

Activity patterns of African White-backed Vultures *Gyps africanus* in relation to different land-use practices and food availability

Campbell Murn^{1,3*} and Mark D Anderson²

¹ The Hawk Conservancy Trust, Andover, Hampshire, SP11 8DY, UK

² Northern Cape Department of Tourism, Environment and Conservation, Private Bag X6102, Kimberley 8300, South Africa

³ Centre for Wildlife Assessment and Conservation, PSL Building, University of Reading, Whiteknights, Reading, RG6 6AS, UK

* Corresponding author, e-mail: campbell@hawkconservancy.org

Changing patterns in land use in relation to the breeding distribution and foraging behaviour of the African White-backed Vulture *Gyps africanus* were investigated around Kimberley, South Africa. Recent land-use trends indicate a significant increase in game farming and a decrease in traditional cattle and sheep enterprises. Combined cattle and game farms were significantly larger than other farm types and associated with land-use activities that positively affect vulture behaviour. Vulture breeding colonies were found in *Acacia* woodland areas that are associated mostly with cattle farms and combined cattle and game farms. Food availability, as either livestock mortalities or animals wounded by hunters, was positively associated with vulture activity except on farms with sheep, which had less vulture activity than other farm types. The observed increase in area used for game farming is concluded to offer potential benefits to the resident African White-backed Vulture population.

Introduction

Raptors are sensitive to habitat modification brought about by land-use change and human activities (Herremans and Herremans-Tonnoeyr 2000, Avilés *et al.* 2001). Whilst some vulture species can adapt to human-modified environments, such as livestock farming areas (Robertson and Boshoff 1986, Scott *et al.* 2000), vultures clearly benefit from the existence of protected areas and occur at significantly lower densities outside them (Liversidge 1984, Aumann 1997, Herremans 1998, Rondeau and Thiollay 2004, Thiollay 2007).

Human development is associated with the construction of artificial structures, such as electrical powerlines and water reservoirs, and these are frequently significant causes of mortality for vultures (Anderson and Maritz 1997, Anderson *et al.* 1999). Secondary poisoning is also a constant threat to vultures due to their scavenging lifestyle (e.g. Anderson 1993).

The African White-backed Vulture *Gyps africanus* (AWbV) is a tree-nesting vulture that breeds in loose colonies (Mundy *et al.* 1992, Murn *et al.* 2002). The global population has been estimated at 270 000 birds (Mundy *et al.* 1992), with the South African population numbering about 9 000 individuals (Anderson 2000). It is most often associated with wooded savannas and the species has a marked preference for *Acacia* trees, particularly *Acacia erioloba* (Mundy *et al.* 1992, Anderson and Maritz 1997). Although AWbV breeding areas are often associated with *Acacia* woodland, it is unknown how the breeding distribution of the species relates to land-use practices. Similarly, AWbV foraging and feeding behaviour in a multiple land-use environment is unknown.

The greater Kimberley area in the Northern Cape and Free State provinces of South Africa is an important breeding area for AWbVs, and the population has been studied since the 1960s (Forrester 1967, Mundy 1982, Anderson and

Maritz 1997, Murn *et al.* 2002). Apart from two localities in the southern Kalahari (Askham and Vanzylsrus), the greater Kimberley area is the only other important breeding area for AWbVs in the Northern Cape. The majority of AWbV nests in this province are located on private land outside protected areas (Anderson and Maritz 1997).

Across greater Kimberley, spatial and temporal variation in land-use patterns could affect vultures, particularly if they favour one land-use type over another. Identifying trends in land-use change is therefore an important part of the conservation management of AWbVs, especially as they may respond negatively to certain land-use changes. Food availability for vultures may be associated with some of the threats outlined above. The distribution and severity of these threats for the Kimberley AWbV population is unknown.

Using farm surveys and questionnaires, our objective was to determine how the distribution of AWbV breeding colonies and vulture foraging behaviour were related to land use and food availability in the greater Kimberley area.

Study area and methods

Study area

The study area is approximately 4 000 km² in size and located in the Northern Cape and Free State provinces of South Africa, surrounding the city of Kimberley. Domestic livestock and game farming are the typical agricultural types, resulting in a relatively low degree of landscape modification. Crop production and alluvial diamond mining have, however, resulted in significant habitat change adjacent to the main rivers in the study area, the Vaal and