

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA



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Timber issues

Bigleaf mahogany

INTERNATIONAL WORKSHOP OF EXPERTS ON NON-DETRIMENT FINDINGS
ON BIGLEAF MAHOGANY (CANCUN, APRIL 2007): ENDORSEMENT AND ADOPTION
OF GUIDELINES FOR MAKING NDFS FOR MAHOGANY

1. This document has been prepared by Mexico, as Chairman of the Bigleaf Mahogany Working Group of the Plants Committee.
2. The document comprises two Annexes, described below, and has been drafted in order for the Committee to review and endorse at the present meeting the results of the International Workshop of Experts on Non-Detriment Findings on Bigleaf Mahogany (*Swietenia macrophylla*), held in Cancun, Quintana Roo, Mexico, from 10 to 13 April 2007.

Annex 1: Results of the International Workshop of Experts on Non-Detriment Findings on Bigleaf Mahogany (*Swietenia macrophylla*); and

Annex 2: Working group's interpretation of the term 'planes de ordenación de la caoba' (mahogany management plans).

Background

3. At its 16th meeting (Lima, July 2006), and further to Decision 13.58, the Plants Committee decided *inter alia* (see the PC16 summary record):
 - i) to encourage the issuance of new recommendations to exporting countries regarding necessary elements for the formulation of non-detriment findings for timber species, and
 - ii) to organize a course on non-detriment findings for timber species that will focus on how to identify the information necessary for evaluating and documenting non-detriment findings.
4. Mexico, as Chairman of the Mahogany Working Group, organized the International Workshop on Non-Detriment Findings on Bigleaf mahogany. The main purpose of this workshop was to define a feasible methodological approach that could be used to formulate non-detriment findings (NDFs) for the bigleaf mahogany, in order to improve the implementation of the provisions of CITES Appendix II and to ensure the sustainability of the harvesting of and international trade in the species.

5. Mexico, as Chairman of the Mahogany Working Group, submitted the results of the workshop as information document CoP14 Inf. 24 at the 14th meeting of the Conference of the Parties (The Hague, 2007).
6. At that meeting, the Conference adopted Decision 14.145 which states: "The Conference of the Parties adopted the 'Action plan for the control of international trade in bigleaf mahogany (*Swietenia macrophylla*)', attached as Annex 3 to these Decisions."
7. The *Action plan* states the following:
 - 1) *All range States of the bigleaf mahogany should:*
 - e) *facilitate the making of non-detriment findings by:*
 - i) *preparing, adopting and implementing, as a priority, forest management plans at a national and/or local levels that include specific requirements for the bigleaf mahogany, as outlined in the results of the International Workshop of Experts on Non-Detriment Findings on Bigleaf Mahogany held in Cancun (April 2007) (see document CoP14 Inf. 24) after its endorsement and adoption by the Plants Committee;*
 - ii) *developing and conducting forest inventories that enable specific identification and data analysis of the bigleaf mahogany, as well as programmes to monitor the distribution, population size and conservation status of the bigleaf mahogany, based on the results of the International Workshop on Non-Detriment Findings on Bigleaf Mahogany, after its endorsement and adoption by the Plants Committee, and incorporating the three basic requirements for non-detriment findings highlighted in document MWG2 Doc. 7, paragraphs 44 a) to c).*

Recommendation

8. In order to comply with the request made to the range States in the *Action plan*, in particular with the making of non-detriment findings, the Plants Committee is invited to review and adopt the recommendations that resulted from the workshop and which are included in Annex 1 of the present document.

RESULTS OF THE INTERNATIONAL WORKSHOP OF EXPERTS
ON NON-DETRIMENT FINDINGS ON
BIGLEAF MAHOGANY (*SWIETENIA MACROPHYLLA*)*

Cancun, Quintana Roo, Mexico (10-13 April 2007)

I. PROGRESS OF THE MEETING

The Workshop was held in Cancun, Quintana Roo, Mexico, April 10 – 13, 2007.

The workshop was attended by 46 participants, representing 12 range states (Belize, Bolivia, Brazil, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama and Peru); the European Union in its capacity as importers (Belgium and Spain); the Chair of the CITES Plants Committee; a representative of the CITES Secretariat; a representative of the International Tropical Timber Organization (ITTO); two representatives of non-governmental organizations and a representative of the International Importers Association (Annex 4).

The event took place as described in the workshop agenda (Annex 3). The workshop was inaugurated by Mr. Francisco Javier Díaz Carvajal, Minister of Urban Development and the Environment of the Government of the State of Quintana Roo. The following officials were present: Dr. Steve Johnson (Associate Director of ITTO), Mr. José Cibrián Tovar (Director General of the National Forestry Commission - CONAFOR), Mr. Martín Vargas Prieto (Director General of Wildlife of the Ministry of the Environment and Natural Resources - SEMARNAT, CITES Administrative Authority in Mexico), Professor Ana Luisa Guzmán (Executive Secretary of the National Commission for the Knowledge and Use of Biodiversity - CONABIO, CITES Scientific Authority in Mexico), Dr. Francisco García García (Director General of Forestry and Soil Management - SEMARNAT and President of the Mahogany Working Group - MWG), Mr. Manuel Mercado Béjar (Director General of Contamination Source Scrutiny of the Federal Environmental Protection Agency - PROFEPA, representative of the CITES Law Enforcement Authority in Mexico).

In the first session, Dr. Margarita Clemente (Chair of the Plants Committee) gave the following presentation; "Mahogany in CITES and the Mahogany Working Group". Dr. Rafael Navarro (Spain) completed this presentation with a preliminary proposal on the use of remote sensors for the formulation of non-detriment findings (NDFs) on mahogany, based on acquired experience with *Prunus africana*. Mrs. Milena Sosa Schmidt (CITES Secretariat), gave a presentation on "Non-Detriment Findings", followed by Dr. Steve Johnson's presentation: "ITTO and CITES" and Dr. Patrick Van Damme's (Belgium) presentation on "Relevant Information for the Formulation of Non-Detriment Findings". The session concluded with Dr. Patricia Dávila's overview of the summarized outcomes of the Mahogany Comprehensive Report (CoP14 Doc. 64) and an explanation by biologist Hesiquio Benítez of the workshop logistics and desired outcome.

Based on the conclusions of the Mahogany Working Group's (MWG) comprehensive report, four thematic sessions took place. Each thematic session was structured as follows: 1) Presentation by the moderator of the main conclusions of the MWG comprehensive report; 2) Presentation by the experts of the proposals on methodology and analysis of the necessary actions; 3) Discussion of the experts' proposals and 4) Feedback from the audience regarding the experts' proposals and drafting of conclusions.

The panel comprised five mahogany experts: Dr. Laura Snook (Bioversity International), Dr. Carlos Manuel Navarro Pereira (Costa Rica), Dr. James Grogan (United States of America), Mr. Luis Alfonso Argüelles Suárez (Mexico) and Dr. Roberto Kometter Mogrovejo (Peru), who held discussions and issued recommendations thus fulfilling the goals of the workshop. Four more specialists contributed to the guidance and development of the workshop: Dr. Patrick Van Damme (Belgium), Dr. Kenneth Farr (Canada), Dr. Rafael M^a. Navarro Cerrillo (Spain) and Dr. Alfonso García-Ferrer Porras (Spain).

* Text from document CoP14 Inf. 24.

The moderators for each session were: Theme 1.- Classification Plans (Marina Rosales, Peru); Theme 2.- Range Area (Patricia Dávila, Mexico); Theme 3.- Population and Environmental Parameters (Kenneth Farr, Canada) and Theme 4.- Management principles, criteria and indicators (Rafael Navarro, Spain).

A field trip to the Noh-Bec forest community, located in the Felipe Carrillo Puerto Municipality in the State of Quintana Roo, was organized in order to demonstrate community-based forest management activities for mahogany.

The following is a list of the basic elements for the formulation of Non-Detriment Findings on Mahogany (Section III) which were suggested, based on the results of the theme sessions.

1. Estimation of Mahogany range areas,
2. Population parameters,
3. Management principles, methods and indicators

The workshop also analyzed the cost of silviculture as well as the tools necessary to monitor and verify conservation and processing activities (Sections IV and V of Annex I). In addition, the workshop analyzed the working group's interpretation of the term "planes de ordenación de la caoba" (mahogany management plans), as a problem with the translation of this term has been identified which has affected the response of Countries of origin regarding compliance with Decision 13.58 (Annex 2).

The workshop ended with a presentation by Dr. Patricia Dávila on conclusions reached, followed by the Closing Ceremony with the participation of Dr. Francisco García García, Dr. Margarita Clemente Muñoz and Mr. José Luis Funes, representative of the Government of the State of Quintana Roo.

II. ESSENTIAL ELEMENTS FOR THE FORMULATION OF NON-DETRIMENT FINDINGS (NDFS) ON BIGLEAF MAHOGANY (*SWIETENIA MACROPHYLLA*)

II.1. ESTIMATION OF MAHOGANY RANGE AREAS

Based on territorial classification at the country level, it is appropriate to identify the range area of mahogany at the national (potential), sub-national (departments, states, provinces, water basins) and local (management unit) levels. Some of the available tools for each of the three levels are:

1. National level

- a. National ecologic forest mapping (such as, Holdridge Life Zones map)
- b. National forest maps
- c. National forest inventories
- d. Available imagery (such as NOAHH, MODIS, Landsat, ASTER).

2. Sub-national (optional) level

- a. GIS resulting from national level analysis.
- b. National databases (management units)
- c. Sub-national forest inventories
- c. Sub-regional mapping derived from projects or other available sources
- d. Available imagery (such as Landsat, ASTER, SPOT)

3. Management plan comprising two levels:

- a. Forest management unit
 - GIS of the areas under management
 - Statistical sampling (exploratory inventories from Forest Management Plans)
 - High or medium resolution images (e.g. ASTER, IKONOS, QuickBird)
- b. Harvesting plots (areas)
 - GISs of harvesting areas
 - Commercial censuses at 100% (geo-referenced databases)

The information obtained and analyzed at these three levels should make it possible to obtain potential and present distribution maps of the species throughout the country as well as to define its commercial harvesting areas.

II.2. POPULATION PARAMETERS

In order to assess Bigleaf mahogany populations (and related species) as well as the environmental conditions under which mahogany grows, periodical documentation of certain biological parameters and indicators of sustainable management is essential, as is incorporation of reference values.

1. Periodic measurement parameters

1.1 Characterization of the structure of mahogany populations:

- a. Direct
 - Diameter [measuring trees with a Standard Diameter (SD)/DBH > 10 cm, based on an appropriate sampling method for a population with an irregular spatial distribution].
 - Total and commercial height, measured or estimated (optional).
 - Eco-physiographic situation [information on the populations (distribution), as well as geomorphologic, edaphic and climatic data at the location of said populations].
- b. Subsequent
 - Density (trees/ha; trees/100 ha), by size classification
 - Volume (m³)
 - Base area (optional and additional to density)

1.2. Estimation of seed production based on annual stratified sampling of a statistically appropriate number of trees, according to a range of diameter classes, preferably before and after harvesting. In order to evaluate the regularity of seed production and to observe changes over time, it is advisable to have sampling trees located in areas that are not subjected to harvesting.

1.3. Estimation of standing trees to be harvested in the subsequent cycle (reserve trees, future harvest): trees that will be incorporated to the commercial size classification (<Minimum diameter cutting limit MDC).

2. Sustainable management indicators

These indicators make it possible to identify the level of success of forest treatments (bearing in mind that an equivalent population of mahogany trees must be established for regeneration and maintenance purposes, so as to replace the ones that were harvested), by monitoring the following elements:

- a. Potential seed-bearing trees
- b. Regeneration rate / recruitment (natural or through enrichment planting)
- c. Replacement rate in number of trees across the range of size classifications.
- d. Number of trees available for future harvest.

3. Local reference values

These values allow monitoring of the population parameters of Bigleaf mahogany under management (in a given region) over time, providing information for adjusting future harvesting levels.

- a. Testimonial information derived from compliance with the Management Plan and the annual cutting Plans. Said local references are useful to monitor harvested trees and their relationship with geo-referenced inventories.
- b. Growth rate, which is obtained from permanent sampling plots or from individual mahogany trees measured regularly (preferably annual measurements). This specific type of monitoring may be simultaneously used to follow-up on other harvested species.

II.3. Management principles, methods and indicators

II.3.1. PRINCIPLES

- a. There is sufficient knowledge about the ecology and forest parameters of the species to establish a basic silviculture. However, more detailed information on some aspects of the species' ecology (i.e., reproductive ecology) and on some forest parameters (i.e., growth, seed tree selection criteria, MDC or target diameter, etc.) is still needed.
- b. The available information suggests that mahogany, within its range, follows certain relatively homogeneous growth and/or development patterns. This, together with the relevant precautions, allows the establishment of some common reference values for silviculture of the species throughout its range area.
- c. An adaptive mahogany silviculture is essential. It must be based on current knowledge, but must be subject to modification based on the results of regeneration and growth sampling practices carried out in the management areas (as per the abovementioned guidelines). Likewise, it must be founded on relevant auto-ecologic data (reproductive physiology and ecology, etc.) and must be implemented through silvicultural management parameters (rotation, cutting diameters, growth, etc.). This adaptive silvicultural principle is based on the assessment of the results obtained in management activities and must be incorporated to the species management plans.
- d. Management plans constitute the foundation for the biological and/or silvicultural arguments necessary to establish the minimum diameter cutting limit and, where appropriate, the maximum diameter cutting limit, taking into consideration the seed bearing age, the annual diametric growth (available information indicates that annual growth varies between 0.4 and 0.7 cm) and the timber quality of the trees.
- e. Despite the fact that this species is the primary harvesting objective, it is essential that mahogany silviculture incorporate harvesting of additional species. Doing so results in increased harvesting profitability and healthier silvicultural practices (i.e., regeneration of forest stands based on the creation of appropriately sized openings).

f. Although multiple species harvest planning may initially represent an additional cost, it provides financial support to harvest areas (by making additional resources available) and promotes comprehensive and sustainable forest management.

g. Management entails different intensity levels, ranging from intensive silviculture in plantations, semi-intensive silviculture in managed secondary forests, up to extensive silviculture in low-mahogany-density primary forests. Community and industrial forest management are two-additional possibilities. However, similar minimum management guidelines and principles may be applied in both cases.

h. The outcomes of successful management programs, such as the Noh-Bec Community Forest (Mexico), must be broadly disseminated in order to enhance silvicultural knowledge of the species and improve management programs in other areas.

II.3.2. METHODS THAT GUARANTEE THE SUSTAINABILITY OF MAHOGANY POPULATIONS.

a. Logging planning strategies

- To define the type of logging to be undertaken according to the terrain and the populations.
- Depending on the type of logging, to define the type of silviculture that will be implemented based on the distribution of the desired initial and final diametric classifications.

b. Logging: Based on the terrain and mahogany populations, different types of logging may be carried out:

- Thinning / Selection-cutting Method
- Uniform shelterwood cutting / Protective cutting
- One- or two-step clearance cutting / One- or two-step clearcutting / Cutting down to a stump
- Thinning / Clearing

c. Regeneration. Given the low natural regeneration levels of mahogany, it is necessary to define and implement the following:

- Protection of the trees to be retained for future harvests (those that will be cut during the subsequent cycle), based on inventories and silvicultural measurements.
- Opening of clearings or forest product concentration yards in the cutting area (known as "bacadillas" in Mexico). These should ideally be areas of more than 2,000 m², although their size can vary and therefore should be defined in each processing area.
- Enrichment of clearings through planting.
- Encouraging retention and protection of seed trees, bearing in mind available information indicates that trees with a DBH of >75cm and a broad crown bear significantly more seeds than do smaller trees. However, this value may vary and therefore would need to be defined for each harvesting area.
- Establishing the maximum distance between seed trees (taking into account requirements for successful pollination).
- Development of other silvicultural treatments such as: liana cutting, directed cutting and log removal optimization (planning log removal work).

d. Conservation

- To protect the different populations found throughout the mahogany range in order to ensure that the variety and diversity of the populations will be preserved.

- Establishing reserve areas (possibly areas of low density, or areas having healthy or inadequate diametric structures).
- Adequate seed selection for enrichment plantings.
- Sowing selected seeds or planting seedlings grown in nurseries, according to the ecological and productive conditions of the area.
- Coordinating a mahogany seed collection and management program between national and regional seed banks and accurately documenting seed collection locations; protecting seed trees and stands, creating seed orchards.

e. Commercial Planting

- Establishing pure and mixed plantings and plantings in agro-forestry systems as a medium-term alternative for mahogany harvesting in natural populations.

Note 1: The drafting of a document that includes basic silvicultural guidelines for this species was suggested. Said document could be used as the basis for establishing the most important silvicultural parameters for mahogany management under CITES.

Note 2: It is important to promote and encourage training and the exchange of experience and information among the mahogany range states, so as to harmonize the knowledge of management criteria and indicators, silvicultural techniques and regeneration programs. Likewise, countries must share their experiences on subjects such as logging regulations, regulations on domestic transport control and exports. This proposal had already been made at previous Working Group meetings.

II.3.3 LOGGING AND PROCESSING

a. Determining quotas

Establishing quotas necessarily implies an accurate knowledge of populations. Therefore, when quotas are established without knowledge of populations and based solely on commercial and pre-commercial stocks, it is impossible to ensure the impact that exports will have on the populations. Likewise, establishment of quotas must be done at the management unit level, since the characteristics of the populations may vary.

- Implementation of minimum viable population models, so as to supplement the calculation of the maximum volume (number of trees) subject to harvesting. It is advisable to include growth and regeneration/recruitment data to determine harvesting volumes.
- Analysis of harvesting/export quotas based on the available yield studies (i.e., methodology proposed by Dr. James Grogan), so as to reflect losses inherent to processing round wood into sawn timber; export quality percentage; stem/bole quality (holes or poor condition) in order to identify physical and pathologic defects, and elements such as bark thickness, stem shape and others relating to size and age. Failure to take these values into consideration will probably result in an overestimation of export quotas.
- Establishing quotas one year in advance whenever possible in order to ensure verification capability.

b. Timber use and processing optimization

- A continuous training program for the staff involved in logging activities is required.
- In the course of census-taking activities, drafting of geo-referenced maps of harvestable and future crop trees is recommended.

c. Monitoring and verification

- Whenever possible, establishment of permanent plots is advisable in order to gain a detailed and long-term understanding of the impact of logging in mahogany forests.

Note: The establishment of databases and electronic exchange systems is recommended: (a) establishing a domestic and international database network on the existing plots for information exchange purposes; and (b) establishing a database that incorporates existing scientific information (CITES Web).

III COST OF SILVICULTURE

Various research studies indicate that the correct implementation of silvicultural management activities for mahogany and associated tropical species will guarantee harvesting sustainability as well as increase mahogany regeneration and establishment in range areas. However, appropriate silviculture does imply additional costs necessary to meet requirements such as promoting regeneration, low-impact harvesting, timber traceability, maintenance of conservation areas, certification processes or maintenance of logging roads.

- Implementing non-detriment harvesting plans for mahogany requires external financial support. Each country should estimate the cost, according to its situation and needs. In order to determine the actual cost of harvesting plans, the creation of a cost and activity matrix has been proposed.
- Funding of a National Management Plan for mahogany should be one of a series of actions aimed at the sustainable harvesting of forest timber species, strengthening the Administrative Authority's power to control said harvesting activities.
- It is necessary to evaluate the role that the various institutions play in the creation and implementation of a national management plan, so as to define responsibilities and make efficient and transparent use of resources.
- The experience of the BOLFOR project in Bolivia may be regarded as an exemplary international forest enhancement project at the national level.
- The high cost of sustainable harvesting plans may reduce the competitiveness of timber on the international market. Therefore, it is important to revise the marketing chain so that both costs and benefits may be shared by import and export intermediaries, logging companies and end users.

IV MONITORING AND VERIFICATION TOOLS FOR CONSERVATION AND HARVESTING ACTIVITIES

It is necessary to follow up conservation and harvesting activities in order to reduce illicit activities that could encourage illegal mahogany logging. Therefore, the following measures were suggested by the Group:

- Establish a timber marking and traceability system (thus strengthening the chain of custody), from harvesting to export. The model implemented by Brazil is suggested, along with prior validation of the methodology through different technical alternatives.
- Establish a verification system based on forest inventories (quality of inventories), on-site inspection of forest management plans and annual plans, as well as monitoring systems utilizing remote sensors.
- On-site verification in large mahogany harvesting areas, using a statistical sampling that guarantees compliance with the approved management and logging measures. To supplement field inventories through the use of images derived from high spatial resolution sensors (such as IKONOS or QuickBird).
- Strengthen the implementation of management plans by means of control systems combined with severe penalties in case of noncompliance, reinforced by the timber traceability systems.
- Strengthen the chain of custody of forest certification and of traceability systems as a means of intensifying the control on legally and illegally logged timber.

WORKING GROUP'S INTERPRETATION OF THE TERM "PLANES DE ORDENACIÓN
DE LA CAOBA" (MAHOGANY MANAGEMENT PLANS)

Decision 13.58, subparagraph a), states that:

The range states of *Swietenia macrophylla* (Mahogany) should:

- a) Prepare and officially adopt, as a priority, forest management plans for mahogany at a national and sub-regional level.

On this subject, a semantic problem was identified. The English version of Decision 13.58, the PC14 WG7.1 working documents and those derived from CoP13: E13-COM1.04 and S13/COM1.04, refer to Management Plans for mahogany. The Spanish version of Decision 13.58 uses the term "Planes de ordenación de caoba". It was concluded that the correct reference is "Planes de manejo de caoba". This explains why, throughout the compilation exercise of the national reports on mahogany, most of the countries stated that they did not have specific management ("ordenación") plans for the species, since the term was mistaken for "ordenamiento" (classification), which refers to an instrument of higher hierarchical status (at the national or sub-national level) that surpasses the implementation scope of the NDFs. Therefore, it was acknowledged that the appropriate domain for the formulation of the NDFs is at the Management Plan level.

The Working Group's interpretation of Classification Plans is as follows:

1. Territorial classification at two levels:

National: Land classification based on its increased use capacity (forest, agricultural, livestock, urban, protection, conservation, etc.). At this level, it is necessary to chart a basic national map that includes coverage of the various types of plants and life zones (1:250,000), for identification of potential harvesting (production forests) and conservation areas. This is a necessary undertaking which is within the capabilities of all range states. Virtually all range states have such maps and it would be advisable to up-date them regularly.

Tools:

- Mapping of plant types and life zones
- National forest maps
- National forest inventories
- Use of 250m images (such as Modis, at no cost), or 30m images (such as Landsat)

Sub-national.- Classification of forest types at the level of states, provinces, departments, water basins or other smaller units at country scale. At this level, it is necessary to have larger scale maps to identify of the types (maturity level, sucesional stages) and current state of forests (plant communities that contain the species), whose information will be subject to on-site verification. The human resources (universities, research centers, government agencies, corporations, etc.) that are necessary to carry out this activity are available in the range states.

Tools:

- Mapping of plant types
- 30m and 15m images (such as Landsat and Aster, respectively)

Note: Teleidentification requires training plots and on-site verification.