

Ignoring species hybrids in the IUCN Red List assessments for African elephants may bias conservation policy

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To the editor:

Elephants in Africa can be assigned to two different species, savannah elephants (*Loxodonta africana*) and forest elephants (*L. cyclotis*) [1]. The IUCN recently recognised this taxonomic consensus by publishing Red List assessments for both species [2, 3]. Red List assessments are widely regarded as authoritative and they inform and influence conservation policy. Species assessors are experts selected by the respective Red List Authority for the species to be assessed. Although assessors follow the IUCN's detailed and transparent criteria [4], there is always an element of interpretation – in this case, we are concerned that the way assessors assigned elephant populations to either species will be detrimental to elephant conservation policy.

An individual elephant can be assigned to either elephant species based on just a few genetic markers [5]. Where populations have yet to be sampled, species assignments can be done with a 'nearest neighbour' model [6]; the IUCN assessors used this for a strict interpretation of binary species assignments for elephants. However, genetic screening has detected hybridisation between African elephant populations in suture zones, with hybrids reported in at least 10 extant populations [5, 6]. The nearest neighbour model ignored hybrids, both as an input and output category, as can be seen from the occurrence of hybrids inside the polygon where the probability of a forest species assignment is supposedly absolute (Figure 4 in reference 6). This figure also shows an East-West gradient in West Africa, where ecological gradients are generally North-South. This report is written

by two authorities in this field and may be the best evidence there is for the assessment, but we note that it has not been peer reviewed and that it hinges on precarious data: by our calculations, the addition or subtraction of a single savanna elephant in Senegal could change the model outcome substantially. Until field samples from these populations are analysed, we suggest that museum samples could be considered to bring the nearest-neighbour model more in line with the natural history of the species in the region.

One result of the assessment's binary species assignment is that all elephants in West Africa have been evaluated only in the forest elephant assessment, even those occurring in savanna habitats. The sole exception is an elephant population roaming in desert habitat in the Gourma region of Mali, where hybrids were found alongside savanna elephants. Even though this population migrates partly into Burkina Faso [7], Mali is the only West African state mentioned in the savanna elephant assessment. The nearby W-Arly-Pendjari (WAP) complex, the largest protected savanna in West Africa and a stronghold for many savanna species, with hybrids alongside forest elephants [5], is not included in the savanna elephant assessment. Likewise for Senegal's elephants: while their taxonomic status is unknown, based on the model [6] they were only included in the forest elephant assessment.

Senegal, Burkina Faso and Niger are Sahel countries, like Mali, and their elephants are ecologically essential for the arid systems they live in. Other countries have forests in the South and savannahs in the North, such as the WAP component in North Benin. Yet, the Red Listing assessment process has not accounted for this regional pattern. Red List guidelines clearly exclude the assessment of hybrids as a taxon [8], but guidance is missing on how to account for hybrid individuals. We agree that West African elephant populations with forest elephants must be included in the forest elephant assessment, but elephant populations with hybrids in savanna habitat could equally have been included in the savanna elephant assessment with reference to uncertainty and complexity.

The assessors' choice to ignore hybrids has important policy consequences: with the exception of Mali, former West African elephant Range States are now classified as forest elephant Range States, not as savanna elephant Range States. Red List assessments carry a lot of weight at international conventions, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), where elephants have been discussed at great length [9]. Within CITES, being a Range State is important – for example, proposals on a certain taxon are usually introduced by Range States who would normally first consult with each other. Intentional or not, these Red List assessments will prime future CITES debates; for instance, West Africa's dryland states might go to one working group, together with Central Africa, where forest elephants could be proposed for the highest listing and strictest annotation. Meanwhile, the working group with savanna elephant Range States could be debating legal ivory trade, leaving West Africa as outsiders to a discussion that is core to their conservation policies [10].

The IUCN Red List elephant assessments set a precedent in an area where technical guidance is lacking; such guidance is essential to assess taxa where hybridisation and genetic admixture are relatively common (e.g., plants, but also some insects, fish and birds). The IUCN SSC African Elephant Specialist Group stated that it has formed 'a taxonomy task force to develop supporting documentation for the economic, political, and conservation implications of the two-species listing'

[1], but that may be ‘too little too late’. We suggest a revision whereby taxonomic correctness does not compromise the prime goal of the Red List: to assess extinction risk, in this case of elephants in West African savannas.

The authors declare no competing interests.

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