

# Factors Affecting the Survival of Giraffe in Ethiopia

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## Abstract

Giraffe is a social animal and a none- territorial and tend to live in a small group. In Ethiopia there are two species of giraffe; the Nubian giraffe (*Giraffa Camelopardlis*) and Retuculated giraffe ( *Giraffa reticulata* ) occur in southern low lands in east of Omo river including the Mago national park, Borena and Ogden area. Giraffe populations in Ethiopia diminished over the past century in diversity, density and distribution as a result of illegal hunting, habitat degradation, civil war and unrest, Absence of a compressive land use plan, lack of comprehensive research, the impact of skin disease in giraffe population and land degradation due to overgrazing. This review discusses the different physical and biological factors that leads to the declining of giraffe population in Ethiopia.

**Key words:** Biological factors, Ethiopia, Giraffe, Physical factors

## Introduction

The name "giraffe" has its earliest known origins in the Arabic word "zarāfah" perhaps borrowed from the animal's Somali name *geri* (Peust,2009). The Arab name is translated as "fast-walker"(kingdom, 1997). Camelopard" is an archaic English name for the giraffe deriving from the Ancient Greek for camel and leopard, referring to its camel-like shape and its leopard-like coloring (Merriam, 2014).

Giraffe adapted to go without drinking water for several days during which they depend whole on performed water contained in the browse forage. Giraffe is a social animal and a none- territorial and tend to live in a small group but intermittently form the study that done on the genetics of Giraffe, which were thought to combine to compose a single giraffe species suggested they were six species: the West African, Rothschild's, reticulated, Masai, Angolan, and South African giraffe (Brown, *et al.*, 2007).

Giraffes are exclusive browsers , mainly focusing on nutritious young and a new trees and shrub shoots, but Acacia trees are their favorite source of forage (Estes,1992).They also live within scant large coalitions or aggregation of about 12 to 15 individual comprising of familiar females and their calves and this relationship for short duration (Ottichilo *et al.*, 2000).

In Africa, Giraffes are found wide spread in south of Sahara desert particularly Eastern, Southern and central part of the continent (Skinner and Smithers, 1992). Their habitat is mainly Savana landscapes where they exploit browse forage resource found in vegetation community with trees ,specially Acacia and shrubs (Vander and Prins, 2000).

In Eastern Africa, different giraffe species existed but in some countries species of giraffe decline like, *G. c. camelopardalis* has declined from an historic estimate of 20,577 individuals in to the current estimate of 650 individuals , -97%, ( Wube *et al.*, 2016). *Giraffa c. tippelskirchi* has declined from an historic estimate of 63,292 individuals to the current estimate of 35,000 individuals, -50%, (Bolger *et al.*, 2016). *Giraffe c. reticulate* has declined from an historic estimate of 36,000-47,750 individuals to the current estimate of 8,661 individuals (Simmons and Altaerg, 2010). *Giraffe c. Rothschild* has increased from an historic estimate of 1,331 individuals in the 1960s to the current estimate of 1,671 individuals within their natural range 26%, ( Fennessy *et al.*, 2016). *Giraffa c. thornicrofti* has stabilized at close to 600 individuals since 1973, following an increase from approximately 300 giraffes in the early 1970s (Bercovitch *et al.* 2015).

In Ethiopiatwo species of giraffe, the Nubian giraffe (*Giraffa Camelopardlis* ) and Retuculated giraffe ( *Giraffa reticulata* ) occur in southern low lands east of Omo river including the Mago national park, Borena and Ogden area. In Ethiopia giraffe population show a sharp decline in population size in the last decades and now goes to disappear or extinct (Marais *et al.*, 2012). Therefore, the overall objective of this paper was to review the different factors that leads to the declining of giraffe population in Ethiopia.

## Status and distribution of giraffe in Ethiopia

### Historical occurrences of giraffe in Ethiopia

Giraffe formerly occurred in the western and southern lowlands of Ethiopia (East 1999). As a large portion of the country is covered by high-altitude mountain afroalpine ecosystems, the distribution of giraffe has probably never been much more extensive, being limited by the foothills of the central plateau, by the dense forests of the southwest and by the Shebelle River (Fust 2009). According to historical records, Nubian giraffe (*G. c. camelopardalis*) occurred in the western and south-western parts of the country and reticulated giraffe (*G. c.*

*reticulata*) in the south (Yalden *et al.* 1999).

The Omo River, which flows into the top end of Lake Turkana (formerly Lake Rudolf), was thought to act as an ecological barrier between the two (sub) species (Yalden *et al.* 1999).

According to Dagg (1962), reticulated giraffe were abundant along the southern border of the country; occurred in eastern Ethiopia along the borders of the Danakil Desert and in the Ogaden Region. In contrast to East (1999) did not refer to the occurrence of Nubian giraffe in the western and south-western parts of the country. Kingdon (1979) suggested that giraffe once extended throughout the Ogaden Region, and included the Danakil Desert as part of their range. However, Yalden *et al.* (1984) indicated that there was no firm evidence to support Kingdon's belief of giraffe incidence in the Danakil Desert; although Hunt (2000) suggested that local place names were indicative of the former presence of the species in northern Somalia. Blower (1968) noted the occurrence of giraffe in the southern Ogden Region, but did not indicate the (sub) species concerned, and suggested that their continued survival there was doubtful by the late 1960. Reticulated giraffe occurring in the north western parts of the country.

A small population of giraffe remains in the Omo-Tama and Borana areas along the border with Kenya (Fust2009; Renaud 2006). These animals are in a critical situation and very close to local extinction (Renaud, 2006). Less than 20 giraffe were observed during an aerial survey of Omo National Park in 2006, indicating that the population has been further decimated over the last decade (Renaud 2006). According to anecdotal information, giraffe still occur in the Tama Wildlife Reserve, but their status is unclear and likely less than 20 individuals. Currently, a population of giraffe approximately 90 individual of Nubian giraffe observed during aerial count in Gamble national park in the far west of Ethiopia in 2009 (Wube 2013).

### **Factors affecting the survival of giraffe in Ethiopia**

Ethiopia is one of the most densely populated countries in Africa with an estimated population of over 90 million people. Population pressure contributes significantly to environmental degradation in the country (Bekele and Hailemariam, 2010). Wildlife populations in Ethiopia have diminished over the past century in diversity, density and distribution as a result of a loss of habitat, illegal hunting, land clearing for farming and land degradation due to overgrazing (Tefera, 2011). Several of Ethiopia's protected areas exist on paper only, while others have declined in size or quality (Jacobs & Schloeder 2001; Hillman 1992, 1993). There are different physical and biological factors that affect giraffe population distribution in Ethiopia. Now those factors describe in detail as follows:

#### **Physical factor**

##### **Hunting**

Giraffes were probably common targets for hunters throughout Africa (Kingdon, 1999). Different parts of their bodies were used for different purposes. Their meat is used as food source for human. The tail hairs served as flyswatters, bracelets, necklaces and thread. Shields, sandals and drums were made using the skin, and the strings of musical instruments were from the tendon. Some African countries people used the skin of giraffe as medicine like treat nose bleed (Dagg, 2000).

In Ethiopia giraffe in Tama reserve and Mago national park are primarily hunted with automatic rifles by tribe members living adjacent to the parks and protected area boundaries for their tail, which is used to make strings for the production of highly traditional necklaces and for their meat, the hammer tribe who inhabit the adjacent areas of along the eastern boundary of the park. The men of this tribe have access to automatic rifles and traditionally the men will have better chance of getting wives, if they wear such necklaces and present as a gift to would be wives and wife initiates the husband to go and kill big wild animal like giraffe, so as to be respected by the neighboring peoples considering that she is the wife of a bold man who killed big wild games amongst their ethnic groups. This leads giraffe population decrease or disappeared from time to time in most parts of Ethiopia (Wube, 2013).

##### **Habitat degradation**

Habitat degradation has hurt the giraffe population in Africa. The need for fire wood and grazing room for livestock those lead to deforestation (Pellow, 2002). In Ethiopia most people cutting the Acacia species for charcoal due to this the distribution of giraffe population decrease because Acacia tree are the most necessary food source for giraffe. As a result of those and other factors the population of giraffe decline and recorded by IUCN red book as endangered species (Ducworth, 2002).

##### **Civil war and unrest**

During the periods of civil unrest, machine guns were readily available through Ethiopia's black market and, as a result, hunting increased throughout the country (Jacobs and Schloeder, 2001b). Giraffe is the most vulnerable to hunting during this time included, other species, The Ethiopian Wildlife Conservation Organisation (EWCO),

established in 1965 as a semi-autonomous body responsible for wildlife conservation in Ethiopia, has reported ongoing illegal hunting of wildlife in Mago, Omo and Gambella National Parks, all of which have been important refuges for giraffe (Duckworth 2002).

#### **Absence of a comprehensive land use plan**

In Ethiopia there is lack of a comprehensive land use plan in the last periods and currently for the country is a major cause for concern (Damtie, 2010). Potential future threats include the development of a large scale infrastructure like sugar development scheme by the Ethiopian Sugar Development Agency in the important place of giraffe like lower Omo Valley, which is envisioned to occupy 150,000 ha, including parts of Omo National Park, Tama Wildlife Reserve and Mago National Park this leads the extinction of giraffe in those important place of giraffe (Enawgaw *et al.* 2011).

Additionally, the Gibe III hydroelectric dam with an associated hydropower plant, currently under construction on the Omo River by the Ethiopian Electric Power Corporation, can possibly have major negative environmental implications (Wikipedia 2012).

Other potential threats include the mismanagement of environmental resources, i.e. continued expansion of agriculture and other human activities into natural land at local and commercial scale leads of extinction of most mammal including giraffe population in Ethiopia (Bekele & Hailemariam, 2010).

#### **Lack of comprehensive research**

Giraffe have been largely overlooked in terms of research and conservation in the past and also know a time in all part of Africa and also in Ethiopia due to lack of research the current status of Ethiopian giraffe is not clearly known. However, it indicated in the summery report giraffe still occur in Ethiopia. An aerial survey that done in Mago national park 20 individual giraffe population still occur and 100 reticulated giraffe distributed in Gambella national park and around ogaden (Fennessay, 2013).

#### **Biological factor**

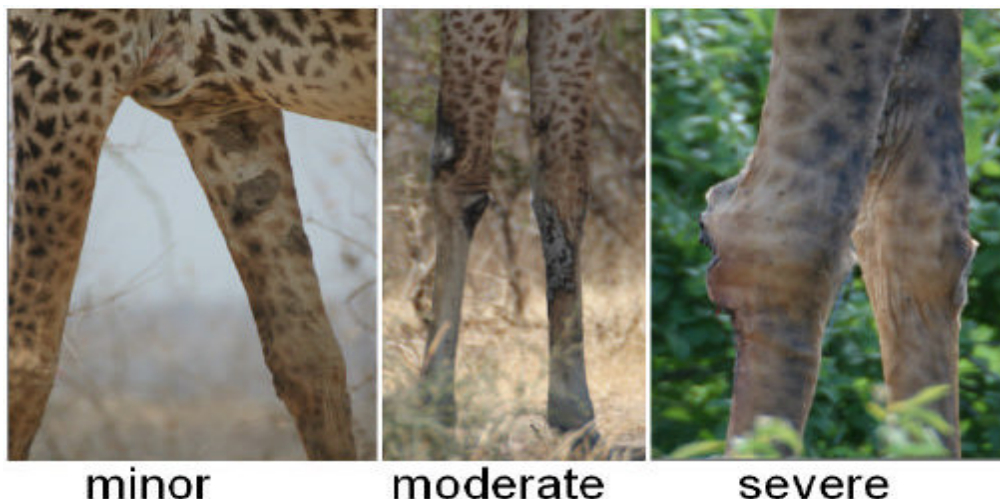
Biological factor or density dependent factor are a limiting factor that depends on population size. Those factors include competition, predation, parasitism, disease, and drought. From those factors mostly giraffe affect by the skin disease.

#### **The impact of skin disease on giraffe population in Ethiopia**

Disease is one of a significant problem in Africa wild life resource and have adverse impact in population status and distribution in protected area, in community conservation area, in national park. From the different disease that affect giraffe population in Africa specially in Eastern African countries, like Kenya, Tanzania and Ethiopia the skin diseases more adverse impact (Fust, 2009)

The skin disease tend to affect the inside and rear portion of the front legs, surrounding the carpal joints of giraffe. Observation of giraffe conducted from vehicles in 2006 in Ethiopian national park specially giraffe population existed like in mago national park, Gambela national park and in Gamble national park some giraffe population is severely affected by the skin disease this case giraffe population decrease from time to time and go to extinction (Fennessay, 2013). In addition of skin diseases there are different disease that affect giraffe population like susceptible to outbreaks of anthrax, bacterial disease and epidemics of gastroenteritis (McIntock, 1999).

Giraffe host numerous species of internal parasites and are susceptible of to various disease and disorder of the skin



**Fig. 1** showing the three severity classes of skin lesions. Note that the "severe" class requires that the behavior of the individual is also affected.

The above figure show the impact of skin disease on the giraffe specially in the skin part of giraffe.

### Conclusion

The current giraffe population in Ethiopia are estimated at <150 Nubian ,<20 Rothschilds giraffe ,this indicate now a time giraffe population in Ethiopia is in critical situation due to different factor like lack of compressive research , lack of awareness of the local society that lived in the protected area and in the national park that giraffe population inhabited , lack of compressive land use plan in the country, illegal hunting ,habitat degradation due to expansion of agriculture and different investment activities, civil war and unrest, and disease are some major factors for the disappearing of giraffe population in Ethiopia.

### Recommendation

The following recommendations are suggested to mitigate the threats that could be faced by the giraffe population in Ethiopia:

- Greater understanding of giraffe population numbers, range and conservation status across the country, including (sub) speciation.
- Development of National Giraffe Strategy for the country.
- Identification of priority conservation efforts for giraffe conservation, specifically for viable remaining populations such as in Gambella National Park and;
- Support to dedicated giraffe conservation, habitat protection, education and awareness initiatives (government, NGO and academic).

### References

- Bercovitic, F. Brand, R. Bolgar, D. (2015).The threatened giraffe population in Eastern Africa .PP.129-132.
- Bolgar, D. Muller, Z. Carter, K. (2016) .Giraffe species in Eastern Africa .Pp.126-129.
- Fennessay, J. Hussein , A. Lee ,D. (2016).Giraffe population in Kenya and Tanzaniya.Pp. 123-135.
- Bekele, S. & Hailemariam, A. (2010). Population dynamics and environment in Ethiopia: An overview. In Ethiopian Environment Review **1**: 1-18. Forum for Environment. Addis Ababa, Ethiopia.
- Dagg, A. (2000).Giraffe camelopardalis PDF mammalian species **5**: 1-8
- Damtie, M. (2010). Legal and institutional issues for environment in Ethiopia in 2008. In: Ethiopian Environment Review **1**: 1-18. Forum for Environment. Addis Ababa, Ethiopia.
- Duckworth, F. (2002ab). An assessment of Ethiopia's wildlife situation. Ethiopian Reporter,
- East, R ,(1999).African antelope data base 1998. IUCN/SSC. Antelope specialist group, IUCN, Gland Switherland and cameridige ,UK.Ethiopia.
- Fennessay , J. (2013) Giraffe letter.**7**:4-5.
- Fennessay , J. (2010). A rapid assessment of giraffe conservation status in Ethiopia.*
- Fust , P. (2009).Influence of anthropogenic activites on the giraffe population of Omo national park, giraffe .**3**:29-31.
- Hunt ,T. (2000). A general survey of the Somaliland protocrate water low and sons, London .Pp. 231-241.
- Jacobs , M. & Schloeder , C. 2001. Impacts of conflict on biodiversity and protected areas inEthiopia Biodiversity Support Program, World Wildlife Fund, Inc., Washington, D.C., USA.

- Kindon , J. (1999) .East African mammal: An. Atlas of evolution in Africa University of Chicago press. Pp. 313-337.
- Kingdon , J. (1997). *The Kingdon Field Guide to African Mammals*. Academic Press. pp. 339–44.
- Kingdon, J. (1999). East African mammal: An Atlas of evolution in Africa .3:231-249.
- Marais, G. Dagg, A , Forster, J. (2012).The status of giraffe population both past and present annual report .Pp. 2-7.
- Mclintock, D. (1999). A new natural history of giraffe Charles Scribneers Sons, New York .Pp. 130 -132.
- Merriam, W. (2014).Definition of camelopard .Encyclopedia Britannica: Retrieved 3: January. 2017
- Ottichilo ,W. Deleew , J. Skidmore , A. Prins , H & Said , H. (2000). Population trends of large non –migratory wild herbivores and livestock in the MaasaiMara ecosystem, Kenya, African jornal of ecology .**38**:202-216 .
- Pellow, R. (2001). "Giraffe and Okapi". In MacDonald , D. *The Encyclopedia of Mammals (2nd ed.)*. Oxford University Press. pp. 520–27. ISBN 0-7607-1969-1.
- Peust , C. (2009). "Some Cushitic Etymologies". In Dolgopol'skiĭ, A.; Takács, G.; Jungraithmayr, H. *Semito-Hamitic Festschrift for A.B. Dolgopolsky and H. Jungraithmayr*. Reimer. pp. 257–60.
- Renaud , P. (2006). Omo national park report for the wet season aerial survey , African park Foundation ,Ethiopia .
- Simmons. R & Altwegg,T (2010). "Necks-for-sex or competing browsers? A critique of ideas on the evolution of giraffe". *Journal of Zoology*. **282** (1): 6–12.
- Skinner, K. &Smithers , B .(1992). *The Mammals of souet Africa sub region*.University of Pretoria press Pretorial. Pp .604-606
- Van Sittert , S. J. Skinner, J.Mitchell, G. (2010). "From fetus to adult An allometric analysis of the giraffe vertebral column". *Journal of Experimental Zoology Part B Molecular and Developmental Evolution*. **314**: 469–79.
- Wube, T. ( 2013ab). Status of giraffes in Ethiopia – the case of Mago National Park and Tama Wildlife Reserve.Unpublished Report. Department of Zoological Sciences, Addis Ababa University, Addis Ababa.
- Wube , T, Brown, M .Bolger. D, Deacon. F ,(2016).Giraffe a Camelopardalis. The IUCN read list of threatened species.IUCN.Giraffe.**26**:16-21.