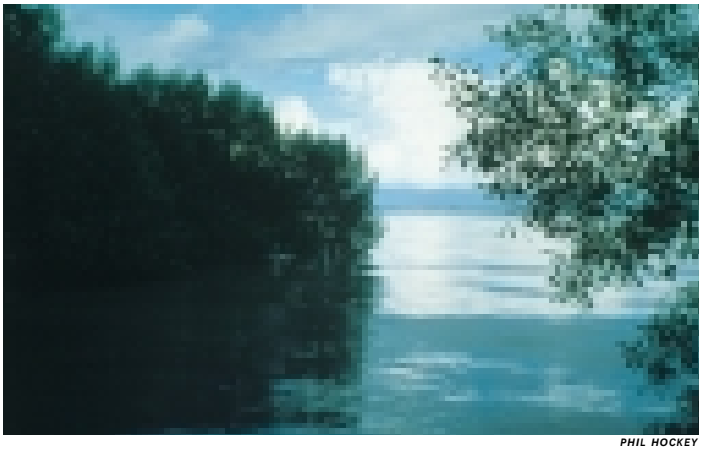
Land-bird migrations
Do global paradigms exist?

The past 10 years have seen substantial debate about the ecology of migrant land birds travelling between north temperate and tropical latitudes. These debates have centred around ecological attributes that might drive migration and how migratory birds on their non-breeding grounds interact with residents. Much of this research has been undertaken in the New World where, among other things, there appears to be a link between fruit- or nectar-feeding and migration. In Central and South America, there is also a (contentious) hypothesis that migrants may be forced into 'poor' habitats by competition with residents. Few studies have attempted to test these ideas elsewhere in the world.

Some ideas generated in the New World cannot be invoked to explain patterns of migration between the Western Palearctic and Africa. For example, the overwhelming majority of migratory land birds are insect-eaters; very few are fruit- or nectar-feeders. Even the dominant ways in which insect-eaters catch their prey differ. In the New World, many species catch insects in the air by 'perch-and-sally' hunting. In Africa, a greater proportion hunts insects on the ground, using a 'perch-and-pounce' technique.

Masters student Jane Hamblin has recently completed a study comparing patterns of land-bird migration across the world's three major flyways – North to South America, Western Palearctic to Africa, and Eastern Palearctic to Asia. This comparison included attributes of the birds themselves (such as size, habitat choice, diet and foraging behaviour), and also aspects of the geography of the flyways (such as available land area, availability of different habitat types and the existence of potential barriers to migration, such as unavoidable water crossings).



PHIL HOCKEY

Even sea crossings as narrow as the Straits of Malacca appear to form a migration barrier for some birds.

She found that remarkably few paradigms hold across all three flyways. The number of migrant species decreases with increasing distance from the breeding grounds. The drop-off rate, however, varies, being most rapid in Asia and slowest in Africa. This is best explained by physical geography, with fragmentation of the Indonesian Archipelago proving a much greater barrier to migration than the wide open spaces of Africa (even the Sahara). Those species that migrate to both Africa and Asia travel much further south in Africa. On all three flyways, diet is linked to habitat choice and insectivory is most pronounced among the longest-distance migrants. The latter is probably best explained by insects being the food with the greatest seasonal variation in abundance. It is advantageous for insect-eaters to migrate to southern latitudes to exploit the flush of insects during the southern summer.

Habitat too plays a role in shaping migrant bird communities. In Central and South America, migrants use different habitats in direct proportion to the extent of those habitats. In Africa and Asia, by contrast, they mostly avoid forested areas (despite the fact that Asia is predominantly forested). Indeed, results of several analyses concluded that habitat use and behaviour of birds in Asia and Africa are more similar to one another than either is to the New World, suggesting that the New World is actually the 'odd man out'! This may well have to do with the evolutionary histories of Asian and African birds being closer to one another than either is to that of the New World.

The study also raised some interesting questions about the phenomenon of leap-frog migration – a pattern whereby those species breeding the furthest north migrate the furthest south. This pattern has been well established for shorebirds worldwide, and certainly exists for land birds migrating to Africa. In the New World the pattern is only weak, and in Asia it appears not to exist. This may in part be due to the water barriers of Indonesia, but it is unlikely that this is the only reason. In stark contrast to equivalent latitudes in Africa and South America, almost no land birds from the north migrate to Australia, despite the fact that there is substantial local migration within Australia and between Australia and New Guinea. The explanation for this remains a real challenge for future research. □

Visit the FitzPatrick website: http://www.fitzpatrick.uct.ac.za
Percy FitzPatrick Institute of African Ornithology, University of Cape Town, Rondebosch 7701, Cape Town, South Africa.
Tel. (021) 650 3290; fax (021) 650 3295; e-mail birds@botzoo.uct.ac.za