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

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CITES AT 40: PERSPECTIVES, TRADE PATTERNS AND FUTURE PROSPECTS

The attached document has been submitted by the Secretariat at the request of the UNEP World Conservation Monitoring Centre (UNEP-WCMC)[*] in relation to item 21 on *Capacity building*.

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CITES at 40:
Perspectives, trade patterns and future prospects

Compiled by

United Nations Environment Programme
World Conservation Monitoring Centre

With
contributions from guest authors

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ABOUT UNEP-WORLD CONSERVATION MONITORING CENTRE

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CITATION

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Forty years of CITES: summary of findings

In 1973, the Convention on International trade in Endangered Species of Wild Fauna and Flora (CITES) was agreed between founding States to ensure that international trade in specimens of wild animals and plants does not threaten their survival. Forty years on, this aim continues to be the central focus of CITES. This report brings together perspectives and lessons learned from a variety of CITES experts and partners to assess various aspects from forty years of CITES. These contributions are combined with key findings from an assessment of the trade data compiled in the CITES Trade Database over the lifetime of the Convention. It is hoped that the findings will enable the CITES community to improve its understanding of the global context of international wildlife trade, strengthen the capacity of national authorities to implement the Convention, and support progress towards the Aichi Biodiversity Targets.

Perspectives: Inputs from guest authors highlight areas where CITES has helped to regulate wildlife trade and support conservation. The first contributed article, by the Secretary General of CITES, considers how developments in information technology could contribute to the future of the Convention. Other articles go on to cover the value of the unique trade data holdings; the use of risk assessments in assessing taxa for inclusion in the Appendices; the added value of partnerships between CITES and other organisations, particularly for improving enforcement and tackling large-scale problems such as timber trade and marine fisheries; developments in the making of non-detriment findings; and the use of new forensic techniques in enforcement.

Trade patterns: To assess trade patterns over time, the report brings together highlights from two separate reports on analyses of trade in Appendix I and II species. These show that during the lifetime of the Convention, reported trade has grown substantially, with some 900 thousand transactions for trade in CITES-listed species being processed annually. Approximately 80% of Parties have reported trade in recent years in over 14,000 taxa. However, the source of both Appendix I and Appendix II animals and plants in trade has changed over time from mainly wild collected specimens during the early years of the Convention to a high proportion of captive-bred or artificially propagated specimens in recent years. Many of these captive-bred or artificially propagated specimens are produced outside range States, particularly for Appendix I species. The analysis also described some notable changes in trade patterns of particular taxa, with evidence of trade switching between countries and also between similar taxa within a country. In general, the quality of reporting by CITES Parties has improved notably over time, with Parties reporting more complete data in recent years, although improvements are needed in terms of timeliness of submission.

The analysis of trade data has also revealed some individual compliance issues. Infractions concerning commercial trade in wild-taken Appendix I species were reported, notably for mammal and reptile taxa. For mammals, this occurred in every year from 1990-2010. Apparent contraventions of CITES trade suspensions were also noted for Appendix II species, in addition to non-compliance with voluntary export moratoria. CoP-approved quotas for Appendix I species were, however, generally complied with in recent years and overall compliance was good.

A preliminary assessment of the value of trade in key commodities of CITES-listed species indicates that the value is substantial, but more work is needed to develop a full understanding of the economic values of CITES trade throughout the value chain.

Conclusions

The Convention has clearly made much progress since its entry into force in 1975, with success stories for many species and improved capacity in many Parties. But, looking ahead, there is still much to achieve to address the current poaching crisis and to ensure that CITES meets its

overarching objective. To ensure that international trade in specimens of wild animals and plants does not threaten their survival – the CITES community should continue to work together to find ways to address the following challenges:

- In the short term, improving the science-base and increasing capacity for trade data analysis to support robust non-detriment findings remain a key challenge.
- For species which appear to meet the CITES listing criteria and would seem to benefit from CITES oversight, then early CITES intervention is needed.
- For CITES trade data to deliver most value in terms of supporting key processes, improvements in annual report submission rates and data quality are needed, as well as use of information technology to facilitate real-time reporting.
- For compliance issues, improvements in information management systems and development of electronic permitting could help with detection of infractions and adoption of appropriate action.
- To demonstrate CITES contributions towards the Aichi Targets regular assessments will be needed, including of trends in trade from the CITES Trade Database.

The evolution of CITES processes and the development of collaborative approaches outlined by the guest contributions in this report give cause for optimism that the Convention is well placed to address these challenges in the years to come.

I. Introduction

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between 177 States[1] that aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. This report is designed to provide an overview of progress made, patterns detected and future prospects for the Convention. It consists of three parts: 1) perspectives on featured topics of interest to CITES Parties contributed by invited guest authors; 2) an overview of trends in global trade over time; and 3) lessons learned to inform future implementation.

The featured articles cover a range of topics. First, the Secretary General outlines how new information and communication technologies can help to ensure that trade in wildlife is legal, sustainable and traceable. The next two articles explore the value and uses of CITES trade data and the use of risk assessment in considering whether trade regulation is appropriate for certain fish species. Other guest articles cover some of the collaborative partnerships that have been a recent feature of the work of CITES. These include the work of CITES and the World Customs Organization; the work of CITES and the International Tropical Timber Organisation and the work of CITES and the Fisheries Department of the UN Food and Agriculture Organization. The final two guest articles cover the making of non-detriment findings, and the use of new forensic techniques.

The second part of the report focuses on an analysis of the CITES trade data and presents notable global and regional patterns in trade, as well as highlighting key findings from two separate analyses of trade in Appendices I and II, respectively. CITES is virtually unique amongst the multilateral biodiversity conventions in its extensive data holdings and compilation of primary data. The CITES Trade Database, managed for the CITES Secretariat by UNEP-WCMC, currently contains over 13 million trade records representing reported trade in CITES-listed species for almost 40 years. These data provide the basis for monitoring the implementation of the Convention and support key decision making. Analysis of trade data can also highlight any areas of potential concern and the need for increased capacity building.

The report has been compiled by UNEP-WCMC, with contributions from a number of invited experts from organisations working in the diverse field of wildlife trade. It presents a broad snapshot of CITES trade and implementation over the first 40 years of the Convention, and provides some key summary messages to inform future trade management. Ensuring effective implementation of CITES can support legal and sustainable trade, providing benefits for both livelihoods and the environment.

[1] Includes the Maldives, for which CITES will enter into force on 12/03/2013.

II. Perspectives from guest authors

Introduction

CITES has seen many changes and developments though its long history. In this chapter, guest authors reflect on issues that are central to the development and functioning of the Convention. In the first article, the Secretary General of CITES highlights the importance of embracing new information and technologies to ensure that CITES moves with the times.

CITES and new information and communication technologies to ensure legal, sustainable and traceable trade in wildlife

John E. Scanlon, CITES Secretary-General

CITES regulates international trade in close to 35,000 species of plants and animals[2], both terrestrial and marine, including flagship species such as tigers, elephants, polar bears, the great white shark, rhinos and mountain gorillas. Trade in CITES species is diverse, ranging from reptile leather to medicinal plants, and it operates at various scales, from large commercial enterprises to small-scale traders. At the 16th meeting of the Conference of the Parties (CoP16) to be held in Bangkok, Thailand, from 3 to 14 March 2013, Parties will consider the inclusion, up-listing or down-listing of several significant species such sharks, rays, vicunas, crocodiles and timber.

CITES has been described as an action-oriented convention that provides clear rules to ensure that international trade in CITES-listed species is legal, sustainable and traceable. It marries law and science in the pursuit of sustainability. The proposals to list species under CITES are based on agreed biological and trade criteria, the importance of which has been further reinforced at Rio+20 where heads of governments recognized CITES as: "…an international agreement that stands at the intersection between trade, the environment and development…We further stress the importance of basing the listing of species on agreed criteria."[3]

CITES prohibits international trade for commercial purposes for only about 900 or 3% of listed species - species that are already threatened with extinction. For the other listed species, approximately 34,000, trade is regulated to be sure that species are not threatened by trade. Regulation also includes making a non-detriment scientific finding prior to authorizing any trade under CITES.

Non-detrimental findings are considered by many to be at the heart of the Convention, and one of the reasons CITES is often referred to as a science-based Convention. A key element ensuring the effective application of non-detriment findings is the collection of and access to reliable trade data on wildlife for insights on trade patterns, spikes, and possible outliers.

CITES has put in place a universally recognized system of permits and certificates to conduct trade. These trade documents are compiled every year per Article VIII, paragraph 7(a) of the Convention[4] and submitted to the Secretariat or UNEP-WCMC as annual reports for inclusion in the CITES Trade Database[5], which is arguably the world's most extensive global database on the sustainable use of biodiversity.

[2] Details can be found at: http://www.cites.org/eng/resources/species.html
[3] *The Future We Want* (A/CONF.216/L.1).
[4] http://www.cites.org/eng/disc/text.php#VIII
[5] http://www.unep-wcmc-apps.org/citestrade/trade.cfm

At the time of writing, the CITES Trade Database contains over 13,000,000 trade records. This is the primary data used to help develop indicators to assist with efforts aimed at ensuring that international trade in wildlife is sustainable. It can also contribute to efforts related to the achievement of the Strategic Plan for Biodiversity 2011-2020 and the relevant Aichi Biodiversity Targets[6].

Currently, many Parties to CITES are using new information and communication technologies (ICTs) to develop CITES electronic permitting systems. If permits are electronic, permit and certificate data can be registered with the CITES trade database immediately on issuance and receipt (rather than one or more years later) creating an up-to-the-minute monitoring resource and possible indicator.

This real-time reporting of trade would provide radical improvements in monitoring levels of trade – including for the CITES Review of Significant Trade, and offer CITES Scientific Authorities with access to up-to-the-minute data when making non-detriment findings on exports and imports of CITES-listed species. It would also provide enforcement and Customs Authorities with a valuable resource in efforts to track and trace species in trade and detect smuggling and other related offences against wildlife.

Efforts by Parties to develop CITES e-permitting systems received a boost when standards on the development of CITES e-permits as published in the CITES e-permitting toolkit were included in the recently released World Customs Organization (WCO) data model, version 3.3. This collaboration between the CITES Secretariat and the WCO is a first for a multilateral environmental agreement and it will facilitate the development of e-permitting systems and Single Window environments. A new version of the CITES E-permitting toolkit[7] fully mapped to the WCO Data Model was launched in February 2013.

Parallel to the development of e-permitting systems, the CITES Secretariat and UNEP-WCMC are developing jointly a CITES species portal for the provision of key species information, development of country and region specific CITES checklists, and harmonization of nomenclature among different biodiversity-related conventions.

The first tool available through the species portal is a database-driven CITES Checklist where data can be downloaded in various formats, and "pulled" into national checklist systems. The electronic CITES Checklist will also be linked with various other CITES data resources, including the CITES Trade Database, CITES Wiki-identification manual, and the CITES Dashboards. A beta version of the database-driven CITES Checklist will be demonstrated at CoP16.

Finally, the CITES Secretariat is aware that new skills and capacities are needed for CITES Authorities to make effective use of developments in ICTs. In this regard, the CITES Secretariat launched the Virtual College[8] to assist Management, Scientific and Enforcement Authorities to gain knowledge on the Convention, share expertise through the development of communities of practice, and access resources for train the trainers activities.

The first web-based course launched through the College provided the CITES community with in-depth information on non-detriment findings. Tailor made courses for Customs and enforcement officials are also available. Currently, the Secretariat is designing a course on development of CITES e-permitting systems, which should be completed in late summer or fall 2013.

[6] http://www.cites.org/eng/news/SG/2011/20110909_SG_IISD_art.php
[7] http://www.cites.org/eng/prog/e/e-permitting-toolkit.php
[8] https://eva.unia.es/cites/

In conclusion, the advent of new ICTs is benefitting efforts to ensure trade in specimens of CITES-listed species that is legal, sustainable and traceable. These efforts can secure the livelihoods of local and indigenous communities whose survival is often dependent on biodiversity. Use of new ICTs also provides new means to deliver services related to the enhancement of capacities that are cost-effective and available 24 hours a day, 7 days a week.

As CITES celebrates its 40th anniversary, the need for an effective global instrument that regulates wildlife trade is recognized more than ever. Using new ICTs, CITES is able to cope with a number of challenges generated by a globalized economy and a human population of 7 billion and growing. The creative use of new ICTs enables CITES to better achieve its objectives at both the national and global levels.

Thematic assessments

This section presents two thematic studies, one concentrating on plants and the other on aquatic species. First, in "CITES Trade Database – Uses and Abuses by a Botanist", we are provided with a botanist's perspective illustrating the multiple and varied uses of CITES trade data for plants, from detecting unsustainable trade and identifying implementation problems, to targeting of enforcement efforts and guiding the design of national and regional priorities for capacity building.

Second, "Trawling the Appendices – will CITES net the right fish?" shines a spotlight on CITES and commercially-exploited aquatic species. Significant commercial fishery species such as Queen Conch, European eels and Sturgeon have been brought under CITES management, often at a point where pre-existing management arrangements were failing. Commercially exploited aquatic species (predominantly fish) are notably under-represented in the Appendices, and whilst proposals to list such species are receiving increased attention, they have varied in success. This contribution explores the question of whether the Convention is effectively serving the management needs of internationally traded aquatic species, and whether a more systematic risk based approach can identify appropriate taxa for listing to ensure that conservation and sustainable use are achieved.

CITES Trade Database – Uses and Abuses by a Botanist

Noel McGough, UK Scientific Authority (Flora)

The CITES Trade Database is a unique and invaluable resource for regulation, management and review of international trade in plants and animals. Analysis of the data can reveal potential non-sustainable trade, possible illegal trade or indicate that a CITES listing is flawed because Parties cannot interpret and apply it with consistency on a day-to-day basis. Analysis of the trade data can also reveal if a listing is redundant, that international trade has, quite simply, moved on to other species or is in parts and derivatives not covered by the current listing.

Article IV is the core of the Convention- the non-detriment finding – whereby Parties seek to ensure that trade is sustainable. The first indicator that trade may be edging towards non sustainability may be seen in subtle changes in the trade data. The Review of Significant Trade uses the trade data to help identify such situations. The core data from the CITES permits that populates the trade database is species and country based but the global reach and depth of data can help us put together patterns of trade on a regional and international basis and allow us to detect changes in trade in discrete groups of plants – such as succulents from Madagascar or medicinal plants from Himalayan range States.

As a CITES Scientific Authority the trade database helps you place your trade in an international context. As such it can help you plan research, target enforcement training,

review effectiveness of listings covering native species and connect with countries that have similar patterns of trade and most likely, similar problems in implementing listings.

I have worked with data from this source for some 25 years and over that time the data has become more and more accessible and more accurate. One of the most frustrating issues in the late 1980's was that plants were not on the priority list for many Parties. Permitting and reporting was often done at generic or even family level and as a result the data was pretty much useless for any form of effective trade analysis. Thankfully, that situation is now much improved and poor reporting on plants by a Party is often an indicator of wider problems in CITES implementation.

I have been very lucky to work in a large scientific institution with access to experts on a wide range of the CITES plant families. One of my most productive tasks, over the years, has been to supply these experts with extracts of the trade data on "their" plant groups for review. This has produced a mine of information on potential detrimental trade, claims of artificial propagation that were highly unlikely and "species" names that were improbable, if not impossible. Innumerable issues would come to the surface when the scientists had an opportunity to review the data. Often they had to be persuaded, cajoled, minded and gently reminded to address the data, as the task stole valuable time from their research. But once tempted, they quickly became addicted. One of the most intriguing finds was the discovery of "black holes" in the trade data and one of the most entertaining was their horror at some of the names used by the trade. The black holes occurred, for example, in the case of cacti, orchids and succulents where an expert would be aware of a significant trade in wild plants which was completely missing in the trade data. This might occur in the case of medicinal plants, where a formally structured horticultural trade in wild and propagated plants was well represented in the trade data but a traditional trade in roots and stems for medicine which crossed borders in large volumes occurred outside the formal CITES structure and therefore was not reported.

Regular review of regional and international trade data by national experts can be an important tool in calibrating the CITES mechanism at national level. The inclusion of enforcement experts can also be a revelation with their knowledge of trade, trade routes and the darker corners of the Customs tariff code system. Trade changes constantly and it is difficult for CITES Authorities to evolve processes and target their limited resources to ensure effective implementation. National structures often may not respond to the listing of new species that fall outside the traditionally regulated plant groups. Using the trade data to provide a regional analysis and then testing this in a small workshop with local experts, trade representatives, CITES Authorities and enforcement officials can be a very fruitful exercise. Doing this on a regional basis can increase the value of the interaction between a wide range of stakeholders. All trade starts locally, but very seldom are local stakeholders allowed access to the full international scope of plant trade.

CITES plant trade is changing, the early listings concentrated on the large horticultural groups, more recently Parties have expanded listings to cover more trees in trade for their timber and a range of medicinal and pharmaceutical listings where the trade is in complex derivatives. Appendix-II listings are annotated to define which plant parts are controlled. In the past the process of selecting an appropriate annotation to the plants parts traded was pretty much neglected. Parties did not really consider the impact of different types of annotations and, in effect, annotations were selected as an afterthought. This had little effect in the case of horticultural trade where the standard annotation adequately covered the plants in trade. This all changed when the Convention sought to regulate trade in commercially important timbers and medicinals; the choice of the appropriate annotation made the difference between an expensive and unnecessary licensing burden on Management Authorities and a targeted regulation of the primary material in trade from the wild.

The CITES Plants Committee and Standing Committee are currently grappling with the Sisyphean task of standardizing annotations. The trade database is an important tool in identifying problems with annotations and can also supply the information required to help craft annotations that limit regulation to the primary material in trade. CoP16 will consider a number of proposals and working documents concerned with effective regulation of derivatives of agarwood producing trees and shrubs. These include a proposed new annotation and a suggested derogation for household effects. The first stage in the review of these proposals is to check the trade database to assess what derivatives Parties are reporting in trade. How do the proposals match the reported trade?

Capacity building for implementation and enforcement of the Convention can also be guided by the trade data. All Parties have limited resources and this is intensified in the mega-diverse countries. The trade data will tell you what taxa are in trade, the parts and derivatives in trade and the patterns in trade. Training material, identification material and development of novel tests and enforcement initiatives can be targeted using this data. In addition, given that trade data can be a little dated and incomplete where there has been a recent rapid change in trade demand, this data can be supplemented by internet surveys. A trade review can help target implementation and enforcement initiatives, taking what at first glance seems an impossible task and distilling it to a series of discrete objectives. The data can also tell you what countries should be your partners in training initiatives.

The trade database can often indicate where Parties are having problems with implementation of plant listings and indicate possible problem annotations or indeed "problem" listings. Parties may be reporting on products that are not covered by the annotated listing, on species which have been delisted, on cultivars and hybrids that are exempted. Parties may also use plant names that have challenged the database or that are clearly unlikely to reflect the real entity in trade, or that drive nomenclature experts to distraction! Plants which are highly likely to be wild are declared as artificially propagated and plants which are highly likely to be propagated are declared as wild. These are all indicators of Parties struggling to apply the controls in a practical fashion. This is very often because we do not give the Parties simple practical guidance on how to apply the detail of complex Resolutions - guidance that matches local conditions.

There is ongoing pressure to reduce the reporting load of Parties, given their commitments over a range of MEAs and their restricted resources. Within CITES there are calls to reduce the load in reporting in any detail on artificially propagated plants in trade. This would be a great pity, this data is vital identifying taxa that should be delisted from the Appendices and taxa that are likely to be wild collected and declared as artificially propagated. In addition, there is the issue of making non-detriment findings on mother stock of new species entering into cultivation for international trade. This is an issue the Parties have yet to address but where the trade data could help identify some real issues with detrimental trade.

The CITES trade database is a goldmine. However, we the Parties have not utilized it to its full potential. In comparison to the extent of the resource, its value and the global legacy that it represents, there are far too few "users", especially in the case of the plant data. To date, the wider scientific botanical research community has made very limited use of the data, other than on a very occasional basis, nor do many know of its existence. It is not mined or valued as a core research facility.

The Mexican CITES Authorities, in 2008, revitalized the Parties approach to the challenge of making non-detriment findings through organizing the Cancun workshop which brought together over 100 experts from 33 countries. It provided the independent scientific critical mass that was needed to refresh the process and added real scientific vigour. The results of this process continue to build better NDF's at country level. We need a Cancun process that

highlights the CITES trade database as a unique resource, as an interactive library of 40 years of wildlife trade experience and explore its future through case studies, critical analysis and by exploiting research opportunities. *"CITES at 40 – Perspectives, trade patterns and future prospects"*[9] is a true flagship for such a process. I look forward to the Parties taking up the challenge to work with UNEP-WCMC to exploit the full potential of this resource which is the legacy of all those who have worked to help the Convention grow and evolve to meet the challenges of regulating the international trade in wild plants and animals. It's our resource – let's use it.

Trawling the Appendices – will CITES net the right fish?

Using risk assessment to identify potential candidates for listing commercially exploited aquatic organisms in the CITES Appendices

Vin. Fleming[1], Glenn Sant[2], Thomasina Oldfield[2], Alison Littlewood[1]
[1]UK Scientific Authority (Fauna) and [2]TRAFFIC International

Background

Is CITES listing those species of fish for which it is most likely to make a genuine difference to the sustainability of trade and exploitation? Proposals to include commercially exploited aquatic organisms (subsequently 'fish[10]') in the CITES Appendices (Figure 21, p. 35) have increasingly polarised opinions. Typically, those opposed to listings cite the primacy of fisheries management rather than trade regulation as the means to achieve sustainability of harvests and note the burdens associated with implementing a listing; conversely, advocates see regulation of trade and associated non-detriment findings as a beneficial complement, not an alternative, to fisheries management. There seems to be little middle ground.

Inevitably, therefore, any listing proposals for commercially exploited fish species are subject to intense scrutiny with respect to whether regulation of trade by CITES is likely to benefit the species or, conversely, to act as an impediment to fisheries management. Views even differ as to how the criteria (Resolution Conf. 9.24) for inclusion in the Appendices should be applied to fish (Box 1), despite there being a footnote specifically to explain how decline in commercially exploited fish should be interpreted.

Box 1: Recent listing proposals for marine species

The FAO Export Advisory Panel produced assessments for 22 taxa relating to proposals to amend the CITES appendices concerning commercially-exploited aquatic species submitted to CoPs 13, 14, and 15. At CoP 13, recommendations were formulated by the FAO Expert Panel to support the proposed Appendix II listing of *Cheilinus undulatus* and oppose that for *Lithophaga lithophaga*; these proposals were both accepted by the Parties. At CoP14, two FAO-supported proposals were accepted by the CoP, and the proposals relating to five taxa that did not receive FAO panel support were withdrawn or rejected, with only one proposal being accepted contrary to the FAO recommendation. However, CoP15 saw the rejection of all six proposals relating to commercially-exploited aquatic species, even though four were supported by the FAO Panel.

But, whilst the merits of individual cases are examined, the one question which is rarely asked is whether the species proposed for listing are the ones, globally, which might benefit the most

[9] Including the accompanying analyses of trade in Appendix I and II (Secretariat, 2012, UNEP-WCMC, 2013).
[10] 'Fish' is used here to refer to fish and invertebrate species harvested commercially in marine waters and/or large freshwater bodies. This definition excludes aquatic amphibians, reptiles, birds, mammals and plants.

from regulation of international trade by CITES? In other words, are these species the priorities for listing or are other candidates (which have not been proposed) potentially more deserving?

That the issue deserves attention is beyond doubt. Fish are vital to the food security of a growing human population. Over-exploitation of fish species has been identified as the dominant direct driver of biodiversity loss in the marine environment (Millennium Ecosystem Assessment 2005) and many fish stocks are subject to harvest levels that exceed sustainable levels. One of the drivers for such harvests is international trade: in 2008 39% of total global fish production (liveweight) entered international trade and world exports reached a record value of $ 102 billion USD (FAO 2010).

Yet of the 1600 or so taxa for which FAO has records of catch data, is it possible to stand back from the intense and detailed debates at CITES and develop a process to objectively select potential priority candidates for which trade regulation might be desirable? This was the goal of a study commissioned by the UK Scientific Authority (Fauna) from TRAFFIC (Sant *et al.*, 2012).

Risk assessment

The study sought to use risk assessment techniques to try and select those species of greatest likelihood of over-exploitation and thus most likely to benefit from management measures. Risks to commercially exploited aquatic fish and invertebrates were initially assessed under three broad headings (the three 'Vs derived from FAO 2000), namely:

- vulnerability (ecological risk);
- value (economic risk, related to the profitability of exploitation); and
- 'violability' (compliance risk, namely the risk that management rules might be violated).

From 1600 fish taxa known to be harvested, 505 known to be in trade or migratory (the study aimed to consider in parallel the role of the Convention of Migratory Species (CMS)) were selected, scored against a range of criteria for their vulnerability and value, and ranked (Sant *et al.*, 2012). Of these, a sub-set of 109 species were then assessed for compliance risk, a task that proved to be challenging when done at global rather than at stock level. Ultimately, a set of 54 species emerged in a high risk group, a high proportion (43%) of which were already listed by CITES or CMS; this set also contained a number of species which have been considered as proposals by the CITES Conference of the Parties but several which had not. Sharks were heavily represented in the high risk group comprising 17 of the 54 species (31%).

However, as a first iteration of this approach, the study encountered some difficulties applying the method and also produced both 'false positives' and 'false negatives' in the final analysis. Accordingly, the study was subject to peer review by expert workshop in September 2011 (Fleming *et al.* 2012; Sant *et al.* Submitted) in order to improve the method and define next steps. Outcomes from that review included recommending ways to identify better indicators to assess the intrinsic vulnerability of taxa; recognising that value does not warrant being considered as a stand-alone risk factor but is better treated as a component of violability; and that such compliance risk was more difficult to assess because, unlike vulnerability of species, it can vary over time and space between different governance regimes.

Subsequently, an assessment of the intrinsic vulnerability of a smaller taxonomic sub-set of species, namely sharks (Oldfield et al., 2012) has been undertaken as one of the recommended steps from the peer review. The UK Management Authority plan to support further analysis of this same group during 2013 to assess the risk of their exposure to fisheries and from which a sub-set of those shark species at highest risk can be identified.

The approach being taken broadly parallels the productivity-susceptibility analyses used in fisheries management (e.g. Hobday *et al.*, 2007; Patrick *et al.*, 2010) but which have not been used before in a context such as this nor at a global scale. Identifying high risk species from such a risk-assessment approach does not necessarily mean they should be listed in the CITES Appendices, nor even that they meet the CITES listing criteria, but it is likely that they will be candidates for some form of management intervention to reduce the risks of over-exploitation to them. CITES is one multi-lateral tool that is available to Parties and fisheries managers to consider.

CITES Achievements

The achievements of CITES over the past 40 years have been many and varied. The Convention has shown flexibility in adapting to changing circumstances and emerging threats. It is widely recognised as being one of the most important legal instruments for conserving biodiversity, and here we briefly focus on some of its key accomplishments. These achievements relate to the transfer of species from Appendix I to II, the forging of successful partnerships in relation to Customs, forestry and fisheries, and the ongoing development of key CITES processes such as the Review of Significant Trade, the non-detriment finding process and on-the-ground enforcement.

Species successes

One potential metric for success is the transfer of species from Appendix I to Appendix II. There have been 184 proposals to transfer taxa from Appendix I to Appendix II submitted to the Conference of the Parties (CoP). A number of these result from improvements in species conservation status. Success rates of proposals have varied, with 82 (45%) accepted. These included 34 proposals to transfer mammal populations, 20 for plants and 19 for reptiles (Figure 1). In total, fifty-seven taxa were transferred from Appendix I to II by the first fifteen meetings of the CoP, a number of which demonstrate that tight controls on international trade combined with national or regional management can be effective in improving species conservation status.

Successful transfer proposals have included populations of *Vicugna vicugna (*Vicuña), *Loxodonta africana* (African Elephant) and several species of Crocodylia amongst others. Further details of the 57 taxa transferred are available

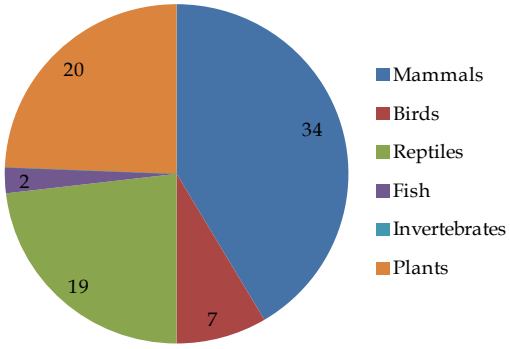


Figure 1. Number of successful proposals to transfer taxa from Appendix I to Appendix II, by taxonomic group.

in an analysis of Appendix I trade conducted by UNEP-WCMC (UNEP-WCMC, 2013). Such transfers (which relax trade controls) can enable local communities to benefit from economic incentives from trade to encourage use that is sustainable.

The 40th anniversary brochure produced by the CITES Secretariat for CoP16 highlights many other examples of species success.

Collaborative partnerships

Working with partners has been vital in expanding the effectiveness of the Convention, and CITES currently has in place memoranda of understanding (MoUs) with three other multi-lateral environmental agreements and six intergovernmental organisations, as well as individual governments, NGOs, universities and research centres.

Broad collaboration has been a feature of many recent CITES programmes (e.g. making non-detriment findings with the International Tropical Timber Organisation (ITTO) and the UN Food and Agricultural Organisation (FAO)). Under its enforcement support role, the Secretariat collaborates with a broad range of law enforcement agencies and organisations around the world, including INTERPOL, the World Customs Organisation (WCO), the World Bank, the UN Office on Drugs and Crime, the ASEAN Wildlife Enforcement Network, the International Consortium on Combating Wildlife Crime (ICCWC) and CITES Enforcement Task Forces, to address illegal trade issues and to ensure that laws governing trade in CITES species are enforced effectively.

At the Party level, Management Authorities work with Police, Customs and Border Agencies and many Scientific Authorities gain input from national museums and national research institutes, but other academic institutions and NGOs also have much to offer. The threat of invasive species and emerging diseases also requires close collaboration with Phytosanitary, Animal Health and environment officials, as well as with traders associations. In short, CITES work must be fully mainstreamed through government and civil society organisations.

Significant achievements have been made by harnessing specific expertise through working in partnership, and the collaborative efforts between CITES and the WCO, ITTO and the FAO are highlighted here as examples of such cooperation.

CITES and Customs

Gareth Lewis, World Customs Organisation

Background

Customs is responsible for implementing a wide range of government policies in border security, revenue collection, trade compliance, trade facilitation, interdiction of prohibited substances, protection of cultural heritage and enforcement of intellectual property rights. Customs administrations have powers that exist nowhere else in government including the authority to inspect goods shipped into, within and out of a country; to refuse entry or exit and to allow entry.

The WCO is the global voice of Customs. It has 179 members covering 98 percent of global trade and was established as an international convention in 1952. The main mission of the WCO is to ensure the harmonization and standardization of Customs procedures and the development of Customs technique in order to facilitate and secure international trade. The WCO provides a means for governments to compare policy experiences, seek answers to common problems, identify good practices and standards, and coordinate Customs policies. The WCO has extensive cooperation with other international organizations in both the government and private sectors.

Partnership between the WCO and CITES

The two organizations signed a Memorandum of Understanding in July 1996 in recognition of the vital role that Customs law has in the fight to maintain Earth's natural heritage, in particular the means Customs can adopt to combat illicit trade in endangered species. The memorandum specifies a number of practical ways that WCO and CITES can work jointly such as information exchange, awareness raising with each other's respective audiences and attendance at appropriate meetings. In this latter aspect, the CITES Secretariat has been very active in the ongoing development of the WCO Data Model through attendance at technical meetings, and all CITES e-permit requirements have been incorporated into the recent version of the data model. In March 2011, the CITES Secretary General (Mr. John E. Scanlon) opened the WCO Enforcement Committee meeting and reinforced the message of shared objectives and a common purpose in addressing the many challenges involved in combating illicit trade

in endangered species. Mr. Scanlon is to deliver a keynote address the WCO IT Conference in Dubai in May 2013, which is themed around the Coordinated Border Management concept and the enabling role of information technology.

Emerging Challenges in the Fight Against Illicit Trade

One of the biggest threats remains the illegal trade in ivory from sub-Saharan Africa where the size and scale of operations strongly indicates the presence of organized crime. Another well-known threat is the trade in rhinoceros horn for medicament purposes also from Africa, and also seemingly within the ambit of organized criminals. An emergent threat is the trade in African pangolin scales – also for alleged medicinal purposes and, more recently, the illegal logging and trade of timber from endangered species of trees.

There is evidence of some online activity in this respect, but it is not yet fully assessed despite some related seizures via the post and express courier cargo.

Success Stories/Lessons Learned

The collaboration of WCO and CITES with respect to the merger of our information needs mentioned above is a real success story, and promises to herald closer cooperation around the globe as more countries embrace single window systems[11] for which the WCO Data Model is uniquely suited. The real lesson learned is that working together in an open and cooperative environment both at international level and within our Member countries will lead to the best possible outcome.

Emergent Technologies including Single Window

The data model (incorporating CITES e-permit requirements) and single window systems have been mentioned already. Coupled with single windows is the notion of integrated risk assessment where entities of high risk (parties, locations, means of transport, specific goods and so on) within the profiles of any agency are made known more broadly to all relevant agencies. Whilst remaining mindful of data protection and privacy issues, an integrated risk system lessens the likelihood of high risk consignments or other things escaping the attention of border regulators.

Summary

As the principal custodians at the border, Custom administrations are best placed to continue to fight against illicit international trade in partnership with CITES Management Authorities and national law enforcers. Both the WCO and CITES Secretariat have a shared commitment and an acute awareness of the importance of the ongoing fight to combat that trade. CITES considerations are foremost in the development of the WCO Data Model and thus, for single window systems as they are implemented nationally. This is a partnership that must prove successful in the interests of our living environment.

Collaboration for sustainable trade in tropical timber and related forest products

Steven Johnson[1] and Milena Schmidt[2]
[1]International Tropical Timber Organisation and [2]CITES Secretariat

In 2006, the Secretariats of the International Tropical Timber Organization (ITTO) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

[11] A single window is a cross-border, 'intelligent' facility that allows Parties involved in trade and transport to lodge standardized information, mainly electronic, with a single point of entry to fulfil all import, export, and transit-related regulatory requirements.

entered into a partnership to ensure that international trade in CITES-listed tropical tree species is consistent with their sustainable management and conservation. This partnership, made possible through EU-led multi-donor grants to ITTO, has now been operational for more than five years with a second phase of the programme commencing in 2012.

ITTO was established in 1986 under the International Tropical Timber Agreement with a mandate to promote sustainable development through trade, conservation and best-practice management of tropical forests. CITES entered into force in 1975 and it is designed to ensure that international trade in specimens of wild animals and plants that are covered by the Convention is legal, sustainable and traceable.

The ITTO-CITES programme is the first collaborative effort to provide support for implementing CITES for tropical tree species at the national level. The programme's main objectives are to assist countries to:

- improve management and regulation of trade in products from tropical tree species (primarily timber but other products like bark, resins and oils are also covered);
- improve forest management to ensure species survival and sustainable incomes for local communities and others involved in timber and related products trade;
- increase regional and international cooperation in research, silviculture and CITES compliance; and
- integrate knowledge on sustainable forest management and species conservation measures to provide a coherent policy framework.

CITES has differing degrees of regulation for the species listed in its three Appendices, based on a system of permits and certificates. Species listed in Appendix I are threatened with extinction and international commercial trade in wild-taken specimens of such species is generally prohibited. Species listed in Appendix II are not threatened with extinction, and international commercial trade can occur under certain conditions (i.e. a finding of legal acquisition and, a finding that the trade will not be detrimental to the survival of the populations of the species in the wild). The latter, known as an NDF finding, is a way of ensuring that the trade in such species is sustainable.

Table 1 shows the tropical tree species listed in CITES Appendices I and II as of early 2013. The ITTO-CITES programme focuses on the tropical tree species currently listed in CITES Appendix II whose products are most traded internationally. These were initially the timber species *Pericopsis elata* (afromosia or assamela) in Africa, *Gonystylus* spp. (ramin) in Asia, and *Swietenia macrophylla* (bigleaf mahogany) in Latin America. Under the second phase of the program currently underway work has expanded to cover *Dalbergia* and *Diospyros* spp. (rosewood and ebony respectively) from Madagascar, *Aquilaria* and *Gyrinops* spp. (agarwood-producing species) from South East Asia and, *Prunus africana* (African cherry or pygeum) an African species primarily used for its bark which has medicinal uses . The programme has also undertaken a few activities regarding other species such us *Cedrela odorata* (the American cedar or cedro, also from Latin America but widely planted globally) listed in CITES Appendix III (which requires only a certificate of origin from the exporting country) and, has assisted countries with data collection and assessment required for proposing species for listing (including some species to be considered for Appendix II listing at the CITES CoP16 (Bangkok, March, 2013). Table 2 shows the programme activities being implemented as of early 2013.

Details of these and more than 30 completed activities carried out under the first phase of the programme can be found on the programme website (www.itto.int/cites_programme/). Additional activities were being assessed in early 2013 by the ITTO and the CITES Secretariats, with several new activities expected to begin implementation before mid-year.

In addition to the country-level and regional activities listed in Table 2, another issue being tackled under the programme is information sharing and closer cooperation between relevant agencies that are responsible for implementing and enforcing CITES legislation. Several national and regional workshops have been held to share experiences and strengthen communications among authorities and interested stakeholders (including the private sector). Most recently an international meeting with nearly 100 programme stakeholders was convened in Bali, Indonesia in January 2013 to share experiences gained to date and make recommendations for future work. The CITES Secretariat is producing a video on the outputs of the programme to date which is expected to be launched at CITES COP 16.

Table 1. Tropical tree species in CITES Appendices I and II

Appendix	Species	Distribution
I	*Abies guatamelensis*	El Salvador, Guatemala, Honduras, Mexico
	Balmea stormiae	El Salvador, Guatemala, Honduras, Mexico
	Chrysalidocarpus decipiens	Madagascar
	Dalbergia nigra	Brazil
II	*Aniba rosaedora*	Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, Venezuela
	Aquilaria spp.	*covering many species in Asia
	Becarriophoenix madagascariensis	Madagascar
	Bulnesia sarmientoi	Argentina, Bolivia, Paraguay
	Caesalpinia echinata	Brazil
	Caryocar costaricense	Colombia, Costa Rica, Panama, Venezuela
	Chrysalidocarpus decipiens	Madagascar
	Gonystylus spp.	*covering 31 species, mainly found in Indonesia and Malaysia
	Gyrinops spp.	*covering 10 species in Asia
	Lemurophoenix halleuxii	Madagascar
	Marojejya darianii	Madagascar
	Neodypsis decaryi	Madagascar
	Oreomunnea pterocarpa	Costa Rica
	Pericopsis elata	Cameroon, Congo, Democratic Republic of Congo
	Platymiscium pleiostachum	Costa Rica, El Salvador, Honduras, Nicaragua
	Prunus africana	Angola, Burundi, Cameroon, Democratic Republic of Congo, Equatorial Guinea, Ethiopia, Kenya, Madagascar, Rwanda, Sao Tome and Principe, South Africa, Sudan, Swaziland, Uganda, United Republic of Tanzania, Zambia, Zimbabwe
	Pterocarpus santalinus	India
	Ravenea louvelii	Madagascar
	Ravenia rivularis	Madagascar
	Satranala decussilvae	Madagascar
	Swietenia humilis	Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama
	Swietenia macrophylla	Belize, Bolivia, Brazil, Colombia, Costa Rica, Dominica, Ecuador, El Salvador, French Guiana, Guadeloupe, Guatemala, Guyana, Honduras, Martinique, Mexico, Montserrat, Nicaragua, Panama, Peru, Saint Lucia, Saint Vincent and the Grenadines, Venezuela
II (cont.)	*Swietenia mahagoni*	Anguilla, Antigua and Barbuda, Bahamas, Barbados, Cayman Islands, Colombia, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Jamaica, Martinique, Montserrat, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, Turks and Caicos Islands, United States, Venezuela
	Taxus chinesis	China, India, Malaysia, Viet Nam
	Taxus wallichiana	Afghanistan, Bhutan, China, India, Malaysia, Myanmar, Nepal, Pakistan, Viet Nam
	Voanioala gerardii	Madagascar

Table 2. ITTO-CITES programme activities

Region	Currently implemented activities
Africa	• Monitoring system for logging and processing of Assamela and training on the use of CITES tools and procedures in Cameroon • Raising awareness of CITES and its implementing texts in the Republic of Congo • Non-detriment findings for *Prunus africana* (Hook.f.) Kalman in North and South Kivu, Democratic Republic of Congo • Data collection and analysis for the preparation of Appendix II listing proposals for Madagascar's precious woods • Improving intra-African trade and market transparency in timber and timber products
Asia	• The assessment of ramin plantation requirement and the establishment of ramin genetic resources conservation gardens in Indonesia • Use of DNA for identification of *Gonystylus* species and timber geographical origin in Sarawak, Malaysia • *In vitro* propagation of *Gonystylus bancanus* (ramin) in Sarawak, Malaysia
Latin America	• Big-leaf mahogany (*Swietenia macrophylla*) in the Brazilian Amazon: long-term Studies of population dynamics and regeneration ecology • Ecology and silviculture of mahogany (*Swietenia macrophylla* King) in the western Brazilian Amazon • Assessment of regeneration of natural big-leaf mahogany and cedar populations in Peru
Global	• Preparation of publication on identification, technological characteristics and uses of 273 tropical timber species

Accurate and reliable NDFs are essential to ensure sustainability of trade in species in CITES Appendix II. However, many countries face problems in carrying out NDFs for CITES-listed tropical timber species. As a result, many programme activities focus on strengthening capacity and collecting and analyzing information required for NDFs. This programme also co-sponsored the first International Expert Workshop on CITES Non-Detriment Findings, held in Mexico in 2008, to discuss the methodologies, tools, information and expertise needed to formulate NDFs for all CITES taxonomic groups, with a special working group on tree species. Key results of the programme to date in this area include, *inter alia*:

- Peru strengthened its capacity to make NDFs for trade in bigleaf mahogany, and provided relevant information to the Plants Committee at its 17th meeting, causing the Committee to determine that it was not necessary to include the country in the Review of Significant Trade for this species (The Review of Significant Trade is one of the CITES mechanisms that include corrective actions and sometimes ends in a suspension of trade in that particular species of the country concerned);
- Cameroon strengthened its capacity to make NDFs for afromosia and thereafter provided a report on the management plan that it was implementing for this species to the 19th meeting of the Plants Committee, causing the Committee to determine that it was not necessary to include the country in a Review of Significant Trade for this species;
- Cameroon established a voluntary zero export quota for the African cherry tree in 2009, after the CITES Standing Committee's review of Cameroon's implementation of the recommendations made by the Plants Committee under the Review of Significant Trade in this species. Under the ITTO-CITES programme, Cameroon has since then established a scientifically-sound NDF that allowed it to reopen a management area for producing dry bark of this species in a sustainable manner. Since lifting its voluntary zero export quota, Cameroon has been able to re-open other production areas in the country by undertaking inventories and implementing management plans funded by the programme;

- Exports of dry bark of the African cherry tree from the Democratic Republic of the Congo (DRC) were temporarily suspended by the Standing Committee in 2009 as a result of its failure to implement recommendations made by the Plants Committee under the Review of Significant Trade in this species. At the most recent meeting of the Standing Committee in mid-2012, DRC provided information which demonstrated that support under the ITTO-CITES Program had enabled it to strengthen its capacity to make NDFs for this species. The Standing Committee agreed to withdraw its recommendation to suspend trade with DRC in this species provided that future exports were managed under an annual export quota. The country has now established a preliminary quota and has recommenced the sustainable harvest of and trade of this species; and
- Both Malaysia and Indonesia continue to make progress in ensuring the conservation, management and sustainable use of ramin species and have been able to set annual harvest and export quotas for these species in accordance with the provisions of Article IV of the Convention.

The joint ITTO-CITES programme has successfully raised awareness of CITES implementation for tropical tree species among CITES Management Authorities and Scientific Authorities in both exporting and importing countries. It has increased cooperation and involvement of the private sector with these authorities and has attracted significant interest and participation from a wide range of other stakeholders. Both ITTO and CITES strongly support the continued operation of this important programme to ensure that trade in tropical timber and related forest products is not detrimental to the survival of the species that they are derived from.

CITES and commercially-exploited aquatic species: a perspective from FAO

Johanne Fischer, Food and Agriculture Organization

The CITES Appendices currently include over 100 aquatic species of fish and molluscs (as well as more than 1,000 corals). As the recognized UN organization with competence for fisheries, FAO was requested by its Members to collaborate with CITES on questions related to the listing of commercially-exploited aquatic species as well as to assist developing countries with the implementation of CITES regulations. For this purpose and after years of actual collaboration, a Memorandum of Understanding between FAO and CITES was signed in 2006[12].

In the context of this collaboration, FAO has contributed to the 2004 revision of the CITES criteria for listing species on Appendices I and II by advising on appropriate scientific criteria for commercially-exploited aquatic species. The scientific assessment of marine resources is an integral part of fisheries management; it uses quantitative as well as qualitative and other methods to deal with data-poor fisheries and increasingly incorporates the precautionary approach. Since 2004, FAO convenes the "*Expert Advisory Panel for the Assessment of Proposals to Amend Appendices I and II of CITES Concerning Commercially-exploited Aquatic Species*" a few months in advance of each CITES Conference of the Parties. The Panel is composed of experts on the proposed species, fisheries and trade as well as fish stock assessment scientists. It provides information and advice to CITES Parties on the biological status of fishery species proposed for a CITES listing as well as on relevant fisheries management and international trade of these species.

In addition to the above mentioned activities FAO has also given input to CITES on the interpretation and application of the so-called "Introduction from the Sea" (concerning the

[12] http://www.cites.org/eng/disc/sec/FAO-CITES-e.pdf

import of aquatic organisms from the high seas) and has been playing an active role in promoting capacity building of Member Countries on issues related to fishery species listed in one of the CITES Appendices such as sharks, queen conch, sea cucumbers, humphead wrasse and seahorses.

At present, there are a few (10) elasmobranch (shark) species listed under CITES Appendix I or II and a number of additional shark species have been proposed for listing in recent years. This reflects the international concern for the status of many vulnerable sharks which also gave rise to the 1999 FAO "*International Plan of Action for the Conservation and Management of Sharks (IPOA Sharks*). Among the numerous shark-related activities by FAO, the following two are highlighted here as they relate to CITES, i.e. the 2008 *Technical Workshop on the Status, Limitations and Opportunities for Improving the Monitoring of Shark Fisheries and Trade* and the 2010 *FAO/CITES Workshop to Review the Application and Effectiveness of International Regulatory Measures for the Conservation and Sustainable Use of Elasmobranchs*.

The above mentioned 2010 FAO/CITES workshop found that the most effective way for conservation of vulnerable commercially-exploited aquatic species consists in proper regional and national fishery management systems and that for fishery species, the regulation of international trade by CITES can be considered a complementary instrument to fisheries management. Thus, under the right circumstances international trade measures – provided they are properly implemented – can play a valuable supportive role in helping to ensure sustainable fisheries and provide incentives for the creation or enhancement of fisheries management measures for the species concerned.

It should be kept in mind that international trade often may not be the main driving force for the unsustainable exploitation of many vulnerable fishery species. The priority of FAO must be to ensure that aquatic resources can be used in a rational and sustainable manner to help address the problem of supplying an ever-growing human population on a sustainable basis with high-quality food from the oceans and inland water bodies. To accomplish this goal FAO has initiated and promoted the 1995 Code of Conduct for responsible Fisheries as well as advanced and supported the "Ecosystem Approach to Fisheries" (EAF) as a management framework for aquatic resources which takes into account a broad range of local and regional environmental, biological and socio-economic conditions.

The collaboration of FAO with CITES is providing opportunities for national fishery managers and those responsible for CITES to exchange views on matters of common interest with the benefit of furthering the mutual understanding, coordination and adequate presentation of information in the two different fora.

CITES and FAO share the same overarching objective of ensuring the long-term sustainability of biological resources. In fact, it is a given that the conservation of natural resources is required for their continuous exploitation and it is as well widely accepted that conservation efforts are likely to fail if they are not supported by stakeholders and the general public. Thus, the sustainable use of biological resources can contribute to fighting hunger and poverty in the world - as FAO is set up to do – while also ensuring the long-term conservation of biological resources.

Evolution of key CITES processes

Although some CITES processes have been in place for many years, the Convention recognises the need to review and, where appropriate, to revise implementation approaches. Support for making non-detriment findings has been developed through the Review of Significant Trade

(RST) in specimens of Appendix–II listed taxa. The RST has recently been evaluated and found to make an important contribution to ensure that trade is managed at sustainable levels[13].

The non-detriment finding process (NDF), now almost 40 years old, is widely regarded as one of the key foundations of the Convention, yet guidance for this process is still being developed. However, significant advances are being made, as outlined in the contribution by TRAFFIC on this topic below.

Developments in forensic science have also been invaluable in assisting the CITES enforcement community. This is most pressing for the current rhino and elephant poaching crisis, and forensics will be discussed as part of a set of combined approaches at CoP16 within this context[14]. The use of DNA analysis and other techniques for application to CITES enforcement are considered in the contribution from the TRACE Network that follows.

The CITES non-detriment finding process

Paola Mosig[1], Adrian Reuter[1] and Thomasina Oldfield[2]
[1]TRAFFIC North America-Mexico, [2]TRAFFIC International.

Ensuring international trade of wild species is within sustainable levels is at the core of CITES. According to Articles III and IV of the Convention, Parties shall allow trade in specimens of species included in Appendices I and II only if the Scientific Authority (SA) of the State of export has advised that such export will **not be detrimental** to the survival of that species, and it should ensure it is conserved at a level consistent with its role in the ecosystems in which it occurs. These "Non-Detriment Findings" (NDFs) are a key element to the effectiveness of the Convention. Making well informed, science-based decisions about whether trade in a species is detrimental or not is key to preventing over-exploitation through international trade. The process can and should be an essential part of adaptive management of the harvest of species, whether through setting of quotas or other mechanisms, and is therefore central to the successful implementation of CITES.

Although making NDFs has been a requirement of the Convention since its inception, there is no agreed method of how they should be made, only that they should be based on the scientific review of available information on the population status, distribution, population trend, harvest and other biological and ecological factors, as appropriate, and trade information relating to the species concerned. How this is done is up to the Scientific Authorities of each Party. However the process remains unclear to many Parties; CITES SAs are continually challenged to develop these NDFs and define what information and parameters are most relevant to formulate them and decide upon them.

Numerous efforts and resources to help SAs with this challenging endeavour have been dedicated by CITES Parties, as well as the Secretariat, intergovernmental and nongovernmental organizations (IGOs and NGOs). The CoP has also recommended Parties make use of CBD's Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity when undertaking NDFs, and has urged them to use the best available scientific evidence as their basis (through Res. Conf. 14.2 and CITES Strategic Vision 2008 -2013).

Significant advances have been made thus far; both general and taxon-specific guidelines have been developed through – or based on the results of - national, regional and international workshops, among others. The most significant achievements - and development of tools - on guiding SAs on the process of formulating comprehensive NDFs at this point have been:

[13] AC26/PC20 Doc. 7 Annex 5 Evaluation of the Review of Significant Trade: Case Studies.
[14] Rhinos: CoP16 Doc. 54.2 (Rev. 1); elephants: CoP16 Doc. 53.2.1

- the development and publication of "IUCN's Guidance for CITES Scientific Authorities: Checklist to assist in making non-detriment findings for Appendix II exports"[15] (Rosser and Haywood, 2002); and
- the results of the "International Expert Workshop on CITES Non-Detriment Findings" (Cancun, Mexico, 17-22 November 2008[16]).

IUCN's publication, which is based on the results of two workshops organized by its Species Survival Commission and supported by the CITES Secretariat, Parties and other organizations, is a tool that includes a detailed checklist for undertaking NDFs.

The main goal of the Cancun Workshop was to provide guidance to SAs relating to the processes, methodologies and information needed to formulate NDFs by building on existing work. Experts from all six CITES regions attended, including CITES authorities, and key staff from academic, scientific institutions and conservation organizations. Taxon specific aspects of NDF formulation were analysed, taking case studies on current or potential approaches to making NDFs and how these could be undertaken in a more practical and effective way. Results included general guidelines (principles and criteria) that summarize the different approaches and paths followed by SAs along the NDF decision-making process; and taxon-based guidelines (principles and criteria) for developing NDFs for taxa commonly found in trade. Since then Parties have been encouraged to provide feedback on the applicability of these products. A draft resolution on NDFs (see CoP16 Doc. 33) has been submitted by the Plants and Animals Committees for consideration of the CoP at its 16th meeting recommending some general definitions and non-binding guiding principles based on the Cancun workshop outcomes. In particular it recommends that NDFs be based on resource assessment methodologies and lists some of the elements that may be considered, and highlights sources of information that could be considered by SAs for making NDFs. SAs are also encouraged to use the taxon-based guidelines that resulted from the nine working groups at the Cancun workshop, and other available guidance.

Besides these two major steps for improving NDF formulation, other efforts predominantly at a regional level have related to different taxa including timber species, marine invertebrates, large mammals and ornamental and medicinal plants (see CoP16 Doc. 33). Workshops gathering experts or focused on capacity building on conducting NDFs have taken place in a variety of countries including China, the Dominican Republic, Canada, Indonesia, Kuwait, Mexico, Nepal, Peru and Viet Nam. Additional materials and tools have also been developed, such as national and regional experts directories to support SAs, and user friendly guides for developing NDFs (e.g., an electronic guide directed to Central American and Caribbean SAs developed by TRAFFIC, and a Nine Step Process for Making NDFs for Perennial Plants developed by TRAFFIC, supported by BfN and WWF-Germany, which is currently under review). Furthermore, a number of species have been used to test available guidelines, some with excellent results and others where important lessons have been learnt (see AC25 Inf. 2).

The bottom line.

Despite significant advances on the guidance on formulation of NDFs, there remains a key limitation - lack of necessary information. Many exporting countries lack the resources to conduct field based research and to establish long-term monitoring programs for the CITES species they harvest and export. Monitoring programmes may not even make economic sense when compared with the value of the trade. So while more tools and training are certainly needed, the realities of the limitations within exporting countries have to be borne in mind. The question of long-term financing and capacity for implementing the Convention in at least

[15] http://data.iucn.org/themes/ssc/our_work/wildlife_trade/citescop13/CITES/guidance.htm#guide
[16] http://www.conabio.gob.mx/institucion/cooperacion_internacional/TallerNDF/taller_ndf.html

some range States remains unresolved, but will ultimately be vital to ensuring "that international trade in specimens of wild animals and plants does not threaten their survival".

DNA Testing as a CITES Enforcement Tool

Rob Ogden, TRACE Network

Enforcement of wildlife trade legislation is essential for compliance with CITES. At a national level, CITES signatories need to effectively control the import and export of all forms of wildlife; internationally it is necessary to detect and investigate illegal trade routes. Wildlife law enforcement is often hampered by an inability to robustly identify animal and plant parts and products in trade. Unlike human victim crime, where the emphasis is usually on the identification of the criminal, investigations of CITES infringements often rely on the ability to prove that an offence has taken place. This typically requires the identification of the traded wildlife products to answer one of four investigative questions: What species is it?; Did it come from this individual?; Was it really captive bred?; Where did it come from? The use of scientific analytical techniques to answer these questions and help enforce CITES has been gradually increasing over the past twenty years. A wide range of methods can be employed, but the most common form of laboratory based identification is DNA analysis. This section provides a brief overview of how DNA testing works, examples of how it can be applied and where to go for further information.

The ability to recover, analyse and identify DNA from biological material linked to a crime has revolutionised law enforcement. The most common application of DNA testing in CITES enforcement is **species identification**. This relies on the analysis of gene sequences that vary among species but are typically the same within a species. By generating a DNA sequence from an unknown sample and comparing it with a reference data base, the species of origin can usually be determined. One example of this approach is the system known as DNA barcoding. Where wildlife samples have been heavily processed, or multiple species have been mixed (e.g. Traditional Medicines), it may not be possible to generate a DNA sequence for comparison. In such instances alternative methods such as DNA 'SNP' markers may be used, but these usually require prior knowledge of what the species is likely to be.

Matching a DNA sample to an individual plant or animal uses DNA profiling, which is essentially the same approach to that used in human DNA forensics. Demonstrating that a sample actually came from a specific individual also requires a reference database for the species; in contrast, excluding a sample from a possible source does not. This means that while exclusion is possible for many species, individual identification is limited to those species where validated background data are available.

Verifying captive breeding claims may also be possible using DNA analysis, by conducting parentage testing between animals and their apparent parents. As with individual identification, parentage testing relies on DNA profiling, but where the claimed parents are available for analysis, the investigation relies on exclusion of parent-offspring relationships and is therefore simpler to perform.

The most challenging application of DNA testing to CITES enforcement is **geographic origin identification**. This may be required to prove that an offence has occurred or to provide intelligence regarding trade routes, and is becoming a common request from enforcement agencies. Geographic origin identification relies on assigning the DNA profile of a sample to its most likely genetic population of origin. This requires a comprehensive data set of DNA profiles from possible source populations and a DNA method for differentiating populations of interest, for example different islands or continental regions. This approach will not work for captive populations where genetic signals of population origin are often mixed. The availability of geographic origin DNA testing is currently very limited.

Forensics or Research?

Where the results of scientific analysis are being directly used as evidence to prosecute a CITES offence, then the identification process must be conducted according to **forensic science standards**. Wildlife DNA forensics is an applied discipline and fundamentally differs from DNA analysis undertaken in a research laboratory. While the same basic techniques of DNA sequencing and DNA profiling may be common to forensics and research, the processes involved in establishing and implementing tests are quite different. It is essential that forensic evidence is handled and analysed correctly. The Society for Wildlife Forensics Sciences has recently published Standards and Guidelines that describe how wildlife DNA forensics should be conducted[17]. Where DNA results are not used as evidence, for example where data is required to provide intelligence on trade routes, forensic standards are less important, meaning that there is wider scope for using novel technologies and research. However it is important to identify from the beginning how the DNA results will be used, before selecting a laboratory and method.

Elephant ivory

The use of DNA testing to identify elephant ivory is quite well-established. Extracting DNA from ivory is possible following special laboratory protocols. Species identification is available as a forensic test. Geographic origin identification is available as an intelligence tool, with the greatest geographic resolution available for African elephants following extensive research and development of origin assignment tools (Wasser *et al.,* 2004). Geographic assignment in Asian elephant is also possible to some extent. Individual and parentage exclusion tests can also be performed, however they are not typically requested in ivory smuggling investigations.

Rhinoceros horn

As with elephant ivory, it is possible to obtain DNA from rhinoceros horn and identify its species of origin for forensic application. Species identification itself provides a level of geographic origin identification in rhinoceros. Research has also been conducted into matching horn samples to individual poached rhinoceros and a database for collating individual DNA profiles, RHODIS™, has been developed in South Africa. The potential exists to develop a common, forensically validated DNA method, for use in rhinoceros CITES enforcement globally. This would enable horn seized anywhere in the world to be linked back to a poached animal, stolen museum specimen, hunting trophy or stockpile. Development of such a system is ongoing.

Accessing DNA testing for CITES enforcement

Many countries have established national research facilities for performing DNA tests on wildlife samples; however relatively few have forensic laboratories for providing evidence to support wildlife crime prosecutions. The U.S. Fisheries and Wildlife Service offer a free forensic DNA testing service to support CITES enforcement in any country. Countries are also starting to build their own capacity in this area and a number of regional initiatives are underway to support and coordinate these efforts. Information and advice on DNA testing for CITES enforcement is available from various sources, including TRACE Wildlife Forensics Network (www.tracenetwork.org) and the Society for Wildlife Forensics Sciences (www.wildlifeforensicscience.org). CITES MAs with general or specific enquiries relating to possible testing are encouraged to contact such organisations.

[17] www.wildlifeforensicscience.org/swgwild/

III. Trade data analysis snapshots

Introduction

CITES trade data provide the basis for monitoring the implementation of the Convention and support key decision making. They are used to inform many fundamental CITES processes such as the making of non-detriment findings, the Review of Significant Trade process, establishment of quotas and trade restrictions, assessment of compliance, and reviews of the appropriateness of species listed in the Appendices. Analysis of trade data can also highlight any areas of potential concern and the need for increased capacity building. Ensuring effective implementation of CITES can support legal and sustainable trade, providing benefits for both livelihoods and the environment.

The CITES Trade Database, managed for the CITES Secretariat by UNEP-WCMC, currently contains over 13 million trade records representing all reported trade in CITES-listed species over the lifetime of the Convention. A summary of major features of trade in CITES species drawn from an analysis of thirty five years of trade data is provided herein.

The following sections provide an overarching summary of global and regional trends as well as highlighting major features of trade in CITES species by Appendix. For the latter, the key findings of two more detailed studies which analyze Appendix I trade[18] and trade in Appendix II for selected terms and taxonomic groups[19] are summarized. Areas highlighted include improvements in reporting; the use of reservations; the changing source of specimens in trade and the expansion in captive breeding outside of range States. The final section provides a snapshot of compliance issues which indicates that compliance with CoP-approved quotas and suspensions has generally been good.

Data included The data used for these analyses comprised the primary data provided by Parties in their annual reports to CITES as recorded in the CITES Trade Database. Data were downloaded from the CITES Trade Database[20] on 16 November 2012 for the overview of global and regional trade data, and for Appendix-specific analyses on 29 February 2011 (Appendix II species) and 31 August 2012 (Appendix I species). Any annual reports not included in the database at these times were not included in the analysis. For detailed methodologies relating to the analysis of Appendix I and II trade, see the respective reports.

[18] UNEP-WCMC, 2013. *CITES Trade – A global analysis of trade in Appendix I-listed species.* UNEP-WCMC, Cambridge. www.unep-wcmc.org/species-publications_691.html

[19] Secretariat, 2012. CITES Trade: recent trends in international trade in Appendix II-listed species (1996-2010). Prepared by UNEP-WCMC, Cambridge. Funded by the European Commission.

[20] CITES Trade Database, www.unep-wcmc.org/citestrade/trade.cfm

Global trade trends throughout 35 years of trade monitoring

Over time, the annual number of recorded trade transactions has increased partly reflecting an increasing number of Parties, peaking at just under 900,000 transactions per annum in 2008 (Figures 2 and 3 below).

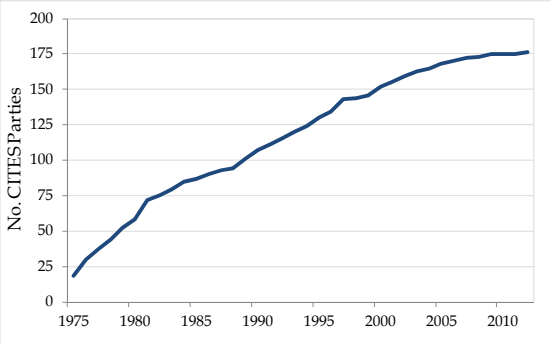


Figure 2. Number of CITES Parties over time, 1975-2012.

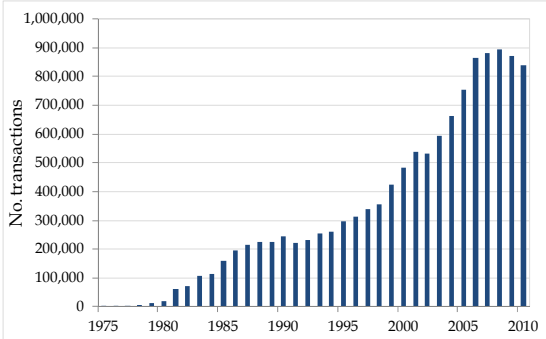


Figure 3. Number of trade transactions (combining import and export report trade), 1975-2010 (Trade data for 2011-12 not yet complete).

Live animals

Growth in the trade in live CITES-listed animals is also evident, with reported exports increasing gradually over the lifetime of the Convention to a peak of over 7 million p.a. in 2003, and averaged 3-5 million p.a. in recent years (Figure 4). During the 1980's and 1990's, the majority of reported trade in live animals was in live birds and reptiles. But, the trade in live birds has declined since 2003 when over 1.37 million live birds were exported, to less than 100,000 birds exported annually from 2006 onwards. This follows a European Union ban on the import of live wild birds in 2005 for reasons of biosecurity. In recent years, trade in invertebrates and reptiles has dominated the trade. Overall, live reptiles were the animal group traded most prolifically by volume.

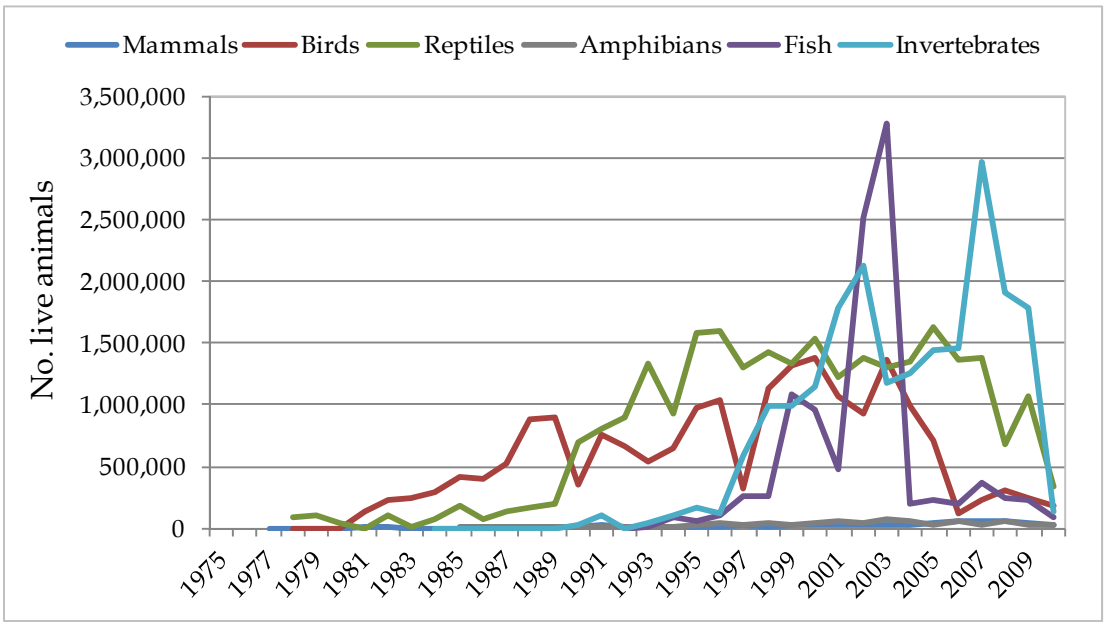


Figure 4. Direct trade in live, wild-sourced and captive produced specimens of CITES-listed animals 1975-2010 by taxonomic group. All trade was reported by exporters and was recorded for commercial purposes. [Low levels of trade in 2010 may reflect missing annual reports from key trading partners at the time of analysis.]

Live plants

The numbers of live plants in trade far outstrips the numbers of live animals in trade, with exports of Appendix II species, for instance, averaging around 60 million plants p.a. in recent years (1996-2010). The majority of these (77%) concerned artificially propagated live specimens, with wild plants comprising 22% of overall exports. Exports of live Appendix II plants peaked at 120 million live specimens in 2006 .

Trade by source

Although captive breeding and artificial propagation production methods are increasingly important for CITES trade, individuals of many taxa are still harvested from the wild. Trade has been reported in wild individuals of 377 and 3,744 taxa listed in Appendix I and II, respectively. For Appendix II, trade in plants, birds and invertebrates comprised the widest variety of taxa (Figure 5).

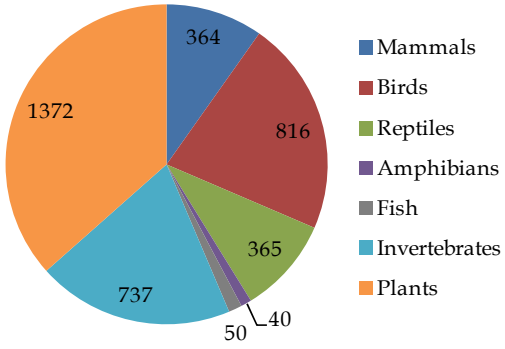


Figure 5. Number of Appendix II taxa exported as wild caught, 2006-2010 (reported by exporters).

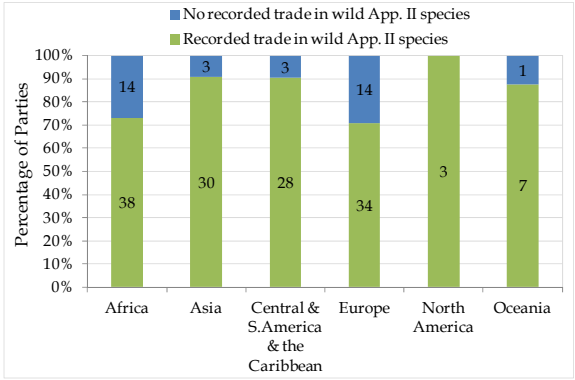


Figure 6. Percentage of Parties within each CITES region trading in wild Appendix II species 2006-2010. Number of Parties indicated.

The majority of Parties (141 or 81%) have reported exports in the period 2006-2010. This included over 70% of Parties from each CITES Region (Figure 6), with Asia, South America and the Caribbean and North America exporting wild taxa from ≥90% of Parties.

Managing trade in species of concern to the international community

Several species included in Appendix II are currently classified by the IUCN at the global level as Critically Endangered (CR) or Endangered (EN) at the global level. To understand how CITES manages trade in such species, provisions were examined for these species where annual trade levels have averaged over 50 live individuals per year in the period 1996-2010 (Table 3).

Of the 20 live animals which met this criterion, the CoP transferred two species to Appendix I, 15 species had been subject to the Review of Significant Trade process for one or more range States and *Acipenser gueldenstaedtii* had been subject to a Secretariat recommendation not to accept imports from shared stocks unless a quota had been published in accordance with Resolution Conf. 12.7 (Rev. CoP14). For the amphibian species, seven Critically Endangered (CR) or Endangered (EN) *Mantella* species were exported as live wild individuals from Madagascar, 1996-2010. A review of trade in *Mantella* spp. was undertaken in 2008 under the CITES Review of Significant Trade (RST). The Animals Committee put in place recommendations for management of the four species where trade was considered to be of Possible Concern: *M. crocea*, *M. expectata*, *M. milotympanum* and *M. viridis*. The CITES

Animals Committee has continued to monitor trade in *Mantella* spp.; *M. aurantiaca* was re-instated into the RST with further recommendations formulated in 2012.

For only two species of the 20 species highlighted in Table 3 (both fish), *Cheilinus undulatus* (Humphead wrasse) and *Anguilla anguilla* (European eel), recent trade had been reported and the species had not been subject to some form of CITES measures (e.g. RST). However, *C. undulatus* has been the subject of a workshop on CITES implementation held in Indonesia in 2010, and for *A. anguilla,* members of the European Union have issued zero export quotas in recent years.

No plant species met the high volume criterion for live wild trade; however, exports of CR or EN species for which trade was reported at the genus level could not be assessed.

Table 3. Management action for animal taxa of conservation concern (CR and EN only) showing high volume of commercial trade (purpose T) in live individuals (defined as 750 individuals reported in trade 1996-2010).

	Taxon	Current App.	Common name	IUCN Red List	Quantity 1996-2010	Reported by	Included within RST?	Trade 2006-2010?
Reptiles	*Batagur borneoensis**	II	Three-striped Batagur	CR	15403	Exporter	✓	x
	Orlitia borneensis	II	Malaysian Giant Turtle	EN	15266	Exporter	✓	x
	Heosemys annandalii	II	Yellow headed Temple Turtle	EN	13228	Exporter	✓	x
	Heosemys spinosa	II	Sunburst Turtle	EN	12633	Exporter	✓	✓
	Indotestudo elongata	II	Yellow-headed Turtle	EN	8792	Exporter	✓	✓
	Manouria emys	II	Burmese Mountain Tortoise	EN	7274	Exporter	✓	✓
	Indotestudo forstenii	II	Travancore Tortoise	EN	6860	Exporter	✓	✓
	Pyxis arachnoids	I	Spider Tortoise	CR	3604	Exporter	x	x
	Pyxis planicauda	I	Flat-tailed Tortoise	CR	1981	Exporter	x	x
Amphibians	*Mantella aurantiaca*	II	Golden Mantella	CR	103511	Exporter	✓	✓
	Mantella viridis	II	Green Mantella	EN	13409	Exporter	✓	✓
	Mantella expectata	II	Blue-legged Mantella	EN	13223	Exporter	✓	✓
	Mantella crocea	II	Yellow Mantella	EN	9427	Exporter	✓	✓
	Mantella milotympanum	II	Black-eared Mantella	CR	6781	Exporter	✓	✓
	Scaphiophryne gottlebei	II	Red Rain Frog	EN	4675	Exporter	✓	✓
	Mantella bernhardi	II	Bernhard's Mantella	EN	2895	Exporter	✓	✓
Fish	*Cheilinus undulatus*	II	Humphead Wrasse	EN	62121	Exporter	x	✓
	Huso huso	II	Beluga	CR	12000	Exporter	✓	x
	Acipenser gueldenstaedtii	II	Russian Sturgeon	CR	1000	Exporter	x	x
	Anguilla anguilla	II	European Eel	CR	20970	Importer	x	✓

**included within the Review of Significant Trade as Callagur borneoensis*

Changing patterns of trade

Changing patterns in the trade of CITES-listed species can occur as a result of many factors, including the transfer of species between Appendices, implementation of CITES trade suspensions or application of stricter domestic measures. Resultant shifts can occur in the individual taxa traded, the source of specimens (e.g. from wild to captive-bred) or the distribution of exporting Parties. Shifts in taxa and exporting countries are illustrated in the following examples; shifts in source are highlighted elsewhere in this report.

Shifts in taxa exported from range States

Batagur borneoensis was exported predominantly as live specimens for consumption from Malaysia before its selection in the Review of Significant Trade (RST) in 2004. In response, Malaysia set a zero harvest quota for the species in 2005 and 2006. It was deemed to be of Least Concern and removed from the RST process in 2006. Coinciding with the decline in exports of *B. borneoensis* from Malaysia, trade volumes increased for the similar species, *Orlitia borneensis* (Figure 7). Similarly, trade in *Cordylus vittifer* increased following a trade suspension implemented under the RST for *C. tropidosternum* from Mozambique in 2001.

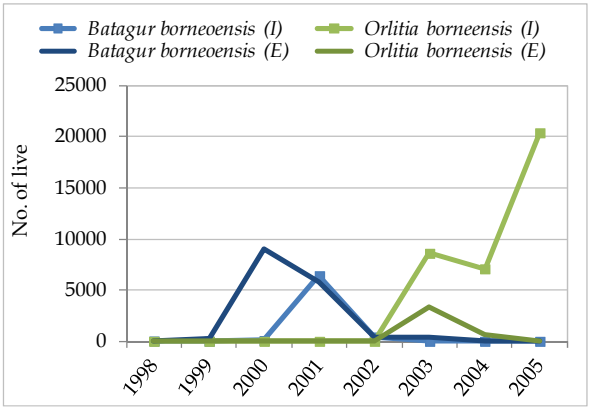


Figure 7. Trade in live *Batagur borneoensis* and *Orlitia borneensis*, as reported by exporters and importers.

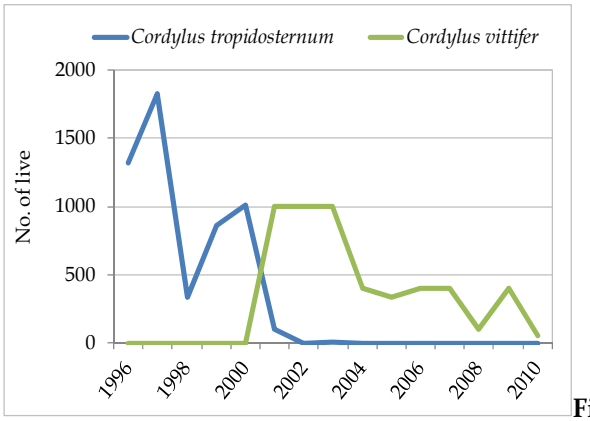


Figure 8. Trade in live *Cordylus tropidosternum* and *C. vittifer*, as reported by exporters.

Shifts in patterns of trade geographically

A general shift in the source of the global trade in live birds from wild exports to captive production since the mid 2000's coincided with a change in the geographic distribution of exporters. In 1996, 23 countries reported commercial exports of ≥ 50 live wild birds. A wide distribution of countries were involved in the trade, with clusters in West Africa, South America and South East Asia (Figure 9). In 2010, only eight countries reported commercial exports of ≥ 50 live wild birds. In comparison, commercial exports of ≥50 captive-sourced birds were reported by 19 Parties in 1996; in 2010 this has remained relatively constant (18 Parties), with many facilities located in consumer countries in Europe and North America (Figure 10). The change in trade patterns from wild to captive-production often results in the loss of livelihoods in range State countries, and a shift in the benefits from the rural poor elsewhere.

Figure 9. Top exporting countries of live wild Appendix II birds in 1996 and 2010.

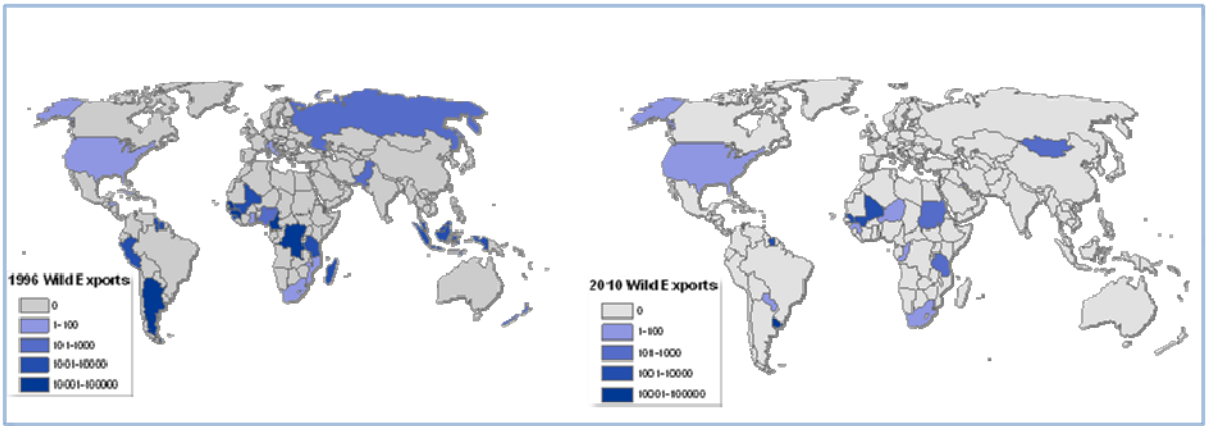
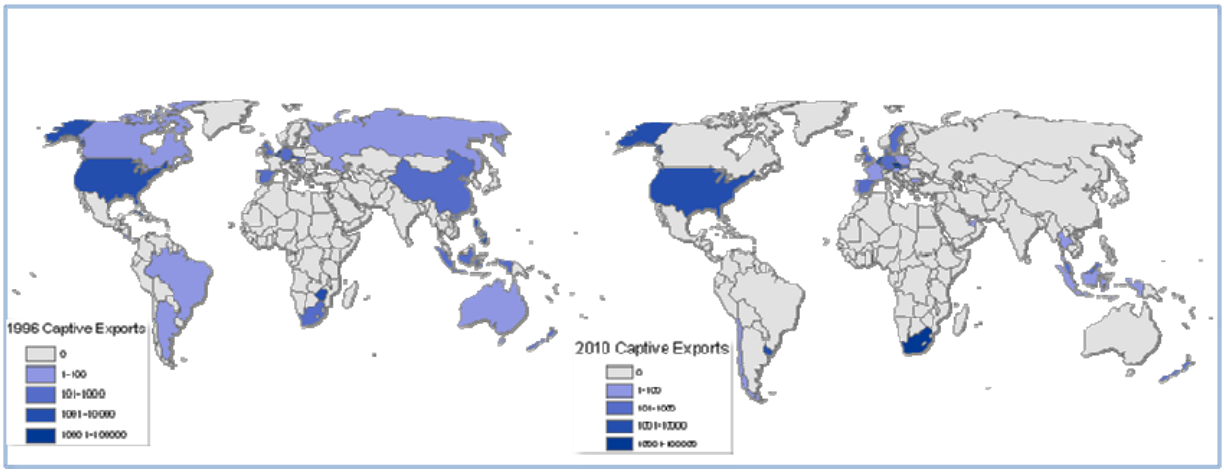


Figure 10. Top exporting countries of live captive-sourced Appendix II birds in 1996 and 2010.



Regional trends

A snapshot overview of regional trade trends for Appendix I and II species, highlighting the terms that were traded at highest levels, trends over time and the species that were involved, (as reported by exporters), is summarised below.

An examination of regional trade indicated that the number of animal taxa exported over a 15 year period was fairly similar for each of the six CITES regions. The source of specimens, however, varied across regions with the majority of wild-sourced specimens being exported from the following CITES regions: Africa, Asia, and Central and South America and the Caribbean. In contrast the number of plant taxa in trade was more variable across regions, ranging from a maximum of over 6000 taxa from Central/ South America and the Caribbean to less than 2000 taxa from Africa. The analysis also described some notable changes in trade patterns of particular taxa, with evidence of trade switching between countries and also between similar taxa within a country. A case study focuses on Appendix II trade for Oceania.

Appendix I trade

The CITES region that issued the highest number of Appendix I export permits in 1975-2010 was North America, representing 30% of direct export transactions. Within this region, the United States was the main exporting country (Figure 11). However, Asia dominated overall exports by volume for both plants and animals.

Plant trade dominated Appendix I exports by volume from Africa and Oceania (live plants), Asia (derivatives) and Central and South America and the Caribbean (timber). Europe's largest Appendix I export in terms of volume was mammal meat (whales).

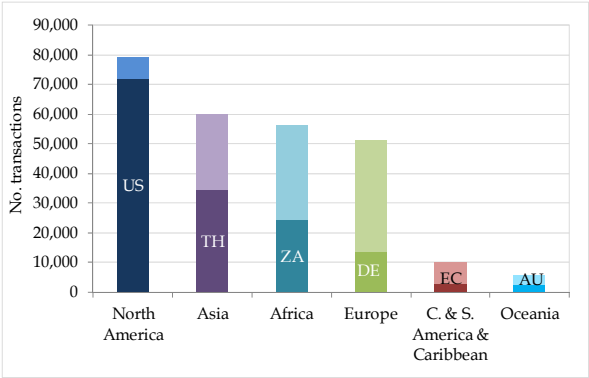


Figure 11. Proportion of reported Appendix I export transactions by CITES region, including the main exporter per region (represented by the darker colours).

Appendix II trade

Over the most recent 15 years (1996-2010), Asia was the region with the highest levels of export transactions for Appendix II species (i.e. the number of permits issued, which does not necessarily indicate the volume of trade), representing 38% of all direct export transactions. Indonesia was the main exporter within Asia, but also on a global scale, issuing 29% of all permits. Although, with 32% of export transactions overall, North America issued fewer permits than Asia, Canada reached very similar levels of export transactions to Indonesia, with 28% of all permits globally (Figure 12).

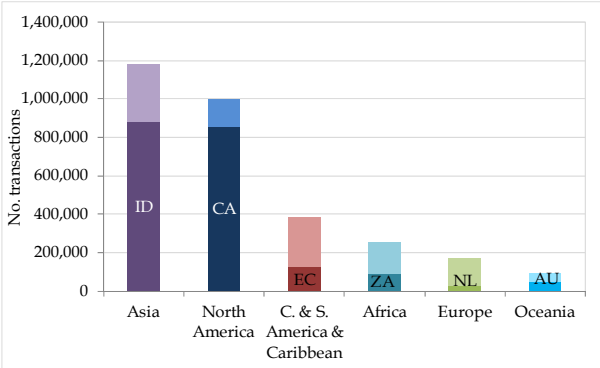


Figure 12: Proportion of reported Appendix II export transactions by CITES region, including the main exporter per region (represented by the darker colours), 1996-2010.

A relatively small number of taxa accounted for the bulk of the trade; however, overall, a total of 14,311 different animal and plant taxa were exported over the fifteen years analyzed. Central and South America/Caribbean was the CITES region trading the highest number of Appendix II plant taxa over the period 1996-2010, while Europe traded the highest number of animal taxa.

Four of the six CITES regions traded proportionally more animals from wild, unknown and unspecified sources than from any other sources, while all regions traded more artificially propagated plants than those from wild, unknown and unspecified sources (Figure 13).

Live animals and plants were exported from all six CITES regions, with Asia exporting the highest number of live plants and animals overall (as reported in number). Figure 14 provides an overview of the volume and sources of live plants and animals exported by region.

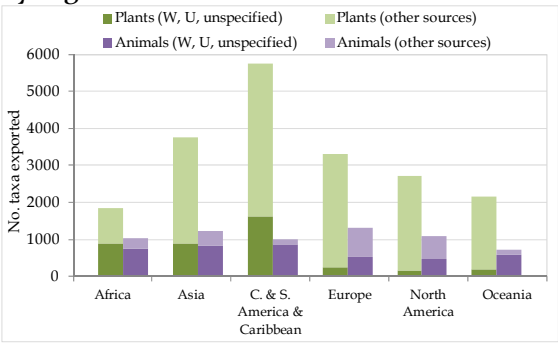


Figure 13: Number of plant and animal taxa traded per CITES region, 1996-2010.

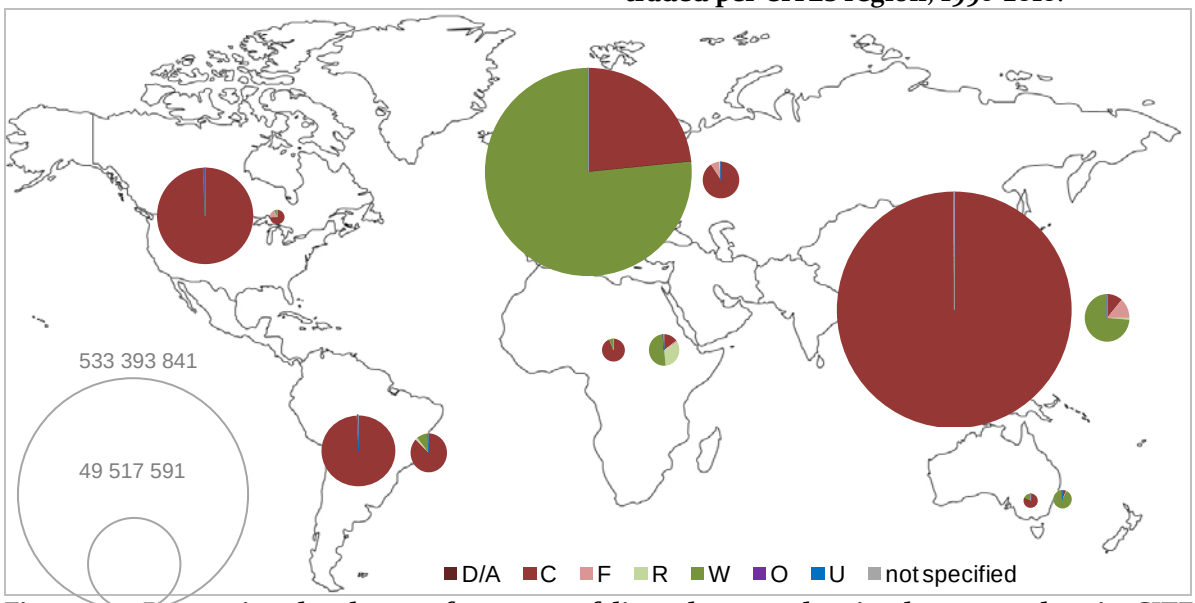


Figure 14. Proportional volume of exports of live plants and animals across the six CITES regions 1996-2010 (as reported in number), by source. The chart on the left indicates the volume of plants and the chart on the right the volume of animals traded; sources are indicated. Overall volumes of live plants and animals exported are indicated by the large and small circles respectively, to the left of the map.

Case study: Oceania

Live corals (in kg) and live plants were the two most highly exported terms from Oceania 1996-2010. Trade over time showed an apparent decrease for live plants (Figure 15), whilst trade increased for live corals from 2003 onwards (Figure 16).

Exports in live plants involved a wide range of species, with *Cymbidium* spp. representing 20%, *Dionaea muniscipula* (Venus Flytrap)

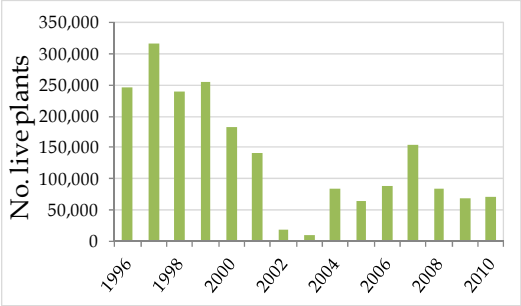


Figure 15: Volume of live plant exports from Oceania 1996-2010.

16%, *Dicksonia antarctica* (Australian Tree Fern) 14%, Orchidaceae spp. 8% and *Dicksonia* spp. 7%, with another 2113 taxa exported at lower levels.

Scleractinia spp. accounted for more than 99% of trade in corals reported in kg and 41% of corals reported in number. *Acropora* spp. represented 16% of the remaining trade in corals reported in number, followed by 279 other taxa, each representing 2.3% and less of the total exports.

Exports of live animals and plants (as reported in number) from Oceania were also dominated by invertebrates and live plants; trade in fish, birds and other groups involved much smaller numbers in comparison (Figure 17). Trade in live corals predominantly involved wild specimens (Figure 17). Both live animals and plants were predominantly exported for commercial purposes (97% and almost 100%, respectively).

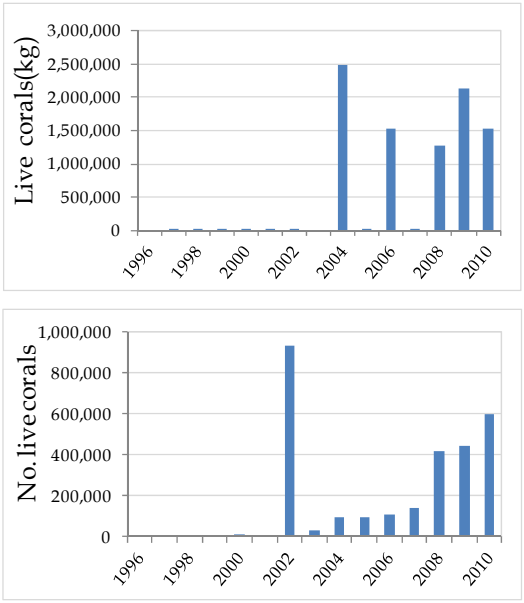


Figure 16: Volume of live coral (kg and number of pieces) exports from Oceania 1996-2010.

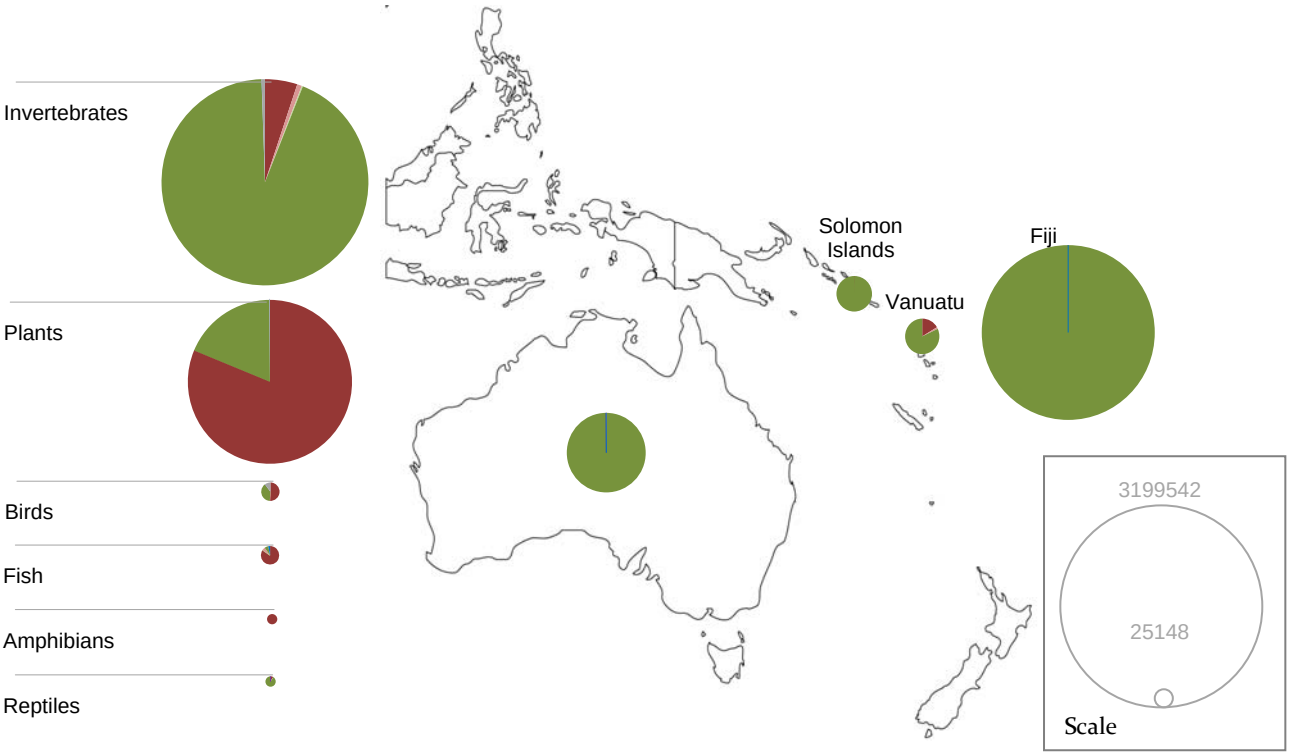


Figure 17: Left: Proportional volume of exports of live plants and animals from Oceania 1996-2010 (as reported in number) and terms traded; only trade above a total of 300 is included. Right: Map shows relative proportions of live corals (in number) reported exported 1996-2010 (all sources). Scale shows overall export volumes for invertebrates and fish.

Exports of mammals, birds, reptiles and amphibians by Oceania appear to have fluctuated or declined over time, while trade levels in fish (predominantly *Hippocampus* spp.) increased, particularly since 2003 (Figure 18).

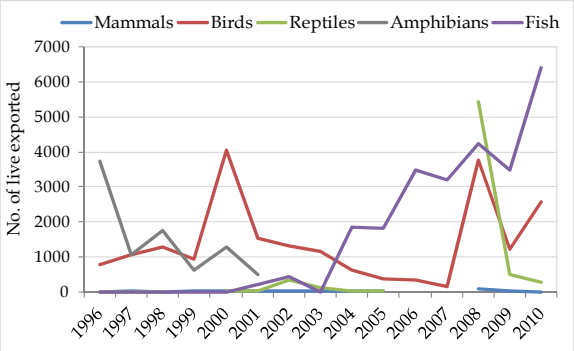


Figure 18: Exports of live animals other than invertebrates from Oceania 1996-2010 (as reported in number).

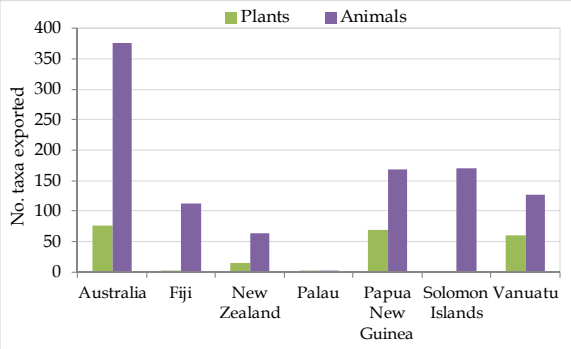


Figure 19: Number of taxa exported from Oceania 1996-2010 by exporting country.

Within the Oceania region, Australia exported the highest number of animal taxa 1996-2010, while comparable numbers of plants taxa were exported from Australia, Papua New Guinea and Vanuatu (Figure 19). Whist overall exports from the Oceania region are small compared with other regions, the trade still represents a wide range of species and involves all eight CITES Parties (reported by either trading partner). Exports of live wild-sourced invertebrates (predominantly corals and clams) are of particular importance to this region, which includes many Small Island Developing States.

Appendix I species – a snapshot analysis

Appendix I includes species that are threatened with extinction which are or maybe affected by trade. Accordingly, trade in specimens of Appendix I species is subject to particularly strict regulation in order not to further endanger the survival of the species. Trade is authorised only in exceptional circumstances, for non-commercial purposes (e.g. private use, scientific purposes, education or training)[21]. Exceptions are made for trade in captive-bred or artificially propagated specimens, and where Parties have adopted reservations (these terms are strictly defined). The original Appendices included 341 species and 98 subspecies of animals, and 73 species and one subspecies of plants in Appendix I; currently, there are 625 species and 44 subspecies of animals and 301 species and four subspecies of plants included (Figure 20).

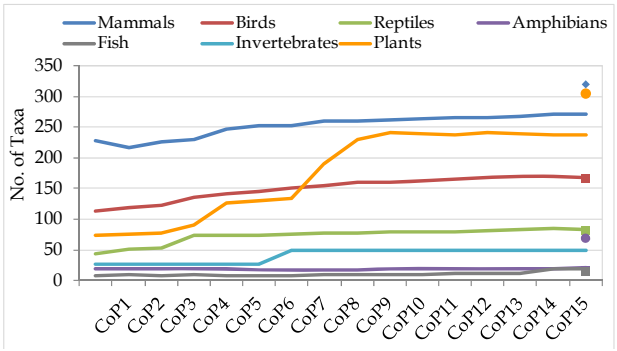


Figure 20. Cumulative listings of Appendix I taxa as determined by accepted CoP proposals. Data points indicate the number of current listings considering changes in standard nomenclature.

An assessment of trade in Appendix I species was recently conducted by UNEP-WCMC for the German Federal Agency for Nature Conservation (BfN) (UNEP-WCMC, 2013). Throughout the Appendix I analysis, case studies were chosen to illustrate key trade patterns and issues for Appendix-I listed species. These studies included reported trade in the following commodities: mammals skins and meat, live birds, reptile skins and plant derivatives.

[21] In accordance with Article III of the Convention, and Resolution Conf. 5.10 (Rev. CoP15 *Definition of 'primarily commercial purposes'*)

Key findings of the Appendix I analysis include:

Taxonomic trends:

- **Trade in mammals** (which represent almost half of Appendix I species) was dominated by skins (unspecified source), specimens (predominantly of wild origin) and captive bred live mammals;
- Exports of Appendix I **birds** increased gradually over the lifetime of the Convention, but showed a shift from trade recorded without a source specified in the early years of the Convention to trade from captive sources from the early 1980s onwards. Analysis of trade in live birds also highlighted cases of Appendix I birds bred in captivity for commercial purposes by operations not registered with the Secretariat, as well as the expansion of captive breeding within non-range States;
- Trade in **reptile** skins showed a similar trend to live birds, with the source shifting from unspecified to captive-bred. Four reptile taxa (*Varanus* spp., *Varanus bengalensis* V. *flavescens* and *Crocodylus siamensis*) represented 95% of all trade in Appendix I reptile skins in 1975-2010 according to exporter data;
- Trade in Appendix I **plants** was dominated by trade in derivatives over the lifetime of the Convention, but these were traded at comparatively lower levels (and predominantly as artificially propagated) in recent years.

Shifts in source:

- Captive-bred or artificially propagated specimens and hunting trophies for personal use accounted for the majority of reported trade in Appendix I species;
- Trade in captive-produced specimens of live birds, reptiles and fish increased over time, with the majority of trade dominated by relatively few taxa;

Regional trends:

- The CITES region that issued the highest number of export permits in 1975-2010 was North America, but exports by volume were dominated by the Asian region.
- Plant trade dominated exports by volume from Africa and Oceania (live plants), Asia (derivatives) and Central and South America and the Caribbean (timber). Virtually all trade in plant derivatives occurred between countries within the Asian region.
- Europe's largest export in terms of volume was mammal meat (whales).

Compliance:

- Poor reporting in the earlier years of the Convention precludes a comprehensive analysis of infractions of the Convention relating to trade in Appendix I specimens; however, the commercial use of wild-taken specimens occurred in every year from 1990-2010 demonstrating a continued problem. Infractions mainly involved mammals and reptiles.
- Sustainable use programmes exist for a number of Appendix I species. Quotas for hunting trophies and skins, approved by the CoP as part of sustainable use programmes, have been largely complied with;
- Discrepancies in reporting were noted throughout the analysis. Overall, reporting has improved over the course of the Convention, particularly with regard to source and purpose codes. These findings stress the importance of accurate and consistent reporting across Parties.

Appendix II species – a snapshot analysis

Appendix II includes species that are not necessary threatened with extinction, but for which trade must be controlled in order to avoid utilization incompatible with their survival. The majority (~97%) of CITES species are included in Appendix II. The original Appendices included 397 species and 58 subspecies of animals and 21,443 species and one subspecies of plants in Appendix II. The number of Appendix II taxa has increased over time; currently, there are 4,685 species and 8 subspecies of animals and 29,105 species including two populations of plants included (Figure 21).

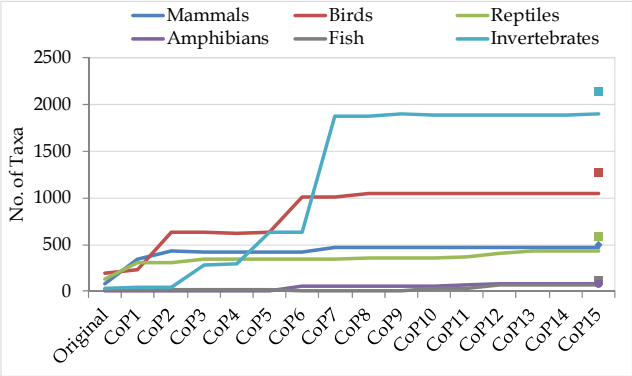


Figure 21. Cumulative listings of Appendix II taxa as determined by accepted CoP proposals. Data points indicate the number of current listings considering changes in standard nomenclature.

Analysis of trends in selected taxa for key trade terms can be found in Secretariat (2012).

Key findings of the analysis of Appendix II trade included:

- For many taxonomic groups, there was a notable increase in the number of captive-produced or ranched specimens in trade with a decrease in the number of wild specimens;
- Overall volumes of trade in CITES Appendix II live animals and plants peaked in 2000 and 2006, respectively with a decline seen since then. Recent decreases in 2009-2010 reflects delays in reporting of trade data and, potentially, global market factors;
- Of the almost 4,700 animal species listed in CITES Appendix II (representing over 85% of all CITES-listed animals), the majority of the trade (75-80%) in Appendix II-listed mammals, birds, and reptiles for key trade terms was accounted for by around 60 taxa during 1996-2010. In total, 14,311 plant and animal taxa were reportedly exported;
- Live plants and animals were exported from all regions, with Asia exporting the highest volumes overall;
- The regions that exported the widest variety of biodiversity, on the basis of number of plant and animal taxa represented in trade, were Central and South American and the Caribbean and Europe respectively;
- The CITES Review of Significant Trade process has contributed to the management of trade in globally threatened species at national levels; and
- Through the mechanisms it puts in place to support a sustainable trade, CITES plays an important role in achieving sustainable development.

Compliance with the Convention

Compliance with the Convention is key to the overall effectiveness of CITES. This section examines broad issues of compliance through analysis of trade data submitted by Parties in their annual reports. The main infractions/non-compliance issues considered were trade in wild-sourced Appendix I specimens for commercial purposes, trade which occurred apparently in contravention of trade suspensions (either imposed directly under CITES or through voluntary export bans), and the control of quotas approved by the Conference of the Parties for Appendix I species.

Wild-sourced trade in Appendix I species for commercial purposes

Under the provisions of the Convention, imports of wild-sourced specimens of species listed in Appendix I are not permitted for primarily commercial purposes (reported in trade under source code "T"). The CITES Trade Database indicates that such imports, which are not subject to reservations, have regularly occurred.

The majority of these infractions involved trade in mammals and reptiles. Reported commercial imports included skins and ivory of wild *Loxodonta africana* (African elephant), derivatives of Felidae spp., *Moschus* spp. and *Ursus thibetanus* (Asian Black Bear), in addition to carvings and wax of *Physeter macrocephalus* (Sperm Whale). Reported imports of wild Appendix I reptiles for commercial use included live *Testudo kleinmanni* (Kleinmann's tortoise), crocodile leather products and skins, and marine turtle carapaces, eggs, and leather products. Exporters reported additional commercial trade in wild Appendix I taxa.

Whilst the number of apparent contraventions over time was variable, the commercial import of wild sourced mammal taxa not subject to reservations for example, was reported in every year 1990-2010, indicating continued implementation problems for Parties.

Trade subject to suspensions

Compliance with trade suspensions for Appendix I was generally good. Only one Party reported an import of an Appendix I species (*Amazona viridigenalis*, Red-Crowned Amazon) in apparent contravention of a CITES Animals Committee recommendation to suspend trade during 1996-2010. Voluntary suspensions were apparently ignored more often. Fourteen Parties exported Appendix I species which appeared to be in contravention of voluntarily imposed trade bans (as implemented by the Management Authority of the State of export). This apparent trade involved 54 taxa, whilst 33 Parties reported accepting direct imports from Parties under voluntary export moratoria.

For Appendix II species, compliance with suspensions was more variable. During 1996-2010, over 30 Parties reported trade in Appendix II species in apparent contravention of suspensions established under Secretariat recommendations (37 Parties reported imports whilst 32 Parties reported exports). This involved 75 taxa, including for example, commercial export of 1,518 live wild-caught *Psittacus erithacus* (Grey Parrot) whilst a trade ban resulting from a previous non-compliance issue was in place, and exports of over 3,000 live *Uromastyx dispar*, despite a trade suspension implemented under the Review of Significant Trade. In addition, poor reporting (for example, omission of source codes) makes it difficult to determine accurately whether additional contraventions have occurred.

Contraventions of voluntary export bans were also apparent for Appendix II taxa. Nineteen Parties appeared to export 530 Appendix II listed taxa in contravention of voluntary export bans during 1996-2010. This trade comprised many terms, including live trade (17 Parties) and specimens (11 Parties). One Party reported commercial exports of 7964 live wild-sourced *Cyanoliseus patagonus* (Burrowing Parakeet) whilst a voluntary ban on the live export of

mammals, birds and reptiles was in place. Whilst in some cases, the terms of voluntary suspensions may be unclear leading to misinterpretation and continued trade, increased vigilance concerning trade suspensions for Appendix II species seems necessary.

Control of quotas for Appendix I species

National export quotas may be established for Appendix I species; those approved by the CoP are accepted as non-detrimental in accordance with Resolution Conf. 9.21 (Rev. CoP13). Resolution Conf. 2.11 (Rev.) provides recommendations for acceptance of non-detriment findings for non-commercial exports of hunting trophies, and further resolutions provide specific quota limits for leopard, markhor and black rhinoceros (Res. Conf. 10.14 (Rev. CoP14), Res. Conf. 10.15 (Rev. CoP14) and Res. Conf. 13.5 (Rev. CoP14)). In addition, the Appendix-I listing for cheetah provides an annual export quota for three range States.

CoP-approved quotas for Appendix I species appear to have been generally complied with, although there were some instances where quotas may have been exceeded by a small margin. However, this can be due to Parties cancelling and replacing permits, which are both subsequently included within annual reports or the trade being included from previous quota years.

CITES trade and the Green Economy

The international trade in wildlife is a global industry that supports the livelihoods of people around the world. When managed sustainably, the trade can provide incentives for species and habitat conservation; it can be a direct source of income through harvest and sale of animals and plants, and an indirect source of income through the multiple industries that it supports e.g. tourism, manufacturing etc. Through the mechanisms it puts in place to support sustainable trade, CITES can play an important role in supporting sustainable development[22].

Value and beneficiaries of CITES trade

The many and varied benefits provided by trade in wildlife has been recognised by CITES Parties. In its preamble, CITES recognises that 'people and states are and should be the best protectors of their own wild fauna and flora'. Resolution Conf. 8.3 (Rev. CoP13) also recognises "that commercial trade may be beneficial to the conservation of species and ecosystems, and to the development of local people when carried out at levels that are not detrimental to the survival of the species in question; and that implementation of CITES-listing decisions should take into account potential impacts on the livelihoods of the poor."

The contribution that the international wildlife trade makes to the global economy is substantial. Whilst data on value of total trade in CITES-listed species has not yet been systematically collected, preliminary studies estimated the value of key trade in selected Appendix II animals ranged from USD350-530 million per year, giving a total value of almost USD2.2 billion over five years (Secretariat, 2012). Trade in reptiles accounted for the greatest proportion of the reported value of CITES animals in this subset of trade, largely due to the high volume of reptile skins traded. However, additional commodities which are traded in low volume but are high in value such as caviar extract, would significantly boost the overall figure for value of CITES animals in trade.

Compilation of plant value data lags behind that of animals and a meaningful and comparable assessment of the value of key CITES-listed plants could not be undertaken. However, given the sheer volumes of reported exports (see Figure 14), the global trade in CITES-listed plants is also likely to make an important economic contribution for exporting countries. It is clear the

[22] As expressed in Chapter III of *The Future We Want* adopted at the UN Conference on Sustainable Development in 2012, commonly known as Rio+20.

trade in commercially valuable timber species such as African Teak, Big-leaf Mahogany and Central American Cedar is very lucrative; for example import values of $1875 per cubic metre for *Swietenia macrophylla* (Big-Leaf Mahogany*)* were documented. It is estimated that trade in this species alone is likely to have been worth around USD168 million during the period 2006-2010. It is hoped that further development of valuation methodologies to include plants, Appendix I species, and a more comprehensive range of trade terms can be undertaken in the near future.

The direct value at import or export of the international trade in CITES species is just one aspect of their monetary value, and additional value can be captured further down the trade chain, as shown in a recent study of the Snake Skin Trade in South East Asia which highlighted a sixty-fold increase in value from raw skins to final product (from $107 to $6630)(ITC, 2012).

Indirect or wider benefits provided by utilisation and subsequent trade can also be substantial. For example, the mean hunting trophy price for an African lion in Namibia in 2011 was USD22,940, with daily hunting fees of USD1,975 and hunt packages requiring a minimum stay of 20 days (Lindsey *et al.*, 2011). The manufacture of species derived products also contributes to livelihoods and the local economy. Many species that are traded internationally also play important roles in the provision of ecosystem services. For example, birdwing butterflies are highly traded species that may play an important role in plant pollination. Migratory species such as the Saiga antelope and other CITES listed species may play an important role in nutrient cycling during migration, and peccaries and other fruit-eating species can be important seed dispersers. Many CITES-listed species also provide important income as local foods and medicines.

IV. Lessons for future implementation

CITES has demonstrated significant achievements in its 40 years of existence, but challenges remain to ensure that CITES trade is legal, sustainable and traceable. These can be broadly categorised under themes that are central to effective CITES implementation: science, compliance and enforcement. In addition, the Convention must continue to focus its efforts on effective contribution to the Aichi Biodiversity Targets of the CBD.

Science

CITES is a science-based Convention and the making of scientifically robust non-detriment findings (NDFs) is fundamental to ensuring sustainable trade and preventing over-exploitation. Whilst achievements have been made, such as the CITES-ITTO Programme and many taxa specific workshops, further support is required to assist national managers to compile NDFs, as highlighted in TRAFFIC's assessment, and to improve national capacity for use of CITES trade data.

The basis of listing species on the Appendices should be in accordance with the listing criteria established by the Parties under Resolution 9.24 (Rev. CoP15). For CITES to be most effective in ensuring sustainable trade, risk assessment and early listing of species in Appendix II may ensure that use of trade measures can support those organisations charged with harvest management, particularly for commercially exploited marine species, as indicated in the assessment by Fleming *et al*.

Compliance

National reporting

National reporting is a key requirement of the Convention. Parties are required to submit annual reports to CITES comprising details of trade transactions in CITES-listed species. Reporting of trade data has improved considerably over the lifetime of the Convention. For example, source and purpose codes were omitted on 28% and 32% of permits issued, respectively, during the period 1981-1995. In contrast, source and purpose codes were complete for 99% and 92% of permits that were issued during 1996 2010, respectively.

Despite this progress, there is still room for improvement, particularly in terms of timely submission (see Box) and adhering to the suggested reporting format included in CITES "Guidelines for the preparation and submission of CITES annual reports"[23]. Common issues include a lack of coded data (for countries, terms, source, purpose, etc.) or errors in the codes that are used; misspelled species names and use of synonyms instead of accepted names; use of commas instead of decimal points; trophies reported incorrectly; inconsistencies in reporting of country of origin and incorrect reporting of source or purpose. Submission of data in an inappropriate format (e.g. pdf document) can cause delays in inputting the data into the CITES Trade Database.

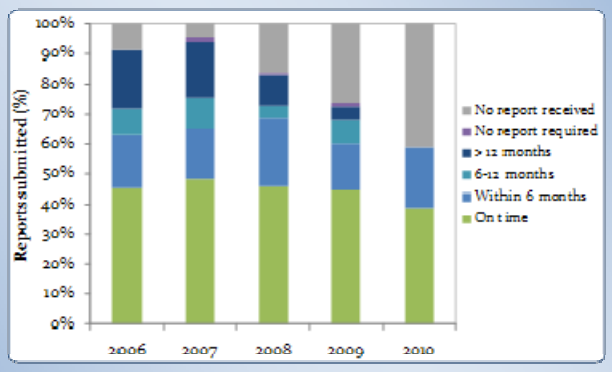
In working towards the goal of improving submission rates and standardisation of annual reports, UNEP-WCMC (in collaboration with the CITES Secretariat), has developed a provisional upload tool for electronic submission of CITES permit data.

[23] Notification to the Parties 2011/019: http://www.cites.org/eng/notif/2011/E019A.pdf

Although many aspects of reporting have improved, a variety of other reporting issues were evident from compiling the snapshot analyses. In some cases (e.g. plants) reporting of the trade at higher taxonomic level where it is not permitted under Resolution Conf. 11.17 (Rev. CoP14) was common, split-listed species were reported erroneously (e.g. under the incorrect Appendix or where the species was not CITES-listed for the range State concerned). Other reporting issues included deviations from recommended terms, use of synonyms and misspellings. Reporting of captive-bred specimens (using source code "D") where there are no operations included in the Secretariat's Register for the species concerned (in accordance with Resolution Conf. 12.10 (Rev. CoP15) was also apparent. In some cases, direct trade in wild-sourced specimens was reported, although the exporter was not recorded as a range State according to UNEP-WCMC species data holdings.

Box 2: Submission of annual reports

There is a notable delay in the receipt of annual reports from CITES Parties. Only around 45% of Parties submitted their annual reports by the 31 October deadline (2006-2010) (see graph below). For the year 2006, a 90% reporting rate was not reached until three years after the deadline.



This lag-time in reporting makes accurate analyses more difficult. There is a clear need to enhance annual reporting rates to improve implementation of the Convention. The move towards CITES e-permitting and electronic exchange of data could play a key role in reducing the burden of compiling annual reports and improving submission rates and timeliness.

For CITES annual report data to deliver the most value in terms of key CITES processes (such as assessing the sustainability of trade, the formulation of non-detriment findings and indicating where infractions have occurred), they need to be compiled in a timely and accurate fashion. A clear challenge for Parties is to improve reporting submission rates and accuracy of reporting in line with Resolution Conf. 11.17 (Rev. CoP14), which will enhance implementation and enforcement and make effective contributions to fundamental CITES processes.

Automated systems to improve compliance

Compliance issues identified through the Appendix I and II analyses, such as commercial trade in wild-sourced Appendix I species taking place where no reservation has been entered, and trade occurring in contravention of suspensions may need further consideration. Whilst these could be addressed through improved vigilance and checking of permits (e.g. against suspensions) in practice this can be arduous with manual systems. Development of an automated system (such as an online CITES Integrated Management System) for detecting and flagging infractions and facilitating trade checks could help reduce compliance issues and aid implementation, in addition to providing reliable access to integrated species information on accepted nomenclature, distribution and CITES legal status, as outlined in the assessment by the Secretary General.

Enforcement

The increased involvement of organized crime in wildlife poaching and illegal trade in wild plants and animals (as demonstrated by the current rhino crisis) means that effective CITES enforcement has never been more pressing. Partnership working and collective initiatives to address enforcement have been successful and Information and Communication Technologies can assist in tackling illicit trade by providing enforcement officers with a valuable resource to detect fraudulent permit use. Visionary Parties are leading the way in the application of ICTs, and some have already developed their own CITES e-permitting systems that facilitate Customs single window approaches. However, wider endorsement, funding and application of these technologies will be needed to support efforts to address illegal trade issues.

Progress towards the Aichi Targets

Effective implementation of CITES can contribute to the attainments of a number of the Aichi Biodiversity Targets (specifically 1, 2, 3, 4, 6, 7, 9, 12, 17, 18, 19 and 20). In particular, CITES can play a role in raising awareness of the values of biodiversity, generating incentives for sustainable use of terrestrial and marine diversity, preventing the extinction of species, sharing knowledge, information and resources to safeguard biodiversity and enhancing the benefits to all from ecosystem services.

The contribution of the Convention towards the Aichi targets could be gauged with regular biennial assessments of trade data, building on the work that is undertaken for the CITES Significant Trade and Periodic Reviews for Appendix II-listed taxa. In addition, Appendix-I–listed taxa may merit further oversight to track progress towards Target 12 on threatened species. Currently, the Special Reporting requirements associated with certain high profile taxa require reporting and review of trade patterns. However, for the majority of species listed in Appendix I, there is no regular requirement for reviewing the status of species. In addition, further collaboration with other MEAs such as the Convention on Biological Diversity and Convention on Migratory Species may be valuable to address Aichi Target 12.

Conclusions

Perspectives from the guest authors have shown how the CITES community has developed innovative approaches and collaborative partnerships to deal with a range of issues faced by the Convention over the past 40 years. Analysis of trade data has demonstrated an increasing volume of CITES trade transactions over time, as well as a wide regional extent of the trade. Whilst much of the trade is reportedly now from captive-bred or artificially propagated sources, the export of specimens harvested from the wild remains an important component of the trade for many range States.

While snapshot assessments of global trade can show broad overall trends, there is a need for more detailed monitoring of some of the 14,000 CITES-listed species reported in recent trade in order to more fully understand trade patterns and identify any potential implementation problems. Trade reporting will deliver more value over future years as developments in information communication technology enable Parties to report and query the trade data more rapidly and to develop tools to automate checking of compliance issues. There is still much to do to address the global biodiversity crisis, but CITES is well placed to bring partnerships together to address the threats from international trade in wildlife.

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