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

Sixteenth meeting of the Conference of the Parties
Bangkok (Thailand), 3-14 March 2013

Taxonomy troubles

IUCN AND TRAFFIC BRIEFING PAPER FOR COP16

This document has been submitted by the United Kingdom of Great Britain and Northern Ireland on behalf of IUCN and TRAFFIC, in relation to agenda item 43 on *Standard Nomenclature**.

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Species are at the heart of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Convention seeks to regulate the trade in selected species So that international trade does not threaten survival: defining the term 'species' as 'any species, subspecies, or geographically separate population thereof'. There are only two ways that species are eligible for inclusion in Appendix I or II; either in their own right (*Res. Conf. 9.24 (Rev. CoP15)* under Annex 1 for Appendix I and Annex 2A for Appendix II) or under the so-called lookalike criteria (Annex 2B) for Appendix II.

Although there are no provisions for listing higher taxa as a group in the Appendices, from the very beginning the Parties have evidently decided that all the species in some higher taxa meet the conditions for inclusion in one or other Appendix. In these cases the listing is given as [Higher taxon] spp. with amendments if appropriate (e.g. **Lutrinae spp.** (Except the species included in Appendix I)). Entire orders, families, sub-families or tribes and genera have all been included in this way. There are currently 103 higher taxon listings in Appendix II and 37 in Appendix I. The vast majority of species included in the Appendices are included under such listings, of which by far the largest is the 25 000+ species of orchid (family Orchidaceae), which are included either in Appendix I or Appendix II. Even if the orchids are excluded from consideration, the great majority of listed species are still included in the Appendices via higher taxon listings.

Many of these higher taxon listings were included in the Appendices before the criteria for amendments to the Appendices in Resolution Conf. 9.24, and its various revisions, were adopted in 1994. The justification for the early higher taxon listings appears to have been a view that, for a significant number of species in that taxon, trade required regulation either at Appendix I or Appendix II level; and that inclusion of the whole taxon would facilitate implementation of the Convention for general 'lookalike' reasons; and because it was not known exactly which species were in need of regulation (trade information for non-CITES listed species was then, as now, often very patchy). In virtually no case was every species subject to scrutiny to determine whether it merited inclusion in its own right, or whether it resembled a species that did merit inclusion in its own right. For these early listings, it is therefore not always clear what the justification behind the listing of any given species was.

Any higher taxon listing comprises, in theory at least, a certain number of recognised species at the time of listing. However, for many higher taxa it is not easy to know what species would or would not have been considered to be included at the time of the listing, for a number of reasons. First, knowledge of wild populations of plants and animals is still incomplete. Even in well known groups, such as primates, entirely new and distinct populations are still being discovered. Second, there is no scientific consensus on what exactly constitutes a species, with different ideas leading to very different classification systems. In taxonomy the classic, but simplest, distinction is between 'lumpers' and 'splitters'; the former tending to aggregate different populations together in the same taxon, the latter tending to recognise many different taxa. Third, taxonomy at all levels is in a constant state of flux. Changes take place because of evolving scientific understanding but also because of changes in scientific fashion. At present 'splitters' predominate over 'lumpers', so that the number of recognised species in virtually all taxa has grown markedly in recent years, and at a considerably faster pace than genuinely new wild populations in those taxa are discovered.
This lack of consensus and constant change is a persistent problem for CITES, the successful implementation of which depends on agreement as to the identity of the 'species' listed in its Appendices. Such agreement has to steer a course between maintaining scientific credibility by keeping abreast of the latest findings and retaining as much stability is possible to make things manageable for those responsible for implementation, particularly enforcement, as enforcement officers are rarely taxonomic experts. The adoption of periodically updated standard taxonomic references has proven very useful in this, as has the preparation of checklists for some of the higher taxa.

Changes in taxonomy of a higher taxon that may be reflected in updated versions of the standard taxonomic references include:

a) New populations discovered are named as new species within the listed higher taxon.

b) Rearrangement of species within the higher taxon (known, named populations are assigned new combinations – i.e. new binomials – still within the higher taxon (e.g. splitting, lumping).
c) Rearrangement which bring species previously outside of the listed higher taxon into the higher taxon.
d) Rearrangement which reassigns a species from a listed higher taxon to an unlisted higher taxon.

The way 'a' and 'b' are currently interpreted (according to CoP16 Doc. 43.1 (Rev. 1) Annex 3) is that species are automatically included in the Appendix that the higher taxon is included in. For example all new species of primates or orchids have automatically been included in the Appendices. Currently some 300-500 new orchid species are named every year; while some of these represent rearrangements of existing species, a significant number are entirely new populations. Similarly, in the case of 'd', such species are still considered to be included in the Appendices.

In the case of 'c', however, it is evidently agreed that the species is not included in the Appendices. A case in point is proposal 39 at CoP16 to include a frog previously called *Colotesthus machalilla* and now known as *Epipedobates machalilla* in order that all species of *Epipedobates* in the proposed standard taxonomic reference for Amphibians will then be included in Appendix II.

From this, it would appear that the way these listings are interpreted is essentially: the Parties agree that all populations of the higher taxon (e.g. [Orchidaceae/Lutrinae/*Dendrobates*]) are included in the Appendices unless specified otherwise, whether their existence is currently know or not, and whatever they might be called, as long as this is consistent with them being in this higher taxon.

These are some of the implications of this:

1. Many species become added automatically to the Appendices without ever having been subject to review against the criteria, that is without being subject to any scrutiny at all. This is in sharp contrast to the considerable (and merited) scrutiny that any proposal for a species not in one of these taxa is subject to. In other words, it is difficult to add a new species to the Appendices through the proposal process, but extremely easy to add new species through taxonomic change.
2. It is not clear that the above approach is consistent where complex taxonomic changes have taken place. In the case of *Dendrobates*; for example, the species that were included in the genus at the time of listing have been subject to major taxonomic changes and are now distributed across 12 genera in two different families. Some of these genera are new genera that are essentially splits from the original *Dendrobates*, others already existed. In most of these genera at least one new species has been described since the split. Under the current interpretation as set out in document CoP16 Doc. 43.1 (Rev.1) new species in genera whose other species were included in *Dendrobates* at the time that *Dendrobates* was included in Appendix II are considered to be included in the Appendices, but any new species in previously existing genera are not, even though these may be very closely related to former *Dendrobates* species. Thus six species of *Ameerega* and seven of *Ranitomeya* are considered included in Appendix II even though they have never in fact been included in the higher taxon '*Dendrobates'* and were not recognised as species when *Dendrobrates* was included in the Appendices (see figure).
3. In the case where existing higher taxa have be split or otherwise reorganised, it is very likely that some of the new listings may serve no useful purpose at all. This is most clearly the case with former *Dendrobates.* Thus, for example, the four species now assigned to the large, previously existing genus *Allobates* do not appear to be extensively in trade, and evidently resemble other members of the genus *Allobates*, which are not listed in the Appendices, considerably more than they resemble species formerly in *Dendrobates* that are still regarded as listed. That is, they would evidently not meet any criteria for inclusion in Appendix II (see figure).
4. The degree to which newly discovered species or species newly created (through splitting or rearrangement) within a listed higher taxon are deemed to be included in the Appendices depends on the exact level of the listing. This reflects the formulation of the original proposal but it seems clear that Parties have not always thought through these implications very clearly. Thus any new species in the fish order Acipenseriformes would be included in Appendix II, whatever existing or new family or genus it were assigned to, and yet a (hypothetical) new species of coelacanth (order Coelacanthiformes) would

only be included in Appendix I if it were placed in the same genera (*Latimeria)* as the existing two species, despite the fact that these two are the only currently known members of the order (that is, the order Coelacanthiformes is *de facto* listed in Appendix I).

5. Higher taxon listings are found in Appendix I and Appendix II. Species cannot be included in Appendix I for lookalike reasons. It is not clear, therefore, how new species in Appendix-I higher taxa can be assumed to meet the criteria for inclusion in that Appendix, although it may be composed of species that are inevitably of international trade value.
6. Given the interpretation above of a higher taxon listing as being that of all populations in that taxon, known and unknown at the time of listing, it is debatable whether species known to have been extinct at the time of listing can be said to have been covered by the original listing at all as there were no populations extant at the time. Several proposals under the Periodic Review presented at the current CoP (e.g. Prop. 14 to delete *Caracara lutosa* and Prop. 22 *Sceloglaux albifacies*) indicate that the assumption is that they are included.

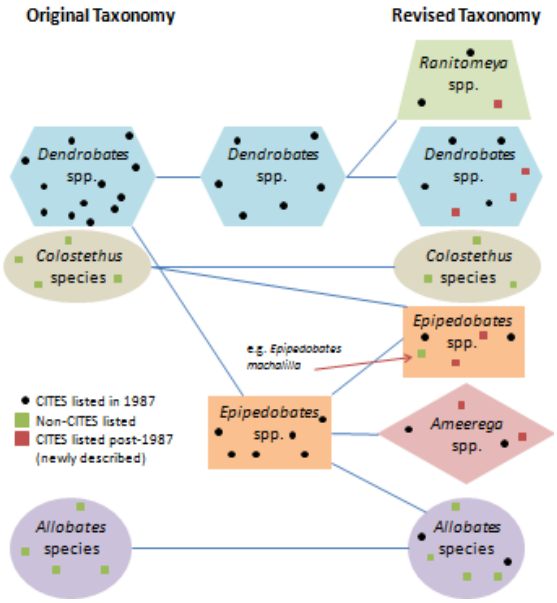

***Figure: Highly simplified illustration of selected taxonomic changes for* Dendrobates.**

None of this might matter if it is assumed that there is no cost attached to having species listed in the Appendices that do not meet the criteria for inclusion. However, the scrutiny which actual listing proposals are subject to indicates that the Parties do consider there is a potential cost attached to each listing, as does the fact that the Periodic Review of the Appendices is one of the major activities currently being undertaken by the scientific committees. The latter proceeds slowly, a reflection of the fact that, once listed, it is quite difficult to remove a species from the Appendices as proposals for deletion are subject to the same degree of scrutiny and high evidential standards as proposals for inclusion.

The vast majority of species included in the Appendices (namely many species of orchid) are scarcely, if at all, in trade. The marginal cost of retaining any one of these in the appendices is probably quite low and it is hard to see what function might be achieved by removing them piecemeal. However, some parts of the scientific community have argued for many years that inclusion of some of these higher taxa in the Appendices is an impediment to scientific work (including taxonomy) and in some cases to *ex situ* conservation efforts, although it is hard to demonstrate exactly what these impediments are.

There is clearly substantial cost in implementing the Convention for higher taxon (and a few individual species) listings in cases where there is a great deal of trade in artificially propagated or captive-bred specimens. However, at present there is no clear understanding of what these costs are, so it is difficult to make a judgement on whether conservation benefits from retaining these higher listings represent good value or not.

All this might indicate that higher taxon listings are best avoided if possible. However, there do seem to be occasions when they might have conservation benefits. At CoP16 this is argued by the proponents proposing the inclusion of Malagasy species of ebony *Diospyros* (Prop. 58) and rosewood *Dalbergia* (Prop. 63) in Appendix II. In these cases a number of species are known to be in trade, and are argued to meet the criteria for inclusion in Appendix II in their own right. Taxonomic uncertainty, reflected in the absence of a widely recognised standard reference or checklist for these species, means that it is not possible to identify all the species concerned with certainty (estimates for the number of species in these genera in Madagascar vary by a factor of three). It could be argued that it is neither practical nor desirable to wait until taxonomic uncertainties are resolved before listing. However, it should be noted that a similar situation existed with the *Dendrobates* listings in 1987 and therefore similar taxonomic changes may be expected in the future.

The Parties may wish to:

- Review their current approach to interpreting how taxonomic changes affect the CITES Appendices, particularly in relation to higher taxon listings
- Consider adopting guidelines regarding the assessment of higher taxon proposals within the guidance on amending the CITES Appendices (*Resolution Conf. 9.24 (Rev CoP15)*);
- Consider undertaking a review attempting to quantify the costs entailed in implementing the Convention for different taxa, as a first step in undertaking a cost-benefit analysis of higher taxon listings.