TRAFFIC

BfN Federal Agency for Nature Conservation

CITES Non-detriment Findings for Timber

A nine-step process to support CITES Scientific Authorities making science-based non-detriment findings (NDFs) for timber/tree species listed in CITES Appendix II

Version 4.0

Daniel Wolf, Thomasina E.E. Oldfield and Noel McGough

CITES Non-detriment Findings for Timber

A nine-step process to support CITES Scientific Authorities making science-based non-detriment findings (NDFs) for timber/tree species listed in CITES Appendix II
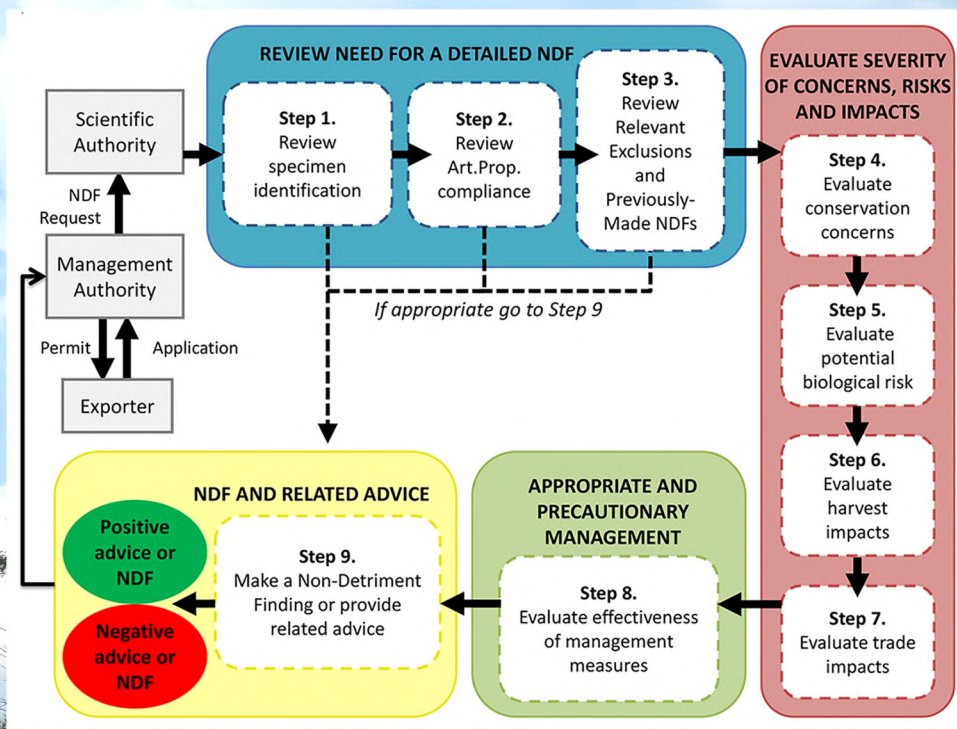
Version 4.0

Daniel Wolf
Thomasina E.E. Oldfield
Noel McGough

Imprint

Authors' contact details:

Dr Daniel Wolf   Bundesamt für Naturschutz (Federal Agency for Nature Conservation)
Konstantinstr. 110, 53179 Bonn, Germany
E-Mail: daniel.wolf@bfn.de

Thomasina Oldfield   Independent Consultant
Cambridge, United Kingdom
E-Mail: thomasina@thomasina-oldfield.co.uk

Noel McGough   Independent Consultant
London, United Kingdom
E-Mail: nmcgough@virginmedia.com

BfN specialist support:

Dr Daniel Wolf   Division II 1.2, Plant Conservation

Table of Contents

Figures

Tables

Introduction

Export permits for CITES Appendix II species, or parts or products derived from these, require that the Scientific Authority of the exporting country carries out a Non-Detriment Finding (NDF). NDFs are a procedure to scientifically evaluate parameters such as species distribution and habitats, population status and trends, harvest practices, as well as volumes and impact of trade in target species. They result in a recommendation to the CITES Management Authority of the exporting State. In general this recommendation is made as a positive NDF (a necessary precondition for issuing a CITES permit) or a negative NDF.

The structure, content and methods used to develop NDFs vary considerably. This is partly explained by the fact that there are different analytical requirements for different groups of species. In addition, there was an absence of specific guidance documents on how to develop CITES NDFs for specific taxa. In the case of timber / tree species only principles for guidance and case studies had been developed before we started our work on the 9-steps NDF timber guidance. These resulted from discussions on and efforts to develop specific guidance for making an NDF for timber in CITES over a number of years. In preparing this guidance we have benefited from the results of these deliberations and include key elements from the following documents in the current guidance:

- Principles for Non-Detriment Findings (NDF) for Trees (Working Group 1, 2008);
- Big-leaf mahogany (*Swietenia macrophylla*) in Peru, Bolivia and Brazil (Mejía, E., Buitrón, X., Pena-Claros, M. & Grogan, J., 2008);
- Non-detriment findings for timber imports from Central Africa: Stepwise approach of collecting documentation on carrying capacity of *Pericopsis* elata populations (PC21 Inf. 4), and
- Guidance on the making of non-detriment findings for tree species – Guatemala and Spain (PC22 Doc 9.2 [Rev.1]).

In 2014, the German Federal Agency for Nature Conservation (BfN) facilitated the development and publication of a guidance document on CITES NDFs for perennial plants (Leaman & Oldfield, 2014). This guidance has undergone various revisions based on user feedback and interaction in training workshops. Version 3.0, was published in 2016 (Wolf et al., 2016), which is currently available in the English, Spanish, French, Chinese, Georgian, Italian and Korean languages. A revision and upgrade to Version 4.0 will be available in late 2024. Given the interest shown in the perennial plant guidance, BfN began a process to develop a guidance document on making NDFs for timber imports into the EU. In November 2015, a 'Workshop on Non-detriment Findings for Imports of CITES-listed Timber into the EU' was convened at the International Academy for Nature Conservation on the Isle of Vilm, Germany, aiming to identify methods and elements of an NDF guidance specific to EU imports of CITES-listed timber / tree species. Some 20 specialists participated, comprising timber and trade experts as well as representatives from CITES Scientific and Management Authorities.

Based on the structure of the 9-step Guidance document for perennial plants (Version 2.0, 2015) the "CITES Non-detriment Findings for Timber – Guidance for EU-member States" was generated. This was further developed by BfN from an EU specific tool to a more general one resulting in "CITES Non-detriment Findings for Timber Version 1.0".

In 2016 the Ministry of the Environment of Peru (with the support of the Amazon Cooperation Treaty Organization (ACTO) and the Amazon Regional Program (BMZ/DGIS/GIZ)) organised a regional workshop on NDFs in Lima. BfN and TRAFFIC led this training, using "CITES Non-

detriment Findings for Timber Version 1.0". At the workshop this guidance was applied, with great success, by members of CITES Authorities from eight Latin American countries. Building on the experience gained in Lima, Version 2.0 of the timber guidance was developed.

In November 2017 a second international expert workshop took place on the Isle of Vilm. The aims of the workshop were: to review the general applicability of the guidance (Version 2.0), assess its potential value to exporting countries and to identify areas that could be improved.

The 2017 Vilm workshop participants took the overall view that the guidance worked well for tree species. However, a significant number of potential amendments were identified and collated during the workshop. "CITES Non-detriment Findings for Timber Version 3.0" was the product of this extensive review process and since that time it has been applied in workshops in Gabon and in Mozambique and at a national level and we have received extensive feedback since its publication. It is available in [English](#), [Spanish](#), [Portuguese](#), [Dutch](#) and [Korean](#).

Version 4.0 has built on version 3.0 and incorporated feedback from experts and from participants in training workshops and on the outcomes from the [CITES NDF project and outcomes](#) from the international NDF experts workshop held in Nairobi, Kenya in December 2023, particularly module 2 on generic framework for NDFs and guidance for timber producing species in module 10. We recommend referring to those modules for further detail. The 9-Steps can be seen as a tool to implement the CITES comprehensive generic framework. Version 4.0 has also been updated with the latest decisions at CoP 19. New features developed include an online training course that can be found on a dedicated 9-Step website (https://www.9steps-cites-ndf.org/). The worksheets that accompany the guidance that can be used to record information whilst making your NDF have additionally been developed into an online decision tree (https://decisiontree.9steps-cites-ndf.org/cites-non-detriment-findings-for-timber/new/), which provides an online 9 step NDF format. We thank all those that have enthusiastically engaged in workshops from whom we have learnt a vast amount and improved the guidance based on lessons from them.

Using this NDF Guidance

This Guidance suggests **nine steps** that a Scientific Authority can take to make a science-based NDF. The overall process is shown in Figure 1.

- Steps 1 – 3 involve the evaluation of whether a detailed, science-based NDF is needed for the species and specimens concerned. Early decision (short cut to Step 9) can be made in some cases (these steps correspond to initial information gathering of the generic framework in module 2 of CITES NDF Guidance discussed at the international expert workshop in Nairobi).

- Steps 4 and 5 involve the evaluation of conservation concerns and potential biological risks. Assessments at these steps set the context of risk that the harvest, trade and management should be considered against.

- Steps 6 and 7 involve the evaluation of harvest impacts, and trade impacts relevant to the species concerned.

- Step 8 involves the evaluation of whether the management measures in place are sufficiently rigorous to mitigate the concerns, risks, and impacts identified in steps 4-7.

- Steps 4 – 8 correspond to the comprehensive assessment of the generic framework in module 2 of the CITES NDF Guidance. A simplified assessment was not recommended by the respective working group on timber (module 10). However, the level of detail should be proportional to the level of risk and a simpler route through the 9-Steps is

possible when a lower risk scenario indicates that less rigour and information are needed to determine non-detriment.

- Step 9 involves the making of an NDF or other advice to the Management Authority based on the outcomes of Steps 1 – 8 (corresponding to "conclusion or decision" of the generic framework in module 2 of the CITES Guidance).

This guidance is not intended to automatically generate the NDF-decision of a Scientific Authority. It provides a standardised mechanism to record and process the information required and available to a CITES Scientific Authority in order to make an adequate NDF.

Anyone using this framework guidance should rely on their own experience and judgment; there will not always be agreement with the level of risk this guidance indicates, and experts may have better insight than a generic tool can provide. Assessing the risks is intended to provide guidance to the level of detail necessary for an informed decision on whether management can ensure that the harvest of and trade in the concerned species is likely to be non-detrimental.

This guidance aims to structure the relevant aspects and information in order to facilitate an individual conclusion on detriment. This guide is not exhaustive, but we hope we have struck the right balance of sufficient guidance, useability and length. It should also be noted that the proposed YES / NO decisions as depicted in the decision path diagrams of each step are only proposals. It may well be that questions further down in the decision path will help assessing the correct answer; therefore, it is recommended to look, at least briefly, into all key questions before going to Step 9 and propose a decision.
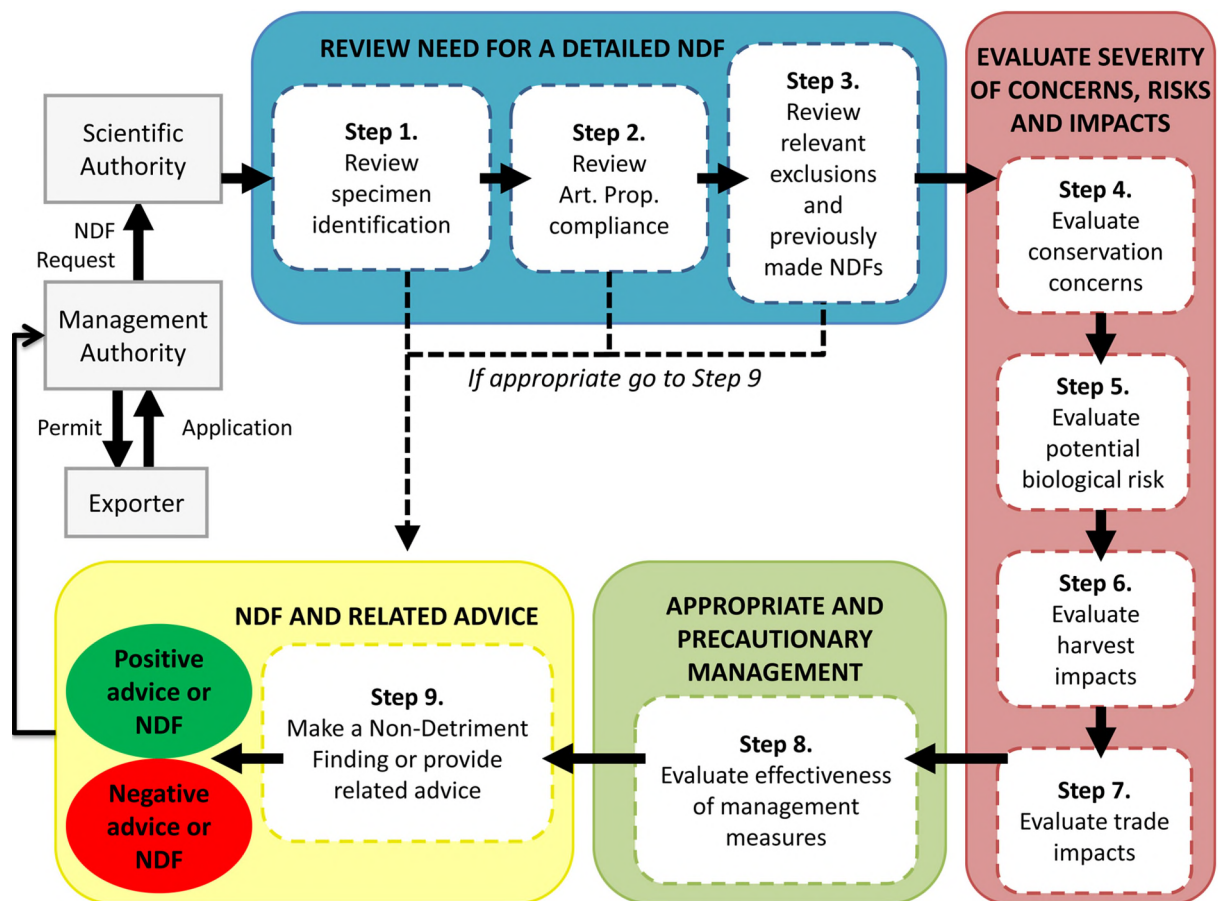
Figure 1: Nine-Step Pathway for Making Non-Detriment Findings for Timber/Tree Species Listed in CITES Appendix II.

All links to online documents were checked and updated in March 2023, however, links may change over time, particularly after CoP meetings. If you cannot access a CITES document, please use the document section on CITES website. All CITES Resolutions are referred to in the text as Res. or Resolution.

For additional information or enquiries please contact Daniel Wolf (Daniel.Wolf@bfn.de) or Thomasina Oldfield (Thomasina@thomasina-oldfield.co.uk) or Noel McGough (nmcgough@virginmedia.com).

STEP 1: REVIEW SPECIMEN IDENTIFICATION AND TAXONOMIC STATUS

Rationale: why is this step important?

In order to make an adequate non-detriment finding, what species this is being made for should be known. Correct identification of specimens and agreement on scientific names for species in trade are essential to CITES implementation and the making of NDFs. Without correct identification at species level a Scientific Authority may be unable to confidently apply the species-related information required to make an adequate NDF. Timber can be difficult to identify to the species level with wood from different species often looking very similar. It may be the case that multiple species are included in timber shipments or processed products. Frequently, common or trade names are used for traded timber. They can be misleading and cannot always be clearly assigned to a scientific name. In other cases, one common name may refer to several timber species, for instance "rosewood".

The classification and naming of species is a dynamic process that can lead to uncertainty and lack of consensus about specimen and species taxonomy and can create confusion between current and previously used names. Uncertainty about the identity and taxonomic status of the specimens entering trade undermines the ability of Scientific Authorities to make an adequate NDF. Therefore, a sound taxonomic basis is required to make an adequate NDF.

1. Has the plant/specimen been correctly identified, and, is the scientific name used compliant with the appropriate CITES Standard?

NO

Go to Step 9 Making Non-Detriment Findings and Related Advice

YES

Go to Step 2 Review Compliance with Art. Prop. Requirements
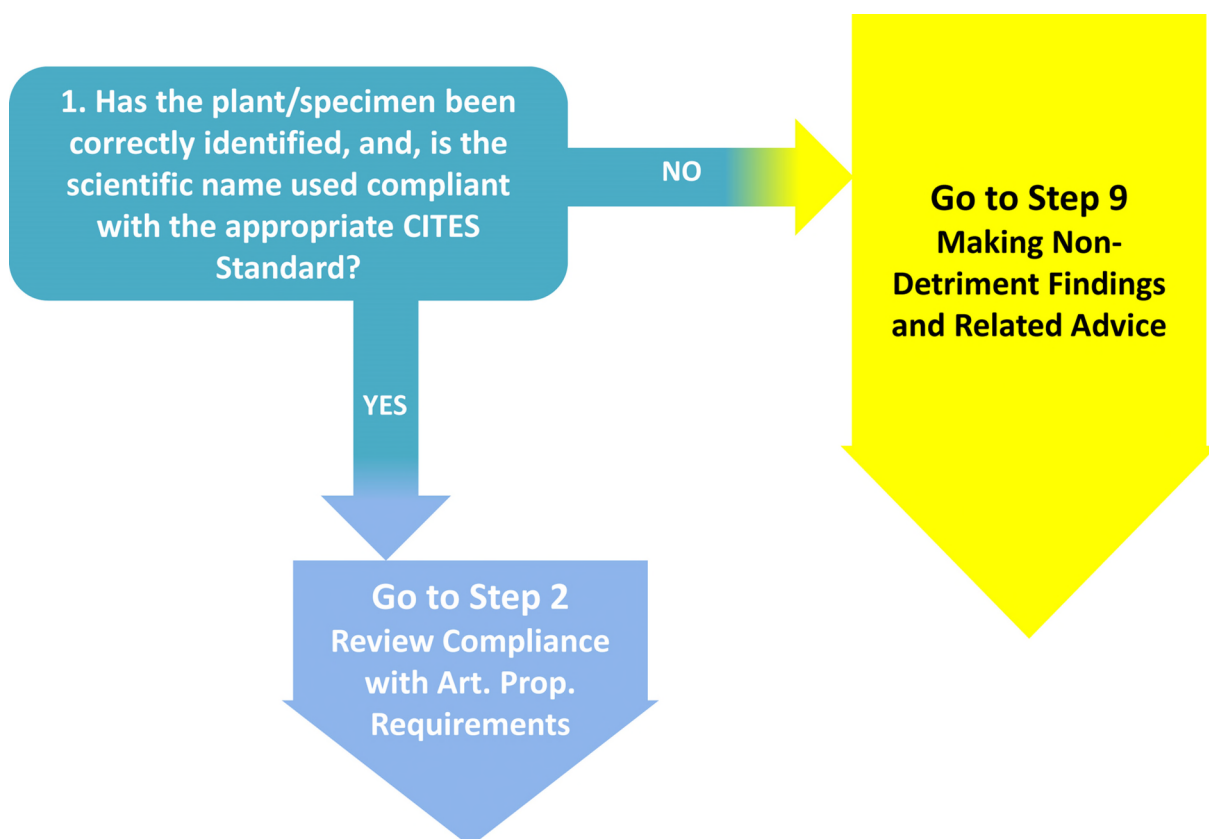
Figure 2: Key Question and Decision Path for Step 1.

Key Question

Is the Scientific Authority confident that the timber or timber product concerned has been correctly identified and that the correct scientific name has been used for the timber?

Guidance

Species Identification

In the first part of the question, the SA is asked are they confident of the specimen being correctly identified. The answer may be a straightforward YES – based, for example on previous research or reliable information from the relevant forest management unit (FMU) or specimen source. It is not suggested by this guidance that it is a Scientific Authorities' task to inspect every specimen before making an NDF.

If there are doubts regarding identification, refer to "Useful Sources and Examples of Recommended Information" below. The application can be referred back to the MA to request the missing information from the applicant or to consult an expert to verify identification.

Forensics

The listing of high value commercial timber on CITES has resulted in increased use of forensic science to aid in the identification and prosecution of illegal trade in CITES regulated woods. Forensic science is the application of the methods of the natural and physical sciences to matters of criminal and civil law. Wood forensic science is taken to include wood identification technologies and the use of these to aid enforcement and potential prosecution. There are a range of technologies now in use to aid identification and enforcement. Information on these technologies, laboratories and specialist services are given in the Useful Sources section. CITES has been looking at the application of forensics to regulated woods and the resultant documents are also included in the Useful Sources section.

Scientific Names

In the second part of the question, the SA is asked if the correct scientific name has been used. CITES adopts Standard References for the names of animals and plants in the CITES Appendices in [Res Conf 12.11 (Rev CoP19](#) which is revised at each CoP. The standard scientific names are consolidated in the [Checklist of CITES Species](#). [Species+](#) is based on this taxonomic backbone but also contains other useful information. These databases are the most accessible source of approved names to be used on CITES permits. Other databases (see Useful Sources) can be used to assist in the understanding of the taxonomy of timber tree species, but these are not sources adopted by CITES.

Many Parties do not have access to appropriate taxonomic expertise to assist in NDF decision making. They should link to the Science Unit of the CITES Secretariat and to the [Nomenclature Specialist of the CITES Plants Committee](#). Preferably the Scientific Authority should have a staff member who is tasked to link with national taxonomic experts and explore the possibly of sharing regional expertise on these issues. Taxonomists have recognised networks that they use to co-ordinate regionally and internationally. The SA should also bring issues of concern to the Plants Committee by suggesting agenda points and tabling papers outlining the problems that they have encountered. At every meeting of the Plants Committee a Nomenclature Working Group is convened and these are ideal venues for addressing taxonomic problems encountered by CITES Parties.

NDF at Generic Level

The Convention asks for an NDF at the species level (Article III, 2a). It seems scientifically doubtful that consideration of mixed populations of different species can lead to a robust finding at single species level. Therefore, the 9-step Guidance encourages that NDFs be made at the species level. However, there might be cases where making the decision at the genus level is the only practical option for a Scientific Authority. In such cases the SA should be confident that there are sufficient mitigating measures in place to ensure non-detriment (with particular emphasis on management at Step 8) for any species included within the mixed population by applying a precautionary approach.

How to Proceed

Use the worksheet for Step 1 to record your findings.

If the Scientific Authority is confident with the species identification and use of correct scientific name (or has corrected a simple error or outdated name): → **go to Step 2**

If the Scientific Authority is not confident that the specimen concerned has been correctly identified, and that the scientific name used is compliant with the appropriate CITES Standard and concerns over the species' identity are not easily corrected or resolved: → **go to Step 9, Decision 9.1**

REMEMBER: Fully cite the references that you use. Put a reference in the worksheet "Step1_Identification" and fully cite it in the worksheet "Sources_used" where you can also include a confidence level for each.

Useful Sources and Examples of Recommended Information

CITES References & Sources

- Checklist of CITES Species
- Species+
- CITES Resolution Conf. 12.11 (Rev. CoP19): Standard nomenclature (Annex: List of standard references adopted by the Conference of the Parties / Flora).
- Nomenclature specialist of the CITES Plants Committee
- CITES Decisions 19.145-19.148 Identification of Timber and other Wood Products
- CITES Resolution Conf. 10.13 (Rev. CoP18): Implementation of the Convention for tree species.
- CITES Dalbergia Checklist

Additional Sources – Scientific Names

- Plants of the World Online
- CITES and Timber: A guide to CITES-listed tree species (Groves & Rutherford, 2023)
- The World Flora Online. Especially good source of information for plant names and synonyms
- International Plant Names Index (IPNI)
- Germplasm Resources Information Network (GRIN)

- [African Plant Database](#)
- [Tropicos](#)
- A Working List of Commercial Timber Tree Species ([Mark *et al.*, 2014](#))
- Plant Resources of Tropical Africa ([PROTA)](#)
- Published national, regional, and global floras
- [CITESwoodID App](#) (now available on Android, IOS for mobile phone, and macOS/Apple Silicon and UWP/Windows)
- [CITESwoodID](#) (Internet version)
- Identification guides and checklists reviewed by taxonomic experts
- Published papers or monographs reviewed by taxonomic experts
- Voucher specimens from the harvest site(s) specified in the application for export permit

Timber Identification Guides and Wood Forensic Science

- [CITESwoodID](#)
- [Inside Wood](#)
- [Timber Identification Resources and Tools](#) – an online resource developed by the CITES Secretariat
- Wood Identification and Screening Center ([WISC](#)) -U.S. Forest Service
- [WorldForestID](#).
- Addressing the need for standardised wood reference collections to support authentication analysis technologies; a way forward for checking the origin and identity of traded timber ([Gasson *et al.*, 2021](#))
- [UNODC](#) Best Practice Guide for Forensic Timber Identification (UNODC, 2016)
- Grant, J. & Hin Keong Chen, 2021: Using Wood Forensic Science to Deter Corruption and Illegality in the Timber Trade ([TNRC Project, 2021](#)).
- Low, M.C. *et al.*, 2022: Tracing the world's timber: the status of scientific verification technologies for species and origin identification. IAWA Journal 44 (1): 63-84.

STEP 2: REVIEW COMPLIANCE WITH REQUIREMENTS FOR ARTIFICIAL PROPAGATION

Rationale: why is this step important?

The material applied for in the export application may be declared as artificially propagated, if so then the Scientific Authority should be confident that it conforms to the requirements laid down by CITES in its Resolutions.

If an applicant for an export permit presents sufficient information for the Scientific Authority to determine that the specimens clearly meet all CITES requirements for artificially propagated as defined in the respective resolutions an NDF is not necessary, and a simple positive decision may be made to approve export.

CoP18 approved the use of source code Y for plants obtained through assisted production. These are plants which do not fulfill the definition of artificially propagated but are not considered to be wild as they have been planted or propagated with some level of human intervention. These plants still require an NDF. In applying the 9 Steps to trees or specimens assigned with source code Y these should not be treated as artificially propagated (see Box 1 below). The full 9-step process should be applied and no shortcut to step 9 should be taken here.
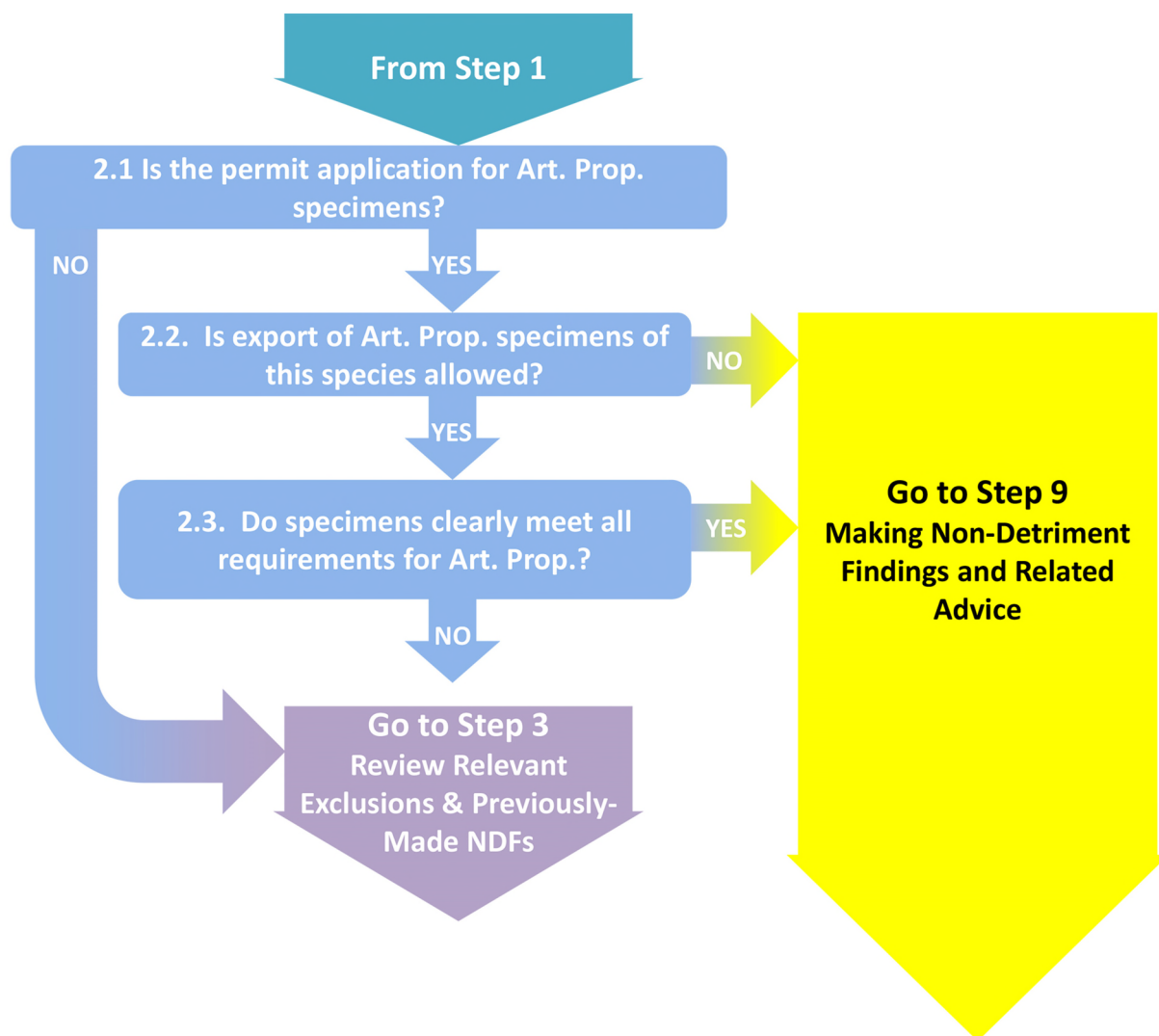
Figure 3: Key Questions and Decision Path for Step 2.

Step 2.1

Key Question

Is the permit application for artificially propagated specimens?

Guidance

The source-code is specified on the permit application. An updated Guide on the application of CITES source codes, including source code "Y" will be updated on the CITES website in 2024. Likewise, the Guidance on terms related to the artificial propagation of CITES regulated plants was adopted at PC 27 and will also be made available on the CITES website in 2024.

Step 2.2

Key Question

Is export of the artificially propagated specimens of this species allowed by national or relevant sub-national legislation?

Guidance

Sometimes the export of artificially propagated timber specimens is not allowed by national regulations of the exporting country (for example, when a national export restriction does not differentiate between wild or propagated sources, and therefore applies to all specimens) or the harvest, trade and transport requires national permits, which are not provided.

Note: The Convention requires that prior to the grant of an export permit the Management Authority (MA) of the State of export is satisfied that the specimens were not obtained in contravention of the laws of that State for the protection of fauna and flora. Although the legal acquisition finding (LAF) is a task of the Management Authority, while going through an NDF a Scientific Authority may obtain information to suggest that all laws were not fully complied with. In this case, the issue should be referred to the Management Authority for review.

Step 2.3

Key Question

If specified as artificially propagated, do timber specimens meet all requirements for artificial propagation?

Guidance

Three resolutions define the CITES-term "artificially propagated" and can be applied to (certain) tree species or under certain conditions. Resolution Conf. 11.11 (Rev. CoP18) is the core definition of artificial propagation for plants. Specific to trees and timber Resolution Conf. 10.13 (Rev. CoP18) states that *"timber or other parts or derivatives of trees grown in monospecific plantations* [should] *be considered as being artificially propagated"*. For Agarwood (*Aquilaria* spp. & *Gyrinops* spp.*)* artificial propagation is defined in Resolution Conf. 16.10; refer to this Resolution when making a decision on the propagation status of these genera.

In the case of doubts about the origin of the material for which an export permit is requested, it is recommended to the SA to seek further information, for example, to:

- check on possible bans with regard to the species in question;
- consult with the competent authorities to clarify the type of plantation (mixed/pure) or other origin;
- verify whether such plantations occur in the region outlined;
- verify if plantation can produce proposed amounts.

REMEMBER: In cases where Res. Conf. 11.11 (Rev. CoP18) applies, the Scientific Authority has to make an NDF on the wild parental stock and any wild stock used to augment propagation at some point (but not on the exported specimens).

REMEMBER: For timber and timber products coming from monospecific plantations (in accordance with Res. Conf. 10.13 (Rev. CoP18), the Scientific Authority does not need to make an NDF.

REMEMBER: If the timber/timber products which the CITES export permit application refers to does not meet the CITES definition of artificial propagation, the SA should treat it as sourced from the wild ("W") or from assisted production ("Y") and, as required, continue to make an NDF (see Box 1 on source code Y).

How to Proceed

Use the **Worksheet for Step 2** to record your findings.

2.1

If the application is not for artificially propagated specimens the specimens should be treated as sourced from the wild or from assisted production and a detailed NDF is required:
→ **go to Step 3**

2.2

If the export of artificially propagated specimens of this species is not allowed by national or relevant sub-national legislation: → **go to Step 9, Decision 9.2**

If the export of artificially propagated specimens of this species is allowed by national or relevant sub-national legislation: → **go to Step 2.3**

2.3

If the specimens covered by the export permit application clearly meet all CITES-requirements for artificial propagation: → **go to Step 9, Decision 9.3**

If concerns regarding artificial propagation remain, the specimens should be treated as sourced from the wild or from assisted production and a detailed NDF is required:
→ **go to Step 3**

REMEMBER: Fully cite the references that you use. Put a reference in the worksheet "Step2_ArtProp" and fully cite it in the worksheet "Sources_used" where you can also include a confidence level for each.

Useful Sources and Examples of Recommended Information

- Export permit application information concerning source of specimens (wild / artificial propagation / unknown)
- National, supra-national and sub-national legislation relevant to export of this species
- Guide on the application of CITES source codes (will be updated in the course of 2024)
- Guidance on terms related to the artificial propagation of CITES regulated plants (please check the CITES website)
- Resolution Conf. 10.13 (Rev. CoP18): Implementation of the Convention for timber species
- Resolution Conf. 11.11 (Rev. CoP18): Regulation of trade in plants
- Resolution Conf. 16.10: Implementation of the Convention for agarwood-producing taxa
- Resolution Conf. 9.19 (Rev. CoP15): Registration of nurseries that artificially propagate specimens of Appendix-I plant species for export purposes
- Resolution Conf 18.7 (Rev CoP19): Legal acquisition findings
- Preliminary guidance on terms related to the artificial propagation of CITES regulated plants (CITES, 2021)

Box 1: NDFs for source code Y.

The complexity of the NDF for specimens of source code Y will depend on the specific production system and area, whether the harvest is part of the species' current range and being enriched, original range and being reestablished, or being planted in a new area outside its range. It may be necessary to determine non-detriment for any initial wild specimens that existed in situ, or any removed from the wild to establish or enrich the production. If additional ongoing wild sourced specimens are harvested to sustain the production system, these would also require an NDF. Where artificially propagated specimens are used to establish or enrich the system, an NDF for the wild parental stock is required. Whichever source code a scientific authority assigns in such a case it should be recorded as well as the reason for the choice. Plant specimens from well managed agroforestry or other mixed cultivation under source code Y may in some cases also be considered lower risk. However, the SA should take an approach that is precautionary to the risks, and take into account the vulnerability of the national population as a whole. Each case is therefore likely to differ.

Example: In 2022, Mexico's Scientific Authority, CONABIO, with the support of the Commission for Environmental Cooperation of North America (CCA) generated guidance on the implementation of CITES source code Y for tree species and developed Non-Detriment Findings in Mexico, with which they concluded that:

o   Planted trees would meet the definition of assisted production ("Y").

o   Trees that grow from naturally dispersed seeds in natural ecosystems will be considered wild ("W").

o   If seeds or seedlings were planted among "wild" trees and distinction between them is not possible, all should be considered as "W", as per the precautionary principle.

o   Only if there is solid data confirming the wood comes exclusively from trees that were planted from seeds from a controlled environment would the "Y" source code be assigned.

o   Overall, the procedure to develop NDF for assisted production would be similar to that of "wild" populations, but with greater attention to the composition and structure of the production area.

o   The situation of polycultures under controlled conditions was not clear within the artificial propagation application and recommend using source code "Y" until this situation is clarified.

STEP 3: REVIEW OF RELEVANT EXCLUSIONS AND PREVIOUSLY MADE NDFs

Rationale: why is this step important?

If the relevant specimens are excluded from regulation by an annotation to the species listing in the CITES Appendices; if harvest or export is prohibited by national legislation; or if the export permit application is consistent with previous science-based findings it may be possible to go directly to Step 9 from this step.
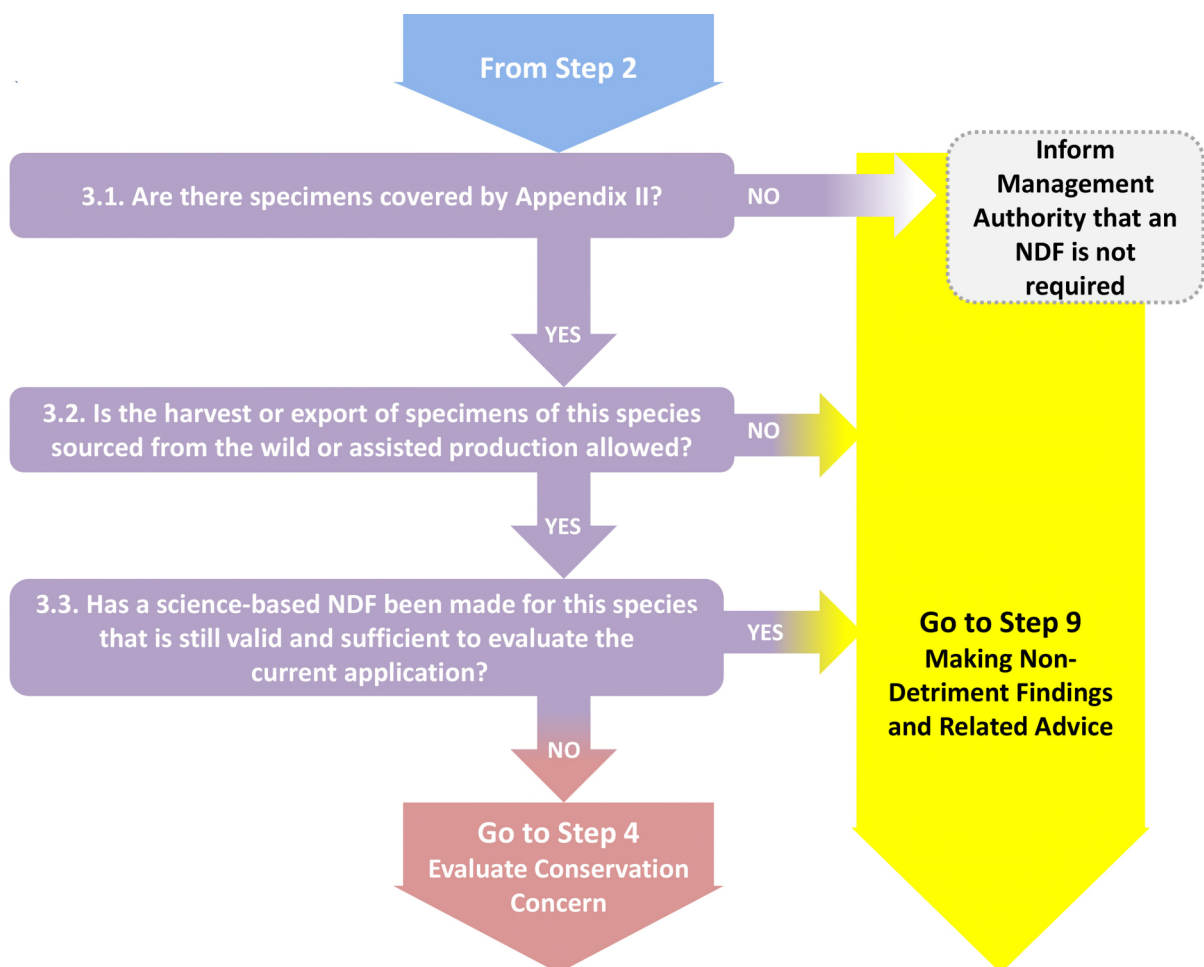
Figure 4: Key Questions and Decision Path for Step 3.

Step 3.1

Key Question

Are the timber specimens applied for covered by CITES Appendix II?

Guidance

CITES Appendix II listings can be annotated (or a note may be included in the Interpretation section of the Appendices) to denote what parts and derivatives are exempt from regulation or if specific populations of the species are excluded. Such excluded material or populations are not subject to CITES regulation and would therefore not require an NDF to be made (go to Step 9).

For example, in the case of *Swietenia macrophylla* only specimens originating from "populations of the Neotropics" are subject to the Convention and products subject to regulation are confined to "logs, sawn wood, veneer sheets and plywood" (#6), with all other products are exempt from CITES regulation. Such exemption may exclude a substantial amount of material or products in international trade.

To check any exemptions that apply to the species subject to a CITES export permit application check the listing in the [CITES Appendices](#). [Resolution Conf. 10.13 (Rev. CoP18)](#) gives definitions used for certain timber parts and derivatives. The [CITES glossary](#), available on the CITES website, summarises, *inter alia*, definitions of terms given in the Convention and Resolutions.

There are also special provisions for scientific and forensic specimen loan and exchange. This facility has been expanded beyond traditional herbaria and scientific institutions to include registration of forensic research and diagnostic testing laboratories to facilitate the expansion of new technologies used in CITES. Parties should check the details in [Resolution Conf. 11.15 (Rev CoP18)](#) and the list of [Registered Facilities](#) on the CITES website.

Step 3.2

Key Question

Is the harvest or the export of specimens of this species sourced from the wild or from assisted production allowed by national or relevant sub-national legislation or regulation?

Guidance

As noted in Step 2, timber-producing countries often make certain wood exports subject to specific national regulations. This can be, for example, log export bans, restrictions of exports to a certain level of processing, ban of exports from natural forests, or export permissions only for registered concessions.

Although the legal acquisition finding (LAF) is a task of the Management Authority, while going through an NDF a Scientific Authority may obtain information to suggest that all laws were not fully complied with. For instance, a forest operator often needs one or more national permits to operate legally. Important prerequisites for legal harvest and export are in many cases submission of a valid forest management plan, the approval of an annual logging permit including detailed harvesting maps and information on the timber stand, as well as wood transportation documents. CITES has been developing [guidance on LAFs](#) (Annex 1 of Resolution Conf. 18.7 (Rev. CoP 19) including a rapid guide to legal acquisition findings (see Annex 3) with a dedicated [webpage](#).

Step 3.3

Key Question

Has the Scientific Authority previously made a science-based NDF for this species that is still valid and is sufficient to evaluate the specimens for the current export permit application?

Guidance

Check for possible previous NDFs. If there has been a positive NDF in the past: What information was it based on and is it still valid? Is there now new, or more up to date information available that would make a new assessment necessary?

A Party may decide that a certain amount of offtake annually will be non-detrimental. This may be formalised in an annual quota, nationally or by area. In this case offtake up to this level and export from the harvest can be allowed without having to make a new NDF for each application. Similarly, for specific harvest areas or concessions, managers may have calculated annual sustainable offtakes which are detailed in management plans. A national quota may be summed up from such individual quotas. For instance, timber export quotas may be derived from aggregating harvest and processing figures from concessions throughout the country where harvests from each concession have been assessed as being non-detrimental.

A well-implemented export quota system eliminates the need for an NDF for each individual shipment of CITES specimens.

If the SA concurs with the non-detrimental assessment of the proposed offtake, it may only be necessary to make this finding once a year, but to track exports from the area (traceability of chain of custody) and ensure that harvest is not being exceeded. The Management Authority will consider the chain of custody in making LAF; exchange with them regarding this may be helpful. If the NDF is not made on a case-by-case basis it may be necessary for the SA to pay attention to external factors (i.e., climatic) or unusual levels of illegal harvest/trade that may impact on the sustainability of the harvest.

A country may establish this predetermined level of export as an export quota, which should relate to named material and volume (e.g. cubic meters of the specific commodity) allowed to be exported over a set period of time.

Export Quotas and NDF

Resolution Conf. 14.7 (Rev. CoP15) outlines the conditions relating to the establishment and management of national export quotas. This Resolution states:

- where possible export quota should cover a calendar year;
- when quotas are established, they should be set as a result of a non-detriment finding by a Scientific Authority;
- export quotas should be set on a level that takes account of the number or quantity of specimens that are taken from the wild legally or illegally;
- export quotas are usually established for a set number or quantity of plants;
- quotas may be set for certain types of parts and derivatives – for example sawn wood;
- names used should follow CITES standard nomenclature;
- terms used should follow those in the Guidelines for the preparation and submission of CITES annual reports (CITES, 2023);

- Parties should inform the CITES Secretariat of nationally established export quotas and updates;
- every Party is responsible for monitoring their export quotas and ensuring that they are not exceeded. Data should be maintained on same.
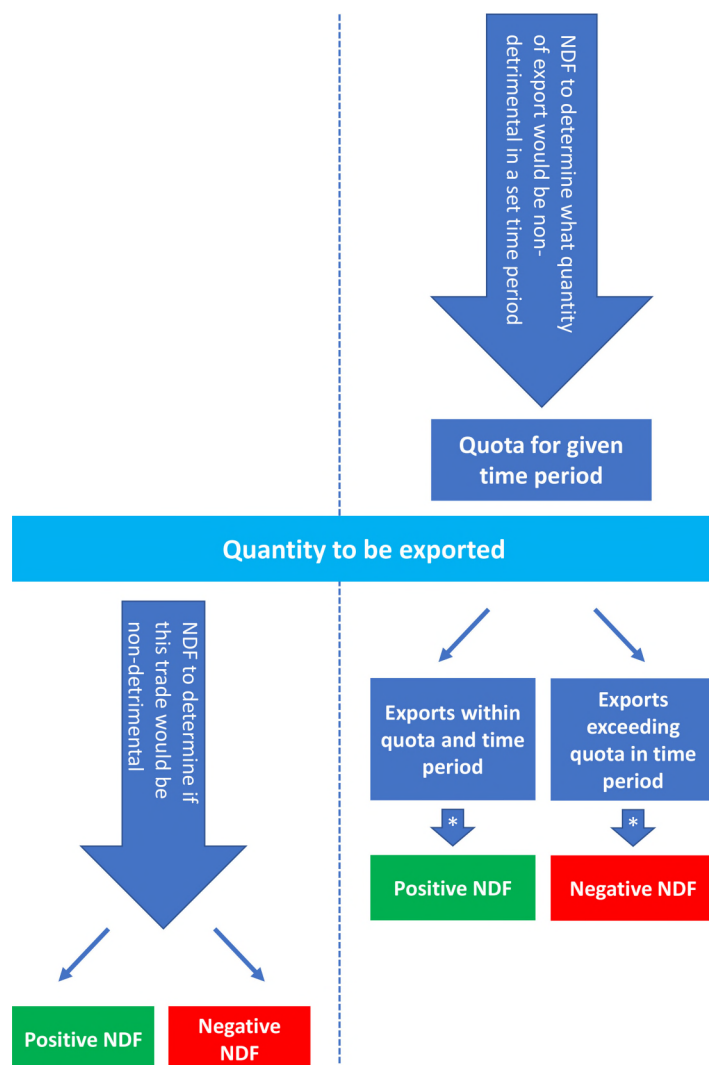
Figure 5: Simplified diagram for export where no quota exists (left hand side) and where a quota has been determined based on an NDF (right hand side).

> * indicates further checks may be necessary. There may also be conditions or advice with the NDF decision. Time period and area to which the quota applies may be specific and should be taken into consideration.

In addition, Resolution Conf. 10.13 (Rev. CoP18) sets out that adequate conversion factors should be used when making non-detriment findings (NDFs) and establishing voluntary annual national export quotas, aiming in particular at converting volumes of traded commodities into volumes of round wood. That enables a Scientific Authority to assess the impact of the traded volume on the species population. A quota may also have evolved over a long period of time based on discrete management of harvested populations, with management adjusting to reflect impact of harvest. Such a process is termed Adaptive Management and is acceptable in CITES if the quota clearly supports a non-detrimental harvest. The 9-step Guidance may be

used to assist in establishing such a quota. An NDF should be made whenever an export quota is established for the first time or revised, and reviewed annually.

How to Proceed

Use the **Worksheet for Step 3** to record your findings.

3.1

If the specimens are not covered by CITES Appendix II: → **go to Step 9, Decision 9.4**

If the specimens are covered by CITES Appendix II: → **go to Step 3.2**

3.2

If the harvest or export of specimens of wild or assisted production species is not allowed by national or relevant sub-national legislation or regulation:→ **go to Step 9, Decision 9.5**

If the harvest or export of specimens of wild or assisted production species is allowed by national or relevant sub-national legislation or regulation: → **go to Step 3.3**

3.3

If the information used for a previous science-based NDF is still valid and sufficient to evaluate the current export permit application: → **go to Step 9, Decision 9.6**

If no previous science-based NDF has been made or previous NDFs are no longer valid or sufficient to evaluate the current export permit application: → **go to Step 4**

REMEMBER: Put a reference in the worksheet "Step3_Exclusions" and fully cite it in the worksheet "Sources_used" where you can also include a confidence level for each.

Useful Sources and Examples of Recommended Information

- The Export permit application
    - Type of material, part or product (whole plant, plant parts, derivatives)
    - Quantity (Number of specimens / volume of material to be exported)
    - Purpose of export

- Species+ which includes data on:
    - Species Appendix listing
    - Relevant annotations
    - Export quotas
    - Reservations on listings
    - EU opinions
    - National or CITES export suspensions

Annotations

- Illustrated manual of plant annotations in the CITES Appendices (Schippmann, 2020) Note this is based on CoP18 Appendices.
- CITES glossary

Assessment of Legality

- [Resolution Conf. 18.7 (Rev. CoP19)](#): Legal acquisition findings
- National, supra-national and sub-national legislation relevant to export of this species
- [ECOLEX (Information service on environmental law)](#)
- [Forest Legality Initiative](#)
- WWF's Global Forest & Trade Network Common [Framework for Assessing Legality of Forestry Operations, Timber Processing and Trade](#) (WWF & TRAFFIC, 2009).
- [CITES Trade Database](#)
  - Records of trade in specimens and species included in Appendices I, II, and III (in accordance with Art. VIII.6)

Managing Nationally Established Export Quotas

- [Resolution Conf. 14.7 (Rev. CoP15)](#): Management of nationally established export quotas
- [Resolution Conf. 12.3 (Rev. CoP19)](#): Permits and certificates
- [Resolution Conf. 10.13 (Rev. CoP18)](#): Implementation of the Convention for tree species
- Periodic reports of the national CITES Authority to the CITES Secretariat, including updates on national [CITES export quotas](#)

STEP 4: EVALUATE CONSERVATION CONCERN

Rationale: why is this step important?

This step considers existing conservation status assessments of the species to document relevant threats.

It is not intended by this guidance that the Scientific Authority will undertake conservation status assessments as part of the NDF. Conservation status is an assessment of the likelihood that a species (or local population of the species) will become extinct in the near future.

Conservation status assessments have a variety of forms (e.g., Red Lists, Red Data Books, threatened species listings) and a range of geographic scope (sub-national, national, regional, or global). They may be formal and published as in the case of IUCN Red List assessments or national Red Data books, threatened species listings etc. Often formal assessments may not be available for the species concerned. Non-published or informally published data or the view of national experts (including local and indigenous peoples and communities) can also be used, but it is important to properly reference the material, and assign it a confidence level. If, for example, valuable information is obtained from an interview with an expert a record of the interview should be made, preferably in a file note, with details of time and place, the expert's details and contact information, the information the expert supplied and, for example, notes on whether this will be published. This should be safely filed where it is known and accessible to SA staff. This file note information should then be used to help assign a category in the worksheet, referenced and assigned confidence levels.

The conservation assessments act as a risk assessment and will guide the SA in the levels of precaution and the level of detail they would require in making an NDF decision; data requirements should be proportionate to the potential risks. If these risks are unknown – i.e. no assessments are available, the SA should be more precautionary in future steps and consider this as higher risk.

The definition of assessment criteria and categories describing extinction risk also varies among assessment systems. A detailed, well-documented, and up-to-date conservation status assessment may also provide information relevant to several of the remaining steps of this Guidance.
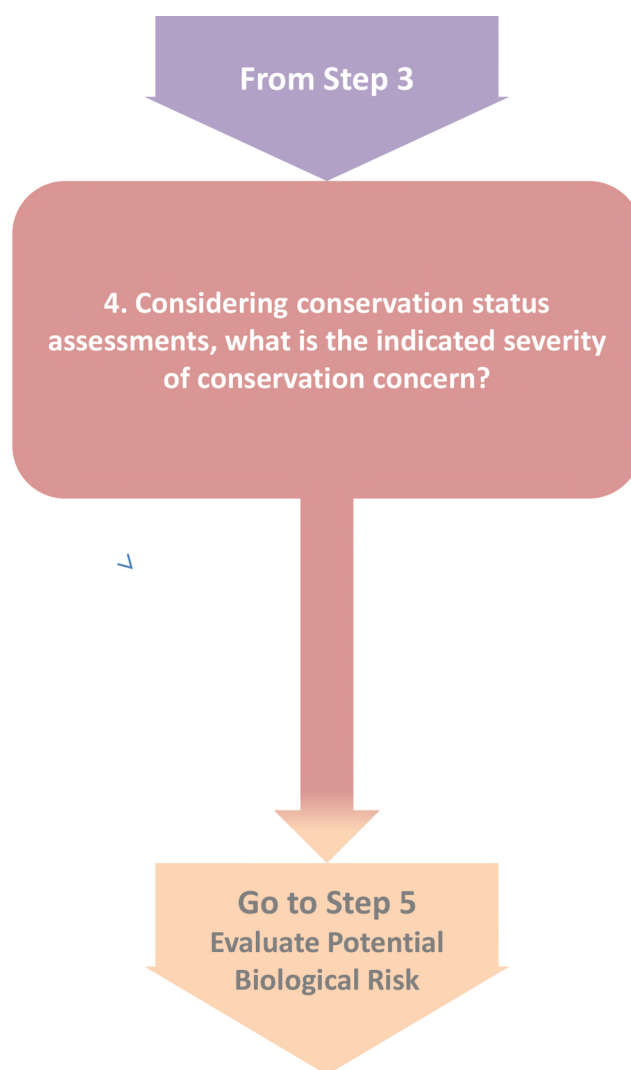
Figure 6: Key Question and Decision Path for Step 4.

Key Question

Considering assessments of the conservation status of the species, what is the indicated severity of conservation concern (i.e. "Low", "Medium", "High", or "Unknown", see Table 1)?

Guidance

Here the Scientific Authority is asked to search for existing conservation assessments, record the geographic scope of the assessment, the threat category and major threats mentioned in the assessment and use them to identify the severity of conservation concern. In addition, the user of this guidance is asked to add the source of the assessment and give a confidence level for the information used from the cited source. A global conservation status assessment of a species distributed in more than one country can be less important for your specific NDF than a national or sub-national assessment, which includes the harvested population – it is important to take this into account.

Refer to Table 1 "**Factors to Consider: Conservation Concern**" to evaluate the severity of conservation concern indicated by existing relevant conservation status assessments.

The Scientific Authority may find information useful for Step 4 (and Steps 5 – 8) of this Guidance in any existing assessment. If the national population or sub-population(s) of the species have been included in more than one assessment system or geographic scope of assessment, the Scientific Authority may select an assessment to evaluate the severity of conservation concern that best combines the following qualities:

- most indicative of the threat of extinction of the national population and sub-populations of the species;
- most recent / up to date.

It is not recommended to average the results of several assessments.

A high conservation concern should result in a more precautionary NDF, as should an unknown concern.

How to Proceed

Use **Worksheet for step 4** to record available information corresponding to the factor in Table 1 and the assessment of conservation concern.

If no adequate assessments are available: answer "Unknown" and consider that **higher rigour in evaluating Steps 5 – 8** will be required for a positive NDF decision.

If conservation assessments (can be multiple and at different scales) are available record these in "Conservation status assessments" of the worksheet. Decide on the most relevant assessment to your harvested population and use Table 1 "**Factors to Consider: Conservation Concern"** to assess the "Severity of conservation concern relevant to harvest area" ("Low", "Medium", "High", or "Unknown") (in the second table of worksheet 4).

To support the evaluation of appropriate rigour of existing management measures (Step 8), the conservation concern ranked as "Low", "Medium", "High", or "Unknown" should be transferred to the **Worksheet for Step 8.2**, then   →   **go to Step 5**

REMEMBER: Fully cite the references that you use in the Information Sources Consulted section of the worksheet and include a confidence level for the information used. You can put a reference in the worksheet "Step4_Cons_Concern" and fully cite it in the worksheet "Sources_used".

Table 1: Factors to Consider: Conservation Concern

Severity of Conser-vation Concern	Example Indicators*
Low	• The species, population, or sub-population has been assessed and is **not considered to be threatened**. The assessment or listing is based on defined criteria (e.g. IUCN Red List category Least Concern/LC or equivalent categories used in other systems). • Little concern over the conservation status and the species is considered to be abundant based on grey literature or expert advice.
Medium	• The species, population, or sub-population has been assessed and is considered to **nearly qualify as threatened**. The assessment or listing is based on defined criteria (e.g., IUCN Red List categories Near Threatened/NT, Vulnerable/VU, or equivalent categories used in other systems). • Some concern over the conservation status with some populations known to have been reduced based on grey literature or expert advice.
High	• The species, population, or sub-population has been assessed and **qualifies as threatened.** The assessment or listing is based on defined criteria (e.g. IUCN Red List Critically Endangered/CR, Endangered/EN, or equivalent categories used in other systems). • Species considered rare or depleted within the country and concerns have been raised regarding conservation status in grey literature or by experts.
Unknown	• Conservation status has **not been assessed** for the species, population, or sub-population (e.g. IUCN Red List category Not Evaluated/NE, equivalent categories used in other systems, or absence of any assessment or listing); or • Conservation status has been assessed but the severity of conservation concern cannot be determined (e.g. IUCN Red List Category Data Deficient). • No information was found on the conservation status of the species in grey literature or through experts.

* The list of example indicators is not exhaustive and other indicators, guidance values or evaluation methods may be more appropriate based on the judgement or experiences of individual Scientific Authorities.

Useful Sources and Examples of Recommended Information

National and sub-national conservation status assessment systems:

- State, provincial, and national Red Data books, nature conservation legislation listings
- Online national Red Lists
- Conservation Data Centres (such as NatureServe Explorer)
- Global conservation status assessment systems:
- IUCN Red List of Threatened Species
- BGCI GlobalTree Portal provides information on tree distribution to country level, national and global conservation status, and, for some species, conservation action in place
- BGCI ThreatSearch
- GeoCat - Geospatial Conservation Assessment Tool

- [Protected Planet](#) – Species biological data and information
- The [Botanical Information and Ecology Network (BIEN)](#) database
- [Global Biodiversity Information Facility (GBIF)](#)
- [Scientists' warning to humanity on tree extinctions](#) (Rivers *et al.*, 2022)
- [World list of Threatened Trees](#) – Note this was published by UNEP in 1998 and therefore assessments are dated.

STEP 5: EVALUATE POTENTIAL BIOLOGICAL RISKS

Rationale: why is this step important?

Some plant species are naturally more susceptible to detrimental effects of wild harvest and commercial trade than other species, based on their biological characteristics. In this Guidance, "potential biological risk" is understood to indicate that certain biological characteristics contribute to the risk that wild harvest will be detrimental to species survival. Using these biological characteristics, Scientific Authorities can identify the particular biological factors that contribute to higher or lower severity of risk that wild harvest will be detrimental to species survival. As with the Conservation Status in Step 4, the higher the severity of risk, the greater the requirements for information quality, effective management, and precaution that should be sought for the NDF in Steps 6 – 9.

From Step 4

5. What is the severity of biological risks?

Go to Step 6
Evaluate Impacts of Wild Harvest
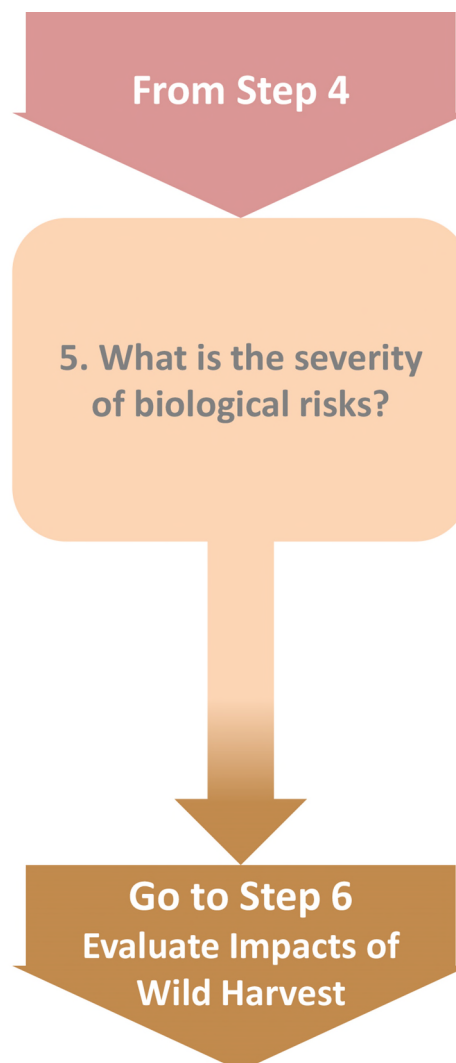
Figure 7: Key Question and Decision Path for Step 5.

Key Question

Consider the characteristics of the species distribution, population, habitat and resilience that affect the potential risk of harvest to the survival of its wild populations. Is the severity of risk indicated for each of these factors "Low", "Medium", "High", or "Unknown"?

Guidance

In Step 5, biological risks refer to:

- Geographic distribution
- National/sub-national population size and distribution
- Structure of national/sub-national populations
- Habitat specificity and vulnerability
- Resilience of tree species

Table 2 "**Factors to Consider: Biological Risks of Harvest"** provides indicators, associated with each of these biological characteristics that affect the risk of wild harvest to species survival, explanations and risk severity levels for the five different potential biological risk factors.

The core sources of information to evaluate potential biological risks for target tree species are scientific descriptions of the species, herbarium records (herbarium specimens note collection sites) and resource assessments (basic national, sub-national or regional).

Remember: Step 5 is not an assessment of the impact of the harvest. This is done in Step 6. Nevertheless, when evaluating factors 3, 4 and 5 (in Table 2) the more relevant information is to the harvested site the more relevant it is to the evaluation of the potential biological risk in the NDF. The distribution and characteristics of the target species may vary between different ecosystems, which does not always allow extrapolation of data.

How to Proceed

Use **Worksheet for Step 5** to record available information corresponding to each of the factors in Table 2 and the assessment of biological risk of harvest.

If no adequate assessments are available: answer "Unknown" and consider that more precaution in evaluating Steps 6 – 8 will be required for a positive NDF decision.

To support the evaluation of appropriate rigour of existing management measures (Step 8), summary lists of "Low", "Medium", "High", and "Unknown" biological risk factors should be transferred to the **Worksheet for Step 8.2.** → **Go to Step 6**

REMEMBER: Fully cite the references that you use in the Information Sources Consulted section of the worksheet and include a confidence level for information used. Put a reference in the worksheet "Step5_Biological_Risk" and fully cite it in the worksheet "Sources_used".

Table 2: Factors to Consider: Potential Biological Risk of Harvest

1. Geographic distribution	
Risk severity	**Example Indicators***
Low	Distribution is widespread, commonly occurring throughout a large region (often one or more continents).
Medium	Distribution is restricted to a medium sized region (often several countries).
High	Distribution is restricted to a small region (often one country or a few smaller countries).
Unknown	Information about this factor is unavailable.

Explanation: This factor assesses the known global range of the species. Consider whether the distribution is broad, or to what degree it is restricted.

2. National/sub-national population size and distribution	
Risk severity	**Example Indicators***
Low	National population is large. Sub-populations are spread more or less homogeneously across the country.
Medium	National population is medium-sized. Sub populations are unevenly distributed across the country.
High	National population is small. Sub-populations are scattered across the country.
Unknown	Information about this factor is unavailable.

Explanation: This factor assesses the current spatial distribution across the species national range. It assesses whether populations are large, abundant and homogeneous or small, clumped and isolated or fragmented. This factor may be assessed differently in different range countries because species with trans-boundary distribution may be more abundant in the center of its natural range and less abundant at the periphery.

3. Structure of national/sub-national populations	
Risk severity	**Example Indicators***
Low	Size classes are distributed in a way that shows a high potential for recruitment and high levels of regeneration, ideally in a reverse J-shaped curve (please also refer to "Explanation").
Medium	Size classes are not distributed in a reverse J-shaped curve. Nevertheless, several size classes show a considerable capacity for recruitment. There are still sufficient fruiting trees as well as considerable signs for regeneration.
High	Distribution of size classes is discontinuous. Insufficient fruiting trees remain in the population. The lack of small size classes indicate that regeneration is disturbed severely.
Unknown	Information about this factor is unavailable.

Explanation: This factor assesses the structure of the population. It evaluates whether the distribution of size classes allows for recruitment and regeneration to substitute for potentially harvested trees. Often this information is not available on a national scale but only for specific management areas. Please note that the actual effect of harvest on the population will be assessed in step 6.

The reverse J-shaped curve (below) describes a negative exponential distribution of numbers of individuals in size classes in a stand with high numbers of small trees and decreasing numbers of trees with increasing size of classes. As many species do not have reversed J-shaped diameter distributions on local level under natural conditions, this specific indicator may not be applicable to all species.
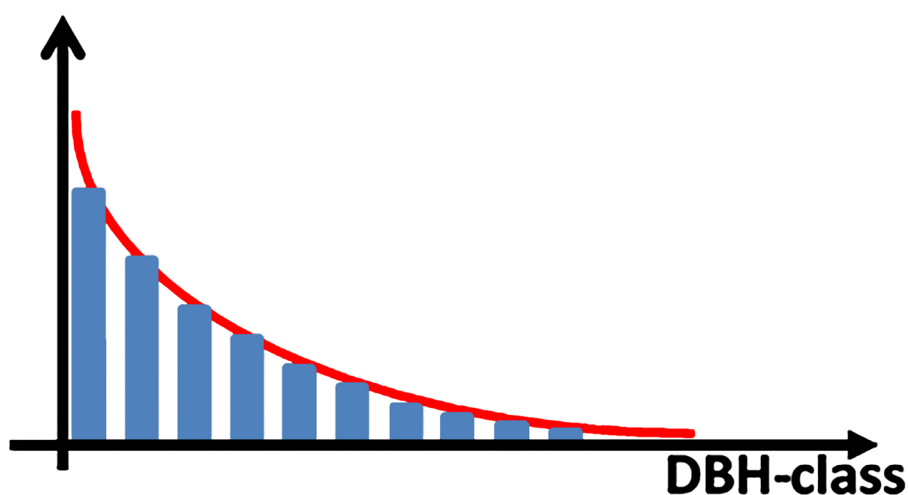
Figure 8: Reverse J-shaped curve of diameter class distribution showing a healthy population structure.

Stand structure is another term used to describe the distribution of trees by species and size within a stand. DeLioncourt (1898) found that plotting the number of stems against equal diameter classes as a frequency histogram results in a reversed J-shaped curve indicating a healthy population structure. Field studies in virgin and old growth forests have confirmed the utility of the negative exponential model worldwide. Foresters have used the stand structure to decide how many trees to cut and how many to remain uncut in each age class.

4. Habitat specificity and vulnerability	
Risk severity	**Example Indicators***
Low	Species is highly adaptable to various habitat types across its range and / or eco-logical zones or is adapted to one or few habitat types which has/have a high pro-portion of the landscape cover; the available habitats are stable (not declining in size or deteriorating in quality).
Medium	Species is adapted to a few stable habitat types, or ecological zones across its range not having a high proportion of the landscape cover, or it is adapted to a vari-ety of habitat types that are declining in size and/or deteriorating in quality.
High	Species is specific to one habitat type or a few threatened habitat types, having a minor proportion of the landscape cover and/or declining in size and/or deteriorat-ing in quality.
Unknown	Information about this factor is unavailable.

Explanation: This factor assesses habitat preference of the species concerned, the availability and abundance of habitats and ecological zones occupied and the threat to these habitats and zones.

5. Resilience of tree species	
Risk severity	**Example Indicators***
Low	High growth rates and/or simple reproduction patterns (e.g. early maturity, wind pollination, yearly fruiting, shoots rapidly regrow), low natural mortality rates.
Medium	Growth rates, natural mortality rates and/or reproduction patterns are intermediate.
High	Slow growth rates and/or complex reproduction patterns. Species is dioecious (male and female flowers on separate plants); adapted to specialised pollinators and/or seed dispersers; late maturity, irregular fruiting patterns, no shooting ability, high natural mortality rates.
Unknown	Information about this factor is unavailable.

Explanation: This factor comprises the species-specific properties of the trees adding to the perfor-mance of the species within the ecological context of the habitat. It very generally addresses the po-tential recovery capacity of the harvested population: i.e., the ability of the remaining trees to rebuild the population or to repopulate areas where individuals or sub-populations have been removed.

* The list of example indicators is not exhaustive and other indicators, guidance values or evaluation methods may be more appropriate based on the judgement or experiences of individual Scientific Authorities.

STEP 6: EVALUATE IMPACTS OF HARVEST

Rationale: why is this step important?

In this step impacts of wild harvest to the harvested population ("target population"), i.e. the population from which the materials for the NDF application have been harvested, need to be considered. These are the most important impacts of the trade and the NDF assessment process.

Depending on the population dynamics of the national population, harvest may also be detrimental to the national population of the species concerned overall, as well as to the species' ecosystem and other species that depend on it. Scientific Authorities can identify and evaluate these impacts by considering the best available information about the harvest practice used and harvest intensity.

The greater the severity of wild harvest impact on the species' target and national population, as well as the ecosystem concerned, the greater are the requirements of information quality, management rigour, and precaution that Scientific Authorities should apply to the NDF.

From Step 5

6.1. What is the severity of harvest impact on harvest population?

6.2. & 6.3. What is the severity of harvest impact on the national population and on the ecosystem?

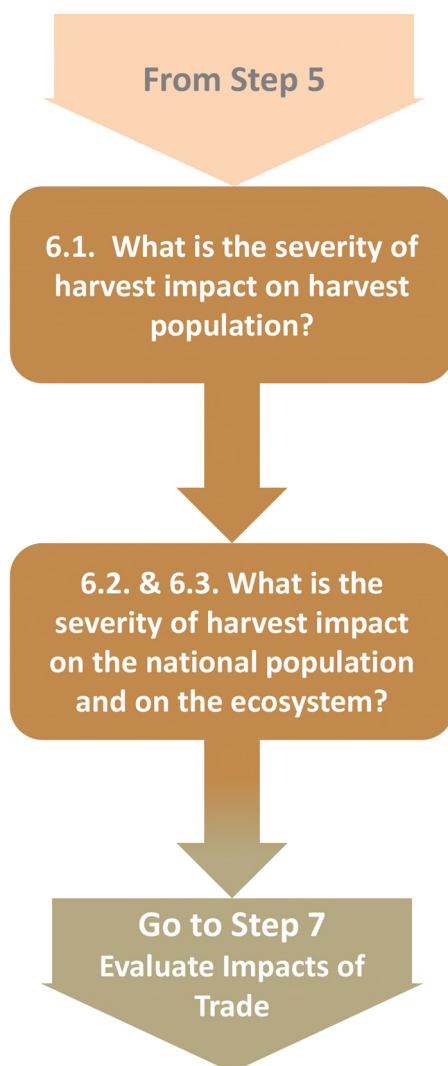**Go to Step 7**
Evaluate Impacts of Trade

Figure 9: Key Questions and Decision Path for Step 6.

Key Question

Considering the impacts of all ongoing harvest and all other threats (e.g. including illegal logging and clearing of forest for non-trade purposes e.g. land conversion) on species survival, is the severity of harvest impact on target populations, the national population, and on the ecosystem "Low", "Medium", "High", or "Unknown"?

Guidance

In this guidance the terms "target population" and "harvest population" are equivalently used to describe harvested populations which are the subject of the respective export application; whether already under a harvesting regime or planned to be harvested. For timber harvesting this is often the forest management unit (FMU).

For tree species, harvest impact is usually closely linked to forest management systems (see Step 8) and cannot be considered in isolation. In Step 6 the impact of harvest on the target population, on the national/sub-national population and on other species is evaluated. The impact of harvest on the target population is the best indicator to evaluate the effectiveness of the management system. Nevertheless, the management system will be assessed separately in Step 8 to identify possible gaps or define conditions to be met for a positive NDF. The higher the severity of risks identified in Steps 4 and 5 are, the stricter are the requirements for information quality and precaution that should be applied in this step.

This guidance recommends putting emphasis on the scale of the harvest population (e.g. the management area, sometimes called FMU). Although the boundaries of a management area do not necessarily comply with the natural boundaries of populations this is often the scale for which most detailed information is available and similar management measures apply.

Impact of Harvest on Target/Harvest Population

In forestry, the area covered, the forest resources and the forest operations are usually outlined in a management plan, often complemented by annual operational or harvesting plans. These plans are time-limited and should cover the period relevant to the trees harvested for export.

Damages during harvesting and losses during transport and stockpiling in the forest should also be considered in the assessment.

For specimens of source code Y see further guidance in Box 1.

Table 3 contains parameters used in forestry management to describe the situation and determine sustainable offtakes. Ideally all these would be available to refer to in considering whether harvesting is non-detrimental and whether offtake (harvest and natural mortality) is less than the regrowth. In many cases this may not be known and therefore available information on parameters should be used in combination to *indicate* the likelihood that the harvest is sustainable. Given management of different harvesting areas may differ, it is important to understand how the total area is being managed. For instance, a forest management unit may be using clear cutting of smaller defined areas on a long rotation or may be selectively logging throughout the area, but the management of the whole FMU would need to be considered. **Table 3 is intended to be used in conjunction with table 4a** assessing the impact of the harvest on the harvest population of the species, a factor fundamental to the NDF assessment. Information may be available in Forest Inventories, which are the systematic collection of data on the forestry resources within a given area. It allows assessment of the current status of tree species for analysis and planning, constituting the basis for Sustainable Forest Management (SFM). See CITES NDF guidance module 10 for further detail. Commercial logging companies

are required to carry out inventories in many countries. A module on forest inventory is included in the online [SFM Toolbox maintained by FAO](#) and a comprehensive standard reference on forest inventory techniques is provided by Rondeux (2021).

Information on some of the parameters in table 3 is likely to be derived from Permanent Sample Plots (PSP), which are a means of measuring tree growth, mortality, and regeneration in relation to stand density. They may be laid down either as a network of sampling plots, passively sampling existing forest management practices; or as measurement plots within an experimental design.

Impact of Harvest on Ecosystem

Harvest can have direct impacts on non-target species in the ecosystem or on the species role in the ecosystems. The Convention text specifically directs that "the export of specimens of any such species should be limited in order to maintain that species throughout its range at a level consistent with its role in the ecosystems in which it occurs." (Article IV paragraph 3). Further detail assessing these impacts is in CITES NDF Guidance Module 1 Section 6.2 and Module 2 Section 6.2.5 Ecosystem Impacts Evaluation. However, it is advised that a pragmatic approach would be to assume that if there is a viable population, distributed over much of its range which is being sustainably harvested, then a species' role in the relevant ecosystems is being maintained.

If a tree species is lost from a particular ecological community, those species linked with the tree through these ecological networks could also be extirpated ultimately leading to an extinction cascade. The roles of individual timber tree species within the ecosystem where they occur vary and may include shelter; provision of food – pollen, fruit, leaves; soil stabilisation and fertility enhancement through nitrogen fixation. *Dalbergia* species, for example, have an important role in fixing soil nitrogen, improving soil quality through the presence of nodules and mycorrhiza in their root systems. In Madagascar the fruits supply food for some species of lemurs including *Lepilemur ruficaudatus* and *Propithecus verreauxi*. In Southern Africa, *Pterocarpus angolensis* provides food for baboons, monkeys and yellow-footed squirrels (*Paraxerus cepapi*) which eat the flowers and seed pods. The flowers also attract bees. Kudu and elephant browse the leaves as do larvae of the butterfly, Emperor or Bush charaxes (*Charaxes achaemenes*) (see https://treesa.org/pterocarpus-angolensis/).

Tables 4a & b "Factors to Consider: impact of harvest" assist evaluating the severity of harvest impact **of harvest on (4a) the harvested area population and (4b) national/subnational population and on ecosystems**. The factors and indicators defined in Table 4 use information on the harvest practices and population trends in a simple ranking of impact severity: "Low", "Medium", "High" or "Unknown". Where information is not available or "Unknown", this should be considered as higher risk. Reliable data on national/sub-national population as well as on impacts on ecosystems and other species may not be available. In the absence of sound inventory data, arguments need to be strong and convincing to favour a positive evaluation.

Table 3: Parameters most relevant to evaluate harvest impacts.

Parameter	Definition	Notes/Use
Number of individuals and density of the species *Unit = Number, N or N/ha*	Count of the number of individual specimens of the species as a total for the area in question or by area.	This is the basic figure for any extrapolation of size and volume of a population. In case of uneven distribution (gregarious species) the need for statistically sound inventory data is higher than for even distributed species. Number of individuals is best represented by size distribution.
Size distribution (Class distribution) *Unit = N trees per size class* In relation to a specific area *Unit = N/size class/ha*	Size distribution gives the number (and/or volume) of trees in each size class (often divided into units of 10 cm diameter measured at DBH) per area.	This parameter can be used to calculate harvestable volume as well as provide an indication of the regenerative health of the species in the harvesting area. The age or size distribution of trees within population provides information about the future development of the population (under a planned harvest regime), e.g. about recruitment and remaining seed trees. Ideally the size class width should not exceed 10 cm and an inventory should include all sizes.
	The reverse J-shaped curve describes a negative exponential distribution of numbers of individuals in size classes in a stand with high numbers of small trees and decreasing numbers of trees with increasing size of classes (see Box 2 in Step 5). As many species do not have reversed J-shaped diameter distributions on local level under natural conditions, this specific indicator may not be applicable to all species.	A reverse J-shaped curve can indicate a healthy reproductive stand. Low numbers of lower size class could indicate poor regeneration in future. Low numbers of trees in size classes corresponding to seed producing mature trees could indicate poor future regeneration. (also see cutting diameter) *Size and age may not be closely correlated.*
Diameter at breast height (**DBH**) *Unit = cm*	Diameter measured usually at 1.3 m (4.3 ft) above ground as an indicator of size.	
Basal Area (BA) *Unit = m^2*	The cross-sectional area of the trees in a forest unit, usually measured at DBH and expressed in m^2 per hectare.	Commonly used as a measure of tree density in a forest.

Parameter	Definition	Notes/Use
Size class at maturity for the species. *Unit = cm*	Size class or diameter at breast height [**DBH**] at which a species reaches maturity and produces seed.	This figure is most meaningful in this context if it describes the size at which the majority (e.g. 70 %) of trees of a certain size will fruit (sometimes referred to as effective fruiting diameter). Note, that for some tree species the phenomenon of mass fructification occurs. Successful generative reproduction depends on such mass fructifications.
Minimum Cutting Diameter (**MCD**) *Unit = cm*	A minimum size (diameter) of harvestable tree set as a management tool. Size measured at breast height.	Often a minimum cutting diameter is set by national or sub-national law or by the forest management (sometimes also referred to a Minimum Exploitable, Minimum Logging Diameter Minimum Felling Diameter (MD) or Minimum Diameter of Exploitation (MED)). Cutting trees less than this diameter should not happen. It is sometimes determined to ensure that sufficient trees reach maturity to enable regeneration through fruiting and seed production. Sometimes it is set to ensure a certain restoration. In some cases the MCD is the general rule set by law and the MED is the stricter management measure set for individual FMU. This information is used to a) calculate the harvestable volume of timber, b) to evaluate recruitment into size classes. The minimum cutting diameter should be above the size of maturity/seed production. If the minimum cutting diameter is below or close to the minimum size at maturity, regeneration may be disturbed; and c) to understand the influence of harvest on the population.
Area *Unit = ha or km^2*	Area of forest being managed (e.g. FMU) and the target population to be harvested in a year.	Area of forest being managed (i.e. forest management unit (FMU)) and the target population to be harvested in a year are important parameters to know. Generally, the stocks of species are calculated per ha from inventory data and extrapolated to the entire area. For a more accurate estimation of stock, information on how much of the area does not add to the forest cover (e.g. water bodies, settlements, roads, rocks) or will not be subject to any harvest (reserve) are important. In case of different forest types involved in an area a differentiation between these in terms of area covered is advisable as often densities and volumes of species vary between types.

Parameter	Definition	Notes/Use
Growing stock if looking at total "site" *Unit = m³* or per unit area *Unit = m³/ha or m³/km²*	The estimate of growing stock volume by FMU or concession, or by other area is based on calculations, which at a minimum require the number of trees and their diameter at breast height and uses the length of the tree.	Growing stock is not always defined the same way; for example, FAO (2020) defines it as "Volume over bark of all living trees with a minimum diameter of 10 cm at breast height (or above buttress if these are higher). This includes the stem from ground level up to a top diameter of 0 cm, excluding branches." In some cases "Growing stock" is species specific and restricted to commercial sized trees (≥ **MCD**) and to parts of the trunk and branches which can be commercialized (sometimes called "standing roundwood volume", see PC17 Inf 3) this figure is very important because timber is generally not traded in numbers of individuals but in volumes. The accuracy of the estimate depends, inter alia, on the choice of an equation appropriate to the species.
Growth rate (increment) by diameter *Unit = cm* or by volume *Unit = m³* [may be expressed as growth rate per unit area]	The increase in diameter or volume per year.	Growth rates in relevant size classes (just below cutting limit) are more relevant than an average rate across all sizes. Growth rates are influenced by site conditions. Therefore, information from the management unit is preferable and often Permanent Sample Plots (PSP) are used for this purpose. Increment data should be accompanied by the number of trees monitored for growth, the monitoring period over which the increment was calculated and the location of those trees, to assess how representative it is. If assessment from the management unit is not available, in such cases it may be supplied later, or a proxy from a different site can be used. If several estimates are available, for precautionary reasons, the lowest value for the species should be used. The growth rate is needed to predict the future development of the population (e.g. recruitment – will the regrowth compensate for the harvested volume within one cutting cycle?). Please note that other factors such as size class distribution and regeneration also influence this evaluation.

Parameter	Definition	Notes/Use
Cutting/felling/logging/rotation cycle *Unit = years or a*	Period between cuts/felling/logging within the same area	Management of forests often defines periods over which certain volumes of timber are planned to be harvested. To ensure sustainability the length of time between felling needs to be sufficient for regeneration of species and the maintenance of ecological functions of the forest. Often the annual harvest is directed to individual plots (harvesting units) with individual plots then not harvested again until a specific period of time. This is called the cutting or rotation cycle. Understanding the regeneration of a species and its recruitment will help determine whether growth adequately compensates for the offtake over the cycle and additional mortality of the population including anticipated incremental mortality as a result of climate change. This information is crucial when evaluating whether recruitment and regeneration compensates for the losses.
Mortality rate Mortality is measured by number of trees/area/time *Unit = e.g. N/ha/year,* Or Mortality rate in relation to the entire stand *Unit = %*	Natural mortality due to age, diseases, disasters, etc.	Natural mortality should be considered when calculating the harvestable volume. Often the rate differs between size classes. The management in place may have permanent sample plots (PSP) to make such measurements.
Annual Allowable Cut (**AAC**) Number of trees *Unit = N* or volume of standing roundwood *Unit = m³*	Quantity of the species, that may be harvested from a forest management unit, annually.	The AAC is calculated on the basis of the management objectives, the standing stock and growth rates of commercially valuable tree species, and the area of forest under management. Usually specified in an approved management plan. The AAC is a practical measure of the sustainable yield in a given period. Needs to consider the **MCD**. *See Box 2 below for calculation and CITES NDF Guidance module 10 Section 2.8 Annual Allowable Cut for further information.*
Diameter Class Growth Projection per time period *Unit = n/size class or m³/size class*	Applying the Growth and Mortality Rate to the size classes and projecting the development of it over a certain time period	The manual method of diameter class growth projection is the oldest method, first used in Myanmar in 1856, and used elsewhere for simulating the growth of tropical forests. The basis for the projection is the Size Distribution. Growth is projected for a certain time period for each diameter class per hectare by applying growth and mortality rates.

Parameter	Definition	Notes/Use
Recovery rate Unit = %	Percentage of harvestable trees after one cutting cycle	Other than the Diameter Class Growth Projection this parameter calculates the development of the stand over time with a formula. It compares the number of stems above **MCD** to the calculated number of stems remaining after one cutting cycle by producing a ratio (e.g. Durrieu De Madron & Forni (1997). A ratio below 100 % means that the harvestable stock is reduced by the harvest operation throughout the rotation cycle. *See Box 3 and CITES NDF Guide Module 10 section 2.5 Regeneration of tree species populations.*
Sustainable yield	A sustainable yield implies that products removed from the forest are replaced by growth, with or without management interventions. In commercial forests where the major product is wood, calculating and implementing sustainable wood yields requires information on stocking levels and replacement rates (i.e., inventory and growth and yield data).	AAC is a practical measure of the sustainable yield in a given period and can be used to monitor forest production and set limits for forest use.
Reduced impact logging (RIL)	RIL is a sustainable timber harvesting and management approach that aims to minimize ecological disturbance.	Important objectives include minimizing damage to target species (including regeneration), improving timber use and the recovery of the forest and minimizing damage to wildlife. RIL involves selective logging as well as practices such as directional tree felling, stream buffer zones, setting aside areas for habitat protection (such as areas around springs) constructing roads, trails and landings to minimum widths, and methods to extract timber with minimal damage.

How to Proceed

Use the **Worksheet for Step 6** to record available information corresponding to each of the factors in Table 4a and b and the assessment of impact of harvest.

If general information on harvest impact is available but is not fully convincing and/or has important gaps or if no adequate assessments are available: answer "Unknown" and consider that higher rigour in evaluating Steps 7 – 8 will be required for a positive NDF decision.

In cases where there is a lack of critical data (unknown risks) allowing for an evaluation of the harvest impact, this guidance recommends that unless there are strong mitigating factors a positive NDF would be difficult to justify.

To support the evaluation of appropriate rigour of existing management measures (Step 8), harvest impacts and their severity of "Low", "Medium", "High", and "Unknown" rigour should be transferred to the **Worksheet for Step 8.2**   **→ Go to Step 7**

REMEMBER: Fully cite the references that you use in the Information Sources Consulted section of the worksheet and include a confidence level for information used. Put a reference in the worksheet "Step6_Harvest-Impact" and fully cite it in the worksheet "Sources_used".

Table 4a: Factors to Consider: Example Indicators and scenarios for impact of harvest on harvest population. Where information on relevant parameters is not available answer "Unknown"

1. Impact of harvest on harvest population			
Harvest Impact Severity			
Low	**Medium**	**High**	**Relevant Parameters (see table 3)**
Harvested (e.g. **AAC**), damaged and dead volume of the target species is lower than its growth volume in the annual harvest area concerned. Cutting cycle/rotation allows for regeneration and a sustainable yield.	Harvested (e.g. **AAC**) damaged and dead volume of the target species is close or equal to annual re-growth volume in the annual harvest area concerned. Cutting cycle allows for some regeneration.	Harvested damaged and dead volume of the target species is higher than its growth volume in the annual harvest area concerned. Cutting cycle is far too short to allow for adequate regeneration.	**AAC**, natural mortality, Growth rate, Cutting cycle, Regeneration rates or Diameter Class Growth Projection
Seed production of the remnant stand is not influenced significantly either in quantities or in spatial coverage.	Seed production of the remnant stand may be somewhat reduced in quantities or in spatial coverage.	Seed production of the remnant stand is negatively influenced either in quantities or in spatial coverage.	Size distribution Diameter at maturity
Minimum cutting diameter (**MCD**) is (at minimum one size class) above the size at maturity and reproductive size classes are well represented in the FMU/harvest area and will continue to be equivalently represented after harvest.	Minimum cutting diameter is similar to the size at maturity and reproductive size classes are partly represented in the FMU/harvest area and are likely to continue to be represented after harvest in a considerable amount.	Minimum logging diameter is less than the size at maturity and many trees within the main reproducing age/size classes are logged and not many individuals will replace them by reaching maturity after one cutting cycle.	Size distribution Diameter at maturity, **MCD**
Minimum size of tree required for production of end product is well above size at maturity.	Trees of a size below the size at maturity can be harvested to produce end products.	Trees far below size at maturity can be harvested to produce end products.	Size at maturity (plus knowledge of minimum/maximum size of tree needed to produce end product)
Spatial coverage of regeneration (natural or artificial e.g. enrichment planting) is far higher than spatial coverage of extracted or damaged trees in the same harvest area/FMU.	Spatial coverage of regeneration (natural or artificial) is more or less the same in number as that of extracted or damaged trees in the same harvest area/FMU.	Spatial coverage of regeneration is lower than spatial coverage of extracted or damaged trees in the same harvest area/FMU.	**AAC**, natural mortality, Growth rate, Regeneration rates or Diameter Class Growth Projection. Spatial distribution of remaining individuals by size classes/density of species (per size classes)

45

Low	Medium	High	Relevant Parameters (see table 3)
The population(s) of the harvested species is/are increasing over the years.	Population(s) of the harvested species is/are stable over the years and size distribution indicates that long term regeneration is likely to be good.	Population decline is evident, little sign of regeneration.	This indicator requires data from long term monitoring, including post-harvest monitoring.
Reduced Impact Logging (**RIL**) is applied; areas between felling sites and skid trails are left untouched and contain juveniles of target species.	No **RIL** is applied. Some juveniles are present after logging, some enrichment planting is carried out. Some seed trees remain.	No **RIL**. Juveniles are present but may be damaged in the logging process. Enrichment planting is not routinely undertaken. Few seed trees remain.	Information included in management plan and evidence of it being applied. Size distribution. (Please note that for some light demanding species **RIL** can affect recruitment negatively as large open patches are required for that.)

Explanation: This factor considers the impacts of harvest that affect the long-term viability of the reproducing target populations, such as recruitment or regeneration (these terms are sometimes used synonymously and can describe either the addition of individuals to a population through reproduction and/or dispersal from other populations or the addition of younger diameters into upper size classes over the years (one rotation cycle). The actual off-take should be considered, which may include a significant proportion of damaged or lost material that is not accounted for in documentation of material in trade. Impact of the harvest on harvest population is the most important factor for this step.

Note: Where information on relevant parameters is not available answer "Unknown" and consider this to be a higher level of risk.

Table 4b: Factors to Consider: Example indicators and scenarios for impact of harvest on national and subnational populations of the target species and the ecosystem.

2. Impact of harvest on national and sub-national populations of target species	
Harvest impact severity	**Example Indicators***
Low	• Up-to-date monitoring data show that the national or subnational population(s) of the target species is/are stable or increasing over the years. • National or sub-national population decline through harvest operations is unlikely; the species is distributed evenly across the region or country in stable populations; harvest operations only affect a minor part of the national population.
Medium	• Up-to-date monitoring data show that the population(s) of the target species have been stable over the years. • Harvest operations may impact the viability of sub-populations e.g. the species' distribution is scattered and uneven in (partly) low numbers and interconnection between sub-populations is questionable.

Harvest impact severity	Example Indicators*
High	• Up-to-date monitoring data show that the population(s) of the target species have been decreasing over the years. • National or sub-national population decline through harvest operations is likely; the subpopulation of the target species is one of only a few or even the only one in the country.
Unknown	• Information about this factor is unavailable

Explanation: This factor looks beyond the harvest activity for the export in question and considers the characteristics of all harvest operations that affect the long-term viability of populations on a national or sub-national scale. If, for example, repeated national inventories show that the population(s) have been stable or increasing over the past decades, harvest may have a low impact on population viability and species survival on a national scale. The actual off-take should be considered, which may include reasons other than forestry (e.g. land conversion).

Note: Monitoring data or national or sub-national inventories may provide data relevant to this factor. Management plans of other harvesting areas might also include relevant information. Often an adequate data source is not available. Information about the population trend (increasing, stable, or decreasing) may be available from existing conservation status assessments (Step 4).

3. Harvest impact on the ecosystem

Harvest impact severity	Example Indicators*
Low	• Target species easy to identify, accidental harvest of other species is unlikely. • Harvest practices have a minimal (or even positive) effect on non-target species, species diversity and the environment (e.g., better light regime for new vegetation growth after careful and selective logging). • 100 % regeneration, little impact on other species. • The management system includes measures that conserve the role of the species in the ecosystem (e.g. leaving sufficient habitat trees).
Medium	• Target species may be confused with other species leading to their accidental harvest. • Harvest practices are occasionally disruptive to non-target species or ecosystem. • Harvest has a moderate effect on resources available for other species.
High	• Target species is easily confused with other species; indiscriminate harvest of target species with other look-alike species. • Harvest practices have negative effect on non-target species or the ecosystem. • Harvest has a severe effect on resources available for other species. • No RIL (reduced impact logging) measures are applied.
Unknown	• Information about this factor is unavailable

Explanation: This factor considers the characteristics of wild harvest that may impact other species either deliberately (harvest of look-alike species) or incidentally e.g. species that depend on the species concerned (e.g. shade plants and forest animals). Harvest damage to the target species' ecosystem or to other species on which it depends can reduce the viability of the target population. Based on the best available information consider the following impacts:

a. significant change in the abundance of another native species;

b. an increase in the abundance of a non-native species or over-abundance of another species;

c. a reduction in a demographic rate in any life stage of another native species (e.g., germination, seed production, nest success, natal dispersal, etc.) that has the potential to decrease its abundance or otherwise reduce its viability;

d. a change in any ecosystem process or structural feature;

e. a change in the typical patterns of behaviour (e.g., social interactions, patterns of aggregation, movement) among individuals of the species being assessed or other species;

f. a change in genetic structure or variability of the population that indicates that one or more of the ecological functions of the species' are, or will become, impaired.

* The list of example indicators is not exhaustive and other indicators, guidance values or evaluation methods may be more appropriate based on the judgement or experiences of individual Scientific Authorities.

Box 2: Calculating Annual Allowable Cut

There are many ways of calculating the Annual Allowable Cut (**AAC**). For example, FAO (1998) gives an overview. However, an **AAC** must be species specific to be meaningful to an NDF. In the case of CITES-listed species often two ways are used to calculate AAC:

A) Based on the inventory for the entire forest the growing stock/standing round-wood volume of harvestable trees (of which any possible management restriction is subtracted) is divided by the number of years of the felling cycle.

$$AAC = (V-M) \times A/N$$

where:

V = the average volume per ha of the species above a specified stem diameter above MCD that is estimated from the first forest inventory.

M = Volume of standing timber per ha which due to any management measures and regulations cannot be felled and therefore must remain in the forest.

A = the area of a whole forest (productive areas only).

N = the length of the felling cycle, in years.

B) Based on the inventory for the annual cutting unit (often only comprising of size classes above MCD) the growing stock/standing roundwood volume of harvestable trees is calculated and any possible management restrictions are subtracted.

$$AAC = V_a \times A_a - M$$

where:

Va = the average volume per ha of the species above a specified stem diameter above MCD that is estimated from the annual cut forest inventory.

A_a = the area of the annual cut (productive areas only).

M = Volume of standing timber which due to any management measures and regulations cannot be felled and therefore have to remain in the forest.

In some methods to calculate the **AAC** the increment and mortality are included. In other cases, the parameters that lead to the calculation of the AAC as described above are amended by other variables (including annual growth and natural mortality) and used to check the value of the recovery rate (see Box 3).

Box 3: Calculating Recovery Rate

The recovery rate describes the ratio between the stock of harvestable trees at the beginning of the respective forest operation and the predicted remaining stock after one felling cycle. In order to calculate the recovery rate (%RE), the formula of Durrieu de Madron & Forni (1997) produced for Central Africa can be used:

$$\%RE = 100 \frac{[N_0(1-\delta)](1-\alpha)^T}{N_p}$$

Where:

N_0 is the number of stems under minimum cutting diameter **MCD** that will exceed it after a cutting cycle, it corresponds to number of stems between the **MCD** and the Diameter of the Lower limit (DLl) which is calculated with this formula:

$$DLl = MCD - T * MGT$$

This calculation considers several factors, which are explained in the table below.

Recovery Rate of 100 % expresses that the equivalent number of harvestable trees will still be available after one cutting cycle. Likewise, the more the result is below 100 % the less sustainable the forest operation is (a Recovery Rate of 50 % indicates that only half of the originally harvestable trees will remain in the forest after one cutting cycle). Obviously, any figure above 100 % indicates a gain of harvestable trees.

Parameters used for calculating the recovery rate:

Parameters	Unit
MCD: Minimum cutting diameter	cm
MGT: Mean growth rate	cm/year
N_0: Number of stems under MCD that will exceed it after a cutting cycle	Stems
Np: Number of stems above MCD	Stems
α: Death rate	%
δ: Logging damage rate	%
T: Cutting cycle	Years

Useful Sources

- FAO, 2024: Sustainable Forest Management Toolbox.
- ITTO, 2015: ITTO Voluntary guidelines for the sustainable management of natural tropical forests. Available at: https://www.itto.int/guidelines/
- Rondeux, J., 2021: La mesure des arbres et des peuplements forestiers. Les Presses Agronomiques de Gembloux, A.S.B.L.

STEP 7: EVALUATE IMPACTS OF TRADE

Rationale: why is this step important?

The impacts of wild harvest to the harvested populations ("target population") has been considered in Step 6. Here the impact of trade is considered. The term "trade" when used in the context of CITES usually implies international trade, and international trade is the potential threat relevant to CITES. However, in this step both domestic and export trade are considered. The impacts of trade when combined can be detrimental to the survival of the species concerned. Scientific Authorities can identify and evaluate trade impacts by considering the available information about the scale and trend of both legal and illegal trade.

The greater the severity of trade impact on the species concerned, the greater are the requirements of information quality, management rigour, and precaution that Scientific Authorities should apply to making an NDF. In effect, the greater the risk, the more precautionary the decision making should be in the final stages of the NDF process.

From Step 6

7. What is the impact of legal and illegal trade on harvest area population and on species nationally?

Go to Step 8
Evaluate Appropriate Rigour of Existing Management Measures

Figure 10: Key Question and Decision Path for Step 7.

Key Question

Considering the impacts of trade of this requested export on the target species' survival, is the severity of all legal and illegal trade impact on the harvest area population and the national populations of the species concerned "Low", "Medium", "High", or "Unknown"?

Guidance

The impact of all harvest operations on the national population were looked at in Step 6. Here, the impact of trade at the harvest area/FMU level considering the trade quantities in relation to actual offtake is considered first. Then the impact of trade on the national population of the species is looked at. Finally, the impacts of illegal trade are considered. The higher the severity of risks identified in Steps 4, 5 and 6, the stricter requirements for information quality, management rigour, and precaution that should be applied for in this step.

In some cases, existing management measures may mitigate (reduce the severity of) trade impacts. Therefore, this Step considers actual impact rather than potential impact. Management measures in their own right are considered in Step 8.

Trade data can reveal mismatches between stated harvest and actual traded volumes of a species. Illegal trade is considered in this step as well.

It is important to source and consider available information on local, national, international as well as illegal trade trends in the species concerned (see "Useful Sources and Examples of Recommended Information"). To evaluate trade impact for tree species/timber appropriately, knowledge of the national chain of custody (including recorded quantities) of the traded products, from harvest to export, is necessary. The SA may need to liaise with the MA or other national agencies on this issue. If there is confidence in a robust chain of custody this will greatly facilitate decision making.

Trade Data

When evaluating trade data consider:

- that in addition to international trade, domestic trade and use and illegal trade (domestic or international) may also exist, so try to obtain estimates of their volume;
- whether trade in the species may be taking place under the name of a look-alike species or vice versa;
- assessing the range of products of the target species in trade, including derivatives and material sourced from plantations. The level of trade of all commodities, covered or not covered by CITES, of the target species should be analysed, if information is available;
- obtaining and reviewing (understand the source and robustness) the conversion factors where processed products are traded (e.g. sawn wood, veneer, plywood, musical instruments), in order to compare the volumes of trade with the productivity of the forest stands by generating the respective roundwood equivalents.

Quotas

When checking export levels against an export quota consider:

- verification of the number of specimens or volume (use conversion factors to convert to standard CITES units such as m^3 roundwood equivalents), for which an export permit has been requested;
- checking past trade levels to compare against levels for the current year.
- Does the export quota explicitly include or exclude certain commodities?
- How much of the annual export quota has been used to date?

Traceability

Is there a tracking system in place to ensure that the wood covered by the NDF actually comes from the given harvest area and there is a robust chain of custody? Particular precaution may be needed for timber coming from forests allocated for other uses than permanent forest, which may not have comprehensive traceability systems. The traceability of timber continues to be challenging, particularly for front-line personnel responsible for identifying specimens at the border. Technological advances in anatomical, genetic and chemical techniques already underpin many Party's capabilities for tracing timber specimens in international trade see Low *et al.* (2022) (For further identification techniques see Step 1).

When evaluating the robustness of the chain of custody consider:

- the level of documentation and control at each step of the chain of custody from the forest inventory to the exported specimens;
- the durability and protection against forgery of marking techniques.

Unless a new species in trade is being evaluated most of this information should be readily available at national level.

Factors that affect the impact of trade on species survival are elaborated in Table 5 "**Factors to Consider: Impacts of Trade".**

How to Proceed

Use the **Worksheet for Step 7** to record available information corresponding to each of the factors in Table 5 and the assessment of trade impact.

If no adequate assessments are available: answer "Unknown" and consider that higher rigour in evaluating Step 8 will be required for a positive NDF decision.

To support the evaluation of appropriate rigour of existing management measures (Step 8), summary lists of "Low", "Medium", "High", and "Unknown" trade impact factors will be transferred to the **Worksheet for Step 8.2**.   → **Go to Step 8**

REMEMBER: Fully cite the references that you use in the Information Sources Consulted section of the worksheet and include a confidence level for information used. Put a reference in the worksheet "Step7_Trade-Impact" and fully cite it in the worksheet "Sources_used".

Table 5: Factors to Consider and example indicators to evaluate trade impact

1. Trade level (domestic and export) in relation to harvest area population	
Trade impact severity on harvest area population	**Example Indicators***
Low	• The amount of roundwood equivalent on the permit application is low in comparison to total annual production, no other exports have been applied for in the current year. • Permit quantity roundwood equivalent and previous (within the same year) exports and production for domestic trade are well within the harvest area's annual production quantities.
Medium	• The amount of roundwood equivalent on the permit application is close to, but under the harvest area annual production, no other exports have been applied for in the current year. • Permit quantity roundwood equivalent is low in comparison to total annual production, but permit quantity roundwood equivalent and previous exports and production for domestic trade are under but close to the harvest area's annual production quantities.
High	• The amount of roundwood equivalent on the permit application is above the total annual production. • Permit quantity roundwood equivalent and previous exports and production for domestic trade are over the harvest area's annual production quantities.
Unknown	• No conversion factors are available. • Information on previous trade and domestic trade originating from this harvest area is not available. • Information on the sustainable production capacity of the harvest area is not available.

Explanation: Using conversion rates (see Box 4), what is the amount of timber harvested (as round-wood equivalent) being requested for export? This should be compared with production amounts from the area in question. Products in trade may have gone through various stages of processing before export. There may be a significant proportion of damaged or lost material that is not accounted for in documentation of material in trade.

Conversion factors can be used to calculate the raw amount that would have needed to have been harvested to account for the processed products (for which permits are being applied for) to assess if this is a legitimate amount to come from the harvest area. Although some standard conversion rates are available, in reality, conversion rates will depend on each species, sawmill or industry and its machinery, the product and other processors. If these individual conversion rates are not provided, the SA can request this information (from traders/sawmills/industry) or make use of the most conservative value available from other sources or even for other comparable species and products.

2. Magnitude and trend of legal trade (domestic and export) in relation to the national population	
Trade impact severity	**Example Indicators***
Low	• Overall number or volume of specimens in trade is small in relation to abundance of the species (information from Steps 4 and 5). • Trade volume/market demand is decreasing over time.
Medium	• Overall number or volume of specimens in trade is neither small nor large in relation to abundance of the species (Steps 4 and 5). • Trade volume/market demand is stable or slowly increasing.

Trade impact severity	Example Indicators*
High	• Multiple uses are in commercial trade (i.e. the species supplies several products to different types of markets). • Trade volume/market demand is high in relation to information about abundance of species and part used (Steps 4 and 5). • Trade volume/market demand is increasing quickly, or decreasing in response to limited resource availability.
Unknown	• Information about this factor is unavailable.

Explanation: This factor considers the total national trade (domestic and export) level and trend. Trade might be increasing or decreasing which could indicate changes in supply or demand. Price changes may indicate changes in resource availability (supply) or may indicate changes in demand. Trade trends can change quickly; market analyses may reveal species which are traded under the same name. Total trade volumes might exceed the known national harvestable stocks of the species.

3. Magnitude of illegal trade (domestic and export)

Trade impact severity	Example Indicators*
Low	• Good documentation of domestic and export trade • Trade chain transparent and robust (at least for the harvest area) • Little concern about substitution for look-alike species • Estimated harvest corresponds to estimated trade volume
Medium	• Poor documentation of trade (domestic and export) • Trade chain difficult to follow • Some concern about substitution for look-alike species • Some concerns about whether estimated harvest and volume in legal domestic/reported export trade are more or less equal.
High	• Documented or proof of illegal trade • Limited documentation of legal domestic and export trade • Trade chain neither transparent nor robust • Great concern about substitution for look-alike species • Quantities legally exported are significantly smaller than quantities reported by importing countries • Significant concerns regarding whether total estimated volume in legal domestic and export trade are equal to the total estimated harvest volume.
Unknown	• Information about this factor is unavailable.

Explanation: This factor considers whether illegal trade is likely to be, significant in proportion to the overall trade volume, and whether the substitution for a look-alike species has a significant influence on the survival of the species of concern.

* The list of example indicators is not exhaustive and other indicators, guidance values or evaluation methods may be more appropriate based on the judgement or experiences of individual Scientific Authorities.

Box 4: Converting standing tree volume to products.

When trees are harvested a significant amount of "standing volume" may be lost due to not finding the tree which was inventoried, imperfections in the tree and in forming the products to be traded, damages while felling the tree and lost trees in the forest. The simple diagram below on the basis of PC17 Doc. 16.1.3 illustrates this for conversion of standing trees to exportable sawn wood. The conversion will depend on a lot of individual factors. For mahogany PC17 Doc. 16.1.3 found that the conversion of standing timber to sawnwood was 38 % and for export grade only 20 % (not considering losses due to lost trunks or damaged trees in the process of felling, to name only two of the possible options). It is preferable to use specific figures for the species and site. For more information see FAO, ITTO & United Nations (2020) and Maplesden & Pearson (2021).

Conversely volume of products can be expressed in "roundwood equivalent (RWE) volume". RWE volume is a measure of the volume of logs (roundwood) used in the manufacture of wood-based products (including wood pulp, paper, wooden furniture, joinery and plywood). RWE volume does not reflect the reduction in standing volume of trees which is attributable to the felling and extraction of logs. Neither does it reflect the impact of that extraction on the forest ecosystem (taken from https://www.globaltimber.org.uk/rwevolume.htm).

Timber companies should be able to provide conversion rates. Conversion rates for sawn wood above 50 % are rarely achieved. Where possible, conversion rates should be accompanied by details of the parameters used for the calculation in order to assess their appropriateness with the assistance of forestry experts.

From Forest to Sawn Wood
timber losses

Example: yield rate for *Swietenia macrophylla* (Source: PC17 Doc. 16.1.3)
sawn wood: 38% (all grades) to 20% (export grade) of standing volume

Figure 11: Example of conversion losses from standing trees to production of products. Conversion rates will depend on the species and on the product being made from the trees.

Useful Sources and Examples of Recommended Information

National trade data

- National trade data records, quantitative information on number of specimens exported
- Forest certification schemes (which are independently evaluated, e.g. FSC, PEFC, Rainforest Alliance)

International trade data

- CITES Trade Database; also see
- Guide to using the CITES Trade Database (CITES, 2022)
- ITTO Biennual Review Statistics Database
- Customs trade data (these are usually not species-specific, but some exporting countries have some species-specific customs codes, which can provide relevant data)
- CITES Review of Significant Trade Management System
- Wildlife Trade Portal

Illegal trade

- Chatham House Forest Governance and Legality (Illegal logging portal, including seized material)
- USFWS LEMIS databases (for illegal trade) and EU TWIX (restricted access)
- Arbor Harbor
- Forest Plot Network
- Panjiva Supply Chain Intelligence

Trade names

- CITESwoodID App (now available on Android, IOS for mobile phone, and macOS/Apple Silicon and UWP/Windows)
- CITESwoodID (Internet version)
- Commercial Timbers: Descriptions, Illustrations, Identification, and Information Retrieval
- ATIBT, 2016: Nomenclature Générale des Bois Tropicaux
- The Wood Database

Conversion factors – see examples in the following

- United States Department of Agriculture, CITES I-II-III Timber Species Manual - covers conversion cubic feet to meters etc, veneer conversion, volume of a log, but not roundwood equivalents.
- Volumetric Conversion of Standing Trees to Exportable Mahogany Sawn Wood (PC17 Doc 16.1.3)
- FAO, ITTO & United Nations, 2020: Forest product conversion factors. Rome.
- Maplesden, F. & Pearson, H., 2021: Forest products conversion factors: Tropical logs and sawnwood. ITTO.

Further useful guidance and resources

- Thivolle-Cazat, A., 2008: [Conversion factors. A necessity for an accurate estimation of wood consumption by industries](#).
- Global Timber . Org . UK: [Roundwood equivalent volume](#)
- Barua, S.K., Pentilla, J. & Malmstrom, M., 2016: [China as a Timber Consumer and Processing Country. An Analysis of China's Import and Export Statistics With In-Depth Focus on Trade with the EU](#).
- ATIBT / [Association Technique Internationale des Bois Tropical](#) (International Tropical Timber Technical Association): For a legal and certified tropical timber trade.

STEP 8: EVALUATE RIGOUR OF MANAGEMENT MEASURES

Rationale: why is this step important?

Management planning is a prerequisite for legal and sustainable timber operations world-wide. For wild-harvested tree species included in CITES Appendix II, non-detrimental trade requires the effective implementation of appropriate and proportional management measures. The level of management rigour needs to be appropriate to mitigate (reduce the severity of) the specific harvest and trade impacts identified for the species concerned and its populations. Therefore, this is the key step in evaluating non-detriment.

From Step 7

8.1. What management measures are in place for the target species?

8.2. Do existing management measures adequately mitigate harvest impacts, and trade impacts identified for the populations and sub-populations?

Go to Step 9
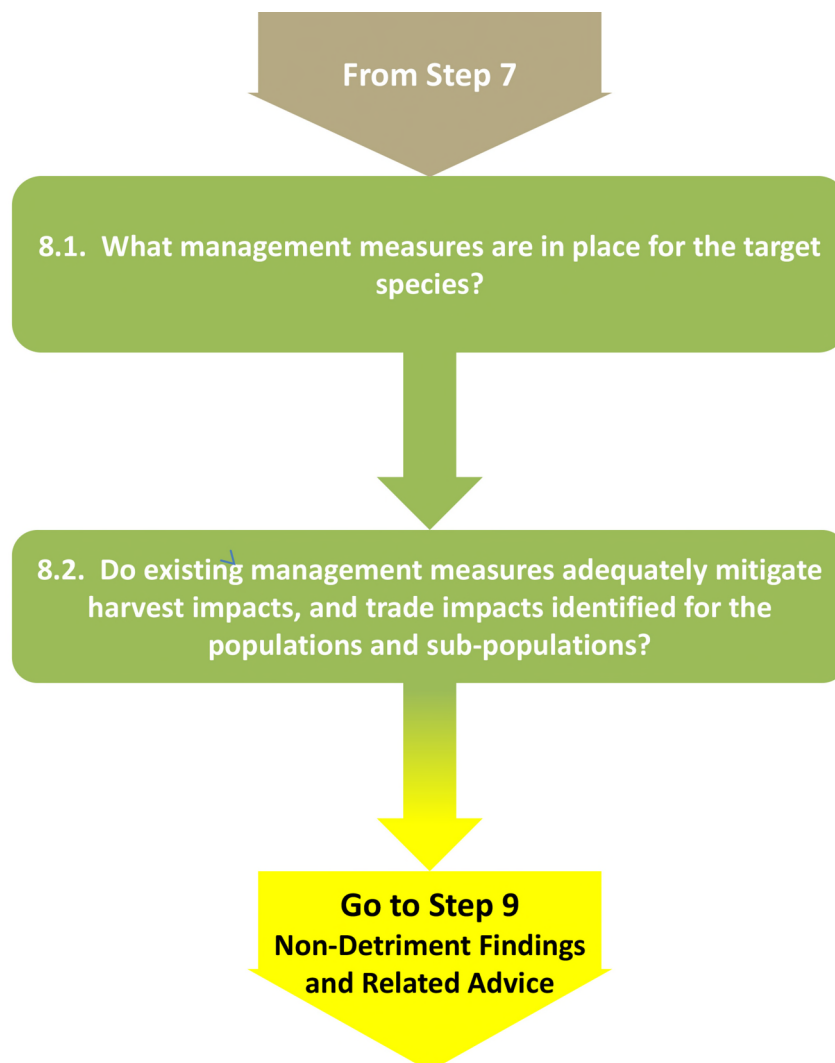**Non-Detriment Findings and Related Advice**

Figure 12: Key Questions and Decision Path for Step 8.

Steps 4 – 7 of this Guidance support Scientific Authorities in assessing conservation concern, potential biological risk, harvest impact and trade impact. These steps also assist the SA in the identification of factors that contribute to the concerns, risks, and impacts.

Existing management measures may mitigate the impacts of harvest and trade; therefore, it is not possible to consider these impacts as independent factors in a non-detriment finding process (for example, if existing management measures are appropriate, harvest impacts and trade impacts will not be "High"). Therefore, the rigour of existing management measures is inherent in the evaluation of the impacts of harvest and trade in Steps 6 and 7.

Step 8 supports use of available information to evaluate whether the management measures in place have the appropriate level of rigour and are effectively implemented to mitigate the identified harvest and trade impacts. Step 8 adds value by:

- Reviewing individual management measures in detail
- Identifying possible major shortcomings in the current management
- Providing an overview of the entire NDF-process to inform the final NDF-decision

Step 8.1

Key Question

What management measures are in place for the target species?

Guidance

In Step 8.1, Scientific Authorities should aim to obtain information on the management systems in place. Many aspects have already been looked at in Steps 6 and 7 and can be collected in the worksheet for 8.1 while dealing with those steps. For further discussion of key principles of sustainable forest management (SFM) to consider see CITES NDF Guidance Module 10, FAO's SFM Toolbox and Box 5 on Silviculture.

In addition, answers to the following questions may help:

- What is the ownership/tenure right of the harvest area (state; communal; private; logging concessions, etc.)?
- Who manages the harvest area (e.g. international corporation; industrial concession, small-scale holder, national or local logging company; communal forest management; state agency, private person, etc.)?
- What management measures are in place and are they documented (e.g. in a management plan), are they comprehensive and adequate to the requirements of the forestry operation?
- Are there State checks and controls of forest operations, transport, sawmills, exports, etc.?
- Is a credible certification system in place?
- Is monitoring conducted to systematically assess the impact of harvesting procedures and also assess whether management objectives have been met?

Scientific Authorities may need to contact the relevant competent authorities or the managing companies to gather information on most of these questions.

Step 8.2

Key Question

Do existing management systems adequately mitigate harvest and trade impacts identified for the populations and sub-populations of the species concerned?

Guidance

The **Worksheet for Step 8.2** aims to provide a synopsis of the previous steps. To do this:

1. Transfer the results of conservation concern (Step 4) and biological risk (Step 5) from the **Worksheets for Steps 4 and 5** into the upper part of **Worksheet for Step 8.2**.

2. Transfer the harvest impacts (Step 6) and trade impacts (Step 7) from the **Worksheets for Steps 6 and 7** into the lower left part of **Worksheet for Step 8.2**.

3. Often not all factors identified in the NDF-process influence sustainable harvest and trade with the same level of impact and sometimes one or several factors can be identified to be of central importance. Of the risks identified in previous steps, identify which are the most important to be adequately mitigated through management measures. If using the worksheets, identify the respective risks in the column titled "Key" with a Red Dot ●

4. Place the existing management procedures against those trade and harvest impacts identified in Steps 6 and 7 (now placed in the lower left part of Worksheet 8.2) which they may mitigate. The management measures should be placed opposite the respective trade and harvest impact in the column headed "Management measures".

5. Evaluate, whether management measures in place adequately mitigate the severity of concerns, risks, and impacts, based on the following conditions for appropriate management rigour and level of implementation. This is the key set of decisions leading up to making a NDF in Step 9.7:

    a) Management measures to address the type and geographic scope of the concerns, risks or impacts do not exist or are unknown to exist. [If applies to majority or to risks and impacts identified as key (red dot), will likely result in a negative NDF in Step 9.7].

    b) Management measures in place address the type and geographic scope of the concerns, risks or impacts but do not have the appropriate level of rigor. [If applies to majority or to risks and impacts identified as key (red dot), will likely result in a negative NDF or a positive NDF with conditions which address the issue of rigour, in Step 9.7].

    c) Management measures in place have the appropriate level of rigour required to reduce the severity of the concerns, risks or impacts are in place but are not implemented effectively or results are unknown. [If applies to majority or to risks and impacts identified as key (red dot), will likely result in a positive NDF with conditions which address the issue of implementation, in Step 9.7].

    d) There is clear evidence that the existing management measures have the appropriate level of rigour and are effectively implemented to mitigate the type and geographic scope of the concerns, risks or impacts. [If applies to majority or to risks and impacts identified as key (red dot) will likely result in a positive NDF in Step 9.7].

This Guidance treats "Unknown" concerns, risks or impacts from the previous Steps as equal to a "High" level of severity, thus requiring high levels management rigour.

Box 5: Silviculture – (for more information see CITES NDF guidance Module 10).

Natural-forest silviculture is defined by FAO (2024) as "the practice of controlling the establishment, growth, composition, health and quality of natural forests to meet diverse needs and values". Silvicultural practice consists of the interventions applied to forests to maintain or enhance their utility for specific purposes, notably for the production of wood. Silvicultural methods applied in assisted natural regeneration include selection of mother trees, selective felling, group felling, successive opening-up of the canopy, soil treatment, protective measures for single trees, tending, thinning and pruning.

Assisted natural regeneration is designed to promote natural regeneration of tree species in a forest, stimulating their growth and maintaining their health. The goal is usually the production of good quality timber while maintaining the basic ecological processes.

In relation to canopy opening, three kinds of species can be distinguished: shade-intolerant species (so-called pioneer species), which need large canopy gaps to develop; long-living shade-intolerant species (so-called nomad species, gap opportunists or gregarious species), which regenerate in small gaps; and shade-tolerant species or forest climax species.

Enrichment planting involves increasing the population density of valuable tree species in degraded forests. Enrichment of natural forests after logging may be appropriate in areas where natural regeneration is insufficient. Nursery-grown seedlings or transplants from the wild (= wildlings) are planted in felling gaps, log landings, or along cleared lines through degraded forest. Seedlings need to be planted under appropriate conditions especially with regards to light availability, and tended until they are large enough to grow as established plants. This process often requires annual removals of lianas and cutting back of encroaching vegetation.

Different silvicultural methods have been developed to promote the use of individual tree species, to sustain existing forests or to create new forest stands. The methods are generally incorporated into Forest Management Plans. Silvicultural knowledge exists for some CITES-listed tree species such as *Khaya* spp., *Gonystylus bancanus*, *Pericopsis elata* and *Swietenia macrophylla* but scarcely exists for most others, such as different species of *Dalbergia* spp. and *Diospyros* spp. (Doc. PC.10.8.1). Where silvicultural measures do exist and are applied, monitoring is necessary on their effectiveness for the recovery of the harvested species.

How to Proceed

Use the **Worksheet for Step 8** to record your findings.

8.1

Use the **Worksheet for Step 8.1** to record the details of the management measures in place, and → **go to Step 8.2**

8.2

Use the **Worksheet for Step 8.2** to evaluate and record the effectiveness of the management. Identify any gaps between the management measures required and those actually in place.

Taking all aspects of the evaluation into consideration, make an overall judgement of whether rigour and implementation of the management in place is appropriate to the severity of harvest impacts, and trade impacts identified. → **Go to Step 9**, **Decision 9.7**

REMEMBER: Fully cite the references that you use in the Information Sources Consulted section of the worksheet and include a confidence level for information used. Put a reference in the worksheet "Step8.1_Management" and fully cite it in the worksheet "Sources_used".

STEP 9: NON-DETRIMENT FINDING AND RELATED ADVICE

Summary of NDF Process

Steps 1 – 8 of this Guidance have been structured to guide Scientific Authorities through a series of Key Questions and Decision Paths to make "a science-based assessment that verifies whether a proposed export is detrimental to the survival of that species" ([Res. Conf. 16.7 [Rev. CoP17] Non-detriment findings](#)). These Steps and the related Guidance support various outcomes, depending on:

- Step 1 – whether there are concerns about specimen identification
- Step 2 – whether the export of artificially propagated specimen is prohibited by law and whether they clearly meet all requirements for artificial propagation
- Step 3 – whether specimens are covered by CITES listing annotations, whether legislation is banning export, or whether the specimens are compliant with a previously made, science-based NDF which is still valid
- Step 8 – whether existing management measures adequately mitigate (= reduce the severity of) harvest and trade impacts identified in Steps 6 – 7.

This Guidance supports Scientific Authorities in their task to gather, evaluate, and document relevant information for which the data quality is "proportionate to the vulnerability of the species concerned" (Resolution Conf. 16.7 [Rev. CoP17] Non-detriment findings). This guidance also helps in identifying information gaps and management deficits for further improvements of the sustainable management of the target species.

The final task for the Scientific Authority is to make a positive or negative NDF or related decision, and to advise the Management Authority whether to allow the proposed export of specimens based on the outcome of the previous steps of this Guidance (= Step 9).

Remember: it is possible to exit early from the 9-Step process at a number of different Steps (1 – 3) depending on the answers to the key questions. The Decisions below guide the Scientific Authority through the next stage depending on which Step they exited at. **Only one of these decisions applies to a single application.**
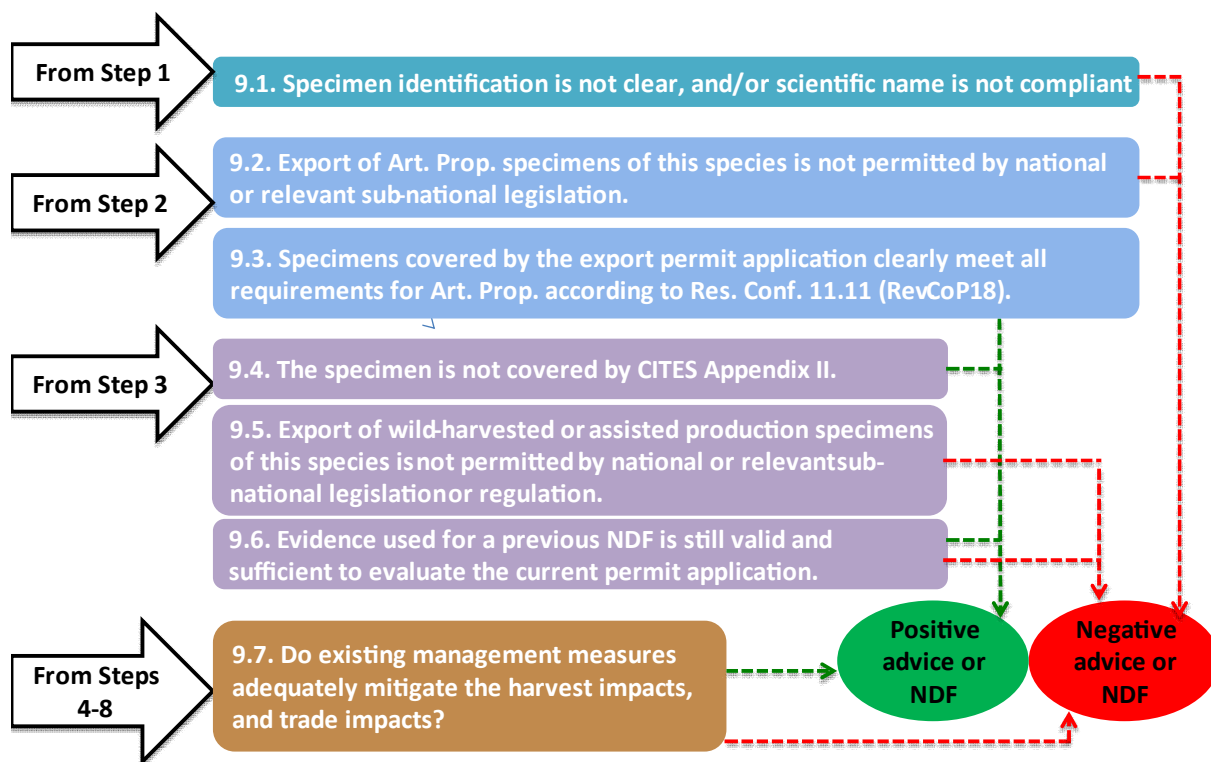
Figure 13: Summary of decisions which can be made in Step 9.

Decision 9.1

The outcome of Step 1 is: The Scientific Authority is not confident that the specimen concerned has been correctly identified, and/or that the scientific name used is compliant with the appropriate CITES Standard Reference.

Guidance

In this case concerns over the species' identity were identified by the Scientific Authority and could not be corrected or resolved by consultation with an expert or the Management Authority.

Record the justification for this finding in the **Worksheet "Step9_Decision"**, Outcome 9.1.

The Scientific Authority's advice supported by this Guidance is:

➔ **Negative decision: Advise the MA that NDF cannot be made.**

If the Scientific Authority decides to make a **positive NDF**, the basis for the finding should be documented and the remaining steps to come to an NDF should be applied.

Decision 9.2

The outcome of Step 2, Key Question 2.2 is: Export of artificially propagated specimens of this species is not allowed by national or relevant sub-national legislation.

Guidance

Advice of the Scientific Authority must comply with national or relevant sub-national legislation.

The Scientific Authority's advice to the Management Authority, supported by this Guidance, is:

→ **Negative decision: Advise the MA that NDF cannot be made and that the export permit has to be denied.**

Record the basis for the decision in the **Worksheet "Step9_Decision"**, Outcome 9.2.

Decision 9.3

The outcome of Step 2, Key Question 2.3 is: Specimens covered by the export permit application clearly meet all requirements for artificial propagation.

Guidance

An NDF for the exported specimens is not required. Inform the Management Authority that an NDF is not required.

The Scientific Authority's advice to the Management Authority, supported by this Guidance, is:

→ **Approve export permit.**

Record decision in the Worksheet **"Step9_Decision"**, Outcome 9.3.

Decision 9.4

The outcome of Step 3, Key Question 3.1 is: The specimens are not covered by CITES Appendix II.

Guidance

An NDF is not required.

The Scientific Authority's advice to the Management Authority, supported by this Guidance, is:

→ **CITES export permit is not required.**

Record decision in the Worksheet **"Step9_Decision"**, Outcome 9.4.

Decision 9.5

The outcome of Step 3, Key Question 3.2 is: Export of wild-harvested or assisted production specimens of this species is not allowed by national or relevant sub-national legislation or regulation.

Guidance

Advice of the Scientific Authority must comply with national or relevant sub-regional legislation.

The Scientific Authority's advice to the Management Authority, supported by this Guidance, is:

→ **Negative decision: Advise the MA that NDF cannot be made and that the export permit has to be denied.**

The Scientific Authority may refer to the Management Authority to investigate potential illegal trade or to the responsible authority for enforcement.

Record decision in the Worksheet **"Step9_Decision"**, Outcome 9.5.

Decision 9.6

The outcome of Step 3, Key Question 3.3 is: Science used for a previous NDF is still valid and sufficient to evaluate the current export permit application.

Guidance

If there is a standing valid NDF or a national quota that has been established based on an NDF, a new NDF may not be required.

The Scientific Authority's advice to the Management Authority, supported by this Guidance, is:

→ **Positive NDF** if the proposed export is within the parameters of the previous NDF;

→ **Negative NDF** if the proposed export is not within the parameters of the previous NDF.

Record decision in the Worksheet **"Step9_Decision"**, Outcome 9.6.

Decision 9.7

Step 8, Key Question 8.2 is: Do existing management measures adequately mitigate harvest and trade impacts identified for the populations and sub-populations of the target species affected by the proposed trade?

Guidance

The Key Questions and Decision Paths in Steps 4 – 7 have supported evaluation of conservation concerns, potential biological risks, harvest impacts, and trade impacts and their severity, using information with a data quality recommended for the severity of concerns, risks, and impacts. Key Questions and the Decision Path for Step 8 have supported identification of management measures in place that are relevant to the identified concerns, risks, and impacts, and evaluation of whether existing management measures are sufficiently rigorous and effective to mitigate the impacts identified.

The Scientific Authority's decision supported by this Guidance is:

→ **Positive NDF** if the evaluation of available information indicates "Yes", management measures in place are sufficiently rigorous and effective, or "Yes" with conditions or management advice on key management gaps identified in the Worksheet for Step 8, Key Question 8.2, to be defined in the NDF. It may be that the SA can only make this decision on condition that certain management, inventory or monitoring activities are undertaken. This would be considered a Positive NDF with conditions.

→ **Negative NDF** if the evaluation of available information indicates "No or Uncertain", management measures in place are not sufficiently rigorous and effective. There may also be conditions or management advice that would need to be implemented before an NDF might be considered Positive.

Note: Any Conditions relating to this process should be recorded in the worksheets. For more information on Conditions and management advice see CITES NDF Guidance module 1.

Record decision in the **Worksheet "Step9_Decision", Outcome 9.7**.

Accumulated data capture over time

In case of substantial information deficits, it may be acceptable to temporarily postpone the incorporation of such information. See the Belgian Scientific Authority concept (PC21 Inf. 4).

Acknowledgements

We would like to thank all who contributed to the development of these Guidelines, including those that have provided invaluable expertise to the development of the 9-step Perennial Plants guide and the "CITES Non-detriment Findings for Timber – Guidance for EU-member States".

Special thanks go to the participants and contributors to the workshop to revise the BfN Non-detriment Finding Guidance for Timber (7th and 8th of November 2017, Isle of Vilm). Each training workshop, consultation and presentation that has been made on the 9-steps has provided invaluable feedback on how to improve the guidance. This comprises:

- May 2017 in Peru with participants from Bolivia, Brasil, Colombia, Ecuador, Guyana, Peru, Venezuela and Guatemala.
- December 2018 in Gabon with participants from Cameroon, Democratic Republic of the Congo, Gabon and Republic of Congo.
- November 2019 in Mozambique with participants from Kenya, Mozambique, Tanzania and Zambia.
- The 9-step guide has also been taught at the Baeza CITES-Master's course with participation from various countries and likewise valuable input.

We have attempted to incorporate this in each revision and are hugely grateful to all of those that have provided their time and wisdom over the years.

This draft incorporates outcomes from the CITES NDF project after the expert meeting in Nairobi, December 2023.

Many thanks also to the translators, French: Richard and Danièle Devitre, Spanish: Wendy Byrnes.

Units used in this guidance

a	year
cm	centimeter
ha	hectare (10,000 m²)
km²	square kilometer
m³	cubic meter
N	number
%	per cent

References

*: Further reading (not cited in the text)

Every effort has been made to ensure the links to documents are up to date. For CITES documents, if links do not work they should be possible to find through the CITES website. Resolutions may be updated at meetings of the CoP but these should be available through the Resolutions page.

ATIBT, 2016: Nomenclature Générale des Bois Tropicaux; 152 pp. – URL: http://www.fao.org/3/a-be999f.pdf.

Barua, S.K., Pentilla, J. & Malmstrom, M., 2016: China as a Timber Consumer and Processing Country. An Analysis of China's Import and Export Statistics With In-Depth Focus on Trade with the EU. – URL: https://www.wwf.org.uk/indufor-china.

Best Practice Guide for Forensic Timber Identification (UNODC): https://www.unodc.org/documents/Wildlife/Guide_Timber.pdf.

*Betti, J.L., 2008: Non-detriment Findings Report on *Pericopsis elata* (Fabaceae) in Cameroon. – NDF Workshop Case Studies, WG1 – Trees, Case Study 2, Cancun; 59 pp. – URL: http://www.conabio.gob.mx/institucion/cooperacion_internacional/TallerNDF/Links-Documentos/WG-CS/WG1-Trees/WG1-CS2%20Pericopsis/WG1-CS2.pdf.

*CBD, 2004: Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity (CBD Guidelines), Secretariat of the Convention on Biological Diversity, Montreal; 21 pp. – URL: https://www.cbd.int/doc/publications/addis-gdl-en.pdf.

*CITES, 1973: Convention on International Trade in Endangered Species of Wild Fauna and Flora. – Text of the Convention. Signed at Washington D.C., on 3 March 1973, amended at Bonn, on 22 June 1979, amended at Gaborone, on 30 April 1983; 14 pp. – URL: https://www.cites.org/eng/disc/text.php.

CITES, 2021: Preliminary guidance on terms related to the artificial propagation of CITES regulated plants. UNEP-WCMC, Cambridge; 16 pp. – URL: https://cites.org/sites/default/files/eng/prog/captive_breeding/Art_Prop_Guidance_Feb2022.pdf.

CITES, 2023: Guidelines for the preparation and submission of CITES annual reports; 22 pp. – URL: https://cites.org/sites/default/files/notifications/E-Notif-2023-132-A1.pdf.

*Congolese Institute for Nature Conservation, 2014: Non-detriment findings on Afrormosia (*Pericopsis elata*) in the Democratic Republic of Congo. Congolese Institute for Nature Conservation (Scientific Authority) and General Secretariat for Environment and Nature Conservation, Ministry of the Environment, Nature Conservation and Tourism (MECNT), Kinshasa; 63 pp. – URL: http://www.itto.int/files/user/cites/DRC/Report%20-%20Pericopsis%20elata%20DRC%20NDF%20English%20-%20Nov%202014.pdf.

*CoP11 Inf. 11.3: CITES Scientific Authorities – Checklist to assist in making non-detriment findings for Appendix II exports. CoP11, Gigiri (Kenya), 10-20 April 2000; 21 pp. – URL: https://cites.org/sites/default/files/eng/cop/11/info/03.pdf.

*Decision 16.58 (Rev. CoP17): Physical inspection of timber shipments. – URL: https://cites.org/eng/node/48579.

Durrieu De Madron, L. & Forni, E., 1997: Aménagement forestier dans l'Est du Cameroun. – Bois et forêts du tropiques 254 (4) : 39-50.

European Union, 2010: Regulation (EU) No 995/2010 of the European Parliament and of the Council of 20 October 2010 laying down the obligations of operators who place timber and timber products on the market. – URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:295:0023:0034:EN:PDF.

♦FairWild Foundation, 2010: FairWild Standard, Version 2.0, FairWild Foundation, Weinfelden, Switzerland. – URL: https://www.fairwild.org/the-fairwild-standard.

FAO, 1998: Guidelines for the management of tropical forests. Available at: https://www.fao.org/3/w8212e/w8212e00.htm

FAO, 2020: Global Forest Resources Assessment 2020 – Terms and Definitions. Rome. – URL: https://www.fao.org/3/I8661EN/i8661en.pdf.

FAO, 2024: Sustainable Forest Management Toolbox. – URL: https://www.fao.org/sustainable-forest-management/toolbox/en/

FAO, ITTO & United Nations, 2020: Forest product conversion factors. Rome. – https://www.fao.org/3/ca7952en/CA7952EN.pdf

Gasson, P.E., Lancaster, C.A., Young, R., Redstone, S., Miles-Bunch, I.A., Rees, G., Guillery, R.P., Parker-Forney, M. & Lebow, E.T., 2021: WorldForestID: Addressing the need for standardized wood reference collections to support authentication analysis technologies; a way forward for checking the origin and identity of traded timber. – Plants, People, Planet: 130-141. – URL: https://nph.onlinelibrary.wiley.com/doi/pdf/10.1002/ppp3.10164.

Global Timber . Org . UK: Roundwood equivalent volume. – URL: https://www.globaltimber.org.uk/rwevolume.htm.

Grant, J. & Hin Keong Chen, 2021: Topic Brief – Using wood forensic science to deter corruption and illegality in the timber trade. – TNRCProject.org; 11 pp. – URL: https://www.worldwildlife.org/pages/tnrc-topic-brief-using-wood-forensic-science-to-deter-corruption-and-illegality-in-the-timber-trade.

Groves, M. & Rutherford, C., 2023: CITES and Timber: A Guide to CITES-listed tree species; 166 pp. – URL: https://cites.org/sites/default/files/timber_id_materials/files/CITES%20%20Timber%20-%20A%20guide%20to%20CITES-listed%20tree%20species%202023.pdf.

Guide to using the CITES Trade Database: https://trade.cites.org/cites_trade_guidelines/en-CITES_Trade_Database_Guide.pdf.

♦Günter, S., Weber, M., Stimm, B., & Mosandl R. (Eds.), 2011: Silviculture in the Tropics. Springer, Heidelberg; 559 pp.

Leaman, D.J. & Oldfield, T.E.E., 2014: CITES non-detriment findings: guidance for perennial plants. A nine-step process to support CITES Scientific Authorities making science-based non-detriment findings (NDFs) for species listed in CITES Appendix II. Version 1.0. – BfN-Skripten 358; Bundesamt für Naturschutz, Bonn, Germany; 88 pp. – URL: https://www.bfn.de/fileadmin/MDB/documents/service/skript358.pdf.

Low, M.C., Schmitz, N., Boeschoten, L.E., Cabezas, J.A., Cramm, M., Haag, V., Koch. G., Meyer-Sand, B.R.V., Paredes-Villanueva, K., Price, E., Thornhill, A.H., Van Brusselen, J., Zuidema, P.A., Deklerck, V., Dormontt, E.E., Shapcott, A. & Lowe, A.J., 2022: Tracing the world's timber: the status of scientific verification technologies for species and origin identification. IAWA Journal 44 (1): 63-84. – URL: https://brill.com/view/journals/iawa/44/1/article-p63_4.xml.

Maplesden, F. & Pearson, H., 2021: Forest products conversion factors: Tropical logs and sawnwood. ITTO. – URL: https://www.itto.int/direct/topics/topics_pdf_download/topics_id=6737&no=1&disp=inline.

Mark, J., Newton, A.C., Oldfield, S. & Rivers, M., 2014: The International Timber Trade: A working list of commercial timber tree species. Botanic Gardens Conservation International; 56 pp. – URL: https://www.bgci.org/resources/bgci-tools-and-resources/a-working-list-of-commercial-timber-tree-species/.

Mejía, E., Buitrón, X., Pena-Claros, M. & Grogan, J., 2008: Working Group 1; Case Study 4. Big-leaf mahogany (*Swietenia macrophylla*) in Peru, Bolivia and Brazil. Cancun, Mexico; 36 pp. – URL: https://cites.org/sites/default/files/ndf_material/WG1-CS4-S_1.pdf.

PC17 Doc. 16.1.3: Volumetric Conversion of Standing Trees to Exportable Mahogany Sawn Wood: https://www.cites.org/sites/default/files/eng/com/pc/17/E-PC17-16-01-03.pdf.

PC17 Inf. 3: Conversion Table for Sawn Mahogany (*Swietenia macrophylla*). Methodology for Developing National Volume Conversion Tables (Standing Volume & Export Grade Sawnwood. URL: https://www.cites.org/sites/default/files/common/com/pc/17/E-PC17-Inf-03.pdf.

♦PC18 Doc 14.1: Non-detriment findings. International Expert Workshop on Non-Detriment Findings. Eighteenth meeting of the CITES Plants Committee, Buenos Aires (Argentina), 17-21 March 2009; 23 pp. – URL: https://cites.org/sites/default/files/eng/com/pc/18/E-PC18-14-01.pdf.

PC21 Doc. 15: Interpretation and implementation of the Convention: Trade control and marking: Development of a timber identification directory for CITES-listed species. Twenty-first meeting of the Plants Committee, Veracruz (Mexico), 2-8 May 2014; 14 pp. – URL: https://cites.org/sites/default/files/eng/com/pc/21/E-PC21-15_0.pdf.

PC21 Inf. 4: Non-detriment findings for timber imports from Central Africa: Stepwise approach of collecting documentation on carrying capacity of *Pericopsis* populations. Twenty-first meeting of the Plants Committee, Veracruz (Mexico), 2-8 May 2014; Scientific Authorities of Belgium, Royal Museum for Central Africa, Tervuren; 4 pp. – URL: https://cites.org/sites/default/files/common/com/pc/21/E-PC21-Inf-04.pdf.

PC22 Doc. 9.2 (Rev.1): Strategic matters: Guidance on making non-detriment findings for tree species. Guatemala and Spain. Twenty-second meeting of the CITES Plants Committee, Tbilisi (Georgia), 19-23 October 2015; 16 pp. – URL: https://cites.org/sites/default/files/eng/com/pc/22/E-PC22-09.02%20%28Rev.%29.pdf.

PC22 Inf. 7: Interpretation and implementation of the Convention, Trade controls and marking: Timber Identification. Twenty-second meeting of the CITES Plants Committee, Tbilisi (Georgia), 19-23 October 2015; 10 pp. – URL: https://cites.org/sites/default/files/eng/com/pc/22/Inf/E-PC22-Inf-07.pdf.

Resolution Conf. 9.19 (Rev. CoP15): Registration of nurseries that artificially propagate specimens of Appendix-I plant species for export purposes; 4 pp. – URL: https://cites.org/sites/default/files/documents/COP/19/resolution/E-Res-09-19-R15.pdf.

♦Resolution Conf. 10.3*. Designation and role of the scientific authorities. CoP10, Harare (Zimbabwe), 09-20 June 1997; 3 pp. – URL: https://cites.org/sites/default/files/documents/COP/19/resolution/E-Res-10-03.pdf

Resolution Conf. 10.13 (Rev. CoP18)*: Implementation of the Convention for timber species. CoP10, Harare, 1997; 4 pp. – URL: https://cites.org/sites/default/files/documents/COP/19/resolution/E-Res-10-13-R18.pdf.

Resolution Conf. 11.11 (Rev. CoP18)*: Regulation of trade in plants; 5 pp. – URL: https://cites.org/sites/default/files/documents/COP/19/resolution/E-Res-11-11-R18.pdf.

Resolution Conf. 12.3 (Rev. CoP19): Permits and certificates; 23 pp. – URL: https://cites.org/sites/default/files/documents/E-Res-12-03-R19.pdf.

Resolution Conf. 12.11 (Rev. CoP19): Standard nomenclature; 24 pp. – URL: https://cites.org/sites/default/files/documents/E-Res-12-11-R19_1.pdf.

•Resolution Conf. 13.2 (Rev. CoP14). Sustainable use of biodiversity: Addis Ababa Principles and Guidelines. CoP13, Bangkok (Thailand), 02-14 October 2004; 3 pp. – URL: https://cites.org/sites/default/files/documents/COP/19/resolution/E-Res-13-02-R14.pdf.

Resolution Conf. 14.7 (Rev. CoP15): Management of nationally established export quotas; 3 pp. – URL: https://cites.org/sites/default/files/documents/COP/19/resolution/E-Res-14-07-R15.pdf.

•Resolution Conf. 16.3: CITES Strategic Vision 2008-2020. CoP16, Bangkok (Thailand), 03-14 March 2013; 4 pp. – URL: https://cites.org/sites/default/files/document/E-Res-16-03-R17_0.pdf.

Resolution Conf. 16.7 (Rev. CoP17): Non-detriment findings. – URL: https://cites.org/sites/default/files/documents/COP/19/resolution/E-Res-16-07-R17.pdf.

Resolution Conf. 16.10: Implementation of the Convention for agarwood-producing taxa; 2 pp. – URL: https://cites.org/sites/default/files/documents/COP/19/resolution/E-Res-16-10.pdf.

Resolution Conf. 18.7 (Rev. CoP19): Legal acquisition findings; 16 pp. – URL: https://cites.org/sites/default/files/documents/COP/19/resolution/E-Res-18-07-R19.pdf.

Rivers, M., Newton, A.C., Oldfield, S. & Global Tree Assessment Contributors, 2022: Scientists' warning to humanity on tree extinctions. Plants People Planet.
– URL: https://nph.onlinelibrary.wiley.com/doi/full/10.1002/ppp3.10314.

Rondeux, J., 2021: La mesure des arbres et des peuplements forestiers. Les Presses Agronomiques de Gembloux, A.S.B.L.; 738 pp. – URL: https://orbi.uliege.be/bitstream/2268/262622/1/Rondeux_2021_mesure-des-arbres-et-peupl-for.pdf.

•Rose, M., 2014: Non-detriment Findings in CITES. Guidance paper on behalf of the Austrian Ministry of Agriculture, Forestry, Environment and Water Management. Version 1.2. Vienna; 97 pp. – URL: https://cites.unia.es/cites/file.php/1/files/guide-CITES-NDFs-en.pdf.

•Rosser, A. & Haywood, M. (Eds.), 2002: Guidance for CITES Scientific Authorities: Checklist to assist in making non-detriment findings for Appendix II exports. IUCN Occasional Paper no. 27, ISBN 2-8317-0684-X; IUCN Gland, Switzerland, and Cambridge, UK; 146 pp. – URL: https://portals.iucn.org/library/sites/library/files/documents/SSC-OP-027.pdf.

SC 65 Inf. 21: A preliminary Dalbergia checklist for Madagascar for CITES; 4 pp. – URL: https://cites.org/sites/default/files/eng/com/sc/65/Inf/E-SC65-Inf-21.pdf.

Schippmann, U., 2020: Plant Annotations in the CITES Appendices. Version 3. – URL: https://www.researchgate.net/publication/344402215_Plant_Annotations_in_the_CITES_Appendices_An_Illustrated_Manual_Version_30_CoP_18

Thivolle-Cazat, A., 2008: Conversion factors; A necessity for an accurate estimation of wood consumption by industries. Workshop on Nation Wood Resources Balances presentation; 14 pp. – URL: https://unece.org/fileadmin/DAM/timber/workshops/2008/wood-balance/presentations/04_Thivolle-Cazat.pdf.

UNEP-WCMC, 2009: Non-detriment findings for timber: an analysis of data and criteria currently used within the European Community; SRG 47/4/2/2; A report to the European Commission Directorate General E – Environment ENV.E.2. – Environmental Agreements and Trade; 186 pp.

UNEP-WCMC, 2022: A guide to using the CITES Trade Database: Version 9.0; 21 pp. – URL: https://trade.cites.org/cites_trade_guidelines/en-CITES_Trade_Database_Guide.pdf.

United States Department of Agriculture, CITES I-II-III Timber Species Manual: – URL: https://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/cites.pdf.

UNODC, 2016: Best Practice Guide for Forensic Timber Identification. UN, Vienna. – URL: https://www.unodc.org/documents/Wildlife/Guide_Timber.pdf.

Wiedenhoeft, A.C. & Baas, P. (Eds.), 2011: Wood Science for Promoting Legal Timber Harvest. – IAWA Journal 32(2): 121-297.

Wolf, D., Oldfield, T.E.E., Schippmann, U., McGough, N. & Leamann, D.J., 2016: CITES non-detriment findings: guidance for perennial plants. A nine-step process to support CITES Scientific Authorities making science-based non-detriment findings (NDFs) for species listed in CITES Appendix II. Version 3.0. – BfN-Skripten 440; Bundesamt für Naturschutz, Bonn, Germany; 69 pp. – URL: https://www.bfn.de/publikationen/bfn-schriften/bfn-schriften-440-cites-non-detriment-findings-guidance-perennial.

Working Group 1, 2008: Principles for Non-Detriment Findings (NDF) for TREES. Trees. Final Report. Trees Working Group Guidelines. First Document of the Working Group. WG1-FR. – International Expert Workshop on Non-Detriment Findings, Cancun, Mexico, November 2008; 6 pp. – URL: http://www.conabio.gob.mx/institucion/cooperacion_internacional/TallerNDF/Links-Documentos/WG-CS/WG1-Trees/WG1-FR%20.pdf.

WWF & TRAFFIC, 2009: WWF's Global forest & trade network. Common framework for assessing legality of forestry operations, timber processing and trade; 12 pp. – URL: http://www.traffic.org/forestry-reports/traffic_pub_forestry24.pdf.

Web Links

⬧: Additional web links (not cited in the text)

ATIBT / Association Technique Internationale des Bois Tropical (International Tropical Timber Technical Association): For a legal and certified tropical timber trade. – https://www.atibt.org/en.

Chatham House, Illegal logging portal: https://landportal.org/node/13155

Checklist of CITES species (UNEP WCMC): http://checklist.cites.org/#/en

CITES export quotas: https://cites.org/eng/resources/quotas/index.php

CITES glossary: https://cites.org/eng/resources/terms/glossary.php

⬧CITES ITTO programme: http://www.itto.int/country_activities/

⬧CITES NDF portal: https://cites.org/eng/prog/ndf/index.php

CITES Nursery registrations: http://www.cites.org/common/reg/e_nu.html

Nomenclature specialist of the CITES Plants Committee: https://cites.org/eng/com/pc/member.php

CITES Review of Significant Trade Management System: http://sigtrade.unep-wcmc.org/

CITES Trade Database: https://trade.cites.org/

⬧CITES Tree Species Programme: https://cites.org/eng/prog/flora/trees/trees_project

⬧CITES Virtual College Module on making NDFs: https://cites.unia.es/cites/mod/resource/view.php?id=58

CITESwoodID App: https://www.citeswoodid.app/

CITESwoodID: http://www.delta-intkey.com/citeswood/en/index.htm (Internet version)

Commercial Timbers: Descriptions, Illustrations, Identification, and Information Retrieval http://www.delta-intkey.com/wood/en/index.htm

ECOLEX: https://www.ecolex.org/

EU-TWIX: https://www.eu-twix.org/

⬦FAO's Global Forest Resources Assessments (FRA): http://www.fao.org/forest-resources-assessment/en/

Forest Legality Initiative. Logging and Export Bans webpage: https://forestlegality.org/content/logging-and-export-bans

Germplasm Resources Information Network (GRIN): https://www.ars-grin.gov/

⬦Global Timber Tracking Network: http://www.globaltimbertrackingnetwork.org

⬦International Expert Workshop on CITES Non-Detriment Findings: http://www.conabio.gob.mx/institucion/cooperacion_internacional/TallerNDF/taller_ndf.html

ITTO Annual Review Statistics Database: http://www.itto.int/annual_review_output/

IUCN Red List of Threatened Species: http://www.iucnredlist.org

National Red Lists: http://www.nationalredlist.org/

NatureServe Canada: http://www.natureserve.org/region/canada

NatureServe Explorer (US and Canada): http://www.natureserve.org/explorer/

Plant Resources of Tropical Africa (PROTA): https://prota4u.org/database/

Species+: http://www.speciesplus.net/

The Wood Database: http://www.wood-database.com/

Tropicos: https://tropicos.org/home

WFO Plant List: https://wfoplantlist.org/plant-list

Plants of the World Online: http://apps.kew.org/wcsp/home.do

Appendix: Tools for recording NDFs

Consolidated Worksheets and Draft Report Format

- Excel Worksheets for Download (also reproduced below)
- Decision Tree (online) to store information.

How to use these worksheets

The Worksheets for Steps 1-9 are intended to assist Scientific Authorities to document the basis for a non-detriment finding and the information sources used. Each Worksheet is designed to provide a record of responses to the Key Questions for each of the nine Steps outlined in the companion document CITES Non-detriment Findings for Timber. In the absence of a preferred NDF report format, Scientific Authorities may find the consolidated worksheets helpful as a draft report format for the NDF and related advice to the CITES Management Authority. As stated above, the new Decision Tree format has also been developed.

NDF Application Data

Species name: **(Genus and species, sub-species, as appropriate)**	
species name filled on Info_Page	
Trade name(s) and/or synonyms found on permit application:	
Permit application reference number:	
Completion date of NDF:	
Contact / Author(s) of NDF:	

User note: When filling out the species name in this sheet, this name will be AUTOMATICALLY repeated in the header of all worksheets.

Information Sources Consulted

This table can be used to keep a detailed record of information sources consulted to make the NDF. This record will be helpful in compiling and justifying the NDF (Steps 1-9).

Level of confidence in information source
- High: up-to-date, directly relevant to the species concerned, published and peer-reviewed; reference recognized by CITES
- Medium: somewhat dated, indirectly relevant to the species concerned, unpublished or not peer-reviewed
- Low: out-of-date, less relevant to the species concerned

Citation used in Worksheets for Steps 1-9	Information source (Full reference)	Relevant Steps	Level of confidence in source
[Number, author & date, or alternative preferred format]		[Steps to which this source contributed information]	[high, medium, low]

Non-Detriment Finding (NDF)

species name filled on Info_Page

Step 1: Review specimen identification

Key questions for step 1	Responses and outcome (Refer to Guidance for Step 1)			Information sources used
1.1 Is the Scientific Authority confident, that the timber or timber product concerned has been correctly identified, and that the right scientific name has been used for the timber?	The Scientific Authority is confident about the species identification or has corrected a simple error or out-dated name and taxonomic concerns have been resolved	**yes**	**X** Describe concerns or error(s) resolved below	Go to step 2	
	The species is not correctly identified and/or concerns cannot be resolved by the Scientific Authority or referral to the MA or an expert	**no**	**X** Describe concerns or unresolved error(s) below	Go to Step 9: Decision 9.1	
	Concerns about clear identification :				
	[text]				

Non-Detriment Finding (NDF)

species name filled on Info_Page

Step 2: Review compliance with requirements of artificial propagation

Key questions for step 2	Responses and outcome (Refer to Guidance for Step 2)			Information sources used
2.1 Is the permit application for artificially propagated specimens?	yes	**X**		Go to Key Question 2.2
	no	**X**		Go to Step 3
2.2 Is the export of artificially propagated specimens of this species permitted by national or relevant sub-national legislation?	yes	**X**	Describe relevant legislation below	Go to Key Question 2.3
	no	**X**	Describe relevant legislation below	Go to Step 9: Decision 9.2
Describe relevant legislation: [text]				
2.3 Do timber specimens covered by the export permit application meet all requirements for artificial propagation?	yes	**X**	Requirements are met	Describe requirements met below	Go to Step 9: Decision 9.3
	no	**X**	Requirements are not met	Describe unmet requirements below	Go to Step 3
Requirements met or unmet for artificial propagation: [text]				

Non-Detriment Finding (NDF)

Step 3: Review relevant exclusions and previously-made NDFs

Key questions for Step 3	Responses and outcome (Refer to Guidance for Step 3)		Information sources used
3.1. Are the timber specimens applied for covered by CITES Appendix II?	yes X	Go to Key Question 3.2	
	no X	Describe reason for exclusion of the specimen from CITES Appendix II (e.g. the relevant Annotation)	Go to Step 9: Decision 9.4	
Reason for exclusion of the specimen from CITES Appendix II (and information for the Management Authority that an NDF and CITES export permit are not required) [text]			
3.2. Is the harvest or the export of wild harvested specimens of this species permitted by national or relevant sub-national legislation or regulation?	yes X	Describe legislation or regulation and its relevance below	Go to Key Question 3.3	
	no X	Describe relevant legislation or regulation below	Go to Step 9: Decision 9.5	
Relevant national or relevant sub-national legislation or regulation (including concerns to be referred to the Management Authority or to the responsible authority for enforcement): [text]			
3.3. Has the Scientific Authority previously made a science-based NDF for this species that is still valid and sufficient to evaluate the current export permit application?	yes X	Describe previously-made NDFs below	Go to Step 9: Decision 9.6	
	no X	Record reasons that evidence used for a previous NDF is not valid and sufficient to evaluate the current permit application	Go to Step 4	
Previously made NDF: [text]			

Non-Detriment Finding (NDF)

Step 4: Conservation Concern

Conservation status assessments

Conservation status	International	Regional	National	Threats noted in assessment	Information sources used	Confidence level

Severity of conservation concern relevant to harvest area

Refer to the factor table for step 4 in the Guidance document

High	Med	Low	Unknown	Information sources used

Copy grey section into spreadsheet Step 8.2_Summary

Non-Detriment Finding (NDF)

species name filled on Info_Page

Step 5: Potential Biological Risks

Refer to the factor table for step 5 in the Guidance document

Factor	Risks	High	Med	Low	Unk	Information sources used	Confidence level
Geographic distribution							
National / sub-national population size and distribution							
Size structure of national/sub-naitonal populations							
Habitat specificity and vulnerability							
Resilience of tree species							

You can insert extra lines for each factor if needed.

Summary of potential biological risks:

	Geographic distribution
	National / sub-national population distribution
	Size structure of national/sub-naitonal populations
	Habitat specificity and vulnerability
	Resilience of tree species

Copy grey section into spreadsheet Step 8.2_Summary

Non-Detriment Finding (NDF)

species name filled on Info_Page

Step 6: Harvest Impacts

Refer to the factor table for step 6 in the Guidance document

Factor	Impacts	High	Med	Low	Unk	Information sources used	Confidence level
Impact of harvest on harvest population							
Impact of harvest on national and sub-national populations of target species							
Harvest impact on the ecosystem							

Copy grey section into spreadsheet Step 8.2_Summary

You can insert extra lines for each factor if needed.

Non-Detriment Finding (NDF)

species name filled on Info_Page

Step 7: Trade Impacts

Refer to the factor table for step 7 in the Guidance document

Factor	Impacts	High	Med	Low	Unk	Information sources used	Confidence level
Trade level in relation to harvest area production							
Magnitude and trend of national legal trade							
Magnitude of illegal trade							

Copy grey section into spreadsheet Step 8.2_Summary

You can insert extra lines for each factor if needed.

species name filled on Info_Page

Non-Detriment Finding (NDF)

Step 8.1: Managament measures in place

HARVEST Management measures	Information sources used	Confidence level

TRADE Management measures	Information sources used	Confidence level

Copy grey sections into spreadsheet Step8.2_Summary

Non-Detriment Finding (NDF)

species name filled on Info_Page

●

Step 8.2: Evaluate Effectiveness of Management Measures

Which concerns, risks and impacts have been identified for the species?

Step	Key	Factor	Conservation concerns & biological risks	High	Med	Low	Unkn
Step 4 Conservation concern		Severity of Conservation Concern					
Step 5 Intrinsic biological risk		Geographic distribution					
		National / sub-national population distribution					
		Size structure of national/sub-naitonal populations					
		Habitat specificity and vulnerability					
		Resillience of tree species					

Step	Key	Factor	Harvest impacts & trade impacts	High	Med	Low	Unkn
Step 6 Harvest impact		Impact of harvest on harvest population					
		Impact of harvest on national and sub-national populations of target species					
		Harvest impact on the ecosystem					
Step 7 Trade impact		Trade level in relation to harvest area production					
		Magnitude and trend of national legal trade					
		Magnitude of illegal trade					

Which management measures are in place for the species?

Management measures	not applicable	don't exist or unknown	address this issue	appropriate rigour	effectively implemented

88

Non-Detriment Finding (NDF)

Step 9: Non-Detriment Finding and Related Advice

Possible decisions of the NDF process based on this Guidance are listed in this worksheet. Each export permit application should have just one of the following outcomes/decisions. The Worksheet, together with more detailed information in the relevant Worksheets for previous steps, may be useful as a summary report of the NDF results and related advice to the CITES Management Authority.

Outcome of NDF Process	NDF Results and Related Advice
9.1. The outcome of Step 1 is: *The Scientific Authority is not confident that the specimen concerned has been correctly identified, and that the scientific name used is compliant with the appropriate CITES Standard Reference.*	x Negative Decision, NDF is not possible (supported by this Guidance) x Other: e.g., Negative Decision pending referral to the Management Authority or to a timber expert **Justification for the advice of Scientific Authority:** *[Summary, or refer to Worksheet 1, Key Question 1.1]*
9.2. The outcome of Step 2, Key Question 2.2 is: *Export of artificially propagated specimens of this species is not permitted by national or relevant sub-national legislation*	x Negative decision (deny export permit) (supported by this Guidance) **Justification for advice of Scientific Authority:** *[Summary, or refer to Worksheet 2, Key Question 2.2]*
9.3. The outcome of Step 2, Key Question 2.3 is: *Specimens covered by the export permit application clearly meet all CITES-requirements for artificial propagation*	x Positive decision (approve export permit) (supported by this Guidance) x Other: **Justification for advice of Scientific Authority:** *[Summary, or refer to Worksheet 2, Key Question 2.3]*
9.4. The outcome of Step 3, Key Question 3.1 is: *The specimens are not covered by CITES Appendix II*	x CITES Export permit not required (supported by this Guidance) x Other: **Justification for advice of Scientific Authority:** *[Summary, or refer to Worksheet 3, Key Question 3.1]*

Outcome of NDF Process	NDF Results and Related Advice
9.5. The outcome of Step 3, Key Question 3.2 is: *Harvest or export of this wild-harvested specimens of this species is not permitted by national or relevant sub-national legislation or regulation*	x Negative decision (deny export permit) (supported by this Guidance) x Other: e.g., Negative NDF pending referral to the Management Authority to investigate **Justification for advice of Scientific Authority:** *[Summary, or refer to Worksheet 3, Key Question 3.2]*
9.6. The outcome of Step 3, Key Question 3.3 is: *Evidence used for a previous NDF is still valid and sufficient to evaluate the current export permit application*	x Negative NDF, proposed export is not within the parameters defined by the previous NDF x Positive NDF, proposed export is within the parameters defined by the previous NDF x Other: **Justification for advice of Scientific Authority:** *[Summary, or refer to Worksheet 3, Key Question 3.3]*
9.7. Step 8, Key Question 8.2 is: Do existing management measures adequately mitigate harvest and trade impacts identified for the populations and sub-populations of the target species affected by the proposed trade?	x Negative NDF if the evidence indicates "No or Uncertain" x Positive NDF if the evidence indicates "Yes" or "Yes, with specific conditions" x Other: e.g., Negative NDF pending additional information required to evaluate harvest impacts or trade impacts or management **Justification for advice of Scientific Authority:** *[Summary, or refer to Worksheet 8, Key Question 8.2]* **Specific management procedures, precautions, other actions that need to be undertaken to ensure the survival of the species:** *(Please list any such recommended actions below)*