

First African white-backed vulture (*Gyps africanus*) tagged with GPS transmitter in North Africa and first record in Algeria

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Abstract

In June 2021, the first African white-backed vulture was tagged with a GPS transmitter in the Western Palearctic. The capture and release site was CRV-Jbel Moussa in Northern Morocco. After several weeks of wandering, the bird crossed the Sahara Desert in August, possibly accompanied by other migratory group of raptors. During its southbound travel, the bird passed through the extreme south-west of Algeria, making it the first known record of the species in the country. The signal from the transmitter was lost in Southern Mauritania in August 2021.

Keywords: White-backed vulture, *Gyps africanus*, GPS-tagging, bird migration.

Introduction

The African white-backed vulture (*Gyps africanus*) (Picture 1) is listed as Critically Endangered due to the decline of its breeding population (Birdlife International, 2021). Its range extends from the Sahel to Eastern and Southern Africa (Anderson, 2004). In North Africa and Europe, it is still considered as a vagrant, although its records have increased slightly recently (Dies *et al.*, 2009; El Khamlichi *et al.*, 2014; Godino and Machado, 2015). Despite having almost similar range over large parts of sub-Saharan Africa, its congener, the Rüppel's vulture (*Gyps rueppelli*), is far more regular in the Western Mediterranean region. In addition to its regularity, the Rüppel's vulture numbers seem to have increased as well during the last two decades to the point where it's not considered as a rarity in Southern Spain and Northern Morocco (Ramírez *et al.*, 2011; El Khamlichi, 2020; Garrido *et al.*, 2020).

Within the framework of the scientific monitoring program of African vultures launched by the Department of Water and Forests and GREPOM/BirdLife Morocco, an African white-backed vulture was captured and equipped with a GPS-GSM transmitter at the Jbel Moussa Vulture Recovery Centre (CRV-Jbel Moussa). This is the first marking for this species in North Africa and it has provided relevant information on its movements in several countries en route to its native distribution area south of the Sahara.



Picture 1. The African white-backed vulture right after its GPS-tagging and release (Benoit Maire).

Materials And Methods

This bird, born in 2020 as indicated by its plumage, was captured in Northern Morocco on 29 May 2021. The GPS device used is model OT-50 GPS-GSM-2G of the Ornitela brand (identification number 182078). This GPS transmitter had originally belonged to a Cinereous vulture (*Aegypius monachus*) released by GREFA in Spain that drowned in the Strait of Gibraltar during its southward migration (GREFA, 2019). The bird was tagged by the Moroccan Association for the Protection of Raptors (AMPR). The tagging system was a pelvic type harness with 44-inch Teflon tubular tape (Thaxter *et al.*, 2014). After a period of quarantine to ensure its good health, the bird was released in the same area where it was captured (i.e., vicinity of CRV-Jbel Moussa in M'diq-Fnideq province) (Picture 2).



Picture 2. The tagged bird at CRV-Jbel Moussa (R. El Khamlichi)

The GPS-GSM transmitter settings were adjusted to provide downloads every sixty minutes and locations every five minutes and the device was maintained above 75% battery throughout the study period. The parameters 'total distance travelled', 'maximum daily displacement' and 'average daily displacement' in kilometres were calculated. The Sahara Desert crossing was quantified from latitude 28°N to latitude 18°N. Spatial analysis was performed using the adehabitat library implemented in R-Studio (Leonard, 2017). Maps were plotted using Qgis software (Thiede *et al.*, 2014) and Google Earth Pro.

Results

The GPS transmitter was active from 19 June until 18 August 2021 (a total of 61 days). The signal transmission was suddenly lost near the Mauritania-Senegal border with no mortality pattern detected in the accelerometer. In this period, 11,796 GPS positions were recorded in the three countries crossed by the bird: Morocco, Algeria and Mauritania (Fig. 1). To our knowledge, this is the first known record of the species in Algeria. This bird travelled more than 6,000 km in two months, with a daily average of 102.6 km.

Before starting the journey south across the Sahara Desert, the bird wandered around Morocco for 40 days and focused its movements on the North Atlantic Plains and Hills, Middle Atlantic Plains and Hills, High Atlas and Anti-Atlas Mountains (Fig. 2). In the province of Settat, there were feeding records on a road for several days, presumably due to the vulture feeding on roadkill animals (Fig. 3). The area where it remained the longest, a total of 29 days, was in the province of Essaouira, around the village of Medahene.

The Sahara Desert was crossed in six days at an average daily speed of 250.5 km in a direct southerly direction without marked course changes (Fig. 4).

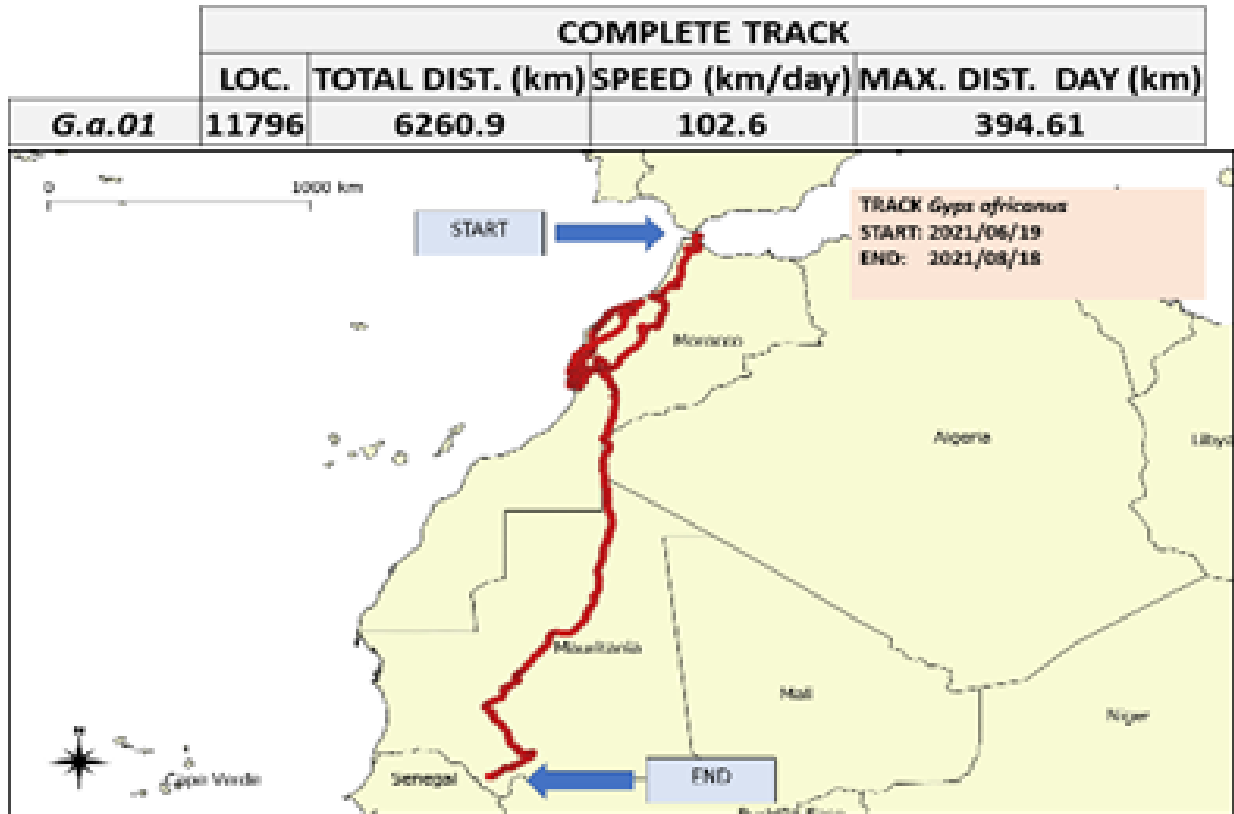


Figure 1. Movements of the African white-backed vulture during the study period.

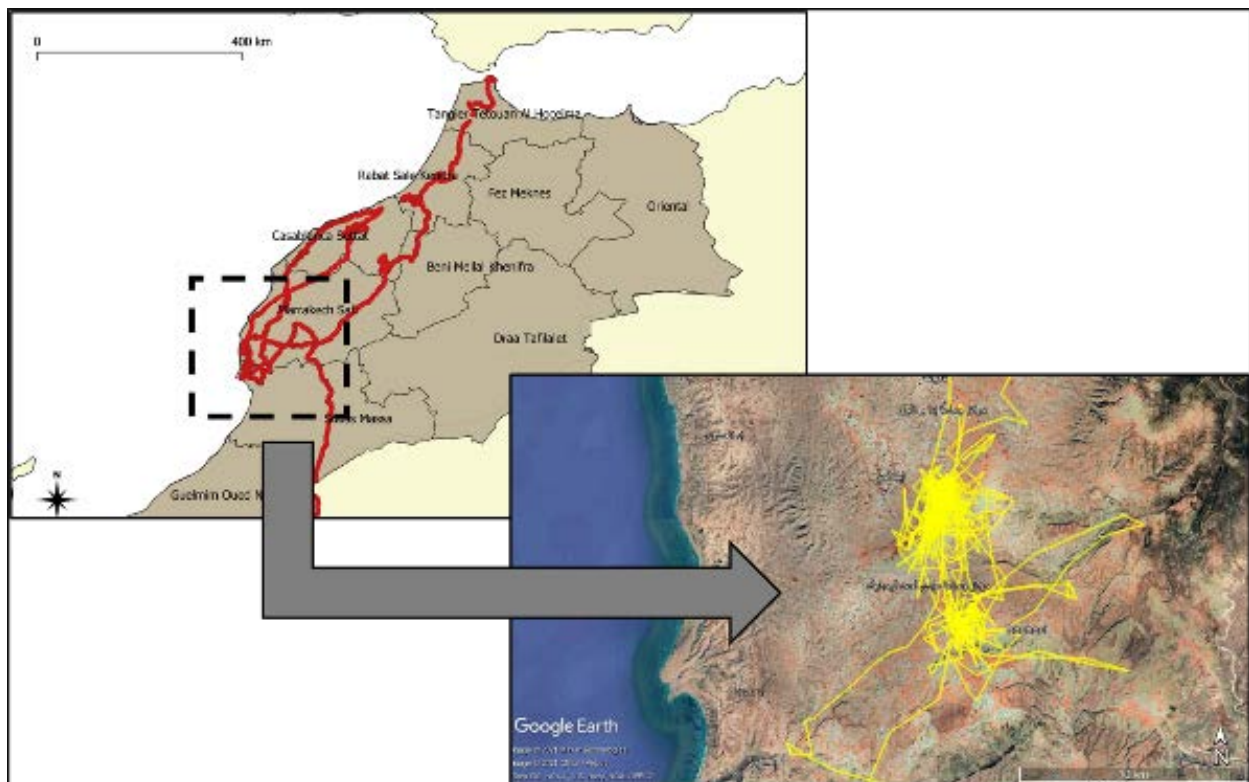


Figure 2. Temporary settlement of the study individual.



Figure 3. Feeding on the road during several days.

CROSSING SAHARA DESERT				
LOC.	TOTAL DIST. (km)	SPEED (km/day)	MAX. DIST. IN ONE DAY (km)	
<i>Gyps africanus</i>	1262	1753.6	250.5	374.2



Figure 4. Sahara Desert crossing.

Discussion

Both the Rüppell's vulture and the African white-backed vulture were not common in the scavenger raptor community in North Africa and Southern Europe but this has changed recently. One of the hypotheses for this appearance of sub-Saharan vultures north of the Sahara is that they join the flocks of Griffon Vultures (*Gyps fulvus*) on their return migration. Thousands of Iberian Griffon Vultures are overwintering within the range of the African vultures in the Sahel region, and it is suggested that when

the European vultures return north, their African congeners follow their flocks to the Western Mediterranean region (Gutiérrez, 2003). After the increase of Rüppell's vulture numbers in the last two decades, the first breeding attempt of this species was confirmed in Spain in 2020 (Elorriaga *et al.*, 2020). Perhaps these dispersal flows and these changes in the breeding range are influenced to some extent by factors attributable to climate change as occurs in other species (Anderson *et al.*, 2009; Carey, 2009).

The experience acquired with the marking of this bird shows that it spent a considerable time wandering around Western Morocco during which it was presumably feeding on dead cattle in the surroundings of several villages. Though, the information provided by the GPS transmitter only seem to have confirmed that it was feeding on roadkill animals (fig. 3). This is common in sub-Saharan countries such as Senegal where dozens of vultures are observed feeding on roadkill dogs, sheep and cows (pers. obs.).

In August, coinciding with the migration of other raptor species breeding in Europe and North Africa, the tagged vulture began to cross the Sahara Desert in a southerly direction. The speed of travel across the Sahara (250.5 Km/day) was higher than those recorded in the Egyptian vultures and Booted eagles during postnuptial migration at 190 km/day (López-López *et al.*, 2014) and 208.8 km/day (Mellone *et al.*, 2015) respectively. Remarkably, it is similar to that of the Black kite at 245 km/day (Meyburg and Meyburg, 2009). The Black kite is the most abundant raptor in migration through the Strait of Gibraltar during the first fortnight of August (Scholer *et al.*, 2016), something that together with the speed of migration reinforces the hypothesis that it joined a migratory flock of this species. The loss of the transmission occurred in Mauritania, very close to the border with Senegal within the breeding area of the species (Birdlife, 2022) and the reason could not be ascertained (we cannot rule out neither a failure in the transmitter or a lack of the GSM-2G coverage).

At the end of 2021, the Migres Foundation captured and GPS-tagged another bird of this species in Spain (Tonkin *et al.*, 2022). The tagging of these birds will have especially important implications for the knowledge of this sub-Saharan species occasionally found in the Western Palearctic region. The conservation horizon that broadens up in North Africa and Southern Europe is vast, as Rüppell's vulture and the African white-backed vulture can be included as breeders in the coming years, although some problems may arise, such as hybridisation of these birds with the abundant Griffon vulture in the Iberian Peninsula.

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