

# The imminent extinction of the Kites *Milvus milvus fasciicauda* and *Milvus m. migrans* on the Cape Verde Islands

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## Summary

We investigated the decline and current status of the Black Kite *Milvus m. migrans* Boddaert 1783 and the endemic and distinct Red Kite (Cape Verde Kite or Cape Verde Red Kite) *Milvus milvus fasciicauda* Hartert 1914 on the Cape Verde archipelago. In 1996 and 1997, the first census of both kites on the entire archipelago (Hille 1998) revealed that fewer than 10 individuals of each species still existed and that extinction of all kites on Cape Verde was imminent. As expected from this first survey, the tiny island populations of kites further declined and only two individual Red Kites and one Black Kite were found in 1999. Both populations are expected to become extinct very soon. The presumed causes of extinction such as indirect poisoning, lack of food in a changing landscape, and human persecution are discussed.

## Introduction

The Black Kite *Milvus migrans* is a very successful species in Africa, Europe and Australasia where several subspecies are widespread and numerous, (Cramp and Simmons 1980, Brown *et al.* 1982, Del Hoyo *et al.* 1994). In contrast, the Red Kite *Milvus milvus* has a much more restricted, western Palearctic distribution. Some of its island populations have declined dramatically, e.g. in Menorca (Pablo and Pons 1999) or became extinct, e.g. in the Canary Islands (Martin 1987). In Corsica a viable population survives and is even increasing (BirdLife France, pers. comm.). The oceanic Cape Verde archipelago is the westernmost area occupied by both species, far away from the nearest mainland populations (almost 3000 km to the south-west for the Red Kite and 500 km to the west for the Black Kite).

The Cape Verde Kite *Milvus (milvus) fasciicauda* resembles a hybrid between a Black and a Red Kite. This may cause difficulties when differentiating it in the field from the Black Kite. However the Cape Verde Kite shows a more greyish head, clearer “white windows” in the wing underside, deeper forked tail and in total more reddish at the underside of rump and upper side of tail. The wings are proportionally longer. The flight resembles more a bateleur than in the Black Kite.

In Cape Verde the first kites were mentioned in the nineteenth century, but due to contradictions in reports (e.g. Bolle 1856, Keulemans 1866, Dohrn 1871, Alexander 1898), it is not possible to deduce numbers or distribution for each taxon. Up until 1993 reports and statements about the situation of either kite in

the Cape Verde archipelago did not provide an accurate picture of the population size, this being at least partly due to difficulties in field identification. Hazevoet (1995) gave a review of all records of kites known at that time and listed the islands where kites had been observed or collected. However, no censuses were performed to assess their population sizes.

The Cape Verde Red Kite is usually treated as a subspecies, the only one apart from nominate *Milvus m. milvus*. Hazevoet (1995) even considers it a separate endemic species. The breeding Black Kite population in Cape Verde is considered to be *Milvus m. migrans*, which is a European wintering migrant in West Africa. The presence of the resident West African Black (Yellow billed) Kite *Milvus m. parasitus* in the islands has never been established.

De Naurois (1984) considered the Black Kite to have become established first in the eastern and southern islands. From there, it is supposed to have expanded its range westwards, progressively excluding or swamping the indigenous Red Kite through competition and/or hybridization. De Naurois (1984) suggested that there was danger of extinction due to hybridization between the very few Cape Verde Kites remaining on Santiago, São Nicolau and Santo Antão and the invading Black Kite. Hazevoet (1995, 1999a) did a study of 36 museum specimens and, based on integumentary characters, identified one as being a hybrid *migrans* × *fasciicauda*. As there has been no evidence for hybridization by observation in the field nor proof by molecular genetic analysis, assumptions of hybridization remain hypothetical. In the 1980s the Black Kite, while still being widespread, was thought to be declining in the Cape Verde archipelago, whereas the Red Kite, declining also in numbers, was known only from the mountainous islands Santo Antão and Santiago (Hazevoet 1995).

Observations of both kites throughout the year reviewed by Hazevoet (1995) show that the kites are resident on the archipelago, though some northern *migrans* may visit the islands at times. The lack of data on recent population sizes and on the status of the two kites in Cape Verde Islands prompted an initial survey in 1996 and 1997 throughout the archipelago. This survey revealed that both birds were nearly extinct on the islands. Only 4–6 Red Kites and 3 Black Kites were observed and these occurred on only two islands (Hille 1998). In this paper, we present the results of a second survey carried out in 1999 to follow the decline of the rare endemic Cape Verde Kite and the European Black Kite on the archipelago.

## Methods

The study area is shown in Figure 1. A first team of three observers (F. H. K.) spent eight weeks on Santo Antão and Boavista where remnant populations of Kites were found during the previous (1996/97) survey. A second team of two observers (T. and T.) joined the first one on Santo Antão. Other islands were also checked for kites. All observation periods are listed in Table 1. We studied the kites between January and May, at the end of the presumed breeding period (cf. Naurois 1969) when birds start to be active feeding the young and more conspicuous in the field.

Large parts of these islands, especially Santo Antão, are very rugged and mountainous with little woodland. Some coastal areas are flat and desert-like.

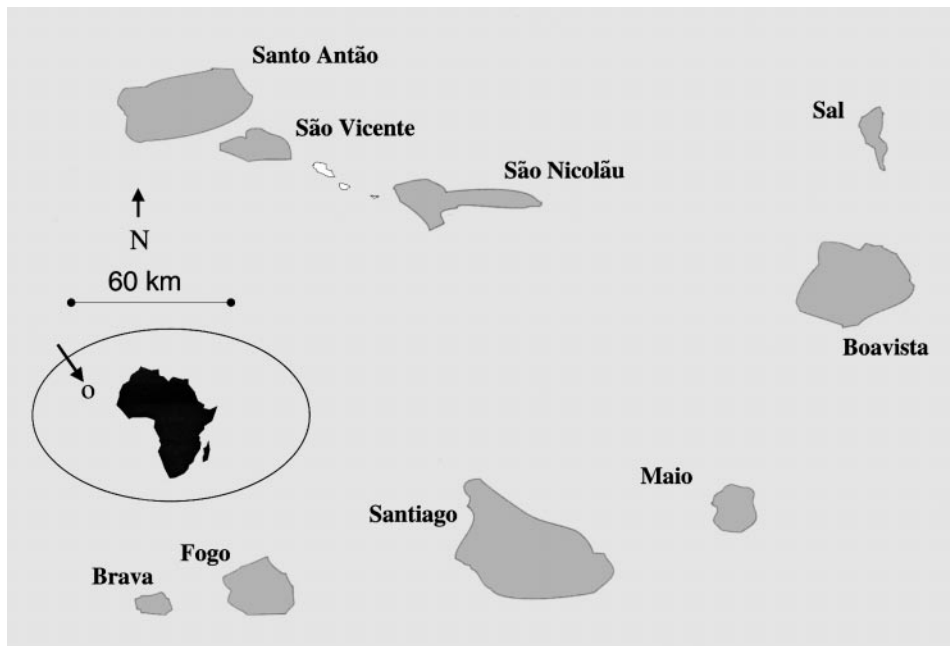


Figure 1. Map of the Cape Verde archipelago.

Table 1. Observation periods of the observers [Furigo (F), Hille (H), Kunz (K), Thiollay (T and T)]

Island	Days spent by observer	Date (1999)
Santiago	4 (F,H,K)	16.3.–20.3.
	2 (T and T)	1.5.–2.5.
Brava	26 (F,H,K)	21.3.–15.4.
Fogo	2 (F,H,K)	16.4.–18.4.
Santo Antão	18 (F,H,K)	19.4.–6.5.
	5 (F,H,K)	9.5.–13.5.
	4 (H)	25.5.–28.5.
	10 (T and T)	21.4.–30.4.
São Vicente	2 (F,H)	7.–8.5.
	2 (T and T)	20.–21.4.
Boavista	11 (F, H)	14.5.–24.5.
	1 (F)	25.5.–28.5.
Sal	8 (F, H)	29.5.–5.6.
	3 (F, H)	6.6.–8.6.

However, after recent road construction, numerous trails and roads allow access to nearly all parts of Santo Antão. It was possible to search the islands thoroughly and systematically during day-long walks, using binoculars and telescopes to scan regularly even the most distant areas. Observers on each island were trained to identify kite taxa and stop for at least 15–20 minutes at every viewpoint and the same spots were again searched on return walks. Soaring kites are among the easiest birds to detect. Sightings and all observed movements were mapped. In addition we visited, often more than once, all potential feeding places such

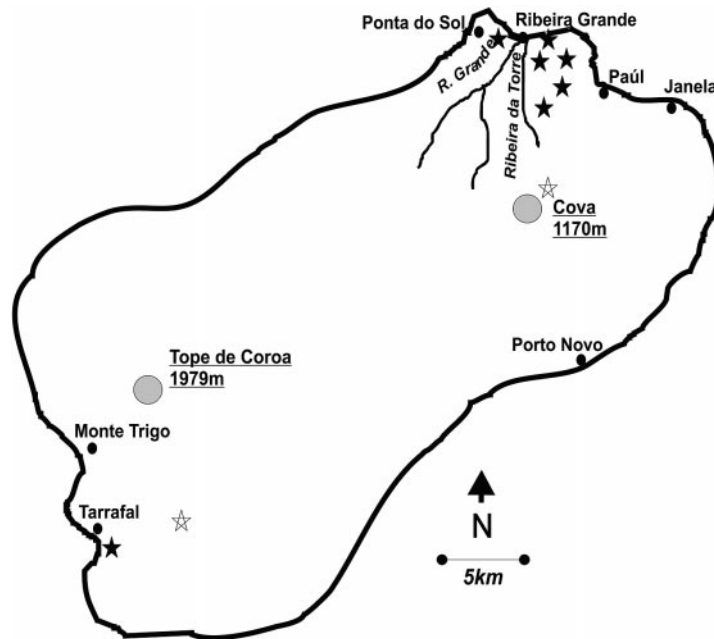


Figure 2. Observations of Cape Verde Red Kites on Santo Antão during the two surveys 1996, 1997 and 1999 (black stars: observations in 1996/97; white stars: observations in 1999).

as harbours, green fields, pig farms, villages and rubbish dumps. Local people, especially farmers, were asked about kite sightings, current or former numbers and behaviour, as well as human attitudes towards raptors.

## Results

In spite of intensive dawn-to-dusk surveys, often under perfect weather conditions and with long distance visibility, we only found two individual Red Kites on Santo Antão and a single Black Kite on Boavista. Again, as in 1996 and 1997 (Hille 1998) we found no evidence of breeding of either kite during this survey.

On Santo Antão, a moulting Cape Verde Red Kite was soaring over a bare stony plateau between Monte Navio and Tarrafal in the south-west of the island on 27 April 1999 (Figure 2). It may have been attracted by some semi-wild goats, but it soon disappeared from the area. None were seen subsequently around the coastal village of Tarrafal and Monte Trigo. On 2 May 1999, above the upper ridge of Ribeira do Paúl, near Cova in the north of the island, a presumably different individual of the same taxon was being chased by a breeding Kestrel *Falco tinnunculus neglectus*. However, although we spent several days in the same area before and after this observation, we did not observe any other kites.

Both sightings occurred in the same areas where several birds were still present in 1996/97 (Figure 2). In the northern part of Santo Antão, local people confirmed our observations. At Ribeira do Paúl, Ribeira da Torre and the mountain range between these two valleys, farmers used to see kites routinely and all agreed on their current absence.

On Boavista, a single Black Kite was soaring over the barren plain of Campo da Serra on 30 May. It was not seen afterwards. According to local people, some decades ago the kites had been seen regularly. We did not see any kites on São Vicente and Santiago nor on the other islands visited during our survey.

#### *Recent populations trends*

*Black Kite* During the 1960s, the Black Kite still occurred on nearly all islands and the majority of kites in the archipelago were believed to be Black Kites (Naurois 1969, 1972, 1987). The species was still widely distributed in the early 1980s, but in the 1990s its known range was restricted to Santiago, Maio and Boavista (Hazevoet 1995, Hille 1998). In August 1997 a surprising observation of 3–5 individuals was reported from São Vicente (Hazevoet 1998), but caution is needed because of possible identification problems as there is a recent claim of a sighting of Cape Verde Kite from the same island (see below). Recently, it was only seen on Boavista, the easternmost island (Figure 1). While 3–5 were seen there in 1996 and 1997 (Hille 1998), three individuals were seen in October 1998 (Barone and Delgado 1999) and two in February and March 1999 (Hazevoet 1999b). During our survey a single Black Kite was observed on Boavista in late May 1999.

*Cape Verde Red Kite* Based on historical records (Bannerman and Bannerman 1968) and the study of specimens in collections (Hazevoet 1995, 1999a), the Cape Verde Red Kite has been reported from at least six islands in the nineteenth and twentieth centuries. During the 1960s, the Red Kite was thought to be declining and, at that time, its range was already more restricted than that of the Black Kite and confined to the north-western islands of São Nicolau and Santo Antão (Naurois 1972). On São Vicente the last Red Kites were seen in 1951, on São Nicolau in 1970 and on Santiago in 1993 (Hazevoet 1995). In 1996 and 1997, only 4–6 birds were found on Santo Antão, declining to two solitary birds in the north and south in 1999. Hazevoet (1995) suggested that the Tarrafal area in the southern part of the island may have been the last potential stronghold of the species. This could not be confirmed, because in 1996/97 only a single individual was seen in the South, whereas in the North in 1996, three were observed in Ribeira da Torre, Ribeira Grande and the mountain range around Pinhão (Hille 1998). In 1998 six Red Kites were seen by the author in those northern valleys (unpubl. data). Recently, two alleged Cape Verde Red Kites were observed over the sewage works on Sao Vicente, 22 March 2000 (M. Berlijn and M. Beaman in litt.). This observation is surprising as on Sao Vicente presumably the last kites were seen in 1951, if the observation in 1997 was no identification mistake (see above Black Kite). It is assumed that kites migrate between the islands. The distance between the islands Santo Antão and São Vicente is about 15 km.

There have been no observations of breeding of either of the two kites since the discovery of a nest on São Nicolau by Naurois (1969) in 1968 (cf. Hazevoet 1995).

#### **Discussion**

It is possible that some individuals may have been missed during the present survey but these must have been few if any. Conditions during the survey, in

combination with the conspicuousness of kites, were such that it is highly unlikely that a breeding population of any of the two kites may have gone undetected in 1999. The alarming decline of kites in Cape Verde was already mentioned by Naurois (1972) and Hazevoet (1997). However the full extent of the catastrophe was not then entirely clear, because the number of breeding pairs was highly overestimated by Hazevoet (1997). There have been several attempts to raise local and international awareness for the decline of the kites and other endemic taxa on the islands (e.g. Hazevoet 1996a, 1997), but no particular action plan focusing on the kites has been proposed. Competition and hybridization with the Black Kite have been mentioned by Naurois (1984) and was recently cited as the cause of the decline of the Cape Verde Red Kite (Ortlieb 1997). In fact, this author gives neither evidence of observations of mixed pairs nor coherent data on morphology, behaviour or genetics of alleged hybrids. One specimen identified as a hybrid by Hazevoet (1995) can neither serve as proof of hybridization nor of being the cause of the Cape Verde Red Kite's decline. Red Kites seen in the field showing characteristics of Black Kites are also not proof of hybridization. Recent hybridization has never been supported by data on mixed pairs gathered during 12 months of fieldwork in the two surveys since 1996. The parallel decline of both species throughout the archipelago does not support this hypothesis or at least reduces its credibility. Moreover, two other carrion feeders, Egyptian Vulture *Neophron percnopterus* and Cape Verde Buzzard *Buteo buteo bannermani*, have declined in numbers as well. The Egyptian Vulture was formerly present on all islands (Bruyn and Koedijk 1990, Hazevoet 1995) but we saw none on Sal, Santiago and Brava in 1999. On Brava two individuals were seen in 1997. It still occurred in small numbers on Santo Antão in 1999. There is evidence that the endemic buzzard has been declining since at least the 1960s (cf. de Naurois 1973). Its breeding population today is restricted to Santo Antão and Santiago where we estimated around 20 breeding pairs (occupied nest sites counted) between 1996 and 1999, excluding the single observation of a non-breeding bird on São Nicolau in 1996.

Humans arrived in the Cape Verde Islands c. 540 years ago and brought terrestrial mammals such as rats and mice. Unfortunately it is not known whether kites had already settled on the islands before the arrival of humans. When natural prey distribution is limited, kites are often largely dependent on food sources provided either directly by people, such as refuse, offal, fish, poultry, carrion and roadkills or they are in habitats created by human activity such as cultivated fields and pastures (Hille 1995). The human population of the islands has increased considerably, especially during the second half of the twentieth century (Lobban 1995). The natural environment has been altered by human activity to such an extent that it is now difficult to assess the status of the original vegetation cover (Hazevoet 1995). Terraced fields are present even on the steep slopes of remote valleys. However many of them are now abandoned and densely covered with introduced shrubs, notably Lantana *Lantana* and Agave *Agave*. In these areas, open ground prey such as large insects, reptiles and the introduced mammals become invisible or inaccessible to raptors. Along with carcasses of goats, large grasshoppers *Acronyctium m. melanorhynchus* were among the favourite prey items of Red Kites identified during the 1996/97 survey. Free ranging domestic animals, mostly chickens, goats and cattle are becoming scar-

cer, with the last very much reduced in numbers due to the droughts in the 1960s (Schleich and Schleich 1995). Livestock is so precious to the impoverished population that these are mostly kept in enclosures near houses, fed with vegetation gathered by hand and fully used when slaughtered. Due to the increase in human population size, humans recycle food more efficiently, so villages, rubbish dumps and small harbours no longer offer as many feeding opportunities for kites. In addition, one big garbage dump in the capital of Santo Antão had been closed to control dissemination of diseases.

Kites were also considered to be chicken thieves (Bannerman and Bannerman 1968) which was confirmed by interviews with local inhabitants which document that kites were regularly chased with stones, especially around settlements. The general use of poison to eliminate rodents, especially on Santiago, and in baits to kill feral cats and dogs was confirmed by farmers and by the Institute of Agriculture (INIDA). These measures have had a devastating effect on kites, buzzards, and vultures and on raptors in other countries (Pablo and Pons 1999).

We suggest that the kite populations (as well as the other scavenging raptors) may have been affected to a large extent on all islands by indirect poisoning, direct persecution and a severe lack of food. The intensive agriculture, including the use of pesticides and poisoned baits, and the spread of introduced vegetation in abandoned fields has made prey inaccessible. This may have facilitated direct persecution, because more kites were attracted to villages. Additional interspecific competition for food, e.g. by the Egyptian Vulture, Buzzard and the omnivorous Brown-necked Raven *Corvus ruficollis* could only have further reduced food availability. It appears that today the highly impoverished countryside cannot provide enough food for a substantial number of kites. As supporting evidence it may not be coincidental that most of the last remaining Red Kites in 1996/97 were in the cultivated area of northern Santo Antão. There, agricultural fields were not in the past treated as intensively with pesticides against rodents and poisoned baits against carnivores as on Santiago. In the south-west of Santo Antão where the highest number of goats occurred, Red Kites continued to feed on carcasses.

Islands are hotspots of speciation, but endemic island taxa bear a high risk of extinction. In the preliminary Red List of endangered species of Cape Verde, Hazevoet (1996b) assessed the status of the Red Kite as Critically Endangered, though he mentioned it (based on older records) as a resident on five islands. In the same list, the Black Kite, reported from seven islands, fell into the Undetermined category. As a result of the surveys in 1996/97 and 1999, both populations must now be classified as Technically Extinct.

It is probably difficult and too late to launch a conservation campaign to save these birds. The most immediate measure now should be to catch all remaining Red Kites and to increase their number by captive breeding. After release, feeding stations will be needed that would also benefit the dwindling populations of the Buzzard and Egyptian Vulture. Furthermore an educational programme for the island inhabitants should provide knowledge on the usefulness of raptors in eliminating rats and rodents in agricultural fields. Within this education, concepts should be offered which lead to a coexistence with humans and raptors on the islands. An immediate cessation of the poisoning of rats and feral carnivores is needed. This would equally benefit the other rare raptors. If no immediate

action is taken, the endemic Cape Verde Kite will soon be added to the long list of island extinctions.

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