AFRICAN STUDBOOK

WESTERN GIANT ELAND

Taurotragus derbianus derbianus
(GRAY, 1847)

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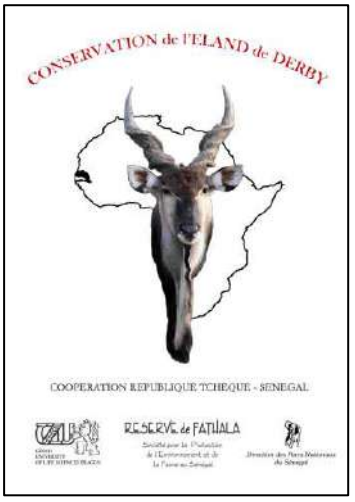

RESERVE de FATHALA

S.P.E.F.S. s.a.r.l.

Société pour la Protection de l'Environnement et de la Faune au Sénégal

CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE
INSTITUTE OF TROPICS AND SUBTROPICS

AFRICAN STUDBOOK

WESTERN GIANT ELAND
Taurotragus derbianus derbianus
(GRAY, 1847)

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funded by the Czech Republic Development Cooperation

&

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Front cover: The face of the breeding male of the Western giant eland in the Bandia Reserve

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Participating organisations and institutions

Society for the Protection of Environment and Fauna in Senegal (SPEFS) founded the semi-captive Western giant eland conservation programme, hosting the animals in their two nature Reserves and providing them with necessary protection, breeding facilities, and management.

Institute of Tropics and Subtropics (ITS) at the **Czech University of Life Sciences Prague** (CULS) provides the Western giant eland conservation programme with scientific expertise in the domains of ecology, behaviour, and genetic management. The ITS CULS also arranges professional veterinary services for animal transport, supports the development of infrastructure in the nature reserves and provides environmental education for local people in the area of the breeding reserves.

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Ministry of Environment and Protection of Nature of Senegal (MEPN) and **Directorate of National Parks in Senegal** (DPNS) provides the legislative framework and represents the government authority responsible for nature conservation in Senegal.

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Introduction

Motto
There is no activity that is as risky as inactivity. It is necessary to apply practical measures that decide on the future of a species before all of the necessary data is available.

Soulé 1985

Evolutionary history shows that extinction can be considered as a natural phenomenon that can happen to any species. The majority of current extinctions appear to be caused either directly or indirectly by human activities and a lot of species are threatened accordingly. The survival of many endangered species, if the preservation of their population within their natural ecosystem is unlikely to be feasible, depends upon the assistance of man in captive breeding programmes *ex situ*. Endangered species are characterised, as indicated by their status, by small populations that need careful management without which their rare gene pool would be forever lost.

The Western giant eland (*Taurotragus derbianus derbianus*), the largest antelope in the world, is the emblematic species representing the rich biodiversity not only of Senegal but the whole West African region. This majestic antelope, numbering fewer than 200 individuals in the wild, has come to the point of extinction. This situation, finally, has highlighted the need for a coordinated conservation programme. Although the need to establish a conservation programme *in situ* (East 1998; Chardonnet 1999), as well as a captive breeding programme *ex situ* (Sausman 1993), was recognised in the 1990s, conservation measures in Senegal were not implemented until the 2000s (Nežerková *et al.* 2004).

The establishment and running of the *ex situ* conservation breeding programme has been a very complex and long-term operation. Success is highly dependent on the coordinated cooperation of all involved partners, on the thoughtful synthesis of scientific knowledge of ecology, behaviour and genetics, linked with shepherd management and veterinary surveys. Successful Western giant eland conservation has incalculable intrinsic value.

The African studbook for the Western giant eland represents an integral part of the conservation breeding programme and aims to provide careful identification of individuals and their life histories. We have paid particular attention to the accuracy of all information (gathered through our own observations). The studbook therefore plays an essential role in breeding management of the Western giant eland semi-captive population and thereby directly contributes to the survival of this charismatic antelope.

SECTION A

The natural history of Western giant eland

The breeding male Niokolo in the Bandia Reserve

Phylogeny

The Giant eland belongs to the family Bovidae. This family is characterised by non-complete findings from the age when a great number of its subfamilies developed. This factor, together with considerable morphological interspecies diversity, led to disunity in taxonomic inclusion, especially as regards subfamilies and tribes (Matthee and Robinson 1999).

The Bovidae are characterised by a basal division which separates the Bovinae (cow, nilgai, kudu clade) from the remaining bovid taxa (Matthee and Davis 2001). Matthee and Robinson (1999) have dealt with taxonomic structure in subfamily Alcelaphinae, Antilopinae, Tragelaphinae and Neotraginae on the basis of cytochrome-b analysis.

Fossils suggest an African branch of Tragelaphines for at least fifteen million years. It seems possible that all African Tragelaphines derive from a single immigrant ancestral type which subsequently branched into a larger and smaller lineage. The elands have almost certainly evolved from a giant form of kudu that was abundant about 1.3 million years ago (Kingdon 1997).

Phylogenetic relationship among the nine spiral-horn antelope species of the African bovid tribe Tragelaphini is controversial. In particular, mitochondrial DNA sequencing studies are not congruent with previous morphological investigations (Willows-Munro *et al.* 2005, Rubeš *et al.* 2008).

Taxonomy

Kingdom	:	*Animalia*
Phylum	:	*Chordata*
Class	:	*Mammalia*
Order	:	*Artiodactyla*
Suborder	:	*Ruminantia*
Family	:	*Bovidae*
Sub-family	:	*Tragelaphinae*
Genus	:	*Taurotragus*
Species	:	*derbianus*
Sub-species	:	*derbianus*
Common name:		Western giant eland

(Kingdon 1982; Wilson and Reeder 1993)

The Giant eland was first mentioned in the 1840s. Dr E J Gray described this animal on the basis of two frontlets with horns together with a single horn of a younger bull from Senegambia shot by collector Mr T Whitfield in 1842, who was working for the thirteenth Earl of Derby, and by two later skins from a cow and a bull (Gray 1847).

In 1862, after visiting Senegambia, Reade (1863) informs us of the existence of an enormous antelope that the native hunters call *Djink-i-junka* ('the bush is dark')

'…double the size of the Senegal bullock, with the horns lying backwards, a black mane, and white stripes on its sides….' and describes the occurrence of these animals in the shrubby and impenetrable landscape.

Although it is assigned by some authors to the genus *Tragelaphus* (Baillie and Groombridge, 1996; East 1998), we place Giant eland in *Taurotragus* together with *T. oryx*, both regarded as full distinct species, according to Wilson and Reeder (1993). Two subspecies are commonly recognized: *T. d. derbianus* and *T. d. gigas*.

Morphology

The Giant eland is somewhat bovine like the eland, yet more elegant, in spite of its size (Bro-Jørgensen 1997). It is a massive antelope with body length of 290 cm in the bulls, 220 cm in the cows, and its height at the withers is between 150 and 176 cm in the bulls, 150 cm in the cows. Males can reach weights of 450-907 kg, females 440 kg. Horn length ranges from 80 to 123 cm (Kingdon 1982; 1997).

Its overall colour is ruddy fawn or chestnut, sometimes with a tint of bluish grey in adult bulls. This depends on the animal's age and the climatic period or according to Bro-Jørgensen (1997) it may reflect the androgen status reaching its extreme in mature bulls during rutting. It has roughly nine to fourteen white stripes on its flanks. The adult bulls grow a knot of brown hairs on the forehead. It has a black mane on its neck from which a black stripe continues along the entire length of the back. From the chin to the chest there hangs an enormous black and white dewlap. Two white cheek spots and a white stripe in front of the eye are present on each side. The ears are broad, rounded and prominently marked, as are the hocks (white and black). The dark tufted bovine tail measure 55 to 78cm. Both sexes have large and massive horns, especially the bulls. They curve in a spiral and can reach lengths of up to 80 to 123 cm; those of the males are longer and more widely splayed and have a looser spiral than in the common eland. They are a greatly prized hunting trophy (Dorst and Dandelot 1970; Kingdon 1982; 1997). False hoof glands and probably apocrine glands under the forehead tuft are present. The hooves are not as broad as those of the eland; the false hooves are large. The cow has four teats (Bro-Jørgensen 1997).

The Giant eland has two sub-species. The difference between the sub-species has, until now, only been determined on the basis of the morphological description. The western subspecies (*Taurotragus derbianus derbianus* GRAY 1847) is characterised by smaller size, bright rufous ground colour and about fifteen body stripes. The eastern subspecies (*Taurotragus derbianus gigas* HEUGLIN 1863) is characterised by larger body size, sandy ground colour and around twelve body stripes (Dorst and Dandelot 1970; Kingdon 1982; 1997; Ruggiero 1990).

Ecology

The Giant eland is predominantly a browser. Its habitat is the savannah woodland that stretches across Africa from north of the 10°N latitude at the Atlantic Coast in

the west to not far north of the equator on the west bank of the Nile in the east, i.e. from Senegal to Uganda (Bro-Jørgensen 1997).

Twenty-eight woody species were recorded as food of the antelope in the NKNP. Microhistological analyses of the Western giant eland faeces confirmed leaves of woody species and fruits of *Strychnos spinosa* as a major part of its diet (Podhájecká 2008). In the NKNP, clear browse marks were found on the species *Feretia apodanthera, Gardenia* sp., *Grewia bicolor, G. flavescens*, *Hexalobus monopetalus*, *Hymenocardia acida*, *Mitragyna inermis*, *Pterocarpus erinaceus*, and *Ziziphus mauritiana*. Although the rangers did not mention *Boscia angustifolia* as part of the Giant eland's diet, the browse marks on this woody species were very conspicuous and corresponded observations from the Bandia Reserve. This species, however, is not one of the most abundant species in the NKNP. On the other hand, *Cassia tora* is very abundant, despite no browse marks being observed on it. *Isoberlinia doka* was indicated by the rangers, but the data related to experience from their own observations in Cameroon. This species has never been recorded in the NKNP (Berhaut 1967; Anonymous 2000).

Geographical distribution and status in the wild

The two subspecies differ in geographical distributions (Fig. 1) as well as in their conservation status IUCN (2007).

The Western giant eland at the beginning of the 20th century was probably found in Senegal, Gambia, Guinea-Bissau, Mali, Sierra Leone, Ivory Coast, Togo and Ghana and might never have been widespread in West Africa owing to the narrowness of the belt with a suitable rainfall of 1100 to 1300 mm (Spinage 1986). The presence of this antelope, however, was not confirmed in Mali, Guinea and Guinea-Bissau at the end of the 1990's (Camara 1990; Chardonnet and Limoges 1990; Heringa 1990; Roth and Hoppe-Dominik 1990; Sournia and Dupuy 1990; Sournia *et al.* 1990; Teleki *et al.* 1990; Chardonnet 1999). There were some indirect indications of the Western giant eland (several hides on local markets) in Mali and Guinea in 2003 (Darroze 2004). Therefore, the only population of this emblematic antelope remains in Senegal, and in other regions seems to be extinct.

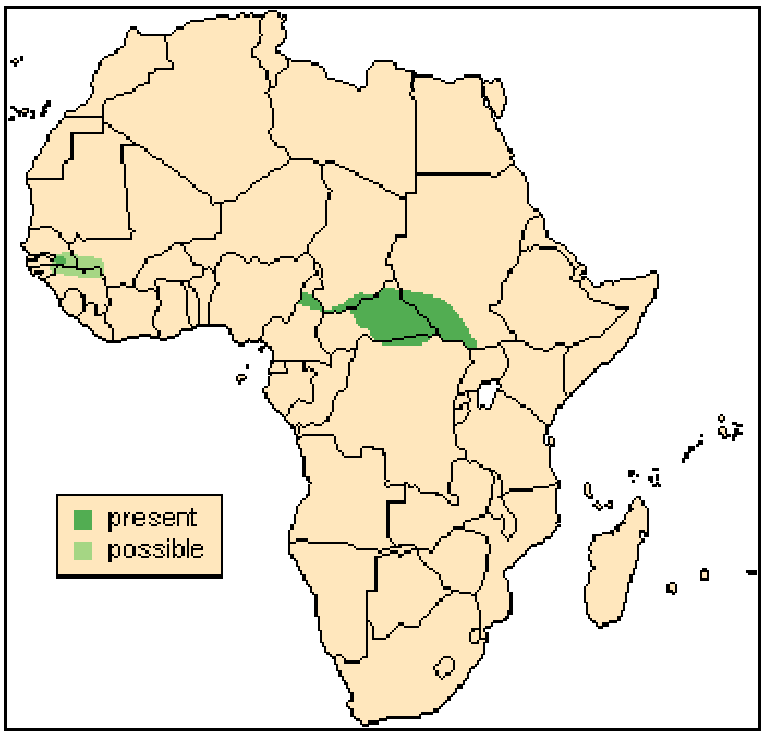

Fig. 1. Geographical distribution of two sub-species of Giant eland: Western giant eland on the left side, Eastern giant eland on the right side (IEA 1998).

In Senegal, the population of the Western giant eland in the NKNP was observed in the framework of aerial and ground-based surveys in the park (Dupuy 1970; 1971; Galat *et al.* 1992; Benoit 1993; Hájek and Verner 2000; Mauvais and Ndiaye 2004; Renaud *et al.* 2006). In 1990, Western giant elands were estimated to number about 1000 individuals, of which 700 to 800 were to be found in the NKNP and the remainder around the Falémé River (Sournia and Dupuy 1990, Fig. 2). Currently population number is estimated to around 100 – 170 individuals (Hájek and Verner 2000, Renaud *et al.* 2008). There is a clear sharp decline of population (Fig. 3), attributed to heavy poaching, and the Western giant eland is therefore considered as a highly endangered subspecies on the edge of extinction. The population of the NKNP is probably the only sure distribution of Western giant eland in the world. The situation of the population in the wild seems to be critical and requires urgent practical measures for the species' protection.

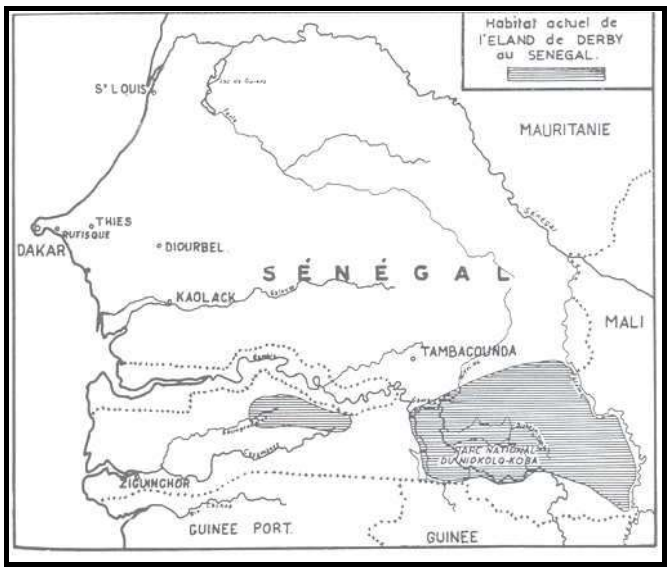

Fig. 2. Overall distribution of Western giant eland in 1960's (Dupuy 1969).

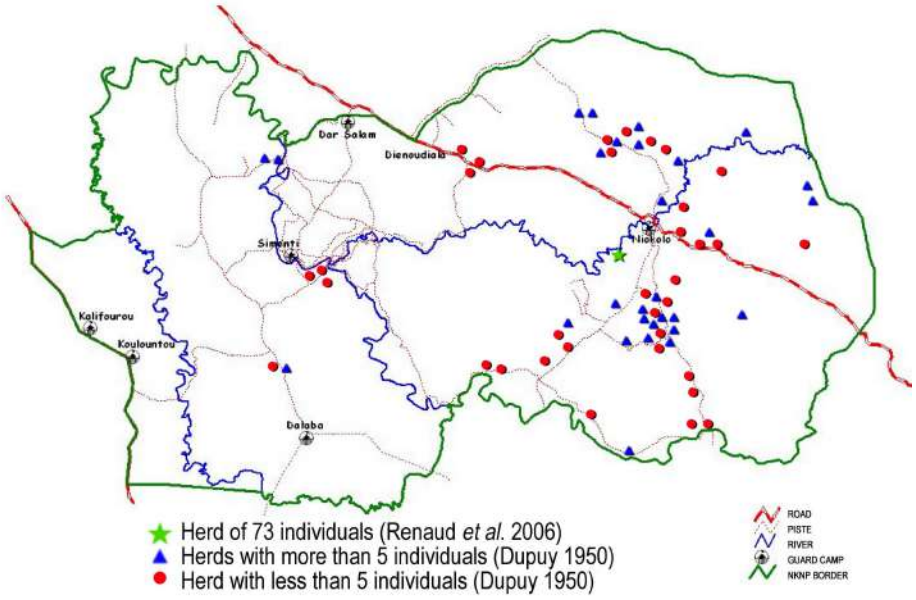

Fig. 3. Distribution of the Western giant eland in the Niokolo Koba National Park in Senegal in 1950's (Dupuy 1969) and in 2006 (Renaud *et al.* 2006).

Current conservation status

The Western giant eland is on the Red list of threatened species with status Endangered (EN C1+2b) (East 1998, IUCN 2007). This classification include taxa where population is estimated to number less than 2500 mature individuals with continuing decline of at least 20% within five years or two generations, whichever is longer, or a continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form whereby all individuals are in a single subpopulation. With regard to the fact that no more than 200 individuals of Western giant eland currently dwell in the West African savanna (Renaud *et al.* 2006, Fig. 4), this classification is fully justified.

Fig. 4. The only herd of the Western giant eland recorded during the aerial count in the Niokolo Koba national park in May 2006.

Conservation strategies

The best strategy for long-term protection is preserving the population in the species' natural habitat (Primack 2000). The NKNP as the Western giant eland's natural habitat offers best ecological conditions for its survival. The pilot study (Nežerková *et al.* 2004) and later aerial and ground surveys (Mauvais and Ndiaye 2004; Renaud *et al.* 2006) confirmed, however, that the prerequisite of security of the area has not been fulfilled till now. In such a situation, the *in situ* conservation can never be successful and *ex situ* strategies took their legitimate place.

Ex situ conservation breeding in a specially fenced area within a managed nature reserve offered the only reasonable solution for the Western giant eland preservation. Hence, the Bandia and Fathala Reserves were selected as appropriate areas and owing

to the premeditated and coordinated capture operation in the NKNP in May 2000 the *ex situ* conservation breeding programme was established.

Our strategy is to secure population by establishing a sufficient number of breeding herds at several suitable sites in Senegal, in order to shelter the population against uncontrolled illegal hunting and against various disasters or disease outbreaks. Another aim is to manage the population to retain genetic diversity as much as possible, because animals in the Bandia and Fathala Reserves are the only animals of the western subspecies held in captivity in the world!

References

Anonymus, 2000. Plan de gestion du parc et de sa péripherie. Ministère de l'Environnement, Direction des Parcs Nationaux, Dakar, 219 pp.

Baillie J., Groombridge, B., 1996. 1996 IUCN red list of threatened animals. World Conservation Union, Gland, Switzerland.

Benoit, M. (Ed.), 1993. Le parc national du Niokolo Koba – Livre blanc.- DPNS, Dakar, 52 pp.

Berhaut J., 1967. Flore du Sénégal. Claireafrique, Dakar, 485 pp.

Bro-Jørgensen, J., 1997. The ecology and behaviour of the giant eland (*Tragelaphus derbianus*, Gray 1847) in the wild. Master's thesis, University of Copenhagen.

Camara, A., 1990. Gambia. In: EAST, R.: Antilopes. Global survey and regional action plans, Pt 3: West and Central Africa, IUCN Gland.

Chardonnet, P., 1999. Survol écologique de 3 zones du sud-ouest du Mali en vue du dénombrement des élands de Derby et des autres grands mammifères. Rapport final. IUCN Mali, DNCN.

Chardonnet, P., Limoges, B., 1990. Guinea-Bissau.- In: EAST, R.: Antilopes. Global survey and regional action plans, Pt 3: West and Central Africa, IUCN Gland.

Darroze, S., 2004. Western giant eland (*Tragelaphus derbianus derbianus*) presence confirmed in Mali and Guinea. In Antelope Survey Update 9. Chardonnet B, Chardonnet P (Eds). SSC Report. Paris, France, IUCN.

Dorst, J., Dandelot, P., 1970. A field guide to the larger mammals of Africa. Collins, Collins, London, 287 pp.

Dupuy, A.R., 1969. Mammifères (Deuxième note). In: Le parc national du Niokolo Koba, fasc.III, Mém. IFAN, No 84, 1969, Dakar, 487 pp.

Dupuy, A.R., 1970. Le récensement général de la faune au Parc national du Niokolo Koba.- Notes Africaines, IFAN Dakar No 127: 94 - 96.

Dupuy, AR., 1971. Le récensement aérien de faune d'avril 1971 au Parc national du Niokolo Koba, Notes Africaines, IFAN Dakar No 131: 67 - 70.

East, R., 1998. African Antilope Database 1998. IUCN/SSC Antelope Specialist Group Report,Gland, Suisse, 434 pp.

Galat, G., Benoit, M., Chevillotte, M., Diop, A., Duplantier, I., 1992. Dénombrement de la grande faune du Parc national Niokolo Koba, Sénégal 1990 – 1991. DPN – Orstom, 54 pp.

Hájek, I., Verner, P.H., 2000. Aerial census of big game in Niokolo-National Park and Falemé Region in Eastern Senegal. Proceedings of 3rd All Africa Conference on Animal Production, Alexandria, 5-9 November 2000.

Herringa, A.C., 1990. Mali. In: EAST, R.: Antelopes. Global survey and regional action plans, Pt 3: West and Central Africa, IUCN Gland. http://gorilla.bio.uniroma1.it/amd/amd333b.html

IEA (Institute of Applied Ecology) 1998. *Taurotragus derbianus. In* African Mammals Databank - A Databank for the Conservation and Management of the African Mammals Vol 1 and 2. Bruxelles: European Commission Directorate. Available online at

IUCN, 2007. IUCN Redlist of threatened species 2007 [online] [cited 2008-01-28] <http://www.iucnredlist.org/>.

Kingdon, J. 1997. The Kingdon Field Guide to African Mammals. Academic Press, London and New York: NaturalWorld

Kingdon, J., 1982. East African mammals, Vol. III. Part C, D (Bovids). London, New York, Acad. Press.

Matthee, C.A., Davis, S.K., 2001. Molecular insights into the evolution of the family Bovidae: a nuclear DNA perspective. Molecular Biology and Evolution 18, 1220–1230.

Matthee, C.A., Robinson, T.J., 1999. Cytochrome *b* phylogeny of family Bovidae: resolution within the Alcephini, Antilopini, Neotragini and Tragelaphini. Molecular Phylogenetics and Evolution 12, 31–46.

Mauvais, G., Ndiaye, A., 2004. Aerial census of wildlife in Niokolo Koba National Park, Senegal. In: *Antelope Survey Update, Number 9: November 2004, IUCN/SSC Antelope Specialist Group Report* (eds. Chardonnet, B., Chardonnet, Ph.), pp. 14-17. Fondation Internationale pour la Sauvegarde de la Faune, Paris, France.

Nežerková, P., Verner, P.H., Antonínová, M., 2004. The conservation programme of the Western giant eland (*Taurotragus derbianus derbianus*) in Senegal – Czech Aid Development Project. Gazella 31: 87–182.

Podhájecká, V., 2008. Foraging ecology of the giant eland (*Taurotragus derbianus derbianus*) in Senegal. MSc. Thesis, Czech University of Life Sciences, Prague.

Primack, R.B., 2000. A primer of Conservation Biology, Boston University, Sinauer, 319 pp.

Renaud, P.C., Gueye, M.B., Hejcmanová, P., Antonínová, M., Samb, M., 2006. Inventaire aérien et terrestre de la faune et relevé des pressions au Parc National du Niokolo Koba. Plan d'Urgence, Rapport Annexe A, Aout 2006. Dakar, APF, DPNS.

Roth, H.H., Hoppe-Dominik, B., 1990. Ivory Coast.- In: EAST, R.: Antelopes. Global survey and regional action plans, Pt 3: West and Central Africa, IUCN Gland.

Rubeš, J., Kubíčková, S., Pagacová, E., Černohorská, A., Di Bernardino, D., Antonínová, M., Váhala, J., Robinson, T.J., 2008. Phylogenomic study of spiral-horned antelope by cross-species chromosome painting. Chromosome Research 16: 935-947.

Ruggiero, R.,1990. Lord Derby's eland.- Swara, East African Wildlife Soc., Vol 13, N°6: 10–13.
Sournia, G., Dupuy, A., 1990. Senegal. In: EAST, R.: Antilopes. Global survey and regional action plans, Pt 3: West and Central Africa, IUCN Gland.
Sournia, G., East, R., Ly, M., 1990. Guinea.- In: EAST, R.: Antilopes. Global survey and regional action plans, Pt 3: West and Central Africa, IUCN Gland.
Spinage, C.A., 1986. The natural history of antelopes. London, Croom Helm.
Teleki, G., Davies, A.G., Oates, J.F., 1990. Sierra Leone. In: EAST, R.: Antilopes. Global survey and regional action plans, Pt 3: West and Central Africa, IUCN Gland.
Willows-Munro, S., Robinson, T.J., Mathee, C.A., 2005. Utility of nuclear DNA intron markers at lower taxonomic levels: Phylogenetic resolution among nine *Tragelaphus* spp. Molecular Phylogenetics and Evolution 35: 624–636.
Wilson, D. E., Reeder, D.M., 1993. Mammal Species of the World (Second Edition). Washington: Smithsonian Institution Press.

SECTION B

The captive management of Western giant eland

Female Salémata in the Bandia Reserve

Conservation programme and captive breeding

The critical situation of the Western giant eland in the wild enhanced the awareness of urgent need for conservation action. In 2000, the first semi-captive Western giant eland population, unique worldwide of that subspecies, was therefore established in Senegal with a clear objective – to establish a viable population in semi-captivity (Nežerková *et al.* 2004). Therefore, a unique conservation programme was launched and remains running today owing to close coordinated cooperation of the partners.

Fig. 5. The map of Senegal: location of the Niokolo Koba national park, the Bandia Reserve, and the Fathala Reserve.

Nine individuals (one young male, five adult females, and three young females) were captured in the Niokolo Koba National Park in Senegal by the SPEFS and the DPNS and placed in the Bandia Reserve. After the post-translocation stress, three adult females died in a quarantine camp, one of them with her new-born calf (Akakpo *et al.* 2004). Hence six individuals (1.5) became the founders of a semi-captive breeding programme in Senegal (Nežerková *et al.* 2004), three females were adult and two females and the male sub-adult at the time. First, the animals were placed into the point of quarantine (30 x 15 m) and they were released in the special enclosure (25 ha) separated from other wildlife species present in other parts of the Bandia Reserve in August 2000. Later, the enclosure was extended to 31 ha 50 ha, 70 ha and 250 ha in 2002, 2004, 2006, 2007 respectively. In 2006, the second breeding herd and a bachelor group of nine sub-adult males were segregated from the core herd. The second breeding herd (1.3) was placed in a separated enclosure (70h) in the Bandia Reserve. The bachelor group was successfully transported to the Fathala Reserve, a

fenced wildlife nature Reserve within the Delta du Saloum national park, for to verify the ability of animals born in captivity to readapt to the Sudano-Guinean savanna of the Fathala Reserve that is close to their natural environment. All individuals were carefully selected as to their age, sex and kinship (Antonínová *et al.* 2006). In 2008, the third breeding herd (1.5) was created in the Fathala Reserve, the breeding male was selected from the bachelor group of the Fathala Reserve and five females were transported from the core breeding herd in the Bandia Reserve.

Up to today, the animals have been held under shepherd breeding management in two nature Reserves, the Bandia and Fathala Reserves in Senegal. In June 2008, the Western giant eland in semi-captivity formed a population of 49 living individuals. The population was divided into three breeding herds: two in the Bandia Reserve and one in the Fathala Reserve; and one bachelor herd. Among these are 31 adults (16.15), ten sub-adults (3.7) and eight calves (2.6).

Identification of individuals

The identification of each individual is essential for careful genetic management of small population of such endangered species as Western giant eland. Each semi-captive bred Western giant eland has its own identification card with a record of kinship and the number of stripes on both flanks and/or other markings as individual identification (Antonínová *et al.* 2004). The identification of each animal was carried out by direct observations, namely during the maternal care, enabling identification of the kinship of new-born animals, and recording of any particular characteristics of the animal and with the help of photographs. The identification card for every single individual was created from recordings.

The identification card includes basic data about the animal: identification number, scientific and French name, local name, date of birth, sex, birth type, birth location, hybrid status, sire, dam, and number of stripes on left and right flank. Identification cards also include a photo from both right and left sides of the animal. Early photos of individuals made in the first months after birth are regularly replaced by new ones up to adult age.

Bandia Reserve

The Bandia Reserve is the first enclosed breeding place for large animals in Senegal and the adjacent states, led by the SPEFS. The Bandia Reserve lies 65 km east of Dakar (14°35‘ N, 17°00‘ W), on the south west border of ‘Forêt classée de Bandia‘. The Bandia Reserve was established in 1990 on an economically exploited and markedly degraded baobab grove. In that year 460 ha were enclosed, later this was expanded to 750 ha and it is still expanding. The first stage of conservation was aimed at regenerating the damaged vegetation and after that at introducing the first animals. Introducing wild animals began slowly in 1991 and reached its peak in January 1997 with the arrival of ungulates from South Africa. Today a visitor to the 750 ha territory of Bandia can see 22 various species of African animals, of which eleven come directly from Senegal, the others coming from South Africa. The Reserve’s operator (SPEFS) has thus directly taken part in preserving large savannah animals and their natural environment in Western Africa.

Fathala Reserve

The Fathala Reserve is second Reserve run by the SPEFS administration in close co-operation with the DNPS in Dakar. The Reserve lies in the southwestern Senegal not far from the coast (13°39‘N; 16°27‘W) and is the enclosed part of the ‚Forêt de Fathala‘ with a protective and partially managed regime in the terrestrial parts of the Delta du Saloum National Park. Here protection is provided for the remains of the thick woody savannah with the remnant fauna. The ‚Forêt de Fathala‘ is threatened by excessive livestock grazing from the surrounding villages, intensive illegal logging, fruit and bark gathering and poaching.

Transfer of animals

The transfer of animals always represents a critical operation with high risk for animals during immobilisation as well as during the actual transport in special truck. First transfers of animals were carried out in March 2006 in the Bandia and Fathala Reserves. Because we were dealing with an endangered species, the entire operation was the subject of profound consultation and prepared in detail. For the principal veterinary survey and operations two experienced veterinarians were invited: Dr. Jiří Váhala from the Dvůr Králové Zoo (Czech Republic), and Dr. A.J.B. Akakpo from EISMV Dakar (Senegal). Technical aspects of the transport were ensured by SPEFS Reserve manager G. Rezk and Ch. Dering and representatives of the DPNS in cooperation with their staff. The scientific expertise was ensured by team members from the ITS CULS.

One week before the operation, the giant elands were extra-fed with *Acacia albida* pods near the fence of their enclosure so as to accustom them to the presence of humans. We immobilised and transferred nine males of Western giant eland from the Bandia Reserve to the Fathala Reserve (DSNP). The distance between the two

Reserves is 300 km. The journey took five to six hours, but the animals remained calm all the time. The animals were transported during the day, except for one animal, which was transported in the evening. The outdoor temperature was 35 to 40 °C. The transport operation took fourteen days, and in one transport day we transferred two individuals, except the last individual, who was transferred alone. After the transport the animals associated as one herd within one day. They remained calm and allowed us to approach them in a car to about five metres. After that we continued to feed them with *Acacia albida* and pellets, and they rapidly found waterholes. At the same time they started to eat natural vegetation in the enclosure.

Four animals of the new breeding herd were transported immobilised on the open pickup car to the new enclosure within the area of the Bandia Reserve (time interval 4 to8 min.). They received antidotes in the new enclosure after having been discharged.

Another animal transfer from the Bandia to the Fathala Reserve was carried out in February 2008, five females from the original breeding herd in the Bandia Reserve for to establish a new (third) breeding herd in the Fathala Reserve and four males to join the bachelor group in the Fathala Reserve.

All immobilisations and transports were well organised, thanks to very good cooperation with staff of the Bandia and Fathala Reserves and the professional work of two veterinarians. The operations were therefore successful and there was no loss of animals. All animals were after transport in good health.

Demographic analysis

The following pedigree data of the Western giant eland were constructed in the SPARKS (ISIS 1992) and corroborated with Population Management 2000 (PM 2000) software (Lacy and Ballou 2002; Pollak *et al.* 2002).Individuals alive in June 2008 and their ancestors were included in the pedigrees; individuals that died without producing any descendants were excluded from the gene-drop analysis. "Founder" means "genetic founder" – wild-born individuals at the top of the pedigree, presumed to be unrelated. With regard to the exclusion of sub-adult males from breeding herds, the dominant male was assumed to be the sire of all the descendants in the captive population.

A total of 50 offspring of the Western giant eland were born from 2000 to 2008 in the herd with 1.5 founders in a special fenced area, initially in the Bandia Reserve (Table 1). Thereby, the Western giant eland formed a population of 49 living individuals (Fig. 6) bred in semi-captivity and managed progressively in four herds in two nature reserves in Senegal: the Bandia and Fathala Reserves.

Table 1 Demographic parameters of the Western giant eland in June 2008.

Variable	Males	Females
Founders	1	5
Present number of individuals *N*	21	28
Number of adults in the population	16	13
Mean number of offspring	50	4.54
Births total	25	25
Deaths total	5	2
Population growth rate (λ) [a]	1.53	1.234
Generation length	5.34	5.18

[a] λ >1 indicate population increase

The reproduction of Western giant elands in the Bandia Reserve started in 2002 with two female calves being born and then continued. Mating occurred most likely synchronously, considering that the majority of calves were born in December (58%). Then, 18% and 12% of births were recorded in January and February, respectively (Fig. 7). The age structure (Fig. 8) was slightly biased to the male sex rather than showing an evenly extended sex ratio.

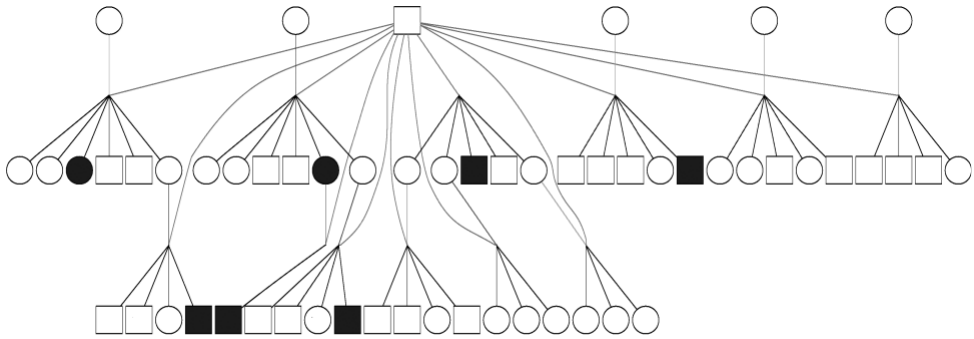

Fig. 6. Pedigree of the population of Western giant eland bred in semi-captivity (June 2000–June 2008). Symbols represent: squares – males; circles – females; empty symbols – living animals; black symbols – dead animals.

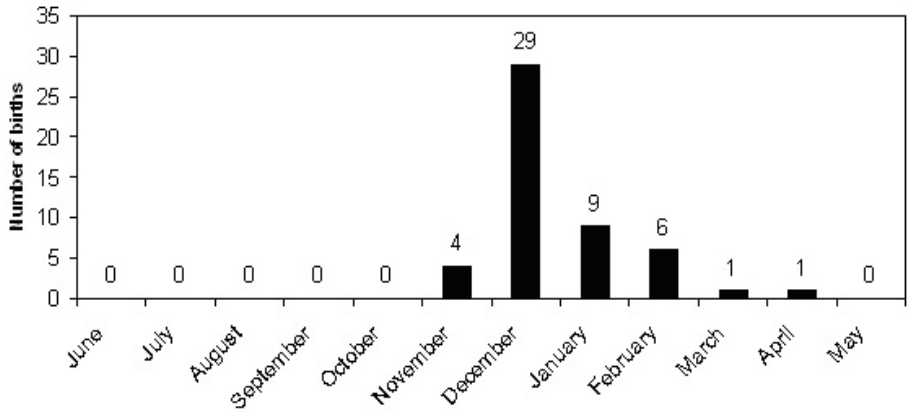

Fig. 7. Birth distributions of Western giant elands in the Bandia Reserve throughout the year in the period of 2002–2008.

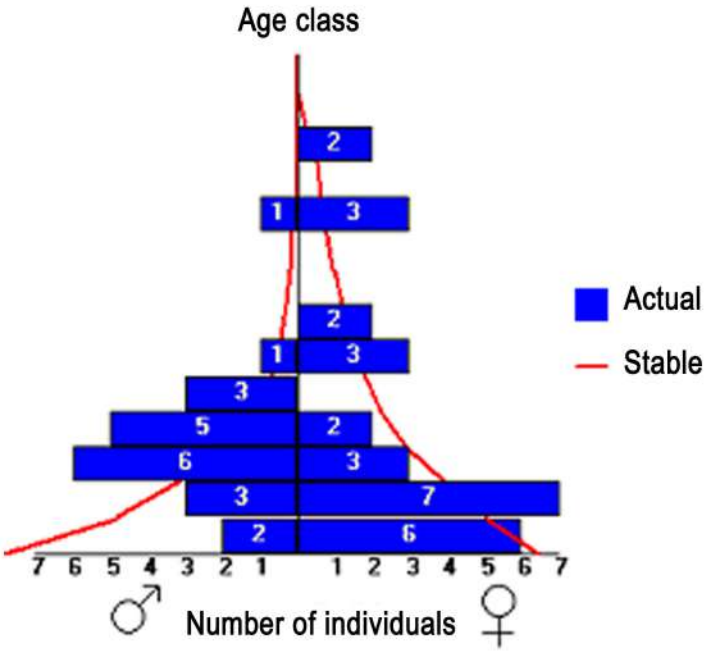

Fig. 8. Male and female age structure of the living individuals of the Western giant elands held in semi-captivity in June 2008. The wild-born proportion (founders) are represented by first 6 animals (1.5).

Considering that the gestation period of the Eastern subspecies of the giant eland lasts on average for 265 days (with a range from 255 to 275 days) (Bro-Jørgensen 1997), the conception of our animals was assumed to take place at the beginning of March. This was, thereafter, confirmed by accidental observations. The youngest age at conception was 16.2 months of age; however, on average it was at an age of 24.56 months (±3.83 S.E.) or 26.2 (±0.89 S.E.) excluding one extreme case. Adult female-founders gave birth for the first time at an age of 35.07 months (±0.9 S.E.) on average, while the youngest cow gave birth at only 25 months. Females produced one offspring per year and bred with a 0.88 probability each year (breeding rate). In the Bandia Reserve, the oldest cow giving birth was eleven years old and the male mated was nine years old, but there were no older animals at this time. The annual calf mortality rate was 5.81% (±7.08 S.E.) and the overall calf mortality was 8% (in total five of 50 calves born). The mortality was registered in male offspring only. The female calf mortality was therefore 0% and the overall male calf mortality 16%. The annual non-calf mortality since the population stabilised (beginning in 2001) was 0.52% (±1.38 S.E.) with an overall non-calf mortality of 6.67% (in total 2 females and one male for 45 individuals). Analyses of the life table of the Western giant eland

indicated that the deterministic annual population growth rate was 1.38 (38.1% ±12.15 S.E.) (Fig. 9, Table 1).

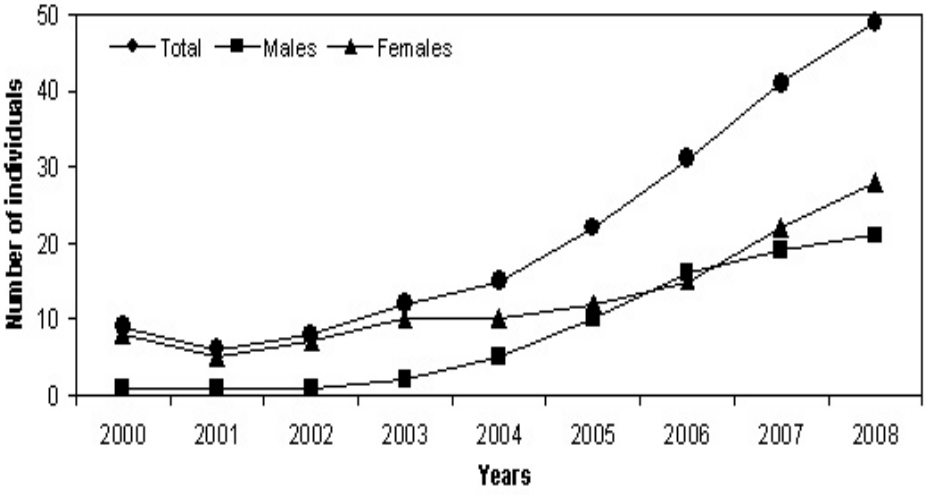

Fig. 9. Population growth rate in the semi-captive Western giant eland population based on the real data collected between 2000 and 2008.

Genetic analysis

The actual population of Western giant eland in semi-captivity reached 49 individuals. On the other hand, the overall effective population size was 3.71 only (including correction of the unequal sex ratio). The *Ne/N* ratio was 0.08, which is weak, especially because of postponed parturition in young females after being moved elsewhere. The animals in the pedigree had 89.5% of known genotypes in the population. The population has retained only 76% of genetic diversity (GD) from the founders. In addition, the overall mean level of inbreeding in the population was 0.136, which is rather high. Founder genome equivalents (FGE = 2.08) and founder genomes surviving (FGS = 5.8) were very low owing to the overrepresentation of only one founder male (Fig. 10, Table 2). On the other hand, a significant potential GD of 92% in the population still remains. Furthermore, the retained amount of the original GD of founders is still present in the population and these can be evaluated by the proper management by mean kinship (MK) that was 0.241 on average (Table 3).

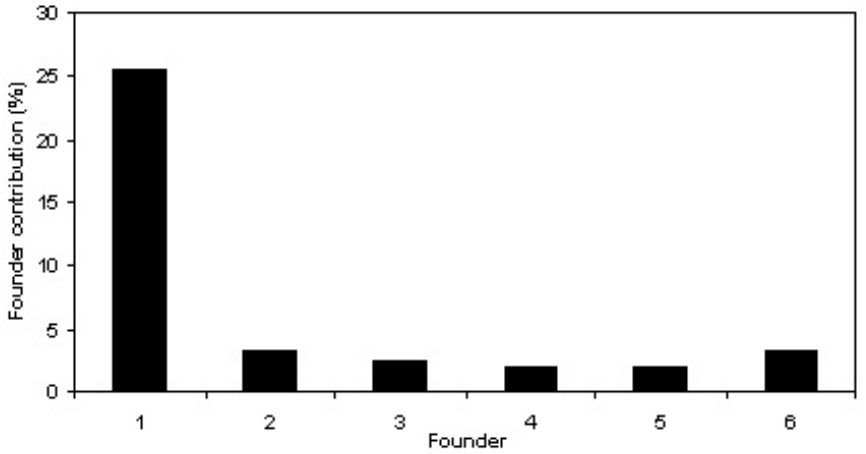

Fig. 10. Founder contributions in the semi-captive Western giant eland population in Senegal. Numerals on the x axis indicate particular individuals: 1 – male, 2 to 6 – females (see Table 2).

Table 2 Founder contributions for the genetic management of the pedigree in the semi-captive Western giant eland population in Senegal.

Founder	Sex	Age	Current founder contribution	Founder genome surviving	Descendants	Target founder contribution	Contribution
1	M	9	0.66	1.00	43	0.17	Over
2	F	11	0.08	0.97	8	0.17	Under
3	F	11	0.06	0.97	5	0.17	Under
4	F	9	0.05	0.94	4	0.16	Under
5	F	9	0.05	0.94	4	0.16	Under
6	F	9	0.08	0.97	8	0.17	Under

Table 3 Mean kinship (MK) distribution in the semi-captive Western giant eland population in Senegal in June 2008.

Mean kinship range	No of individuals	% of population
< 0,0422	5	10.2
0,1851 - 0,1932	21	42.9
0,2029 - 0.2735	8	16.3
> 0,3312	15	30.6

Management plan and recommendations

The breeding of small population in captivity inevitably implies problems of inbreeding depression and loss of genetic diversity (Primack 2000; Thévenon and Couvet 2002). It reduces reproduction and survival in the short term and diminishes the capacity of populations to evolve in response to environmental change in the long term (Frankham et al. 2003). Thus, we aim at maintaining recommended genetic management strategy of the minimisation of kinship (Ryder and Fleischer 1996; Montgomery *et al.* 1997).

As many individuals as possible should be used to found a population and, once the breeding population is established, its early management can greatly influence the potential for future generations (Mace 1986). At least 20 to30 wild-born founders are considered necessary to establish a captive population that represents a high percentage of the gene pool (Lacy 1989). During the captures of Western giant elands in the wild in 2000, the endeavour to acquire a sufficient number of individuals could not be accomplished owing to logistic and local deficiencies and only one male could be determined in the founder herd. On the other hand, we succeeded in careful kinship monitoring and having almost complete information of the breeding history of individuals in our captive population, which is not always the case in conservation programmes.

The captive-bred population of Western giant elands, if appropriate herd constitution and genetic management is continued, may play a considerable role as a potential source of individuals, and thus additional genetic variation, for reinforcing small populations in natural ecosystems in Senegal or elsewhere in future. First, it is necessary to achieve adequate numbers with all possible genetic variations in captivity to ensure the survival of the captive populations. Therefore, the current target of the semi-captive Western giant eland management plan is to establish four breeding herds at two geographically separated localities, respecting the principal of minimising the risk of catastrophes; Frankham *et al.* 2003). The establishment of other herds elsewhere together with inclusion of new founders is, however, highly recommended.

For species consisting of a single population with reduced genetic diversity, the only options are to improve its environment and minimise risks.

Considering the genetic parameters, more founders are essential, for the long-term genetic viability of the giant eland population in captivity. The introduction of new individuals offers the possibility of increasing genetic variability and heterozygosity through the introduction of a sample of alleles from the current free population (in the wild equal migration of individuals). Genetic migrants can have a considerable effect on the total diversity of a population, as has been shown both theoretically (Lacy 1987) and practically (e.g. Trinkel *et al.* 2008). At present, the only confirmed population of Western giant eland was in the Niokolo Koba National Park (Renaud *et al.* 2006). We emphasise the importance of involving new founders from the wild in the current semi-captive population and encourage premeditated and well-coordinated conservation actions of the respective authorities in this context.

In addition, the goal of maintaining the high level of genetic diversity requires population sizes greater than Senegalese nature Reserves can maintain. Hence, global cooperation and the establishment of new regional programmes are considered necessary.

References

Akakpo, A.J., Al Ogoumrabe, N., Bakou, S., Bada-Alambedji, R., Ndiaye, S., 2004. Essai d'élevage de l'eland de Derby (*Taurotragus derbianus derbianus*) à la Réserve de faunede Bandia: prélude à une opération de sauvegarde de cette espèce au Sénégal. Rév Afr Santé et Prod Anim 2: 257–261

Antonínová, M., Nežerková, P., Vincke, X., Al Ogoumrabe, N., 2004. Herd structure of the giant eland (*Taurotragus derbianus derbianus*) in the Bandia Reserve, Senegal. Agricult Trop et Subtrop 37: 1–5

Antonínová, M., Hejcmanová, P., Váhala, J., Mojžíšová, L., Akakpo, A.J.B., Verner, P.H., 2006. Immobilization and transport of Western giant eland (*Taurotragus derbianus derbianus*) from the Bandia Reserve to the Fathala Reserve in Senegal. Gazella 33: 75–98

Bro-Jørgensen, J.,1997. The ecology and behaviour of the giant eland (*Tragelaphus derbianus*, Gray 1847) in the wild. Master's thesis, University of Copenhagen

Frankham, R.:, Ballou, J.D., Briscoe, D.A., 2003. Introduction to conservation genetics. UK, Cambridge University Press

ISIS, 1992. SPARKS: single population animal keeping system version 1.54. Apple Valey/Eagan, MN, International Species Information System

Lacy, R.C., 1987. Loss of genetic diversity from managed populations: interacting effect of drift, mutation, immigration, selection and population subdivision. Conserv. Biol 1: 143–158

Lacy, R.C., 1989. Analysis of founder representation in pedigree: founder equivalents and founder genome equivalents. Zoo Biol 8: 111–124

Lacy, R.C., Ballou, J.D., 2002. Population Management 2000 user's manual. Brookfield IL, Chicago Zoological Society

Mace, G.M., 1986. Genetic management of small populations. Int Zoo Yb 24/25:167–174

Montgomery, M.E., Ballou, J.D., Nurthen, R.K., England, P.R., Briscoe, D.A., Frankham, R., 1997. Minimizing kinship in captive breeding programs. Zoo Biol 16: 377–389

Nežerková, P., Verner, P.H., Antonínová, M., 2004. The conservation programme of the Western giant eland (*Taurotragus derbianus derbianus*) in Senegal – Czech Aid Development Project. Gazella 31: 87–182

Pollak, J.P., Lacy, R.C., Ballou, J.D., 2002. PM2000 (Population Management 2000). Brookfield, Chicago Zoological Society

Primack, R.B., 2000. A primer of Conservation Biology, Boston University, Sinauer, 319 pp.

Renaud, P.C., Gueye, M.B., Hejcmanová, P., Antonínová, M., Samb, M., 2006. Inventaire aérien et terrestre de la faune et relevé des pressions au Parc National

du Niokolo Koba. Plan d'Urgence, Rapport Annexe A, Aout 2006. Dakar, APF, DPNS

Ryder, O.A., Fleischer, R.C., 1996. Genetic research and its application in zoos. In Wild mammals in captivity: 255–262. Kleiman DG, Lumpkin S, Allen M, Harris H, Thompson K. (Eds). Chicago, University of Chicago Press

Thévenon, S., Couvet, D., 2002. The impact of inbreeding depression on population survival depending on demographic parameters. Animal Conservation 5: 53–60

Trinkel, M., Ferguson, N., Reid, A., Reid, C., Somers, M., Turelli, L., Graf, J., Szykman, M., Cooper, D., Haverman, P., Kastberger, G., Packer, C., Slotow, R., 2008. Translocating lions into an inbred lion population in the Hluhluwe-iMfolozi Park, South Africa. Animal Conservation 11: 138–143.

SECTION C

The African studbook of Western giant eland

Female with the calf in the Bandia Reserve

Studbook #	Sex	Age	Birth date	Sire	Dam	Location	Date	Event	Local name	Stripes (L/R)	% Known	F	MK
1001	M	9	1-Jan-99	Wild	Wild	NKNP	19-May-00	Capture	Niokolo	16/14	100	0.000	0.3312
						Bandia 1	20-May-00	Transfer					
1002	F	11	1-Jan-97	Wild	Wild	NKNP	19-May-00	Capture	Dalaba	14/13	100	0.000	0.0422
						Bandia 1	20-May-00	Transfer					
1003	F	11	1-Jan-97	Wild	Wild	NKNP	19-May-00	Capture	Salémata	14/11	100	0.000	0.0325
						Bandia 1	20-May-00	Transfer					
1004	F	9	1-Jan-99	Wild	Wild	NKNP	19-May-00	Capture	Bembou	13/13	100	0.000	0.0260
						Bandia 1	20-May-00	Transfer					
1005	F	9	1-Jan-99	Wild	Wild	NKNP	19-May-00	Capture	Malapa	15/15	100	0.000	0.0260
						Bandia 1	20-May-00	Transfer					
1006	F	9	1-Jan-99	Wild	Wild	NKNP	19-May-00	Capture	Tamba	12/13	100	0.000	0.0422
						Bandia 1	20-May-00	Transfer					
1007	F	6	Mar-02	1001	1002	Bandia 1		Birth	Dagana	14/13	100	0.000	0.2029
1008	F	6	Apr-02	1001	1006	Bandia 1		Birth	Thelma	12/14	100	0.000	0.2029
1009	F	5	1-Jan-03	1001		Bandia 1		Birth	Ndiogoye	14/16	50	0.000	0.3474
1010	M	5	3-Jan-03	1001		Bandia 1		Birth	Karang	13/13	50	0.000	0.3377
						Fathala1	22-Mar-06	Transfer					
1011	F	5	5-Jan-03	1001		Bandia 1		Birth	Guddi	15/16	50	0.000	0.3507

Studbook #	Sex	Age	Birth date	Sire	Dam	Location	Date	Event	Local name	Stripes (L/R)	% Known	F	MK
1012	F	5	12-Feb-03	1001		Bandia 1		Birth	Fathala	15/12	50	0.000	0.3474
1013	M		23-Feb-03	1001		Bandia 1		Birth	Popenguine	14/14			
						Fathala 1	18-Mar-06	Transfer					
							20-Nov-07	Death					
1014	M	4	23-Nov-03	1001	1005	Bandia 1		Birth	Matam	15/13	100	0.000	0.1851
						Fathala 1	23-Mar-06	Transfer					
						Fathala 2	8-Feb-07	Transfer					
1015	M	4	29-Nov-03	1001	1003	Bandia 1		Birth	Sokone	12/14	100	0.000	0.1883
						Fathala 1	22-Mar-06	Transfer					
						Fathala 2	8-Feb-07	Transfer					
1016	F		10-Dec-03	1001	1002	Bandia 1		Birth	Bayane	13/13			
						Bandia 2	27-Mar-06	Transfer					
							15-Dec-06	Death					
1017	M	4	31-Dec-03	1001	1006	Bandia 1		Birth	Toubab	15/12	100	0.000	0.1932
						Bandia 2	26-Mar-06	Transfer					
1018	F	3	22-Nov-04	1001	1003	Bandia 1		Birth	Sindia	15/12	100	0.000	0.1883
						Bandia 2	26-Mar-06	Transfer					
1019	M	3	2-Dec-04	1001	1002	Bandia 1		Birth	Derby	15/18	100	0.000	0.1932
						Fathala 1	15-Mar-06	Transfer					
						Fathala 2	8-Feb-07	Transfer					

Studbook #	Sex	Age	Birth date	Sire	Dam	Location	Date	Event	Local name	Stripes (L/R)	% Known	F	MK
1020	F		4-Dec-04	1001	1006	Bandia 1		Birth	Tuuti	14/12			
							25-Nov-07	Death					
1021	F	3	10-Dec-04	1001	1005	Bandia 1		Birth	Minna	15/15	100	0.000	0.1851
						Bandia 2	26-Mar-06	Transfer					
1022	M	3	14-Dec-04	1001	1004	Bandia 1		Birth	Bandia	15/15	100	0.000	0.1851
						Fathala 1	12-Mar-06	Transfer					
						Fathala 2	8-Feb-07	Transfer					
1023	M	3	5-Jan-05	1001	1008	Bandia 1		Birth	Taiba	13/14	100	0.250	0.2735
						Fathala 1	12-Mar-06	Transfer					
						Fathala 2	8-Feb-07	Transfer					
1024	M	3	11-Jan-05	1001	1007	Bandia 1		Birth	Doole	13/13	100	0.250	0.2735
						Fathala 1	15-Mar-06	Transfer					
						Fathala 2	8-Feb-07	Transfer					
1025	M	3	25-Jan-05	1001	1011	Bandia 1		Birth	Gaaw	15/15	75	0.500	0.3420
						Fathala 1	15-Mar-06	Transfer					
						Fathala 2	8-Feb-07	Transfer					
1026	M	2	4-Dec-05	1001	1003	Bandia 1		Birth	Souleye	14/13	100	0.000	0.1883
						Fathala 1	6-Feb-08	Transfer					
						Fathala 2	8-Feb-07	Transfer					
1027	F	2	12-Dec-05	1001	1009	Bandia 1		Birth	Nelaw	13/14	75	0.500	0.3409

Studbook #	Sex	Age	Birth date	Sire	Dam	Location	Date	Event	Local name	Stripes (L/R)	% Known	F	MK
						Fathala 1	9-Feb-08	Transfer					
1028	M		18-Dec-05	1001	1005	Bandia 1		Birth		12/12			
							25-Dec-05	Death					
1029	F	2	19-Dec-05	1001	1012	Bandia 1		Birth	Foog	13/14	75	0.500	0.3409
						Fathala 1	11-Feb-08	Transfer					
1030	M	2	21-Dec-05	1001	1002	Bandia 1		Birth	Dering	15/12	100	0.000	0.1932
1031	M	2	22-Dec-05	1001	1007	Bandia 1		Birth	Deedet	15/15	100	0.250	0.2735
						Fathala 2	6-Feb-08	Transfer					
1032	M	2	23-Dec-05	1001	1006	Bandia 1		Birth	Tukki	15/13	100	0.000	0.1932
						Fathala 2	7-Feb-08	Transfer					
1033	M	2	24-Dec-05	1001	1004	Bandia 1		Birth	Baax	13/13	100	0.000	0.1851
1034	M	2	28-Dec-05	1001	1008	Bandia 1		Birth	Tidian	15/15	100	0.250	0.2735
						Fathala 2	7-Feb-08	Transfer					
1035	F	2	7-Feb-06	1001	1011	Bandia 1		Birth	Georgina	12/14	75	0.500	0.3420
						Fathala 1	9-Feb-08	Transfer					
1036	M	1	16-Dec-06	1001	1005	Bandia 1		Birth	Mike	13/14	100	0.000	0.1851
1037	M	1	18-Dec-06	1001	1004	Bandia 1		Birth	Bonheur	14/14	100	0.000	0.1851
1038	F	1	20-Dec-06	1001	1003	Bandia 1		Birth	Sao	15/13	100	0.000	0.1883
1039	M	1	22-Dec_06	1001	1011	Bandia 1		Birth	Georges	14/14	75	0.500	0.3420

Studbook #	Sex	Age	Birth date	Sire	Dam	Location	Date	Event	Local name	Stripes (L/R)	% Known	F	MK
1040	F	1	24-Dec-06	1001	1008	Bandia 1		Birth	Tagat	15/13	100	0.250	0.2735
1041	F	1	26-Dec-06	1001	1006	Bandia 1		Birth	Tendresse	12/14	100	0.000	0.1932
1042	F	1	29-Dec-06	1001	1007	Bandia 1		Birth	Dagou	14/14	100	0.250	0.2735
1043	F	1	8-Jan-07	1001	1002	Bandia 1		Birth	Dewene	12/13	100	0.000	0.1932
1044	F	1	9-Jan-07	1001	1012	Bandia 1		Birth	Foulamousou	12/15	75	0.500	0.3409
						Fathala 1	11-Feb-08	Transfer					
1045	F	1	20-Jan-07	1001	1009	Bandia 1		Birth	Nane	13/14	75	0.500	0.3409
						Fathala 1	11-Feb-08	Transfer					
1046	M		25-Nov-07	1001	1020	Bandia 1		Birth					
							26-Nov-07	Death					
1047	M		3-Dec-07	1001	1007	Bandia 1		Birth		14/14			
							7-Feb-08	Death					
1048	M	0	4-Dec-07	1001	1005	Bandia 1		Birth	Mansarinku	13/15	100	0.000	0.1851
1049	F	0	11-Dec-07	1001	1009	Bandia 1		Birth	Nature	14/14	75	0.500	0.3409
1050	F	0	18-Dec-07	1001	1002	Bandia 1		Birth	Didi	15/13	100	0.000	0.1932
1051	F	0	19-Dec-07	1001	1003	Bandia 1		Birth	Saroudia	14/12	100	0.000	0.1883
1052	M		20-Dec-07	1001	1008	Bandia 1		Birth					
							5-Mar-08	Death					

Studbook #	Sex	Age	Birth date	Sire	Dam	Location	Date	Event	Local name	Stripes (L/R)	% Known	F	MK
1053	F	0	21-Dec-07	1001	1004	Bandia 1		Birth	Bandiagara	11/14	100	0.000	0.1851
1054	M	0	15-Fev-08	1001	1011	Bandia 1		Birth	Galago	15/17	75	0.500	0.3420
1055	F	0	16-Fev-08	1001	1006	Bandia 1		Birth	Toubacouta	15/14	100	0.000	0.1932
1056	F	0	18-Fev-08	1001	1012	Bandia 1		Birth	Fatou	13/15	75	0.500	0.3409

Explanatory note:

Studbook #: the number given to the animal within the semi-captive population.
Sex: F – female, M – male
Age: given in years
Sire/Dam: identification of parents of the animal
Location: exact location within breeding enclosures (Bandia 1, Bandia 2, Fathala 1, Fathala 2)
Date: date of an event, if any
Event: birth, death, or transfer of the animal with indication from where to where
Stripes: number of stripes on the left (L) and right (R) flank
% known: percentage of known kinship
F: inbreeding coefficient
MK: mean kinship

SECTION D

The identification cards of Western giant eland

(living individuals)

Female Fathala nursing its calf in the Bandia Reserve

NIOKOLO

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1001
Name: Niokolo	**English name:** Western giant eland
Date of birth: 1.1.1999	**Birth type:** wild born
Sex: male	**Birth location :** Niokolo Koba NP, Senegal
Sire: unknown	**Hybride status:** not a hybride
Dam: unknown	**Current location:** Bandia Reserve 1,Senegal
Number of stripes on: left flank/ right flank	16/14
Other characteristics:	

DALABA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1002
Name: Dalaba	**English name:** Western giant eland
Date of birth: 1.1.1997	**Birth type:** wild born
Sex: female	**Birth location :** Niokolo Koba NP, Senegal
Sire: unknown	**Hybride status:** not a hybride
Dam: unknown	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	14/13
Other characteristic:	

SALÉMATA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1003
Name: Salémata	**English name:** Western giant eland
Date of birth: 1.1.1997	**Birth type:** wild born
Sex: female	**Birth location :** Niokolo Koba NP, Senegal
Sire: unknown	**Hybride status:** not a hybride
Dam: unknown	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	14/11
Other characteristic:	

BEMBOU

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1004
Name: Bembou	**English name:** Western giant eland
Date of birth: 1.1.1999	**Birth type:** wild born
Sex: female	**Birth location :** Niokolo Koba NP, Senegal
Sire: unknown	**Hybride status:** not a hybride
Dam: unknown	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	13/13
Other characteristic:	

MALAPA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1005
Name: Malapa	**English name:** Western giant eland
Date of birth: 1.1.1999	**Birth type:** wild born
Sex: female	**Birth location :** Niokolo Koba NP, Senegal
Sire: unknown	**Hybride status:** not a hybride
Dam: unknown	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	15/15
Other characteristic:	

TAMBA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1006
Name: Tamba	**English name:** Western giant eland
Date of birth: 1.1.1999	**Birth type:** wild born
Sex: female	**Birth location :** Niokolo Koba NP, Senegal
Sire: unknown	**Hybride status:** not a hybride
Dam: unknown	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	12/13
Other characteristic:	

DAGANA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1007
Name: Dagana	**English name:** Western giant eland
Date of birth: March 2002	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: unknown	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	14/13
Other characteristics:	

THELMA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1008
Name: Thelma	**English name:** Western giant eland
Date of birth: April 2002	**Birth type:** wild born
Sex: female	**Birth location :** Niokolo Koba NP, Senegal
Sire: unknown	**Hybride status:** not a hybride
Dam: unknown	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	12/14
Other characteristics:	

NDIOGOYE

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1009
Name: Ndiogoye	**English name:** Western giant eland
Date of birth: 1.1.2003	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: unknown	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	15/16
Other characteristics:	

KARANG

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1010
Name: Karang	**English name:** Western giant eland
Date of birth: 3.1.2003	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: unknown	**Current location:** Fathala Reserve 1, Senegal
Number of stripes on: left flank/ right flank 13/13	
Other characteristics:	

GUDDI

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1011
Name: Guddi	**English name:** Western giant eland
Date of birth: 5.1.2003	**Birth type:** wild born
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: unknown	**Hybride status:** not a hybride
Dam: unknown	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	14/15
Other characteristics:	

FATHALA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1012
Name: Fathala	**English name:** Western giant eland
Date of birth: 12.2.2003	**Birth type:** wild born
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: unknown	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	15/12
Other characteristics:	

MATAM

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1014
Name: Matam	**English name:** Western giant eland
Date of birth: 23.11.2003	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Malapa	**Current location:** Fathala Reserve 2, Senegal
Number of stripes on: left flank/ right flank	13/13
Other characteristics:	

SOKONE

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1015
Name: Sokone	**English name:** Western giant eland
Date of birth: 29.11.2003	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Salémata	**Current location:** Fathala Reserve 2, Senegal
Number of stripes on: left flank/ right flank	12/14
Other characteristics:	

TOUBAB

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1017
Name: Toubab	**English name:** Western giant eland
Date of birth: 31.3.2004	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Tamba	**Current location:** Bandia Reserve 2, Senegal
Number of stripes on: left flank/ right flank	15/12
Other characteristics:	

SINDIA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1018
Name: Sindia	**English name:** Western giant eland
Date of birth: 22.11.2004	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Salémata	**Current location:** Bandia Reserve 2, Senegal
Number of stripes on: left flank/ right flank	15/12
Other characteristics:	

DERBY

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1019
Name: Derby	**English name:** giant eland
Date of birth: 2.12.2004	**Type of birth:** in captivity
Sex: male	**Original location :** Fathala Reserve, Senegal
Father: Niokolo	**Hybride status:** not hybride
Mother: Dalaba	**Current location:** Fathala Reserve 2, Senegal
Number of stripes: left/ right	15/18
Other characteristics:	

MINNA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1021
Name: Minna	**English name:** Western giant eland
Date of birth: 10.12.2004	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Malapa	**Current location:** Bandia Reserve 2, Senegal
Number of stripes on: left flank/ right flank	15/15
Other characteristics:	

BANDIA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1022
Name: Bandia	**English name:** Western giant eland
Date of birth: 14.12.2004	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Bembou	**Current location:** Fathala Reserve 2, Senegal
Number of stripes on: left flank/ right flank	15/15
Other characteristics:	

TAIBA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1023
Name: Taiba	**English name:** Western giant eland
Date of birth: 5.1.2005	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Thelma	**Current location:** Fathala Reserve 2, Senegal
Number of stripes on: left flank/ right flank	13/12
Other characteristics:	

DOOLE

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1024
Name: Doole	**English name:** Western giant eland
Date of birth: 11.1.2005	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Dagana	**Current location:** Fathala Reserve 2, Senegal
Number of stripes on: left flank/ right flank	13/13
Other characteristics:	

GAAW

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1025
Name: Gaaw	**English name:** Western giant eland
Date of birth: 25.1.2005	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Guddi	**Current location:** Fathala Reserve 2, Senegal
Number of stripes on: left flank/ right flank	15/15
Other characteristics:	

SOULEYE

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1026
Name: Souleye	**English name:** Western giant eland
Date of birth: 4.12.2005	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Salémata	**Current location:** Fathala Reserve 2, Senegal
Number of stripes on: left flank/ right flank	14/13
Other characteristics:	

NELAW

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1027
Name: Nelaw	**English name:** Western giant eland
Date of birth: 12.12.2005	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Ndiogoye	**Current location:** Fathala Reserve 1, Senegal
Number of stripes on: left flank/ right flank	13/14
Other characteristics:	

FOOG

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1029
Name: Foog	**English name:** Western giant eland
Date of birth: 19.12.2005	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Fathala	**Current location:** Fathala Reserve 1, Senegal
Number of stripes on: left flank/ right flank	13/14
Other characteristics:	

DERING

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1030
Name: Dering	**English name:** Western giant eland
Date of birth: 21.12.2005	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Dalaba	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	15/12
Other characteristics:	

DEEDET

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1031
Name: Deedet	**English name:** Western giant eland
Date of birth: 22.12.2005	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Dagana	**Current location:** Fathala Reserve 1, Senegal
Number of stripes on: left flank/ right flank	15/15
Other characteristics:	

TUKKI

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1032
Name: Tukki	**English name:** Western giant eland
Date of birth: 23.12.2005	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Tamba	**Current location:** Fathala Reserve, Senegal
Number of stripes on: left flank/ right flank	15/13
Other characteristics:	

BAAX

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1033
Name: Baax	**English name:** Western giant eland
Date of birth: 24.12.2005	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Bembou	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	13/13
Other characteristics:	

TIDIAN

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1034
Name: Tidian	**English name:** Western giant eland
Date of birth: 28.12.2005	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Thelma	**Current location:** Fathala Reserve 2, Senegal
Number of stripes on: left flank/ right flank	15/15
Other characteristics:	

GEORGINA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1035
Name: Georgina	**English name:** Western giant eland
Date of birth: 7.2.2006	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Guddi	**Current location:** Fathala Reserve 1, Senegal
Number of stripes on: left flank/ right flank	12/14
Other characteristics:	

MIKE

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1036
Name: Mike	**English name:** Western giant eland
Date of birth: 16.12.2006	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Malapa	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	13/14
Other characteristics:	

BONHEUR

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1037
Name: Bonheur	**English name:** Western giant eland
Date of birth: 18.12.2006	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Bembou	**Current location:** Bandia Reserve 1 , Senegal
Number of stripes on: left flank/ right flank	14/14
Other characteristics:	

SAO

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1038
Name: Sao	**English name:** Western giant eland
Date of birth: 20.12.2006	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Salémata	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	15/13
Other characteristics:	

GEORGES

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1039
Name: Georges	**English name:** Western giant eland
Date of birth: 22.12.2006	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Guddi	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank 14/14	
Other characteristics:	

TAGAT

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1040
Name: Tagat	**English name:** Western giant eland
Date of birth: 24.12.2006	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Thelma	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	15/13
Other characteristics:	

TENDRESSE

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1041
Name: Tendresse	**English name:** Western giant eland
Date of birth: 26.12.2006	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Tamba	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	12/14
Other characteristics:	

DAGOU

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1042
Name: Dagou	**English name:** Western giant eland
Date of birth: 29.12.2006	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Dagana	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	14/14
Other characteristics:	

DEWENE

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1043
Name: Dewene	**English name:** Western giant eland
Date of birth: 8.1.2007	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Dalaba	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	12/13
Other characteristics:	

FOULAMOUSOU

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1044
Name: Foulamousou	**English name:** Western giant eland
Date of birth: 9.1.2007	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Fathala	**Current location:** Fathala Reserve 1, Senegal
Number of stripes on: left flank/ right flank	12/15
Other characteristics:	

NANE

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1045
Name: Nane	**English name:** Western giant eland
Date of birth: 20.1.2007	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Ndiogoye	**Current location:** Fathala Reserve 1, Senegal
Number of stripes on: left flank/ right flank	13/14
Other characteristics:	

MANSARINKU

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1048
Name: Mansarinku	**English name:** Western giant eland
Date of birth: 4.12.2007	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Malapa	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank 13/15	
Other characteristics:	

NATURE

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1049
Name: Nature	**English name:** Western giant eland
Date of birth: 11.12.2007	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Ndiogoye	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank 14/14	
Other characteristics:	

DIDI

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1050
Name: Didi	**English name:** Western giant eland
Date of birth: 18.12.2007	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Dalaba	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank 15/13	
Other characteristics:	

SAROUDIA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1051
Name: Saroudia	**English name:** Western giant eland
Date of birth: 19.12.2007	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Salémata	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	14/12
Other characteristics:	

BANDIAGARA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1053
Name: Bandiagara	**English name:** Western giant eland
Date of birth: 21.12.2007	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Bembou	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	11/14
Other characteristics:	

GALAGO

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1054
Name: Galago	**English name:** Western giant eland
Date of birth: 15.2.2008	**Birth type:** in captivity
Sex: male	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Guddi	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	15/17
Other characteristics:	

TOUBACOUTA

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1055
Name: Toubacouta	**English name:** Western giant eland
Date of birth: 16.2.2008	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Tamba	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank 15/14	
Other characteristics:	

FATOU

Scientific name: *Taurotragus derbianus derbianus*	**Identification number:** 1056
Name: Fatou	**English name:** Western giant eland
Date of birth: 18.2.2008	**Birth type:** in captivity
Sex: female	**Birth location :** Bandia Reserve, Senegal
Sire: Niokolo	**Hybride status:** not a hybride
Dam: Fathala	**Current location:** Bandia Reserve 1, Senegal
Number of stripes on: left flank/ right flank	13/15
Other characteristics:	

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