

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

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Sixty-first meeting of the Standing Committee  
Geneva (Switzerland), 15-19 August 2011

IMPLEMENTATION OF THE AFRICAN ELEPHANT ACTION PLAN

1. This document has been prepared by Germany\*.
2. Since 2010 the federal government of Germany has commissioned a research project on the determination of age and the geographical origin of African elephant ivory. A brief description of the project is attached to this information document as an Annex.
3. The project and its actual status will be introduced to the CITES community during a side event at the 61st meeting of the CITES Standing Committee.
4. Germany invites all Elephant range states to cooperate in this project by providing ivory samples for the verification of the methods for the determination of age and geographical origin of ivory to be developed by the project.
5. Germany considers this project as a contribution to the implementation of the African Elephant Action Plan (CoP15 Inf. 68), in particular Priority Objective 1, Activity 1.4.3.

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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.*

## Determination of Age and Geographical Origin of African Elephant Ivory

*Research and Development Project of Germany's CITES Management Authority  
(Federal Agency for Nature Conservation)*

Exact methods for the determination of age and geographical origin of ivory are essential to deal with the still persisting problem of smuggling and they can help to avoid the intermixing of legal with illegal ivory. The protection and preservation of the declining elephant populations of Western and Central Africa will only be possible with a control mechanism that helps identifying the age and the geographical provenance of confiscated ivory. At present such a control mechanism is not available for the CITES member states. Therefore the African Elephant Action Plan by the African Elephant range states (CoP15 Inf. 68) highlights the need for improved law enforcement and management by identifying the origin of seized ivory by means of relevant analytic techniques (Activity 1.4.3. of Objective 1).

### Age determination

The purpose of this part of the project is to validate a new method for the determination of the age of ivory that is based on isotopic analysis. The new method will combine the existing radiocarbon dating with the analysis of a variety of additional nuclides ( $^{90}\text{Sr}/\text{Ca}$ ,  $^{228}\text{Th}$ ,  $^{232}\text{Th}$  and others). With the conventional method the results can be ambiguous as the year of death cannot be defined clearly (e. g. 1962 and 1980 for the same sample) but in combination with strontium- and thorium analyses the result is more accurate.

Concerning the analysis of  $^{90}\text{Sr}/\text{Ca}$  a significantly increased value is typical for a death between 1960 and 1970 due to nuclear testing. Lower values indicate a death before 1960 or after 1980. A value below the detection limit indicates a death before 1955.

Concerning the analysis of thorium the ratio of  $^{228}\text{Th}$  to  $^{232}\text{Th}$  is 1:1 if the time of death is dated back before 1960, if the death was approximately 1990 the ratio is higher than 1:1. Therefore by combining these analyses the time of death of the elephant can be determined with a high degree of certainty. This makes the method very precise and extremely reliable.

### Determination of the geographical origin

Furthermore a method for the determination of the exact geographical origin of African elephant ivory will be tested and applied. The focus of this part of the project is to build up a reference database for the African continent by analyzing more than 500 ivory samples and combining the results with the spatial monitoring data of the IUCN. Therefore ivory with known origin from all over Africa must be tested by means of various geochemical analyses (strontium, but also carbon, nitrogen, oxygen and sulphur). The composition of these elements in a tusk is dependant on the food elephants are consuming, which differs according to their habitat (vegetation, soil and climate). I.e. young volcanic regions like the East African Rift are characterized by a low  $^{87}\text{Sr}/^{86}\text{Sr}$  ratio, whereas geologically older parts have a high  $^{87}\text{Sr}/^{86}\text{Sr}$  ratio. Carbon and nitrogen isotopes serve as indicators of the nutritional composition or of the climate zone. A very low  $\delta^{13}\text{C}$  ratio indicates densely forested habitats, a high ratio is indicative of savannah landscapes.

After its completion the database can be used to identify the geographical provenance of confiscated ivory as a device to check the legality and it will be open to everybody.

### 500 ivory samples required!

Governments, natural history museums and private individuals within and outside the EU are welcome to support this research project by providing the German Federal Agency for Nature Conservation with small samples of time- and / or geographically referenced elephant tusks. Any assistance will contribute a lot to the project's success and the long-term protection of the African elephant.

- For the part 'Determination of the geographical origin' samples of 0,25 g are required that can be sawed or broken off the base or taken from the inside of a tusk. It is very important for the project that the country of origin is known, but even better if the exact place of death can be specified.

- For the part 'Age determination' samples of 15g are needed that can be sawed or broken off the base of a tusk. The time of death of the elephant has to be known as exactly as possible. Samples from tusks dated between 1963 and 1982 are required. But younger or older samples are also welcome and will be used for the project part 'Determination of the geographical origin' (if their origin is known).

If you are interested to receive more detailed information about the project please see the website of the German Federal Agency for Nature Conservation: [http://www.bfn.de/0305\\_cites+M5054de7a952.html](http://www.bfn.de/0305_cites+M5054de7a952.html) -> current issues.

If you would like to provide practical input please contact the

**Federal Agency for Nature Conservation**

*Mrs. Hornig / Mrs. Denk*

*Konstantinstr. 110*

*53179 Bonn*

*Germany*

*Phone: 0049 (0)228 8491 13 -40 or -44*

*Fax: 0049 (0)228 8491 1319*

*Mail: [hornigk@bfn.de](mailto:hornigk@bfn.de), [denkic@bfn.de](mailto:denkic@bfn.de)*