

Bird Migration and Bird Strike Situation in Kenya

Oliver Nasirwa

National Museums of Kenya, PO Box 40658, Nairobi.

Abstract

Approximately 21% (229/1086) of all Kenya's bird species are migratory. The migrants include 171 Palearctic, 55 Afrotropical and 4 Malagasy migrant species. Non-migratory species too are very mobile. The bulk of migratory birds visiting or passing through Kenya use the Rift Valley, coast, eastern bushlands, central and western grasslands as their flyway. About 46% (107/229) of Kenya's migratory species are waterbirds. These migrate mainly along the Rift Valley and the coast. Over 70% of the waterbird populations concentrate in the major Rift Valley lakes. These lakes are also on the flight path of most international airline routes to and from Nairobi. While en route, airplanes fly at higher altitudes than migrating birds. Hence most reported bird strike incidents occur in the vicinity of airports when planes are about to land or during take-off.

The Kenya National Bird Strike Committee (KNBSC) has been in existence since 1982. Current efforts to reduce bird strikes focus on reducing bird concentrations in areas along the flight paths in the vicinity of airports. Bird species with highest percentage of bird strikes and fatal ones in Kenya are marabou, black kite, vultures and crows. These birds are mainly scavengers attracted to garbage in rubbish dumps and to carcasses. Along with the population increase, Nairobi and other towns with airports experience a concomitant increase in garbage, with an associated increase in the number of these scavenger birds. At present, solid waste management is the responsibility of Nairobi and municipal councils. KNBSC is in the process of sensitising Nairobi and other municipal councils to the issue of how unmanaged garbage threatens flight safety through bird strikes.

Résumé

De toutes les espèces aviennes kenyanes, environ 21% (22/1086) sont migratrices et comprennent 171 espèces paléarctiques, 55 afro tropicales et 4 malgaches. Les espèces non migratrices sont également très mobiles. Le gros des oiseaux migrateurs qui visitent ou passent par le Kenya utilisent comme voies migratrices le Rift Valley, la côte, les broussailles de l'Est, les savanes herbeuses du centre et de l'Ouest. A peu près 46% (107/229) des migrateurs kenyans sont des limicoles. Ceux-ci migrent essentiellement le long du Rift Valley et de la côte. Plus de 70% des populations de ces limicoles se concentrent au niveau des grands lacs du Rift Valley, qui sont sur le tracé de la plupart des voies aériennes internationales de/vers Nairobi. Toutefois, les avions en vitesse de croisière volent à des altitudes plus élevées que celles des routes des oiseaux en migration, raison pour laquelle la plupart des incidents enregistrés adviennent seulement au voisinage des aéroports quand les avions s'apprêtent à atterrir ou pendant l'envol.

Les efforts actuels pour réduire le taux des collisions se focalisent sur la réduction des concentrations des oiseaux dans les espaces situés le long des voies aériennes et dans les parages des aéroports. Le Comité National Kenyan des Collision aviennes (KNBSC) existe depuis 1982 et travaille beaucoup pour la diminution de l'incidence des collisions aviennes. Les espèces d'oiseaux avec le plus grand pourcentage de collisions au Kenya y compris les collision fatales sont le marabout, le milan noir, les vautours et les corneilles. Ces oiseaux généralement coprophages sont attirés par les déchets des dépotoirs ainsi que par les carcasses. Ainsi, avec l'accroissement des populations, Nairobi et les autres villes pourvues d'aéroports font face à l'augmentation de quantités de déchets et conséquemment à celle de l'affluence de ces oiseaux coprophages.

La KNBSC a depuis quelques années mis le doigt sur les déchets comme étant le facteur principal d'attraction de ces oiseaux vers le voisinage des aéroports. Comme la gestion des déchets solides incombe aux conseils municipaux de Nairobi, la KNBSC est en train de sensibiliser ces conseils sur le fait que les déchets non traités constituent une menace pour la sécurité aérienne, l'insécurité venant des collisions entre avion et oiseaux.

Mots clé : Kenya, migration avienne collision d'oiseau.

Introduction

Kenya is rich in bird species diversity with a total of 1,086 species so far recorded. About 79% percent of Kenya's bird species breed within Kenya (Lewis & Pomeroy 1989) and 21% are migratory. However even the non-migrant species are very mobile. Of the 229 species that are migratory, 171 are Palaearctic, 55 Afrotropical and 4 Malagasy migrant species. About 43 species are partial migrants. Waterbirds make up approximately 17% of the total number of species recorded in Kenya. According to Wetlands International families, Kenya has a total of 184 waterbird species of which there are 81 Palaearctic, 24 Afrotropical and 2 Malagasy migrants. Raptors make up 7% (77/1086) of the total species, comprising 24 Palaearctic and 2 Afrotropical migrants. Near-passerines make up 19% (208/1086) comprising 11 Palaearctic, 13 Afrotropical and 2 Malagasy migrants, while passerines form the largest group with 557 (51%) species, including 55 Palaearctic and 16 Afrotropical migrants. While Palaearctic migration is well studied and reviewed, far less is known of the Afrotropical migrants (Lewis & Pomeroy 1989).

During migration, the altitude at which birds fly depends on the topography of the landscape and atmospheric conditions. Using radar, common cranes have been observed at heights of about 5,000 meters and lapwings have been observed as high as 3,300 meters though more commonly found at 1,600 to 2,000 meters. Poor weather conditions, such as fog, may cause birds to fly very low, and song birds for example are known to travel at heights anywhere between 0.5 to 7,000 meters (Vladimír Bejček 1989).

Most international airline routes through Kenya fly along the bird migratory routes, especially the Rift Valley. However planes fly at altitudes above 10,000 metres, which

is much higher than migrating birds. Hence most bird strikes occur within the vicinity of airports when aeroplanes are approaching to land or during take off (Archer 2001). Despite the occurrence of bird strikes in Kenya, a significant number of cases go unreported, and even when reported some lack important details. In this article I review bird migration and the bird strike situation in Kenya.

Bird Migration

Migratory birds visiting or passing through Kenya use the Rift Valley, coast, eastern bushlands, central and western grasslands as their flyway. The bulk of migratory waterbirds use two important flyways that have a chain of suitable sites for feeding and resting (Fig. 1). One of the flyways is the Rift Valley, which has a chain of alkaline and freshwater lakes from Lake Turkana in the north to Lake Magadi in the south. The other flyway is along the coast, which includes the beaches, reefs and mangrove creeks. The other important waterbird sites lie close to these major flyways. They include the Tana River delta, Lake Victoria, Amboseli, Lake Jipe, Tana River dams and small island dams scattered to the east and west of the central Rift Valley. Numbers of waterbirds are greatest in the southern Rift Valley, which on average holds close to one million birds each January (Table 1).

Site	Estimated total
Amboseli wetlands	3,600
Lake Turkana	215,000
Lake Victoria*	3,500
Nairobi wetlands	18,000
North coast	32,000
South Coast	54000
Southern Rift Valley	970,000
Tana Delta	75,000
Upper Tana dams	34,000

*Census coverage is less than 2% of the lake shore

Table 1. Numbers of waterbirds in major flyways and sites in Kenya, estimated from January counts. (Table extracted from Nasirwa & Bennun 1999).

Palearctic birds wintering in Kenya migrate from as far as the High Arctic (e.g. sanderling *Calidris alba*), Northern Russia (e.g. whimbrel *Numenius phaeopus*), Scandinavia, Central and Eastern Europe, Central Asia (e.g. white stork *Ciconis ciconia*), and the Arabian Gulf and Red Sea (e.g. crab plover *Dromas ardeola*) (Nasirwa & Bennun 1999). Most of the Palearctic migrants arrive in Kenya around September - October with peak abundance in December - January. Northward migration is usually around March to early May. Afrotropical migrants come from Sahelian Africa (e.g. Abdim's stork *Ciconia abdimii*),

Species	No. bird strikes
Black Kite <i>Milvus migrans</i>	27
Marabou <i>Leptoptilus crumeniferus</i>	9
Guineafowl sp.	4
Others	24
Total	64

Table 2. Bird species and number of bird strikes involving Kenya Airways planes (1984-2000).

South and West Africa (e.g. lesser flamingo *Phoeniconaias minor*) and Madagascar (e.g. Madagascar squacco seron *Adeola idea*) (Nasirwa & Bennun 1999).



Bird Strikes

Bird strikes, as in other parts of the world, are a serious problem in Kenya. Lacks of reporting and data collation preclude up-to-date documentation of the situation. However, in the last 17 years (1984-2000), Kenya Airways alone has suffered 187 bird strikes within Kenya. Sixty-four of these strikes were with identified species (Table 2) (Archer 2001).

Whereas most strikes in the Kenya Airways statistics are considered to be by resident species, the majority of black kite strikes are thought to be by the migrant subspecies

(*M. m. migrans*). From 1999 to 2000 alone Kenya Airways incurred costs of approximately \$5.3 million, of which \$2.9 million was attributed to two collisions with Marabou (Archer 2001).

The National Bird Strike Committee (KNBSC) has for several years identified the presence of water bodies and garbage in the vicinity of airports as the main bird attractants. However these observations have not been taken into consideration in the development of new airports. Moreover, the local councils responsible for urban planning and managing solid waste have not been involved in air safety development or planning.

Eldoret and Kisumu Airports are good examples. Fish processing and selling activities, which attract birds, threaten the safety of aeroplanes at Kisumu Airport. The Eldoret Airport is only five years old. First, the buildings at this airport are designed with wall features and roofing that attract nesting birds. Second, it was built near a wetland that has resident grey-crowned cranes only a few kilometres from the end of the runway. The cranes, being low fliers, threaten the safety of aeroplanes on take-off. The airlines, Kenya Airports Authority (KAA) and the Directorate of Civil Aviation (DCA) would like both the cranes and the wetland extirpated. The solution to this issue is complex since the wetland is on private land and had its resident crane population even before the airport was built. Eldoret Airport is an important structure in the development of western Kenya, but ensuring the safety of aircraft from the grey-crowned cranes appears to continue to remain a challenge for the Airport Authorities.

Jomo Kenyatta International Airport (JKIA), Wilson Airport and Kenya Airforce Base in Nairobi are all threatened by an increasing number of scavenging birds due to the increase in garbage that is accompanying the increase in the local human population. The biggest threat is the increase in numbers of marabou, which are currently colonising new areas in Nairobi as a result of increased garbage. A central issue now is that Nairobi City Council (NCC) intends to move Nairobi's biggest garbage dump from a site in Dandora to Ruai. The Dandora garbage dump is approximately 6.5 km north east of JKIA, with a resident population of approximately 5,000 marabou attracted to the garbage. The marabou flocks at Dandora threaten the safety of aeroplanes plying both JKIA and the Kenya Airforce Base, which are only a few kilometres from it.

Ruai is about seven nautical miles directly from the end of JKIA runway. The movement of the dump from Dandora to Ruai is thus even more threatening. JKIA is East Africa's busiest airport, hosting 34 airlines and handling over 3 million passengers annually. It has since been discovered that the NCC had not considered the dangers of designating garbage-dumping sites near airports. The KNBSC has now incorporated the NCC within its membership and both are working to find a solution to this problem.

Aeroplanes landing or taking off from airports in Mombasa and Malindi along the Kenyan coast are also threatened by bird strikes with scavengers. Refuse and garbage dumps from populated areas in their proximity are the major attractants of such birds. The most

abundant scavenger in this area is the Indian house crow (*Corvus splendens*). Efforts to move garbage to safer sites are underway. A program to reduce Indian house crows along the Kenyan coast is already ongoing and this has proven very successful (Jackson 2001).

Discussion and Conclusion

Migration of Palaearctic birds is well studied and much more understood compared to the migration of Afrotropical species. Many species not known to migrate are highly mobile but their movements, though important, are least understood. Proper knowledge and documentation of the movement of these birds is important for their conservation as well for bird strike control. Movements of non-migratory species to their breeding grounds, feeding areas or in relation to sporadic weather patterns have significant importance for their conservation as well as bird strike control. Many Kenyan species (e.g. pelicans, herons, egrets, storks etc.) are known to breed in very few areas, but are widely distributed (Lewis & Pomeroy 1989). This suggests that with more studies, seasonal and weather patterns that trigger their movements can be better understood, making their movements predictable in the future. The percentage of migratory bird species in bird strikes is not known due to lack of detailed reporting. Improved documentation of species involved in bird strikes is necessary. The timing of Palaearctic and Afrotropical migration through Kenya needs to be understood, such that, if need be, an early warning system to pilots and airport authorities can be developed.

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References

- Archer A.L. 2001. Potential Bird and Mammal Strike threats. Jomo Kenyatta International Airport - Nairobi-Kenya. Kenya Airports Authority.
- Bennun L.A. and P. Njoroge 1999. Important Bird Areas in Kenya. Nature Kenya.
- Jackson C. 2001. Malindi / Watamu House Crow Control Project. Report for Watamu for the period July 2000 - February 2001. (unpublished).
- Lewis A and D. Pomeroy 1989. A Bird Atlas of Kenya. A.A. Balkema. Rotterdam.
- Nasirwa O.O. and L.A. Bennun 1999. Migratory waterbirds and their conservation in Kenya in Fleur Ng'weno and Paul Matiku (eds.) Kenya and the African-Eurasian Waterbird Agreements. Proceedings of a workshop held at the National Museums on 29 July 1999. Nature Kenya, Nairobi: 14-23.