

Report on the situation of the Western Derby Eland (*Taurotragus derbianus derbianus*) in 2020



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Background

The known population of Western Derby eland (*Taurotragus derbianus derbianus*) is currently limited to the only country in the world, Senegal, and is listed as Critically Endangered (IUCN). The Western Derby eland population is located in three main sites:

- 1) Niokolo Koba National Park (NKNP) with the only confirmed wild population,
- 2) the Bandia reserve with a semi-captive population,
- 3) and the Fathala Reserve with a semi-captive population, genetically linked with the one in Bandia.

Objective of this report

The objective is to present a complex overview of the status of the western subspecies of Derby eland in all three current localities, in order to provide the basis for decision making for its conservation.

1) Derby Eland in Niokolo Koba National Park

NKNP in southeastern Senegal covers 913,000 hectares and is the largest and oldest national park in Senegal. Its importance as a well-preserved ecosystem of Sudanese and Sudano-Guinean savannahs with an extremely rich biodiversity concerns the whole West African region. The NKNP area is home to a great diversity of plant and animal species. Since 1981, NKNP has been listed as a World Heritage Site and since 2007 as a UNESCO World Heritage Site in Danger (UNESCO, 2014). NKNP and its surrounding areas are probably the only place in the world where the last wild population of Western Derby eland is found, but it suffers from poaching, cattle grazing and other human activities. The nature protection authorities in Senegal, namely the Ministry of Environment and Sustainable Development and the Directorate of National Parks of Senegal (DPN), as well as international assistance, notably from UNESCO World Heritage, have made numerous efforts and management changes since 2015 to save the park from further degradation and thus maintain its rich biodiversity.

With regard to the conservation of the Derby eland, the most important change has been a substantial improvement of law enforcement in relation to environmental monitoring, including regular patrols in the park and long-term monitoring using a set of camera traps throughout the park. In February 2018, the DPN conducted a comprehensive wildlife assessment in NKNP using three complementary methods of wildlife count: an aerial census, a ground foot census, and a ground vehicle census. The Derby eland were not directly identified during these counts. However, they were recorded by camera traps and according to preliminary results, the current number of Derby eland in NKNP is comparable to that recorded in 2006 (Renaud et al. 2006), being between 150 and 200 individuals, which is mainly found in the limited area of Mansa Fara. Details of population structure are currently being analysed (Gueye et al., unpublished data).

2) Derby eland in Bandia and Fathala reserves

The Bandia Reserve is located 65 km southeast of Dakar, Senegal (14° 35' N, 17° 00' W), on the southwestern border of the Bandia classified forest (Forêt classée de Bandia). The fenced reserve contributes substantially to the conservation of natural vegetation (Hejzmanová et al., 2010). Very

few game species are native to the Bandia Reserve, the majority of species are introduced from various regions of Senegal, such as the African buffalo (*Syncerus caffer brachyceros*), kob defassa (*Kobus ellipsiprymnus defassa*), roan (*Hippotragus equinus koba*), and South African giraffe (*Giraffa camelopardalis giraffa*), great kudu (*Tragelaphus strepsiceros*), impala (*Aepyceros melampus*), common eland (*Taurotragus oryx oryx*) and white rhinoceros (*Ceratotherium simum*). The Bandia Reserve was the first site where wild-caught Western Derby eland were placed after the NKNP capture operation in 2000. Since then, the site and the management of the herd have proven to be conducive to breeding success. The Bandia Reserve is a well-equipped wildlife reserve with facilities such as boma and enclosures.

Fathala Wildlife Reserve is a fenced area of the Fathala Forest (Forêt de Fathala), the main terrestrial part of the Saloum Delta National Park (DSNP) located on the west coast of Senegal (13° 39' N - 16° 30' W) near the border of the Gambia. The area is flat with dry plateaus, passing through wet and shallow valleys, such as "Mare of the Dragon", there are native game such as harnessed bushbuck (*Tragelaphus scriptus*), warthog (*Phacochoerus africanus*), the western red colobus (*Procolobus badius*), the patas monkey (*Erythrocebus patas*); and several game species introduced from Senegal, such as the African buffalo, the kob defassa, the roan and from South Africa such as the giraffe and the white rhino. Fathala Wildlife Reserve also hosts two herds of Western Derby eland in enclosures of about 160 ha and 1,800 ha.

The semi-captive population of Western Derby eland in the Bandia and Fathala reserves was monitored annually by members of the NGO Derbianus Conservation, as well as reserve managers and rangers of the DPN. Calves have been identified individually since 2002 and a studbook was established in 2008. The current volume of the Western Derby Eland Studbook is devoted to the semi-captive population of the Bandia and Fathala reserves in Senegal and its current demographic and genetic characteristics. A total of 218 individuals of Derby eland were born from 2002 to 2020 in the reserves from 6 founders (1 male and 5 females). In June 2020, the Derby eland population consisted of 127 live individuals bred in semi-captivity and managed in 6 herds in 2 nature reserves in Senegal (Figure 1).

During the 2019/2020 breeding season, 12 calves were born. 1 male, 6 female and 5 of unidentified sex.

The sex ratio (male : female) has been close to equilibrium, increasing from 1.58 : 1 in 2016 to 1.1 : 1 in 2020, as the number of pre-breeding and adult females has increased (Figure 2).

The number of adult females increased to 50, but this increase was not reflected in the number of calves born, as the reproductive rate was only 24%. This means that 76% of adult females did not reproduce or lost their offspring undetected. During the last season, we did not record any juvenile mortality, which is likely a consequence the limited presence of identification teams during the calving period. In addition, several mortalities of adult males were recorded, particularly in the Bandia reserve. Average mortality values have increased slightly, and the population remains sensitive to changes in mortality rates. Actual population growth was lower than expected (134 individuals expected, 127 individuals recorded). According to projections assessing the current situation, the population size next year is expected to be 142 animals.

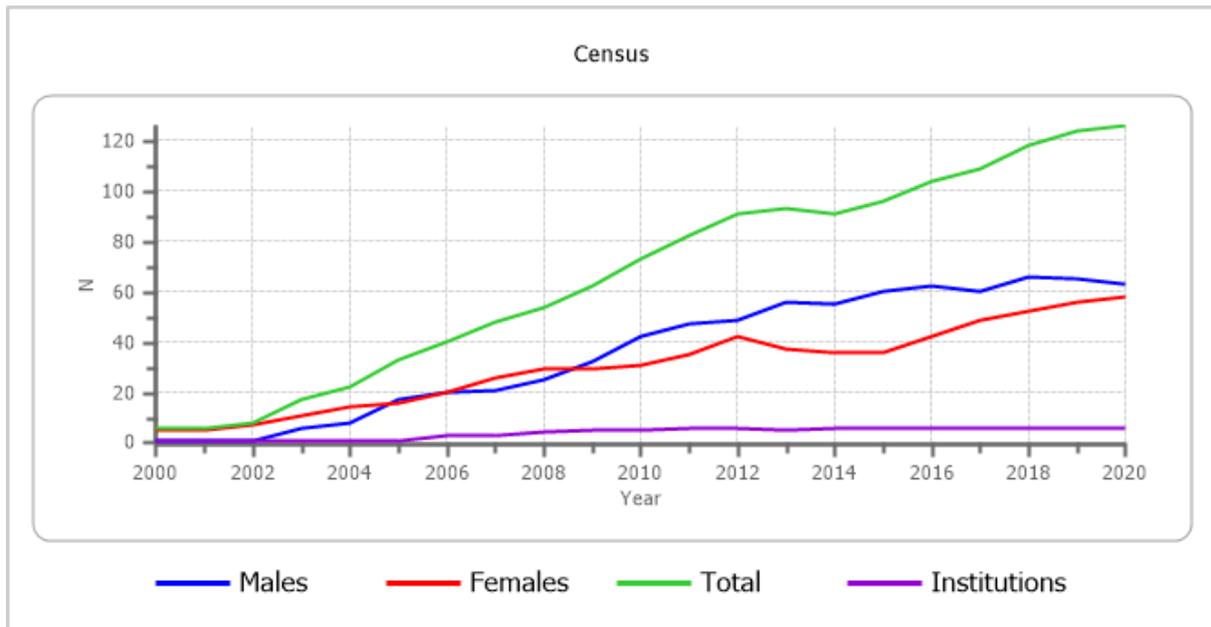


Fig. 1 Number of individuals in the semi-captive West Derby eland population in the Bandia and Fathala reserves (2000-2020).

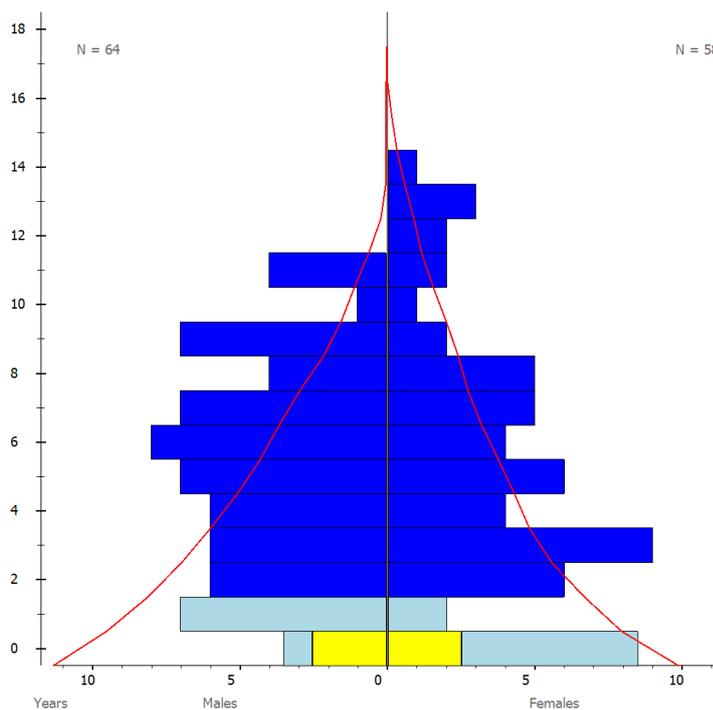


Fig. 2: Age structure of the West Derby eland population in the Bandia and Fathala reserves in 2020.

After the attribution of the missing paternities of the animals born in 2003, 92% of pedigree genotypes in the population are currently known. However, the population has only 62% certain pedigree ancestry, due to the multiplicity of sires present in the pedigree with different reproductive probabilities and also due to the low presence of identification teams in the field that did not allow the attribution of dams to several calves. Results of a long-term monitoring of genetic diversity in the entire semi-captive population has been published (Kubátová et al. 2020), further confirming the

need to add new foundation animals to the population to ensure its long-term existence. We have tried to sample all individuals during transports, but updating should be done regularly and by the least harmful methods in order not to expose the animals to a stressful situation. Biopsy darts should be used when no further handling is required. A total of 52 samples, 11 from sub-adults and adults, 15 from calves born in the 2016/2017 season and 14 from calves born in the 2017/2018 season and 12 calves born in 2019/2020, are still missing to get a complete picture of the population. In March 2018, it was planned to transport 10 sub-adult animals between the Bandia and Fathala reserves to reduce the risk of inbreeding and improve the genetic quality of the breeding herds. In the end, these transports were not carried out for political reasons. Animals that could not have been transported pose a risk to the future development of genetic and demographic health and quality of the breeding herds when they have already reached sexual maturity. Unfortunately, the transport of older animals is logistically more demanding and more expensive.

Projections and recommendations for conservation

The genetic diversity of the Bandia breeding herds (1, 3 and 5) is still considerably higher than that of the Fathala herds (higher genetic diversity, lower average parentage, more surviving founder genomes). This situation highlights the need for additional transfers from Bandia to Fathala, as planned for 2018 (and eventually not realized). It is recommended to continue with individual identifications of newborn calves in both reserves, in order to maintain knowledge of the genetic relationships between individuals so that inbreeding can be avoided in the future.

Over the next 7 years, the genetic diversity of the captive population would fall below 80%. Based on actual data, it is recommended to add at least 6 wild individuals from NKNP to maintain genetic diversity at the current level of 80% of the original genetic diversity over the next 100 years, allowing the population to grow to as many as 200 individuals. The wild and semi-captive population of Western Derby Eland has exceptional potential for the conservation of the subspecies.

The coordinated efforts of Senegalese wildlife conservation authorities and private reserve managers have confirmed the considerable potential to save what remains of the Western Derby eland population and thus ensure the survival of the world's largest and most impressive antelopes for future generations.