



## Inertia in CITES nomenclature

To prevent international commercial trade from negatively affecting the survival of wild species, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) lists roughly 35,800 species in its appendices, which are updated at each Conference of the Parties (CoP). Frank and Wilcove (2019) used pangolins (*Manis* spp.) to illustrate how delay in updating CITES appendices may hinder the conservation of traded species. All 8 pangolin species have been uplisted to Appendix I, and new pangolin species, once discovered, are listed in Appendix II. Species listings in CITES appendices are determined by both threat status and the nomenclatural system CITES uses. The convention adopts nomenclatural standard references for different taxa at each CoP meeting. Sometimes, the nomenclature they apply is not up to date. The CITES inertia toward nomenclatural standard references may delay or undermine species conservation and lead to, for example, enforcement challenges, missed conservation targets, and a lack of timely protection of new species.

The Luzon peacock swallowtail, *Papilio chikae*, has been listed in Appendix I of CITES since 1987. In 1992 a new peacock swallowtail was discovered and was accepted as a full species, *P. bermeli*, by some taxonomists and as a subspecies, *P. chikae bermeli*, by others (Nuyda 1992; Häuser et al. 2005). Given that no nomenclature of the genus *Papilio* has been adopted, whether the newly found swallowtail should be protected as *P. chikae* is pending and would be even if it looked like *Papilio chikae* and was rarer. A proposal was submitted for the upcoming CoP to include this swallowtail in Appendix I (CITES 2019).

The convention is still identifying a nomenclatural reference for the Cuban tree snail (*Polymita* sp.), which has been in Appendix I since 2016 (CITES 2017). The only available reference for identification of *Polymita* is the CITES proposal that describes several type specimens. However, *Polymita* has a wide range of color characteristics, which makes it difficult for prosecutors to prove the smuggled specimen is of a protected species.

In some cases, CITES has not adopted references that are widely accepted by researchers as standard

nomenclature. African forest elephant (*Loxodonta cyclotis*) has been splitted from African savannah elephant (*L. africana*) for about 20 years (Roca et al. 2001). Early in 2002, the Nomenclature Committee of CITES recognized that the subspecies *L. africana cyclotis* may be a full species (CITES 2002). However, forest elephant is still merged as a subspecies of *L. africana* under CITES. Due to its slow growth rate and low population numbers, African forest elephants are more sensitive to human-induced mortality than savanna elephants, and their populations have declined rapidly in the past decade (Poulsen et al. 2017; Turkalo et al. 2017). The convention and its projects, such as the Monitoring the Illegal Killing of Elephants (MIKE), need to treat the forest elephant as a full species, reassess its populations, and reanalyze the data (Groves 2016), so that it can identify primary threats, determine hotspots of protection, and adopt appropriate strategies, which will help build a consensus among polarized factions in debates about global policy on conservation of African elephants.

The convention is trying to explore new strategies. When the Nomenclature Specialists recognize a newly described species (e.g., Asian arowana [*Scleropages inscriptus*] and pygmy three-toed sloth [*Bradypus pygmaeus*]), the CITES Secretariat sends notifications to the parties to confirm their inclusion. For some taxa, CITES uses online databases as nomenclature references. The CITES checklist has extracted information from time-specific versions of the Amphibian Species of the World and the Catalog of Fishes and may do so from the World Registry of Marine Species after CoP 18.

New species are being discovered, and taxonomies are revised from time to time. The delay in application of scientific knowledge to policy could result in species extinctions (Frank & Wilcove 2019). We suggest CITES invite the International Union for Conservation of Nature and UN Environment World Conservation Monitoring Center to track the recent taxonomic updates of threatened species that may enter international trade. Additionally, a periodic review of newly discovered species that are closely related to species listed in CITES appendices should be conducted, and guidelines for reviewing and updating nomenclature references should be developed.

**Article impact statement:** Delay in listing of species in CITES Appendices associated with nomenclature hinders conservation of species threatened by international trade.

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