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

Twenty-ninth meeting of the Animals Committee
Geneva (Switzerland), 18-22 July 2017

Species specific matters

Maintenance of the Appendices

REPORT OF THE SPECIALIST ON ZOOLOGICAL NOMENCLATURE

1. This document has been prepared by the specialist on zoological nomenclature of the Animals Committee. The Secretariat provided information concerning the implementation of Decisions 17.306 to 17.312, which is included in this report. The nomenclature specialist thanks all colleagues and contacts who provided discussion and information.*

Nomenclatural tasks referred to the Animals Committee at the 17th meeting of the Conference of the Parties (CoP17, Johannesburg, 2016)

African Lion (*Panthera leo*) [Decision 17.313]

2. Decision 17.313 states that 'The Animals Committee shall review the taxonomy and standard nomenclature of *Panthera leo* and report its recommendations to the 18th meeting of the Conference of the Parties.' The Nomenclatural Standard Reference (NSR) for *Panthera leo* is WILSON & REEDER (2005)[1]. WILSON & REEDER (2005) recognize a total of 11 subspecies as valid, including *Panthera leo persica* which is the Asiatic Lion now endemic to the Gir forest of Gujarat, India, but historically ranged as far as Iraq. The other 10 recognized subspecies (*leo*, *azandica*, *bleyenberghi*, *hollisteri*, *kamptzi*, *krugeri*, *massaica*, *melanochaita*, *nyanzae*, and *senegalensis*) are African in distribution.

3. Subsequent taxonomic research has argued that this taxonomy is oversplit, with e.g. the *Handbook of Mammals* (WILSON & MITTERMEIER, eds., 2009[2]) recognizing only six extant subspecies. Subsequent detailed studies of craniometry (Mazák, 2010[3]) and molecular systematics (DUBACH et al, 2013[4]; BARNETT et al., 2014[5]) led to conclusions that only two lineages warrant taxonomic recognition: One lineage is formed

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* *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

1 WILSON, D. E. & REEDER, D. M. (ed.) (2005): Mammal Species of the World. A Taxonomic and Geographic Reference. Third edition, Vol. 1-2, xxxv + 2142 pp. Baltimore (John Hopkins University Press). ISBN 0-8018-8221-4.

2 WILSON, D.E., & MITTERMEIER, R.A. (eds.) (2009). Handbook of the Mammals of the World. Vol.1. Carnivores. Lynx Edicions, Barcelona. ISBN 978-84-96553-49-1.

3 Mazák, J.H. (2010). Geographical variation and phylogenetics of modern lions based on craniometric data. Journal of Zoology 281(3): 194-209

4 DUBACH, J. M., BRIGGS, M.B., WHITE, P.A., AMENT, B.A. and PATTERSON, B.D. (2013). Genetic perspectives on "Lion Conservation Units" in Eastern and Southern Africa. Conservation Genetics 14(4): 741-755.

5 BARNETT, R., YAMAGUCHI, N., SHAPIRO, B., HO, S.Y.W., BARNES, I., SABIN, R., WERDELIN, L., CUISIN, J. and LARSON, G. (2014). Revealing the maternal demographic history of *Panthera leo* using ancient DNA and a spatially explicit genealogical analysis. BMC evolutionary biology 14(1): 70-81

by the lions of western, northern and Central Africa as well as the remaining Asiatic population; the other lineage is represented by the lions of eastern and southern Africa.

4. However, none of these studies explicitly proposed an updated taxonomy and nomenclature for lions. Logically, the Asian-Northern African lineage, when recognized at subspecies level, would be assigned the name *Panthera leo leo*, and absorb the subspecies *azandica*, *bleyenberghi*, *kamptzi*, *persica* and *senegalensis* as synonyms. The nomenclaturally valid name for the lineage of eastern and southern Africa would be *Panthera leo melanochaita*, with subspecies *hollisteri*, *krugeri*, *massaica*, and *nyanzae* as synonyms.

5. If the Conference of the Parties were to adopt these taxonomic changes as the standard CITES nomenclature once formalized in the published literature, the main consequence would be the change of the validity of the subspecies name *persica*, to become a synonym of the typical subspecies *Panthera leo leo*. Updating the CITES nomenclature, by adoption of a supplementary NSR for *Panthera leo*, would therefore require that the present Appendix I listing of *Panthera leo persica* be changed to the Appendix I listing of "*Panthera leo leo* [Population of India]", or simply "*Panthera leo* [Population of India]". The latter would be a non-substantive change that would be unaffected by future taxonomic changes to the lion subspecies.

Identification of CITES-listed corals in trade [Decision 17.306-17.308]

6. The Secretariat will provide an oral update at this meeting.

Use of time-specific versions of online databases as standard nomenclature references [Decisions 17.309-17.310]

7. The Secretariat will provide an oral update at this meeting.

Bird family and order names [Decisions 17.311-17.312]

8. At present, the primary NSR for birds at species level is the 3rd edition of *The Howard & Moore complete checklist of the birds of the world* (Dickinson, 2003). Since its adoption by CITES, a fourth edition has appeared in print; moreover, HBW and Birdlife International have produced a two-volume *Illustrated Checklist of Birds of the World* which has found wide following, including by the Convention on Conservation of Migratory Species of Wild Animals (CMS) and the IUCN Red List.

9. A comparison between the 3rd (2003) and 4th (non-passerines volume, 2013) editions of *The Howard & Moore complete checklist of the birds of the world* was provided in Annex 3 of document AC27 Doc.25.1. Differences between the CITES Appendices (following CoP16) and the draft of the non-passerine volume of the *HBW and Birdlife International Illustrated Checklist of Birds of the World* were tabulated in Annex 8 of document AC27 Doc.25.1. A further comparison was made in Annex 4 of document AC28 Doc. 21.1, comparing the differences between the 3rd and 4th (non-passerine and passerine volumes) editions of *The Howard & Moore complete checklist of the birds of the world* and the first (non-passerine) volume of the *HBW and Birdlife International Illustrated Checklist of Birds of the World*. As such, all that remains to be done is to extend the comparisons already carried out to the second passerine volume of the HBW and Birdlife International *Illustrated Checklist of Birds of the World*, and to encompass bird family and order names. In its comments on document CoP17 Doc. 81.1, in which Decisions 17.311 and 17.312 were proposed, the Secretariat had indicated that their implementation would be the subject of a consultancy, requiring an estimated 10,000 to 15,000 USD in external funding. To-date the necessary resources have not been secured, and donors are invited to provide the funding required. The Secretariat will provide an oral update with regard to its efforts to secure these resources and conduct the analysis.

<u>Other nomenclatural issues outstanding after CoP17</u>

Nomenclature of Seahorses (*Hippocampus* spp.)

10. The nomenclature of Seahorses (*Hippocampus* spp.) has been dynamic for many years, and consequently has been a topic of discussion in CITES, most recently at CoP17 [see document CoP17 Doc.81.2 (Rev.1)]. Following CoP17, a total of 14 NSRs concerning the genus *Hippocampus* are contained in the Annex of Resolution Conf. 12.11 (Rev. CoP17) on *Standard nomenclature*. After the document submission date for CoP17, and thus unavailable for possible adoption at CoP17, a detailed, peer-reviewed global checklist of

Seahorses was published by LOURIE, POLLOM and FOSTER (2016)[6]. This Checklist differs in some details from the combined information contained in the 14 adopted NSRs, specifically in the synonymisation of *H. severnsi* under *H. pontohi*, and the provisional synonymisation of *H. waleananus* under *H. satomiae*. In addition, inconsistencies between range countries recorded in the work by LOURIE et al. (2016), the *CITES Checklist of Species* and Species+ database, and national distribution records of Australia and possibly other range State Parties, may need to be clarified. Nevertheless, the adoption of this Checklist as a new NSR would allow the elimination of the great majority of current NSRs concerning seahorses. Alternatively, the option may be evaluated how a date-defined extract for the genus *Hippocampus* from the NSR for all other CITES-listed fishes, ESCHMEYER & FRICKE'S *Catalog of Fishes*[7], would correspond to the prevailing or preferred nomenclature for seahorses for CITES. Consequently, the Animals Committee is invited to consider the relative merits of adopting LOURIE, POLLOM and FOSTER (2016) as a new NSR for the species of the genus *Hippocampus*, or to suggest alternative ways forward.

Nomenclature reference for the mammal genus *Ovis*

11. The adoption at CoP17 of the primary NSR for Mammals, Wilson & Reeder 2005[2], to apply to the genus *Ovis* occasioned suggestions from Parties that further work on nomenclature of the genus was required (see document CoP17 Com. I Rec. 3 (Rev.1) – P.2). Recalling the extensive work done by Dr. Grimm, as presented in Annex 3 of document AC28 Doc.21.1, as well as queries received by the Secretariat and the Nomenclature Specialist concerning *Ovis* nomenclature, further efforts at clarification are warranted. An attempt to summarize the current nomenclature, and nomenclature proposed in the Hoofed Mammals volume of the Handbook of Mammals (Valdez & Weinberg, in Wilson & Mittermeier, 2011[8]) as well as distribution of the specific taxa, is provided in Annex 1 of the present document.

12. One effect of the adoption of Wilson and Reeder (2005) is that its nomenclature uses the same species name for both the domestic sheep and its wild ancestors, separating them only by the different subspecies names applied. The domestic sheep is the typical subspecies, *Ovis aries aries*, while the related wild sheep populations are designated by different subspecies names. Obviously, domestic sheep are not subject to the provisions of the Convention, and to take account of this, the Appendices list the entry for *Ovis aries* as follows:

> *"**Ovis aries*** (Except the subspecies included in Appendix I, the subspecies *O. a. isphahanica, O. a. laristanica, O. a. musimon* and *O. a. orientalis* which are not included in the Appendices, and the domesticated form *Ovis aries aries* which is not subject to the provisions of the Convention)"

13. It has become apparent that the phrasing of the Appendix II listing for *Ovis aries* has created some complications when trade documents do not use valid nomenclature. A specific example involved a trade shipment accompanied by documentation describing the specimens as 'Karakul wool', and using the scientific name *Ovis aries platyura*. This name, however, is an obsolete name that has been synonymized under *Ovis aries aries* (Wilson & Reeder, 2005: Page 709). This shipment labelled *Ovis aries platyura* was deemed by the importing Party not to refer to any of the subspecies listed in Appendix I or the subspecies excluded from the Appendices, and was therefore treated as a shipment of an Appendix II species and refused entry. This emphasizes the importance for traders and Management and Scientific Authorities to ensure that valid, recognized and standardized scientific names are used in all documentation.

14. A possible solution may be found by explicitly listing the subspecies *Ovis aries arkal* and *Ovis aries cycloceros* in Appendix II, and deleting the species-wide annotated listing of *Ovis aries* from Appendix II; the listing of the subspecies *O. a. ophion* and *O. a. vignei* in Appendix I would obviously remain unchanged.

<u>Supplementary Nomenclature Standard References for species included in the Appendices at CoP17</u>

15. With the adoption of proposals at CoP17, several species and genera were added to the CITES Appendices which are not covered by the NSRs as currently adopted [see Annex of Resolution Conf. 12.11 (Rev. CoP17)]. These cases are tabulated below, with a recommendation for the adoption of a NSR. Where these

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6 LOURIE, S.A., POLLOM, R.A. and FOSTER, S.J. 2016. A global revision of the Seahorses *Hippocampus* Rafinesque 1810 (Actinopterygii: Sygnathiformes): Taxonomy and biogeography with recommendations for further research. Zootaxa 4146(1): 1-066.

7 ESCHMEYER, W.N. & FRICKE, R. (eds.): Catalog of Fishes, an online reference. http://researcharchive.calacademy.org/research/Ichthyology/catalog/fishcatmain.asp

8 Valdez, R. & Weinberg, P.J. (2011) Species accounts 188-207 for *Ovis* spp. pp. 727-739 in Wilson & Mittermeier, (Eds.), Handbook of the Mammals of the World. Vol.2. Hoofed Mammals. Lynx Edicions, Barcelona. ISBN 978-84-96553-77-4.

NSRs are in the form of extracts from online databases, it is envisaged to integrate these supplementary NSRs into updated versions of the respective Nomenclatural Standard References for adoption at CoP18.

Taxon	Proposed Nomenclatural Standard Reference
Reptilia: Sauria: Anguidae: *Abronia* spp	Taxonomic Checklist of the Species of the Genus *Abronia*. Species information extracted from UETZ, P., FREED, P., & HOŠEK, J. (eds.) (2016): The Reptile Database. (http://reptile-database.org/), version of 15 August 2016, accessed 11 May 2017. See Annex 2
Reptilia: Sauria: Gekkonidae: *Cnemaspis psychedelica*	GRISMER, L.L., NGO, V.T. and GRISMER, J.L. (2010). A colorful new species of insular rock gecko (*Cnemaspis* Strauch 1887) from southern Vietnam. Zootaxa, 58: 46–58.
Reptilia: Sauria: Gekkonidae: *Lygodactylus williamsi*	Species information extracted from UETZ, P., FREED, P., & HOŠEK, J. (eds.) (2016): The Reptile Database. (http://reptile-database.org/), version of 15 August 2016, accessed 11 May 2017. See Annex 2
Reptilia: Sauria: Gekkonidae: *Paroedura masobe*	NUSSBAUM, R.A. & RAXWORTHY, C.J. (1994). A new rainforest gecko of the genus *Paroedura* GÜNTHER from Madagascar. *Herpetological Natural History* 2 (1): 43-49.
Reptilia: Sauria: Lanthanotidae spp.	Family, genus and species information extracted from the Integrated Taxonomic Information Service (ITIS), an online reference (https://www.itis.gov); and species information extracted from UETZ, P., FREED, P., & HOŠEK, J. (eds.) (2016): The Reptile Database. (http://reptile-database.org/), version of 15 August 2016, accessed 11 May 2017. See Annex 2
Reptilia: Serpentes: Viperidae: *Atheris desaixi*	Species information extracted from UETZ, P., FREED, P., & HOŠEK, J. (eds.) (2016): The Reptile Database. (http://reptile-database.org/), version of 15 August 2016, accessed 11 May 2017. See Annex 2
Reptilia: Serpentes: Viperidae: *Bitis worthingtoni*	Species information extracted from UETZ, P., FREED, P., & HOŠEK, J. (eds.) (2016): The Reptile Database. (http://reptile-database.org/), version of 15 August 2016, accessed 11 May 2017. See Annex 2
Amphibia: Anura: Microhylidae: *Dyscophus* spp.	Species information extracted from FROST, D. R. (ed.) (2017), Amphibian Species of the World: a taxonomic and geographic reference, an online reference (http://research.amnh.org/herpetology/amphibia/index.html), Version 6.0, accessed 12 May 2017. See Annex 3
Amphibia: Anura: Microhylidae: *Scaphiophryne* spp.	Species information extracted from FROST, D. R. (ed.) (2017), Amphibian Species of the World: a taxonomic and geographic reference, an online reference (http://research.amnh.org/herpetology/amphibia/index.html), Version 6.0, accessed 12 May 2017. See Annex 3
Amphibia: Anura: Telmatobiidae: *Telmatobius culeus*	Species information extracted from FROST, D. R. (ed.) (2017), Amphibian Species of the World: a taxonomic and geographic reference, an online reference (http://research.amnh.org/herpetology/amphibia/index.html), Version 6.0, accessed 12 May 2017. See Annex 3
Amphibia: Caudata: Salamandridae: *Paramesotriton hongkongensis*	Species information extracted from FROST, D. R. (ed.) (2017), Amphibian Species of the World: a taxonomic and geographic reference, an online reference (http://research.amnh.org/herpetology/amphibia/index.html), Version 6.0, accessed 12 May 2017. See Annex 3
Elasmobranchii: Carcharhiniformes: Carcharhinidae: *Carcharhinus falciformis*	Information extracted from ESCHMEYER, W.N., FRICKE, R., & VAN DER LAAN, R. (eds.): Catalog of Fishes: Genera, Species, References, an online reference (http://researcharchive.calacademy.org/research/Ichthyology/catalog/fishcatmain.asp), version of 28 April 2017, accessed 12 May 2017. See Annex 4
Elasmobranchii: Lamniformes: Alopiidae: Alopias spp.	Information extracted from ESCHMEYER, W.N., FRICKE, R., & VAN DER LAAN, R. (eds.): Catalog of Fishes: Genera, Species, References, an online reference (http://researcharchive.calacademy.org/research/Ichthyology/catalog/fishcatmain.asp), version of 28 April 2017, accessed 12 May 2017. See Annex 4

Taxon	Proposed Nomenclatural Standard Reference
Elasmobranchii: Myliobatiformes: Myliobatidae: *Mobula* spp.	Information extracted from ESCHMEYER, W.N., FRICKE, R., & VAN DER LAAN, R. (eds.): Catalog of Fishes: Genera, Species, References, an online reference (http://researcharchive.calacademy.org/research/Ichthyology/catalog/fishcatmain.asp), version of 28 April 2017, accessed 12 May 2017. See Annex 4
Elasmobranchii: Myliobatiformes: Potamotrygonidae: *Potamotrygon* spp.	Information extracted from ESCHMEYER, W.N., FRICKE, R., & VAN DER LAAN, R. (eds.): Catalog of Fishes: Genera, Species, References, an online reference (http://researcharchive.calacademy.org/research/Ichthyology/catalog/fishcatmain.asp), version of 28 April 2017, accessed 12 May 2017. See Annex 4
Actinopteri: Perciformes: Pomacanthidae: *Holacanthus clarionensis*	Information extracted from ESCHMEYER, W.N., FRICKE, R., & VAN DER LAAN, R. (eds.): Catalog of Fishes: Genera, Species, References, an online reference (http://researcharchive.calacademy.org/research/Ichthyology/catalog/fishcatmain.asp), version of 28 April 2017, accessed 12 May 2017. See Annex 4
Mollusca: Cephalopoda: Nautilidae	Family, genus and species information extracted from the Integrated Taxonomic Information Service (ITIS), an online reference (https://www.itis.gov), incorporating ITIS 2016a and ITIS 2016b as used by the proponents of Proposal CoP17 Prop. 48 (Rev.). See Annex 5
Mollusca: Gastropoda: Cepolidae: *Polymita* spp.	Recommendation needed! Suggested NSR not suitable [BOUCHET, P. & ROCROI J.P. (eds.) (2005): Classification and nomenclature of gastropod families. Part 2. Working classification of the Gastropoda, Pulmonata (HAUSDORF and BOUCHET). Malacologica **47**(1/2): 263-283.].

Identified nomenclature changes in mammal, bird, reptile, amphibian, fish and invertebrate species listed in the CITES Appendices

16. Taxonomic research on CITES-listed and other species continues at a rapid pace in the biological community, and the nomenclatural effects of this research are extensive. Annex 6 contains a table of nomenclatural changes affecting CITES-listed species that have come to the attention of the Nomenclature Specialist of the Animals Committee since the last such list was prepared for AC28 in June 2015. It is certain that Annex 6 contains only a fraction of the nomenclatural changes proposed in the recently published literature, and the Nomenclature Specialist therefore requests the Parties' assistance in identifying further publications of interest, by sharing such publications directly or via the Secretariat. A number of cases warrant further comment, below.

Crocodylia: Crocodiles, Alligators and relatives

17 The current NSR for the order Crocodylia is Wermuth & Mertens (1996 reprint)[9]. Unfortunately, in its Annex (Anhang, pp. 494-497) a formatting error in the rightmost column on page 497 (cell missing above *C. niloticus madagascariensis*, offset by extra cell under *C. porosus biporcatus*) has the potential to create confusion. Moreover, progress with taxonomy and nomenclature of crocodilians has led to the recognition of cryptic species, as well as the elevation of traditional subspecies to species rank (see Annex 6). The Nomenclature Specialist reached out to the IUCN SSC Crocodile Specialist Group on possible ways forward to address these matters, and will report back as appropriate.

***Daboia russelii*: Russell's Viper**

18. The snake species *Daboia russelii* was included in Appendix III by India in 1984. The current NSR for this snake is MCDIARMID, R. W., CAMPBELL, J. A. & TOURÉ, T. A. (1999): *Snake Species of the World*, recognizing the species to range through Bangladesh, Cambodia, China, India, Indonesia, Myanmar, Nepal, Pakistan, Sri Lanka, and Thailand. The typical subspecies *russelii* occurs in Bangladesh, India, Nepal, Pakistan and Sri Lanka, while *siamensis* occurs in Cambodia, China, Indonesia, Myanmar and Thailand. THORPE, POOK

[9] WERMUTH, H. & MERTENS, R. (1996) (reprint): Schildkröte, Krokodile, Brückenechsen. xvii + 506 pp. Jena (Gustav Fischer Verlag).

& MALHOTRA (2007)[10] argued that the subspecies *siamensis* warrants recognition as a valid separate species (i.e., *Daboia siamensis*), and this view has been widely accepted by the zoological community. However, this nomenclatural change has not been adopted by the CITES Parties to date. In case of Appendix III listings, the CITES provisions in Article V place different document requirements on the Party(ies) which included the species in Appendix III, than those of the other Parties. Recognition of *siamensis* as a separate species by adoption of the work by THORPE, POOK & MALHOTRA (2007) as a NSR would bring CITES nomenclature in agreement with the wider scientific community, but would result in a real change in international regulatory status of the populations of Cambodia, China, Indonesia, Myanmar, and Thailand, which would no longer be affected by the Appendix III listing by India. The implications of this nomenclatural change are therefore significant, and could be addressed by India clarifying whether its Appendix III listing was intended to cover the entire range of the species, as understood at the time of listing (1984), or its national population only, and/or one of the range states for the taxon *siamensis* listing it in Appendix III in its own right.

General considerations on Nomenclatural Standard References for CITES

19. As the list of NSRs for CITES-listed taxa continues to grow (the Annex to Resolution Conf. 12.11 (Rev. CoP17) amounts to 21 pages, comprising over 150 unique references), it becomes increasingly obvious that neither the Nomenclature Specialist, nor the CITES Secretariat, nor any of the Parties' SA or MA, is likely to have the capacity to accumulate and maintain a complete and up-to-date set of all adopted Nomenclatural Standard References, plus previous NSRs which are still required at times for their historical perspective. Fortunately, the increase in availability of many new and some older NSRs as digital pdf files means that NSRs can be shared relatively easily. It would be desirable for a central repository of digitally available NSRs to be established, ideally as part of the CITES website maintained by the Secretariat. Access to such a repository, however, would be in potential conflict with copyright issues associated with NSRs that were not published as Open Access documents. The AC members, Parties and observers are invited to share their views and recommendations for the possible establishment of such a digital library.

Recommendations for the work of the Nomenclature Working Group at AC29

20. It is suggested that the Animals Committee re-establish its Nomenclature Working Group at the present meeting to address the following issues:

    – formulate recommendations and seek input from the Parties on further activities needed with regard to Lions (paragraphs 2 to 5) and the genus *Ovis* (paragraphs 11 to 14);

    – take account of the issues described in paragraphs 6, 7, 8-9, and 19, and formulate appropriate responses;

    – develop recommendations concerning the possible adoption of LOURIE, POLLOM and FOSTER (2016) as a NSR to replace the current 14 separate NSRs for *Hippocampus* spp. (paragraph 10).

    – consider the addition of the Nomenclatural Standard References proposed in paragraph 15 for adoption at CoP18; and

    – develop recommendations for the nomenclatural changes referenced in this document in paragraph 16, and listed in Annex 6.

Recommendations

21. The Animals Committee is invited to consider the present document and the information and recommendations that it contains, and to agree to the actions outlined in paragraph 20 above.

[10] THORPE, R.S., POOK, C.E. & MALHOTRA, A. (2007): Phylogeography of the Russell's viper (*Daboia russelii*) complex in relation to variation in the colour patterns and symptoms of envenoming. Herpetological Journal 17: 209-218.