



A SOARING STEPPE EAGLE - PHOTO BY SHIV KAPILA

AFRICA'S MIGRATORY RAPTORS NEW TECHNIQUES YIELD NEW INSIGHTS

THE AUTHOR



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I saw my first “African” long-distance migratory raptor, a lone Steppe Buzzard soaring above sand dunes south of Cape Town in early March 2004. My brief visit to the Cape Peninsula confirmed what I had read. A migratory Buteo from northern Europe was the most conspicuous bird of prey in the region, at least during northern winter. The Steppe Buzzards I saw that March were building fat reserves they needed as a back-up fuel for their largely solar-powered journeys back to their breeding grounds in northern Europe. My mind raced back to a sentence I had written more than five years earlier in a global atlas of migratory birds of prey “Africa—the world’s second largest and driest tropical continent—may be the most important wintering area for migratory raptors anywhere.” If the Steppe

Buzzards on the Cape Peninsula were any example, then Africa, indeed, is “the most important” destination for many of the world’s birds of prey.

Africa supports at least 34 species of intra-African raptor migrants, birds that remain within the continent year-round but that move considerable distances within it seasonally. It also hosts over-wintering populations of 34 European and 42 Asian breeders. As a result of this seasonal infusion of birds of prey, five East African nations—Kenya, Ethiopia, Sudan, Tanzania, and Uganda—rank among the top 10 globally in terms of raptor biodiversity.

Each autumn more than a million raptor migrants pour into northeastern Africa via the Eurasian-East African Flyway, a major aerial highway that stretches as far north as Scandinavia and as far east as central Siberia. At

least several hundred thousand raptors pour into northwestern Africa via the Strait of Gibraltar along the Western European-West African Flyway. And tens of thousands more cross the central Mediterranean via the Sicilian Channel into Tunisia after traveling south along the Italian Peninsula. On top of all of this a few powerful overwater migrants, including Ospreys, harriers, falcons, and a few honey-buzzards, reach northern Africa having crossed wider stretches of the Mediterranean.

Within West Africa, particularly in the Sahara and Sahel, many Palearctic migrants move south across a broad front. Farther east, the Rift Valley and its escarpments funnel migrants along many of the same migratory tracks used by humans that first poured out of Africa hundreds of thousands years ago.

Until the last decade most of what we knew about long-distance migration into, out of, and within Africa came from three sources: (1) on-the-ground accounts of concentrated movements of raptors at traditional migration bottlenecks, (2) detailed studies of the seasonal occurrences of migrants at a few study sites, and (3) anecdotal reports of birds of prey at oases and other critical habitats scattered across the continent. Today, miniature satellite transponders, together with The Global Positioning System (GPS) data loggers linked to Global System for Mobile Communications (GSM) cards, allow scientists to track the movements of individual birds, sometimes across multiple years, in ways that biologists of my generation never thought possible as recently as the early 1980s.

Initially developed at the U.S. Army's Applied Physics Laboratory in Maryland, USA, and refined elsewhere since, satellite tracking now includes the use of 5-gram platform transmitter terminals (PTT) capable of transmitting locations for several years. Although still in its infancy, this new technology offers the holy grail of raptor-migration studies: an opportunity to follow individual birds of prey on a daily, hourly, and, most recently, minute-by-minute basis throughout their migratory journeys. Although many



PHOTO BY: SHIV KAPILA

Male Pallid Harrier

results from this new technology simply confirm what we already knew from on-the-ground studies at established watch-sites, other findings extend and enrich earlier studies considerably, and still others provide new information that, at least initially, flies-in-the-face of formerly well-established "rules" of raptor migration.

Until quite recently most satellite-tracking devices were too large to attach to raptors weighing less than 300 to 400 grams. Even so, the results have been revealing. What follows is a personal sample of the many studies that have been published so far.

Eurasian harriers that routinely migrate into and out of Africa largely north of the Equator have been tracked in some detail. Former Ph. D. graduate students Christiane Trierweiler and

Rione Stranberg have studied the migrations of two of them.

Trierweiler's studies of Montagu's Harriers involved tracking the movements of 26 northern European breeders, including 14 adult females, seven adult males, and five juveniles. Her results indicate that individual harriers from northwestern Europe tend to migrate close to or within the Western European-West African Flyway that enters Africa at and slightly to the east of the Strait of Gibraltar, and that many of the birds engage in elliptical or loop migration in autumn and spring migration, wherein most individuals returning to their breeding areas in spring do so along more westerly routes than those used in autumn. One tail-wind assisted adult male, managed to travel a spectacular



PHOTO BY: MUNIR VIRANI

Female Montagu's Harrier

1,196 kilometers in a 24-hour period. However harriers typically cover several hundred kilometres a day, with higher rates of daily travel occurring in Europe and the Mediterranean region, than in Africa. Most of the harriers tracked over-wintered in sub-Saharan Africa 10 to 17 degrees north of the Equator across a longitudinal band of 32 degrees that stretched from Senegal to Chad. Importantly, migrants from northwestern Europe over-wintered farther west than those from Eastern Europe. Regional differences such as these suggest a high degree of “migration connectivity” in the species, with birds from the same breeding areas over-wintering closer together on their wintering ground than those from different breeding areas.

This kind of detailed information regarding where individual birds overwinter in Africa allows conservationists to link the breeding and wintering areas of geographically distinct populations, and in so doing assess and understand regional

population changes in the birds better than ever before. This is particularly important in species like Montagu's Harriers, which are declining in many but not all of portions of their large breeding range. Three tagged individuals followed across three years repeatedly returned to the same wintering areas in Mali and Senegal, indicating the likelihood of extreme winter site-fidelity in the species. This, together with the fact that Montagu's Harriers appear to avoid overwintering in extremely degraded habitats and areas with high tree cover, suggests that the species needs shrub lands, natural savannas, and at times slightly degraded crop lands, with seasonally high grasshopper densities to overwinter successfully in Africa. This is clearly important new information for conservation biologists.

Roine Strandberg's work with Marsh Harriers involved tracking three juvenile and 14 adult harriers from breeding locals in southern Sweden into sub-Saharan Africa. The results

indicate that individuals migrate across the Sahara in much the same way as do satellite-tracked Ospreys and Western Honey-buzzards, with all three species crossing into Africa at or slightly east of the Strait of Gibraltar after transiting south through the Iberian Peninsula. After making landfall in Morocco or Algeria, most of the birds over-winter in sub-Saharan West Africa. Like Trierweiler's Montagu's Harriers, most of Strandberg's Marsh Harriers followed elliptical migration pathways into and out of Africa with spring migrants moving west of autumn migrants.

Because habitat types did not coincide with these seasonally distinct pathways Strandberg justifiably concluded that the seasonal difference in routes reflects the geography of predominant regional winds encountered en route. The biometeorological explanation for the phenomenon, which was first proposed by Swedish bird-migration specialist Thomas Alerstam, is that migrating birds, including raptors, are more likely to be “wind-drifted” or pushed sideways by cross winds early in their migratory journeys, and are more likely to compensate for such drift later on. In the case of the Montagu's and Marsh harriers, autumn migrants face high-latitude westerly winds initially followed by low latitude easterly winds in Africa, whereas in spring returning birds initially encounter easterly winds in Africa and thereafter westerly winds in Europe. This, together with Alterstam's assertion that birds tend to be more wind-drifted early in their migrations, and that they tend to compensate for any wind drift later on, results in the elliptical annual routes taken by both Marsh Montagu's Harriers in Africa, as well as other species elsewhere.

A second analysis by Strandberg and others of satellite-tracked Ospreys, Western Honey-buzzards, Marsh Harriers and Northern Hobbies transiting the Sahara concludes the desert forms a formidable barrier to first-year migrants with 31% of tracked juveniles dying as a result, compared with only 2% of all adults. Most of the deaths were preceded by unusual behavior including abrupt changes in



PHOTO BY SHIV KAPILA

Steppe Buzzard migrate to Africa all the way from the Russian Steppes

migration tracks, slower rates of travel, and aborted crossings and retreats from the desert. Dying in the desert is not the only source of mortality for these species, the same study suggests that shooting in the Mediterranean region also takes its toll. Even so, the Sahara's current impact suggests that changes in its size and shape as a result of climate change are likely to affect birds of prey crossing it.

Satellite tracking studies of long-distance trans-equatorial migrants, including Northern Hobbies and Eleonora's Falcons also have revealed important new insights. Four adult Northern Hobbies tracked by Strandberg and others from their breeding areas in southern Sweden exhibited broad-frontal migration across the Sahara, but then conspicuously converged near the equator to a relatively narrow 67-kilometre-band across what some

scientists believe is an important second African barrier to raptor migration—equatorial western Africa's largely unbroken rain forest—before again splitting up en route to wintering areas farther south. Whether the falcons are gathering along a band of better foraging areas within the barrier, or whether they coalesce to take advantage of the best updrafts in the region, remains an open question. Either way, Marion Gschwend's finding that six adult Eleonora's Falcons tracked by satellite from Sardinia en route to Madagascar bypassed the same region of unbroken rain forest altogether, supports the idea that this habitat type presents a serious barrier to long-distance migration, at least in small falcons. As does the fact that most of seven satellite-tracked juveniles that entered the region abruptly shifted their routes to the east and northeast to bypass it.

This small sample of new findings suggests that an enormous amount of new information about the movements of raptors in Africa remains to be acquired via satellite tracking. Unfortunately, as is typical in ecology research, the equally enormous costs involved in such work stands in the way of acquiring this information quickly. That said, as miniaturization proceeds, and as costs decline, satellite tracking will continue to grow in importance during what is fast becoming a golden age of raptor migration science.

Although my focus in this piece has been on long-distance migrants from Europe, the work of Corinne Kendall on three species vultures in Kenya, and that of Rob Simmons on Black Harriers in South Africa, suggests that movement ecology of Africa's so-called "sedentary" birds of prey also is benefiting from satellite tracking.

And all of this is just scratching the surface. Returning to the Steppe Buzzards I saw on the Cape Peninsula in 2004, a small number of unusual looking Buteos is now breeding near Cape Town. At least a few biologists, suspect they represent Steppe Buzzards that have failed to return to their ancestral breeding grounds in the far north, much as Booted Eagles, Steppe Eagles and, possibly, other Eurasian migrants have done before, suggests that understanding the details of the movement ecology of Africa's migratory birds of prey may have as much to do with of knowledge of the evolution of Africa's birds of prey as with their current ecology. ●

ACKNOWLEDGMENTS

Sincere thanks are due to Corinne Kendall, Munir Virani, Simon Thomsett, and Darcy Ogada, and others with whom I have worked and who have taught me much about Africa's birds of prey. I also thank Sarkis Acopian and his family, the Wallace Research Foundation, and Hawk Mountain Sanctuary, for supporting much of my movement-ecology research in Africa.