanist, Division of Scientific Authority, US Fish & Wildlife Service, Headquarters, email correspondence with E. Cooper, August 2016.

Hill, S., Idaho Forest Products, personal communication with E. Cooper, August 2016.

Reuter, A., Latin America Regional Wildlife Trafficking Coordinator, Wildlife Conservation Society, email correspondence with E. Cooper, Dec. 2016 and Jan. 2017.

Unidentified staff person, Aquariums West pet shop, personal communication with E. Cooper, August 2016.

Unidentified staff person, Roger's Aquarium & Pet Supplies, personal communication with E. Cooper, August 2016.

Wiedenhoeft, A.C., Research Botanist and Team Leader, Center for Wood Anatomy Research, US Forest Service, email correspondence with L. Sampson, February 2017.

Appendix A: **Categories of Risk**

Mexico

The legislated categories for species and populations at risk in Mexico, as summarized from the General Law of Wildlife of Mexico (*Ley General de Vida Silvestre*) (Mexico 2016), are as follows:

- **Probably Extinct (in the wild)**: Those species that no longer can be found in the wild and are only known to exist in captivity or outside Mexican territory.
- **Endangered (in danger of extinction)**: Those species whose ranges or population size have declined dramatically in Mexico, thereby threatening their survival, due to factors such as the destruction or drastic modification of habitat; unsustainable exploitation; disease; or predation.
- **Threatened**: Those species that could be in danger of extinction in the short or medium term, if the factors that threaten their survival continue unabated.
- **Subject to Special Protection**: Those species that could potentially be threatened by factors that threaten their survival, and for which efforts are required to promote their recovery and conservation.

United States

The categories for species at risk established by the United States, as defined in section 3 of the ESA, are as follows (USA 1973):

- **Endangered**: Any species which is in danger of extinction throughout all or a significant portion of its range. Species of insects may be exempt if they are deemed by the Secretary to be pests whose protection would present an overwhelming risk to man.
- **Threatened**: Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

IUCN Red List Categories

The Categories and Criteria of IUCN Red List are summarized as follows (IUCN 2012):

- **Extinct (EX)**: A taxon[8] of which no living individuals exist.
- **Extinct in the Wild (EW)**: A taxon that is known to survive only in cultivation, in captivity or as a naturalized population (or populations) well outside its past range.
- **Critically Endangered (CR)**: A taxon that meets any of five established criteria (A to E) and is facing an extremely high risk of extinction in the wild. The criteria for Critically Endangered are based on population size, geographic range and/or at least a 50% probability of extinction in the within 10 years or three generations.
- **Endangered (EN)**: A taxon that meets any of five established criteria (A to E) and is facing a very high risk of extinction in the wild. The criteria for Endangered are based on population size, geographic ranges and/or at least a 20% probability of extinction in within 20 years or five generations.
- **Vulnerable (VU)**: A taxon that meets any of five established criteria (A to E) and is facing a high risk of extinction in the wild. The criteria for Vulnerable are based on population size, geographic ranges and/or at least a 10% probability of extinction in within 100 years.
- **Near Threatened (NT)**: A taxon that has been evaluated against the criteria and does not qualify as Critically Endangered, Endangered or Vulnerable—but is close to qualifying for or is likely to qualify for the category Threatened in the near future.
- **Least Concern (LC)**: A taxon that has been evaluated against the criteria and does not qualify as Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa.

8. The name applied to any taxonomic group in biological nomenclature (i.e., kingdom, phylum, class, order, family, genus, species, etc.) (Merriam-Webster 2016).

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