



## Population Estimation of African White Backed Vultures (*Gyps africanus* – *Salvadori, 1865*) in Gondar Woreda of Ethiopia

Dereje Mulu<sup>1</sup> & C. Subramanian<sup>2</sup>

<sup>1,2</sup>Faculty of Natural and Computational Sciences, University of Gondar, Ethiopia

### Abstract

The present study was conducted on population estimation of African white backed vultures from June, 2011 to January, 2012. The study period includes rainy (June to September) and post rainy (October to January) seasons. Three one kilometer transects were laid in three different sites *viz.*, Debrebrehan Selassea, Bath of Fasiladas and Semiw Michael and surveys were made twice a month. A total of 862 individuals of African white backed vultures were recorded from all the three sites in both seasons. The overall density of vultures differs in different sites. The maximum density was recorded from site III and the minimum density was recorded from site I. The seasonal density varies among the sites, highest density was recorded for both the seasons from Site III followed by Site II and the lowest was recorded from Site I for both the seasons.

**Key words:** African white backed vultures, *Gyps africanus*, Gondar woreda, Population estimation

### Introduction

Vultures have social, cultural and ecological values (Prakash *et al.*, 2003). According to Anderson (2002), vultures also fulfill an extremely important ecological role like that of keeping natural and manmade habitats free of carcasses, waste and even human excrements to prevent the spread of disease such as Anthrax and Botulism. If it were not for vultures, many parts of the world would look like junkyards of bones and rotten meat; as a result, they are considered as “Natures Disposal Squads” or “Incinerators,” and therefore, the dying out of vultures would be an irreplaceable loss of a link in the food chain (Oaks *et al.*, 2004). However, the population of vultures has declined in many areas around the world in the last three decades (Anderson 2000; Oaks *et al.*, 2004), due to different environmental and anthropogenic factors.

There are 22 kinds of vultures in the world which comprise two groups of large diurnal birds of prey the new world and the old worlds (Mundy *et al.*, 1992). The new world vultures are found only in America and the old world vultures occupy the warmer parts of Europe, Asia and Africa (Mundy *et al.*, 1992). Old world and new world vultures are examples of “convergent evolution” means new world vultures are not closely or genetically related to the superficially similar family of old world vultures; similarities between the two groups are due to convergent evolution (Houston, 2001). Among the 22 kinds of vultures 15 are old world and 7 types are new world vultures. Among the 15 kinds of old world vultures 11 species are found in Africa (Mundy *et al.*, 1992) from which 7 species are found in Ethiopia (Janos, 2009). These includes: Hooded vulture (*Necrosyrtes monachus*), Egyptian vultures (*Neophron percnopterus*), Ruppell’s griffon vulture (*Gyps ruppellii*), Griffon vultures (*Gyps coprotheres*), Lappet faced vultures (*Torgos tracheliotos*), Bearded vulture (*Gypaetus barbatus*), and African white backed vultures (*Gyps africanus*).

From the past three decades, the population of vultures has been observed to drop drastically and in many areas around the world vultures are now totally confined only to protected areas such as national parks and game reserves (Anderson, 2002; Oaks *et al.*, 2004; Rondeau and Thioully, 2004). Early accounts suggest that vulture species were once abundant across most of their ranges, having adapted well to anthropogenic modification of their natural habitats (Birdlife International, 2002).

### African White Backed Vultures (*Gyps africanus*)

The African white backed vulture is the most common species in Africa. They are numerous especially in South Africa (Mundy, 1997). The population has been estimated to 100,000 pairs or 200,000 individuals (Mundy *et al.*, 1992). Their distribution correlates with drier wood lands and tall trees such as *Ficus spp.* and *Adansonia digitata* which are suitable for roosting and breeding (Mundy *et al.*, 1992). The species is most common in sparsely inhabited areas and large conservation areas (Mundy, 1997). According to the tour report of Janos, (2009), African white backed vulture (*Gyps africanus*) is one of the old world and among the seven species of vultures which are found in Ethiopia. The population has declined by at least 10% during the past three generations (Anderson, 2000) due to environmental and anthropogenic threats. In his book- Eskimo Red Data book of Birds of South Africa, Anderson (2000) stated that, African white backed vulture is now listed as “vulnerable” (V) in the, Lesotho and Swaziland. In addition, they are “Nearly threatened” (NT) under the new threatened vertebrates of Swaziland and Namibia (Monadjem *et al.*, 2000) Moreover, the near threatening nature of African white backed vulture is confirmed by Birdlife International, (2007).

The loss of habitats and a change in land use, declining food availability, and improved domestic livestock management practice are the major factors which caused for the threatening of African white backed vulture. In addition, the feeding style of African white backed vultures makes it very vulnerable to poisoning, especially when carcasses are laced with poisons to kill other animals. The poisonings can also be deliberate (rarely) persecution of vultures by farmers, or in order to acquire vulture parts for medicine and superstitious purposes by traditional healers (Mundy *et al.*, 1992;

Govender, 2002). According to, Bruce (1974), African white backed vulture can be identified by the following structures, colors and conditions from the other species of vultures, such as:-upper parts- brown, tail- black primaries-blackish, under parts-tawny brown: back and rump- white, head and neck- blackish, pale- under wing coverts, legs-black, bill- brown dark, and eyes- dark brown.

## Materials and Methods

### Study Area

The Gondar woreda is located in north western part of Ethiopia under Amhara Regional State on a mountainous land and bounded by Wogera woreda in the north, Gondar Zuria in the south, West Belesa in the east, and Dembia woreda in the west, at a distance of 715 km from the capital city- Addis Ababa and 180 km from- Bahir Dar (Capital city of Amhara Regional State). The average elevation of this area is 2210 masl with latitude and longitude of 12° 40'N and 37° 45' E., the average monthly temperature is 20°C and the average annual rainfall is 1172 mm (Source: Amhara Region Metrological Service Agency). Three specific sites were randomly selected with one kilometer transect each for the enumeration of vultures. The sites were Debrebrhan Selasse (site I), Bath of Fasiladas (site II), and Semiw Michael (site III). They are located in North East, South West, and South of the center of the town respectively (Fig.1).

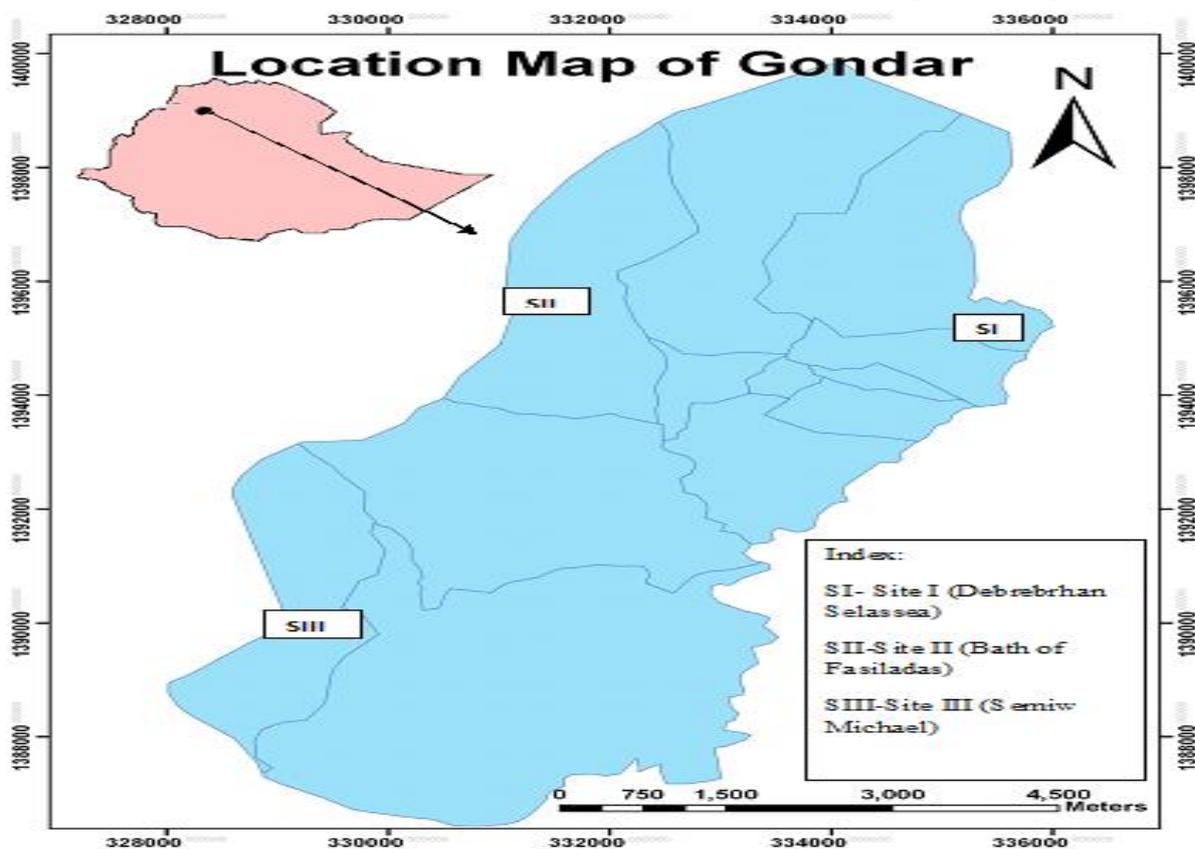


Figure 1. Map of the study area showing the study sites

### Population Estimation

Vultures were enumerated on foot during the early hours of the day from 6:00 am to 10:00 am and late hours of the day from 4:00 pm to 7:00 pm by using the line transect method (Burnham *et al.*, 1980). The entire study period was divided into rainy (June – September) and post rainy (October – January) seasons. The entire rainy season was treated as wet season and the post rainy season was treated as dry season for data collection and interpretation. The sites were visited twice monthly, and the information was gathered for 16 replicas.

## Results

### Records of African white backed vultures

A total of 862 individuals of African white backed vultures were recorded from all the three sites in both seasons. The maximum number was observed from the site III *ie.* 455 birds (263 in wet season and 192 in dry season), followed by site II, it was 295 individuals (166 in wet season and 129 in dry season) and the minimum number of the vultures were recorded from the site I, 112 vulture (62 during wet season and 50 during dry season) throughout the study period.

### Overall density

The density of vultures were calculated invariable of seasons and compared among the sites (Fig.2), it differs in different sites. The maximum density was recorded from site III ( $28.43 \pm 13.46 / \text{km}^2$ ) and the minimum density was recorded from site I ( $7.00 \pm 3.02 / \text{km}^2$ ).

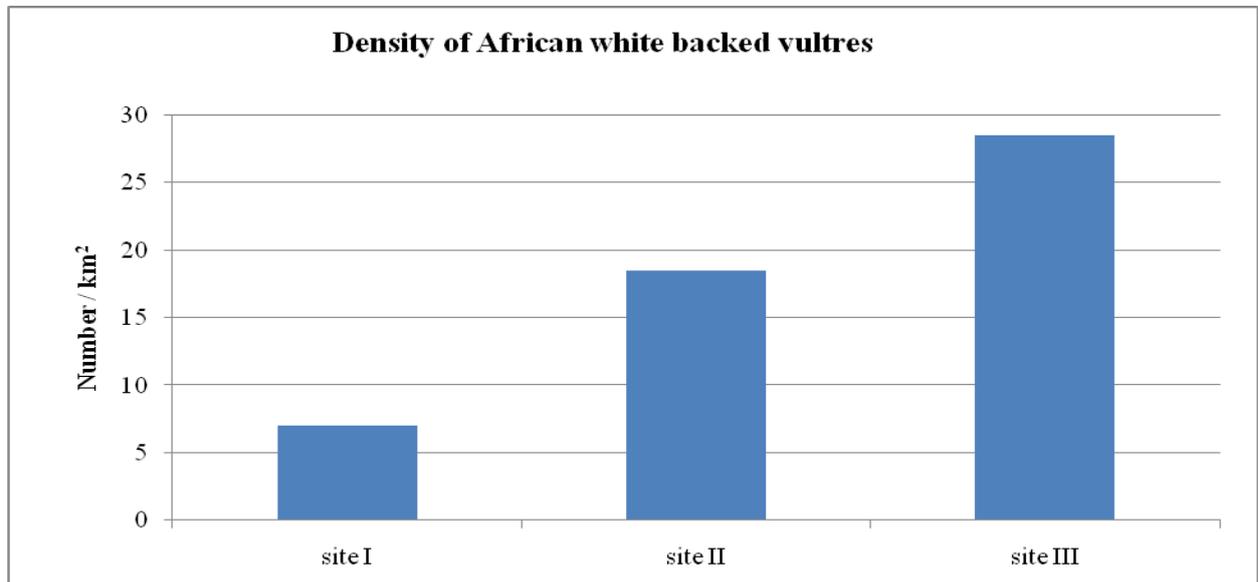


Figure 2. Comparison of overall density among the sites

### Seasonal density variations

The population density results show seasonal variations, during wet season, the highest density was recorded from site III ( $39.75 \pm 8.91 / \text{km}^2$ ) and the lowest was recorded from site I ( $9.50 \pm 2.12 / \text{km}^2$ ) and during dry season the maximum density ( $17.13 \pm 1.49 / \text{km}^2$ ) was recorded from site III, and the minimum density ( $4.5 \pm 0.41 / \text{km}^2$ ) was recorded from site I (Table 1).

Table 1. Seasonal density variations of the African white backed vultures in different sites

Sites	Seasonal density / km <sup>2</sup>	
	Wet Season	Dry Season
Site I	$9.50 \pm 2.12$	$4.5 \pm 0.41$
Site II	$26.25 \pm 4.44$	$10.63 \pm 4.05$
Site III	$39.75 \pm 8.91$	$17.13 \pm 1.49$

### Discussion

The study results show that, the highest density of African white backed vultures from the site III. The reason may be high availability of food sources because of Elfora cattle slaughter house and highest tree density in this site. And also this site is free from the human disturbance for their roosting. However, Ogada and Keesing (2010) stated that the food availability is not a cause of the vultures. As per Herrmann and Herremans (2000) the dispersion in subtropical African raptors is usually related to rainfall pattern. There is a direct relation of rainfall and vultures density in this area. Significant seasonal variations were observed in the population size of African white backed vultures from the study sites. Seasonal variation in avian species composition and abundance had been well documented by Mahabal *et al.*, 1990. Subramanian, (2002) also felt that climatic factors are the major ones influencing the size of animal population. Moss *et al.*, (1982), stated that weather can be important either by itself or through its effect on food supply: Animal seem to limit their own numbers below any threshold set by weather, food, disease, predation, parasites or place to live. Avian population densities can be influenced by the singular or interactive influence of a variety of factors such as habitat physiognomy, habitat availability predation, intraspecific and interspecific resource competition, parasites and disease and weather (Beyon and Mortimer, 1986). The magnitude of the influence of these factors may vary in importance according to geographic areas, food habits, and migratory status of the birds (Subramanian and Raja, 2011)

### Conclusion

According to the present findings, the density and distribution of African white backed vultures is depend on the food and roosting trees availabilities and areas with free of human and other interference. This area has favorable conditions for vultures with good habitat availability and food resource.

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