

Review of Population Status and Conservation Strategy of Endangered Swayne's Hartebeest (*Alcelaphus buselaphus swaynei*) in Ethiopia

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Abstract

This review aims to understand and population status Swayne's Hartebeest (*Alcelaphus buselaphus swaynei*) in Ethiopia. The home range of the endangered Swayne's hartebeest, *Alcelaphus buselaphus swaynei*, was studied in different protected area of Senkele Swayne's Hartebeest Sanctuary (SSHS), Maze National park and Nechisar National Park in Ethiopia. Based on the report from the research, the previous population size of Swayne's hartebeests has decreased and occurs only in four localities of Ethiopia: Nechisar and Maze National Parks, Senkele Swayne's Hartebeests Sanctuary and a smaller number observed in southern Ethiopia Yabello vicinity. According to Mamo et al., (2012) Swayne's hartebeests occur currently in three isolated localities with an estimated total population size of 840 (364 in Maze National Park, 464 in Senkele Swayne's Hartebeest Sanctuary and 12 in Nechisar National Park. Today, even in Ethiopia its distribution and population size has been declining substantially and the two largest populations remaining in the country are in Senkelle Swayne's Hartebeest Sanctuary and Maze National Park. Generally, according to the study from different authors the population status of Swayne's Hartebeest in Ethiopia is decreasing from time to time due to habitat degradation, expansion of agriculture, human settlement and livestock grazing in and around of protected area. Based on the Concept of reviewers of genetic and bioclimatic data suggest Swayne's Hartebeest is distinct and requires immediate conservation actions including genetic monitoring and reintroductions to establish independent populations. This review is important to summaries and indicates the gap to conserve these endemic animals in Ethiopia.

Keywords: Swayne's Hartebeest, Protected area, Population, Conservation status

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Introduction

Africa is one of endowed country by having largest number of endemic animal families and genera with high degree of endemism compared to other continents of the world. This makes African fauna to be so interesting and spectacular (Delany and Happold, 1979, East, 1999). The tropical savanna of Africa is one of the important ecology for spectacular mammal of endemic mammals of Africa like antelopes. Having a diversity of landscape and ecosystem make East Africa is one the country known by diversity and abundance of large mammalian herbivores (Kutilek, 1979).

Lewis and Wilson (1979) reported that, Hartebeests (*Alcelaphus buselaphus*) are African antelopes historically ranged virtually in all African grasslands.

Ethiopia country located at the horn of Africa from 3oN to 15oN latitude and from 33oE to 48°E longitude with an area of 1,127,127km² and have wide range of habitats from arid desert, open grassy steppe, and semi-arid savannas to highland forests and Afro-alpine moor lands, support an exceptionally diverse antelope fauna (Hillman, 1993). Habitat is the suite of resources (food, shelter) and environmental conditions (abiotic variables such as temperature and biotic variables such as competitors and predators) that determine the presence, survival, and reproduction of a wild life population.

Ethiopia is one of the world countries which possess a unique and different characteristic of biota with high level of endemism (Jacobs and Schloeder, 2001). Hillman, (1993) reported due to man-made and natural degradation wildlife has largely been restricted to within a few conservation areas of the country.

The Swayne's hartebeests are one of endemic animals in Ethiopia and grouped in the family of Bovidae (Lewis and Wilson, 1979). In 1892 Sclater described the first specimen of swayne's hartebeest and he was classified as *Bubalis swaynei*. Ruxton and Schwartz (1929) later changed *Bubalis swaynei* to *Alcelaphus buselaphus swaynei*. According to the report of Sclater and Thomas (1894) there are eight distinct *Alcelaphus* species, But Ruxton and Schwartz reported nine but ranked them as sub-species. The two species of *A. b buselaphus* and *A. b. bubalis* are extinct and the remaining seven sub-species have suffered probably the most dramatic contraction in range among all African ruminants (Kingdon, 1982). The species of Swayne hartebeest, previously widespread to wider areas of Morocco up to north eastern Tanzania to south of Congo and from Southern Angola to South Africa. Now day, due to population growth and agricultural expropriation the habitats of these endemic animals become destructed and the range of these animals becomes dramatically reduced. According

to the report of Refera, (2005) Swayne hartebeest occurs only in parts of Botswana, Namibia, Ethiopia, Tanzania and Kenya. This subspecies of animals which previously found in both Somalia and Ethiopia is now restricted only to few localities in Ethiopia.

Swayne's hartebeest (*Alcelaphus buselaphus swaynei*) is one of the 31 endemic mammals of Ethiopia and one among the fifteen forms of *Alcelaphus* (Kingdon, 1982). In Ethiopia the number of Swayne hartebeest became dramatically decline at end of 19th century due to habitat loss, livestock grazing, extensive hunting and disease to the number of 880 (Datiko and Bekele, 2011; Lewis and Wilson, 1979). Because of that Conservation of this endemic animal in Ethiopia is very important to save these animals by protecting habitat loss and illegal hunting. In addition Community-based conservation is increasingly promoted to provide essential space for wide-ranging wildlife species in human-occupied areas that cannot be formally protected as national parks or reserves. The importance of 'ultimate' threats that are fundamentally biological, such as genetic integrity in small populations, have been stressed in the literature (e.g. Greig 1979; Amos and Balmford, 2001), but under-attended *in situ*.

Population Status of Hartebeests in Ethiopia

Different studies showed that, the number of Swayne hartebeest changed in Ethiopia from year to year. In the year of 1970 to 2010 their number Swayne hartebeest fluctuates means increased in some of the years and decreased in the same year. According to the study conducted by Easts (1999) the decline of hartebeest species and its fluctuation form one period in time to the other. This fluctuation and decline in number could be associated with the impacts of human activates like agricultural expansion, settlement overgrazing and illegal hunting in Ethiopian that altered the historical vegetation cover of the Protected areas.

According to the sinuses of 2008, the estimated population of Swayne's Hartebeest was less than 800 (with the majority confined to the Senkelle Swayne's Hartebeest Sanctuary and Maze N.P., and a smaller number in Nechisar Nition Park in Ethiopia (Antoninova *et al.* 2008). Mamo *et al.* (2012) reported 200 in Senkelle and 260 in Mazie National park in 2005. In 2008 the population status of Swayne hartebeest in Senkelle has increased to 900 (reserve staff, pers. comm. 2016). The population status of Swayne heart best in the Nechisar remained stable at 70-90 for about 15 years but then declined due to unknown reasons and only one old male was left in 2016. According to Ethiopian Wildlife Conservation Authority, pers. comm. 2016 the current status of the population size in Mazie national park is not well known but it is believed to number 200-300.

According to the report of Mana and Bereket Netsereab (1994) most of the Swayne's hartebeests inhabit the Senkele Sanctuary increased from 448 to 2379 during 1976-1988.

Based on the report of different authors (Messana and Bereket Netsereab, 1994 and Befekadu Refera and Afework Bekele, 2006) the population size of Swayne's hartebeests has decreased and occurs only in four localities of Ethiopia: Nechisar and Maze National Parks, Senkele Swayne's Hartebeests Sanctuary and Yalden *et al.*, (1984) reported the presence of Swayne's hartebeest in the southern Ethiopia around Yabello vicinity but, according to Hillman (1993) it is now extinct in that area. According to the report of Flagstad *et al.*, (2000) and Pascal *et al.*, (2000) hartebeests, *A. b. Swayne* and *A. b. tora* are classified as endangered and critically endangered, respectively.

Mamo *et al.*,(2012) reported that Swayne's hartebeests occur currently in three isolated localities with an estimated total population size of 840 (364 in Maze National Park, 464 in Senkele Swayne's Hartebeest Sanctuary and 12 in Nechisar National Park. The population size of Swayne's hartebeest is increasing in Maze National Park and Senkelle Swayne's Hartebeest Sanctuary; whereas it is at the verge of extinction in Nech Sar National Park due to habitat degradation, expansion of agriculture, human settlement and livestock grazing (IUCN, 2013; Simon, 2016).

According to the report of Abiot (2013) in Ethiopia the distribution and population size of Swayne heart best has been declining substantially and the two largest populations species remaining in the country are in Senkelle Swayne's Hartebeest Sanctuary and Maze National Park. Because of small protected area of the subspecies of Swayne's hartebeest listed as endangered, currently occurring only at two locations in Ethiopia (IUCN, 2017). Resource availability in an ecosystem is of the important for Species survive, grow and reproduction of an organism at certain habitat but, ecological availability for the conservation of Swayne heart best in Ethiopia are under question(Aarts *et al.*, 2008). Due to some extent of habitat most species could migrate to different habitats with lower resources if faced with great interspecific and interspecific competition. Turner, (1997) reported that wild life can use habitats as a means of survival strategy which prevent them from predation. However, habitats are also important drivers for prey selection made by predators. This is due to the different features that habitats possess (Hayward and Kerley, 2005). Due to variation of resource availability wild life may change habitats which are used, based upon seasons. Thus, a species may use a certain habitat during the summer period and will change into a different habitat in the winter as a result of the variation in resource availability. According to the report of Tewodros, 2006; Hoberg *et al.*, 2009 Most of the time, Swayne's hartebeests are grazers; but very rarely browse low shrubs and herbs. Fasil Tekle,(1996) revealed that, the problems facing the Swayne's hartebeest in Ethiopia are not primarily due to an inability to utilize effectively their natural habitat but due to a reduction of that habitat and the consequent competitions with man and his domestic stock. The subspecies is threatened by further loss of

habitat to subsistence agriculture, overgrazing by domestic cattle and by increasing number of new settlements in and immediately around the Sanctuary. The hartebeests have been restricted into a smaller area because of large number of human movement into areas that were formerly hartebeest habitat. These factors make Swayne's hartebeests in greater danger of extinction at present than any other time in the past in Ethiopia.

Behavioral character

Different studies showed that, Swayne Hartebeests are social animals living in organized herds of up to 300 animals. They form a group aggregated up to 10,000 animals. Swayne Hartebeest form about four social groups within herd. Territorial adult males, non territorial adult males, group of young males, and groups of females and young. According to Kingdon,(1989) the females, within a herd, form groups of 5-12 animals with up to four generations of offspring in their group. Male offspring of Hartebeest may remain with their mother for up to three years, but usually leaves his mother at about 20 months to join groups of other young males. Batty, (2002) reported that within three to four years old, males may begin to attempt to take over a territory with the females within it. Hartebeests are usually conspicuous, nonaggressive and sedentary. They may have a sentinel to warn the herd of predators. According to the study revealed by Batty (2002).

Swayne's Hartebeest although appearing slightly awkward, they reach a speed of 70-80km per hour. Swayne's Hartebeest is the eastern race of *A. b. tora* to whom it is closely related, both species being smaller than the others, but it is distinguished from it by its patches of dark body color. It lives in open country, light bush, sometimes in tall savannah woodland. These are social animals and are normally seen in herds of 4 – 30.

Different studies indicate that, previously Swayne's Hartebeest was found in both Somalia and Ethiopia, but now it is restricted to some protected area of Ethiopia only. In Ethiopia small surviving population was restricted to the grass and thorn scrub plains of the Rift Valley lakes region. Previously their number is declined by hunting, anthropogenic activities of human and due to lack of attention by government. The best known herd is about 100 head which inhabits an area of 400 sq. km in and near the Nechsar National Park. However, the largest known population is on the heavily settled plain of Senkele in the Shashemene area, where a population survives of about 500 individuals; however, their habitat is subject to considerable pressure.

Reproductive status

Different studies show that, the reproduction Swayne Hartebeests varies seasonally depending on the population or subspecies of Hartebeests involved. Birth peaks vary from October to November in South Africa, From December to February in Ethiopia, and February to March in Nairobi National Park. Gestation lasts from 214-242 days and usually a single calf is born. Females isolate themselves in scrub areas to give birth (Batty, 2002). Then leave their young hidden in the scrub for a week, frequently visiting only to suckle. Young are weaned at 4 months (Kingdon, 1989). Hartebeest were among the most widely distributed antelopes in Africa, but have declined rapidly in number and distribution, and seem especially vulnerable to local extinction.

Conservation status

The African large wild mammals are now conserved only in national parks and other reserves, which cover about seven percent of the African land area (Happold, 1995). Current identification of population status of wild life has been very important for conservation of endangered wild life. Ethiopia is one of endowed country by having adverse ecosystem in Africa with a diverse biological wealth of plants, animals, and microbial species. However, conservation strategy and sustainable use of natural resource has been inadequate. The best approach would be to prioritize the conservation needs of our species using a range of criteria that would help to identify those species in need of urgent conservation action. Once this is done the next step would be to prioritize problems and to identify projects (actions) that would help to at least reduce the impact of some of the most important threats.

Ethiopians has developed national protected areas like National park, wild sanctuaries and reserve and, controlled hunting area for wild life conservation. According to international policies hunting in national park and wild life reserve is illegal but licensed hunting for different purpose like for research is permitted within controlled hunting areas. In Ethiopia around protected area due to high population settlement peoples hunting in secured without Licensed when the wild life move out of protected areas. So that due to rare Licensed – for legal hunting the population status of Swayne heart beast become decreasing from time to time with in protected.

One of the important strategies to save these endangered endemic animals is by improvement or maintenance to enhance wildlife habitat. Many people think locking up or preserving an area will make it best for wildlife. While development that would remove the space wildlife needs is certainly detrimental, activities that manipulate vegetation properly are usually good for wildlife. Sankale Sanctuaries and Maze National Park is an important biological area and has great potential for the conservation of the endangered endemic subspecies of Swayne's hartebeest population and other wildlife.

Senkele Swayne's hartebeest Sanctuary was established in 1976 to save the most viable population of the Swayne's hartebeest, an endemic and endangered subspecies (Hillman, 1993). Compositions of Vegetation types

in the sanctuary are divided into three; savanna woodland, valley complex and grassland which make suitable for the survival and reproduction of Swayne hartebeest. In addition to Swayne hartebeest there are other antelopes, such as the greater kudu (*Tragelaphus strepsiceros*), reedbuck (*Redunca redunca*), lesser kudu (*Tragelaphus imberbis*), and carnivores, such as the serval (*Felis serval*), spotted hyena (*Crocuta crocuta*) and common jackal (*Canis aureus*). Mattravers and Netsereab, (1994) reported that, there are about one hundred sixty-seven species of birds have been recorded in Senkele sanctuaries in addition to conservation of Swayne heart best .

The survival of Swayne's Hartebeest depends on effective protection of these remaining populations, especially in protected area .There are a number of policy documents and legal instruments that guide Ethiopia's biodiversity conservation efforts in general and protected area management in particular. At the international level, the Federal Democratic Republic of Ethiopia (FDRE) is signatory to a number of conventions like Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) but the attention given to conserve endangered wild life in Ethiopia still not active. Endangered species often face multiple threats. Their conservation assessment and planning is therefore complex, and requires multiple approaches, including studies on demography, population genetics and ecological modeling. Unfortunately, this information is often hard to collect, and most studies focus only on a limited array of aspects. According to the report of Gardner, Barlow and Peres, (2007) this lack of information is particularly relevant in tropical regions and where most threatened and endemic taxa are concentrated.

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Appendixes

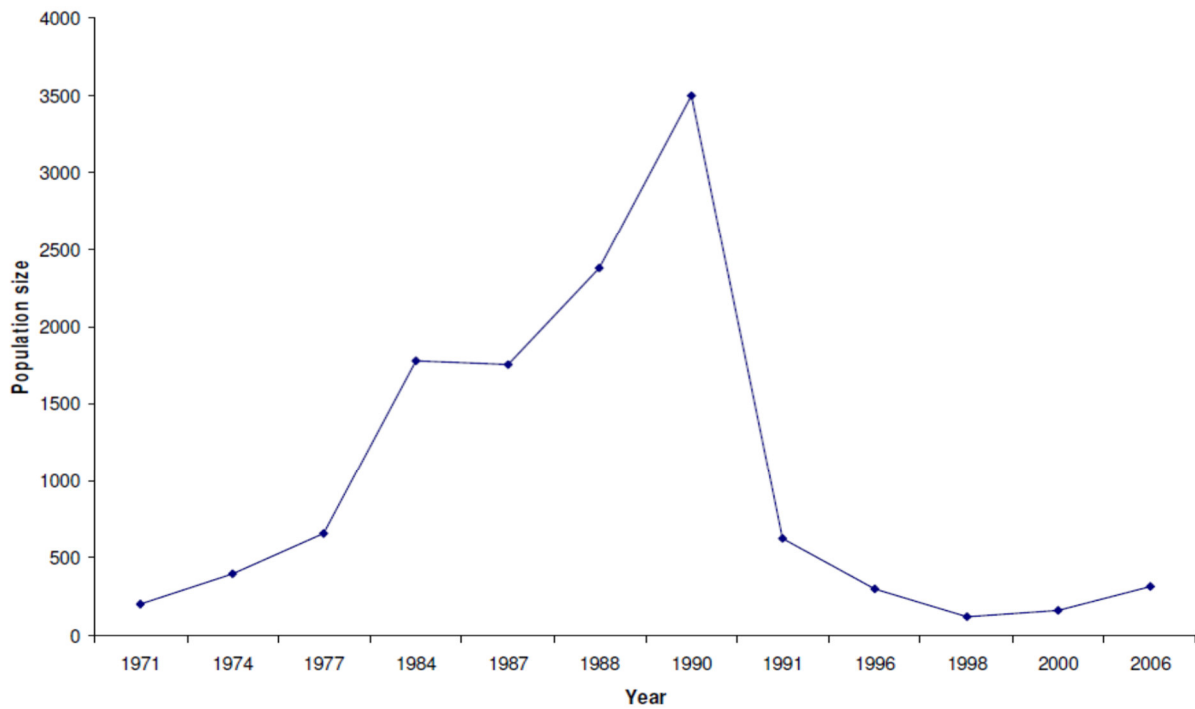


Figure 1. Population trends of Swayne's hartebeest between SSHS from 1971 to 2006 (source: Tewodros Kumssa, 2006).....

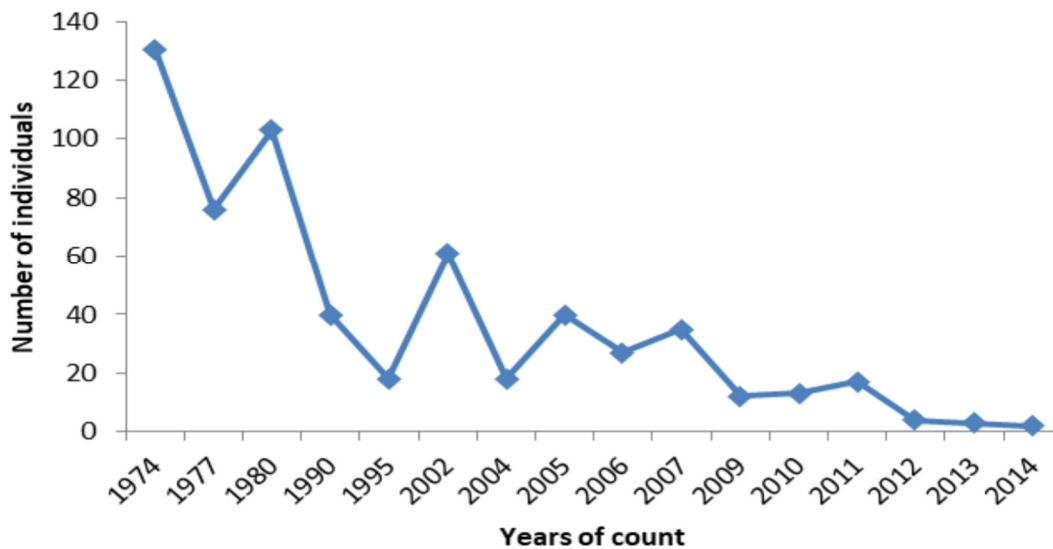


Figure 2. A trend of population size of Swayne's Hartebeest in NSNP between 1974 and 2014 (source: Simon *et al.*, 2020).....



Figure 3 : Swayne's Hartbeest, *Alcelaphus buselaphus Swaynei*, cow with calf (*source: Daan et al.,2012*)