



A juvenile Blue Swallow. Information from protected populations beyond our borders may provide the key to conserving the species in South Africa.

WIM DE GROOT

CONNECTING THE DWINDLING DOTS

MIGRATIONS OF BLUE SWALLOWS

The Blue Swallow *Hirundo atrocaerulea* is quite possibly South Africa's most threatened bird, with the local population undergoing steady decreases in recent years and now thought to number only about 80 pairs. This mist-belt grassland specialist has suffered massive habitat loss through agriculture and forestry, a situation made worse by the fact that very little of its habitat is formally protected. The species is unusual among swallows in that it nests and roosts underground, mainly in disused Aardvark burrows: this also contributes to its extreme sensitivity to human activities.

Part of the reason that Blue Swallows have proven so difficult to conserve effectively is that they migrate, spending the winter in central Africa. Without understanding

the migratory links between the various breeding and wintering populations, it is impossible to coordinate conservation efforts across the species' global range.

Until recently, the only hope for connecting the breeding and wintering ranges of Blue Swallows rested on the recovery of ringed birds. However, the species' rarity and the absence of ringing activity over much of its range meant that ring recoveries were too few and far between to yield useful information. During the last decade, however, cutting-edge biochemical techniques have been developed that allow researchers to infer links between populations from the ratios of naturally occurring stable isotopes stored in the birds' feathers.

Researchers from Ezemvelo KZN Wildlife, the DST/NRF Centre of Excellence at the Percy FitzPatrick Institute and the CSIR have recently been exploring this approach, and have found that these techniques provide the key to unlocking the secrets of the swallows' migrations. Our analyses have revealed that birds from each of the three major Blue Swallow breeding populations, namely South

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A. McKECHNIE

Typical Blue Swallow habitat, Nyika NP, Malawi.



A. MCKECHNIE (2)

Africa and Swaziland, Zimbabwe, and Malawi and Tanzania, contain distinctive isotopic signals in their feathers, and can thus readily be distinguished using feathers alone. This finding means that the origin of any bird caught on the wintering grounds can be inferred from its feather biochemistry.

The steady reduction in the numbers of Blue Swallows breeding in South Africa in recent years means that the identification of migratory connections between populations is a conservation priority for this species. Now that we have established the feather isotope signature for each of the major Blue Swallow breeding populations, the next step is to obtain feathers from wintering birds around Lake Victoria and elsewhere in Uganda. Once the links between the various breeding and wintering populations have been identified, we will have the information required to coordinate conservation strategies across the swallows' range.

The second objective of this project is to identify factors driving the decrease in Blue Swallow numbers in South Africa, and explore ways in which the swallows could be conserved more effectively. The South African Blue Swallow population occurs almost entirely outside of conserved areas; in fact, only 1% of the species' habitat in the province of KwaZulu-Natal lies within formally designated conservation areas. Comparisons of the ecology and behaviour of Blue Swallows within and outside of conservation areas could be critical in identifying reasons for the birds' low breeding success, and it is for this reason we are turning to populations beyond South Africa's borders.

In the eastern highlands of Zimbabwe, Blue Swallows occur in protected areas, most notably Nyanga National Park, as well as in unprotected areas disturbed to varying degrees

Blue Swallow nestlings (above, left) and two researchers (above – one half buried!) collecting feather samples from the nest. The birds' habit of nesting in Aardvark burrows makes this a challenging undertaking...

by human activities. Working together with BirdLife Zimbabwe, we will be comparing swallow populations within and outside of conservation areas. By analysing breeding behaviour, incubation patterns, and factors such as stress hormone levels, we will gain new insights into how well the swallows tolerate different levels of human disturbance. This information from Zimbabwean Blue Swallows will, in turn, provide vital information for developing conservation strategies for the South African population.

In summary, this project combines stable isotope analyses of migratory movements to build a more complete picture of how Blue Swallows move between different parts of the African continent. Behavioural and ecological studies of breeding populations will help identify the factors responsible for the recent decreases in numbers in South Africa. This information is critical to ensure the future of this highly threatened species, especially of the most seriously threatened breeding populations in South Africa and Swaziland.

We are seeking funds to cover the following:

- travelling to the central African wintering grounds (primarily Uganda) to obtain feather samples from birds there;
- running costs and a vehicle for field work in eastern Zimbabwe; and
- costs associated with the stable isotope and stress hormone analyses