

Concentration of non-breeding Lesser Spotted Eagles *Aquila pomarina* at abundant food: A breeding colony of Red-billed Quelea *Quelea quelea* in the Kruger National Park, South Africa

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Abstract: An estimated 1000 Lesser Spotted Eagles *Aquila pomarina* were observed feeding at a 16 km² nesting colony of Red-billed Quelea *Quelea quelea*, during 18-21 February 1997 in the Kruger National Park, South Africa. The roosting and feeding behaviour of the eagles is described and their predation pressure on the queleas is estimated (at about 9%). The role of queleas as an important pre-migratory energy source is discussed, but high variation in between-colony predation is reported.

Key words: *Aquila pomarina*, roosting, feeding, predation, *Quelea quelea*, South Africa

Introduction

The Lesser Spotted Eagle *Aquila pomarina* (LSE) is a non-breeding migrant to sub-Saharan Africa (MEYBURG et al. 1995). Its biology is much better known for the breeding than for the non-breeding season (MEYBURG 1991, 1994, 1996). It feeds mainly on small mammals but includes a wide range of other small animals in its diet. Most prey is taken on the ground, often after a slow prospecting flight, and the long legs and broad wings are well suited for this mode of hunting. In both its breeding and non-breeding range it is normally hunts alone, although concentrations at abundant food sources have been reported during the non-breeding season.

This note reports on a congregation of eagles at a breeding colony of Red-billed Quelea *Quelea quelea*. The location is close to the southern limits of the African non-breeding range of the eagle and in an area where quelea breeding and eagle concentrations have been reported previously (PIENAAR 1969).

Study area and methods

Observations were made over four days (afternoon 18 to morning 21 February 1997) at a breeding colony of Red-billed Quelea just north of Gudzani-Oos Windmill (24°17'S, 31°52'E) in the Kruger National Park (KNP), South Africa. The colony occurred on an undulating landscape and extended across the interface between habitats classified, in the south, as *Sclerocarya birrea*/*Acacia nigrescens* Savanna and, in the north, as Dwarf *A. nigrescens* Savanna (GERTENBACH 1983).

The colony was observed mainly over the three available mornings (dawn-09:00) and afternoons (15:00-dusk). Brief visits were also made during the middle of the two full days, but that time was used mainly to check other breeding colonies of quelea. Observations were made along a tourist road passing through the center of the quelea colony, from within a vehicle, and were facilitated by using binoculars (10 x) and a telescope (28 x).

Results

Quelea nesting density

Quelea nests at the Gudzani-Oos colony were placed in knobthorn bushes and small trees. Scattered larger and emergent trees, mainly marula and knobthorn, were used as perch and roost sites by the eagles (Fig. 1). The colony extended on either side of the Gudzane tourist road along

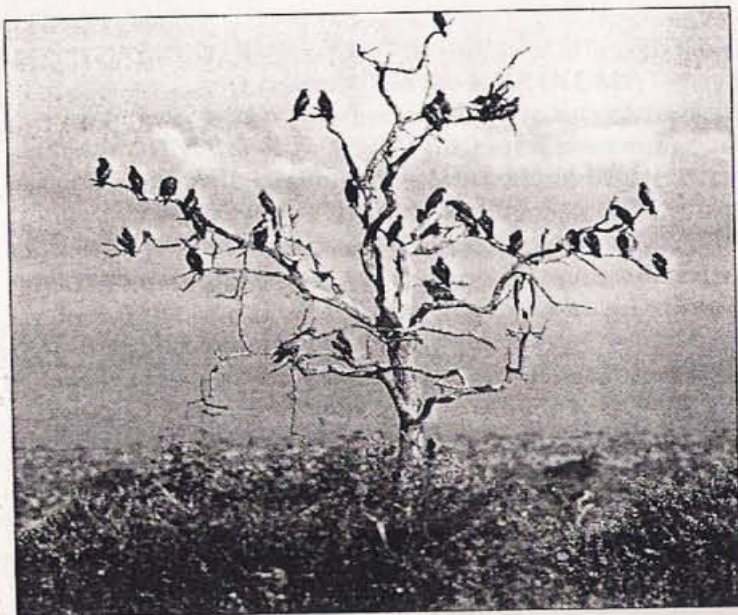


Fig. 1 Scattered larger and emergent trees, mainly marula and knobthorn, were used as perch and roost sites by the eagles.

Photo: A. Kemp

a distance of exactly 4 km. The colony was also estimated to extend about 2 km on either side of the road, based on observations of queleas provisioning chicks and of eagles hunting. Hence, the total estimated area of the colony was 16 km². Bushes containing quelea nests were estimated to occur at a density of about 20 bushes.ha⁻¹ and each bush was estimated to contain an average of 50 quelea nests. The nests contained chicks that were about half grown, just coming into feather but not yet fledged.

Other active quelea colonies with chicks at about the same age were also located north of the Mavumbye Windmill (24°17' S, 31°45' E), south of Bangu Windmill (24°07' S, 31°49' E), east of Nyamari Spring (24°09' S, 31°44' E) and south-east of Mapelane waterpoint (24°14' S, 31°46' E). These were the main colonies accessible by road that were reported by local game rangers within 25 km of the Gudzane-Oos colony. All of these colonies were within the Dwarf *A. nigrescens* Savanna habitat.

Eagle numbers

It proved impossible to count all eagles present. Most eagles were extremely wary of an observer on foot and the dense foliage prevented more than a small section of the colony being visible from the vehicle at any one time. Counts were made of eagles visible during transects driven along the road, and of numbers soaring in thermals during the heat of the day. However, these counts included only that portion of the population that was visible, such as eagles in the air or perched on open branches: many other eagles were found perched within tree foliage or hunting on low bushes among the tall grass.

It was estimated conservatively that at least 1,000 eagles were present at the Gudzani-Oos quelea colony. The majority were LSEs and on one road transect about 20% of the birds were judged to be in immature plumage (n=208). At least six Tawny Eagles *A. rapax* (2 adult pairs, 2 juveniles), four Wahlberg's Eagles *A. wahlbergi* (2 adult pairs), two Steppe Eagles *A. nipalensis* (juveniles)

and 100 Marabou Storks *Leptoptilos crumeniferus* were also present. Only a single LSE was seen at the Nyamari Spring colony and a single Tawny Eagle at the Bangu Windmill colony during single visits to these neighboring quelea colonies. However, in the previous week on 13 February 1997, many eagles were present at the nearby Mavumbye Windmill colony, including Lesser Spotted and Steppe Eagles.

Lesser Spotted Eagle behaviour

LSEs roosted mainly on large emergent trees, both dead and live, but also on smaller dead snags and slender live trees. Many eagles roosted within the quelea colony but in the evening a number of birds flew out into surrounding areas to roost. Up to 32 eagles roosted together in a single tree, often alongside Marabou Storks in the larger trees. It was notable that the eagles perched some distance from one another within a tree (Fig. 2) and that they were evenly dispersed, rather than clumped, along available perches.

At the first light of dawn, eagles flew in from the surrounding areas to enter the colony and, together with the resident eagles, immediately started to feed. Usually a single eagle flew to a bush containing quelea nests, perched on top to assess the bush, and then dropped down into the top or sides of the bush. Quelea chicks were then extracted from within nests deep inside the bush, the eagle using its long legs to reach the nests and sometimes struggled its way into the bush so that only the tips of the open wings protruded. Rarely a second or third eagle would feed simultaneously at the same bush. Many eagles with full crops were already visible within 30 min of first light.

Eagles were recorded feeding throughout the day but most flight activity between perches and bushes and most feeding was recorded during the two hours after dawn and before dusk. During the warmer part of the day there were always eagles visible soaring above the colony, with up to 50 birds together in a single thermal and several thermals active at the same time. Few eagles were seen perched outside the colony during the day, unlike at dusk and dawn.



Fig. 2 It was notable that the eagles perched some distance from one another within a tree.

Photo: A. Kemp

Discussion

LSEs are „quite common“ in the KNP (KEMP 1974) and are found „singly or in small groups“ or „sometimes occur in larger numbers in mixed flocks with Steppe Eagles“, another Palaearctic migrant (SINCLAIR & WHYTE 1991). Concentrations of these migrant eagles at abundant food sources during the non-breeding season have been reported previously, including at quelea colonies in the KNP (PIENAAR 1969; BROOKE et al. 1972). Further north, in Zimbabwe, LSEs are reported in mixed flocks in which Steppe Eagles are more abundant and in which immature birds outnumbered adults (BROOKE et al. 1972), which is the reverse of observations from South Africa.

This paper appears to be the first attempt to assess the numbers present in relation to the extent of the food supply and to describe the basic behaviour of the eagles at such concentrated food sources.

If the Gudazane-Oos quelea colony covered 1,600 ha, with an average of 20 nest bushes.ha⁻¹, 50 nests.bush and broods of three chicks per nest (MACLEAN 1993), then 4.8 million chicks would have been available. If the eagles consumed 25% of their mass each day (300 g), and if the average weight of each quelea chick over a 14-day nestling period was half the adult mass (10 g), then 1,000 eagles would have consumed a total of 420,000 quelea chicks. This comprises only 8.75% of the estimated number of quelea chicks available.

These conservative predation figures suggest that LSEs constitute an important selection pressure, at least on those quelea that build their nests on the periphery of bushes. It also suggests that they are an important mortality factor, together with other raptor and stork species. Concentrations of about 100 LSEs at quelea colonies were also reported from southern Zimbabwe over the same period as these observations (R. HARTLEY in litt.). However, the difference between colonies in the number of eagles present is also notable, confirming the variable predation between colonies of 0-60% that has been reported previously (PIENAAR 1969).

The daily intake of 25% of body mass estimated for the LSEs is about double their daily intake when breeding (CRAMP 1980). This high estimate takes into account the easy availability of prey and the need for the eagles to lay down reserves prior to departure on migration. The timing and availability of concentrated food sources (termite alates, quelea, locusts) may be an important component in the migratory strategy of this and other migrant raptors. Such food sources may be important to regain condition on arrival, as reported for termites for Lesser Kestrels *Falco naumanni* (MCCANN 1994). They may also be important to LSEs, to build up reserves before their departure in about early March (BROOKE et al. 1972, TARBOTON et al. 1980) and for which the timing of breeding by quelea is especially convenient (PIENAAR 1969).

Zusammenfassung

Schätzungsweise 1000 Schreiadler wurden auf einer Fläche von 16 km² zwischen dem 18. und 21. Februar 1997 in einer Kolonie von Blutschnabelwebern *Quelea quelea* im Krüger-Nationalpark in Südafrika beobachtet. Ihr Ernährungs- und Rastverhalten wird beschrieben. Schätzungsweise 9 % der Blutschnabelweber wurden von den Schreiadlern gefressen. Die Rolle der Blutschnabelweber als wichtige Energie-Ressource vor dem Heimzug wird diskutiert. Es wird aber auch über wichtige Unterschiede der Prädation von Kolonie zu Kolonie berichtet.

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