

Symposium Presentation No. 4

# *Migration Routes of the Great Eastern Ranges: Nature's Way of Living the Big Picture*

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*Summarised by Dr Peter Mitchell, Biolinks Alliance*

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This talk was about understanding connectivity at the large scale of the Great Eastern Ranges. When the GER Initiative started in 2007, the vision was a linear link from the Alps to the Atherton Tablelands. Then large-scale connectivity models developed by Michael Drielsma in the NSW Office of Environment and Heritage in 2008 showed a complex network of landscape-scale and local connections stretching from western Victoria to far north Queensland. This network is stronger in some areas and highlights the potential for a strong relationship with wildlife species that move seasonally from north to south. The models also raised questions about how species might be using that landscape.

Examples of these movements are shown for the Rainbow Bee-eater (summer and winter occurrences), Dollarbird and Grey Fantail (in different seasons), and several other species (showing range shifts through eastern Australia). All these analyses provide a greater depth of understanding about the movement of birds through the landscape.

The analyses raise questions about how birds are using the Ranges, how important are the Ranges compared with the coast and inland slopes, and how we might use this information to decide where to do connectivity conservation work. In 2010, GER worked with Birdlife Australia on 18 species of forest and woodland birds with pronounced migratory or nomadic dispersal patterns. The analysis of the Brush Cuckoo shows low numbers in winter, increasing over spring as birds move down the coast then into the Ranges and western slopes to breed, before returning back along the coast to the north. Studies of a range of species showed patterns of movements and pathways routinely used by different latitudinal and altitudinal migrants but also gaps that are not heavily used.

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A lot of information is available for birds, but what about other taxa? The migration patterns of Bogong Moths are well known, with many stories around their migrations, but many other common species also have pronounced migrations. Painted Ladies (butterflies) have been recorded migrating south in huge numbers dating back to at least the 1880s. Migrations of Tiger Blues may have been first recorded during Captain Cook's voyages. Flying Foxes are well known for their nomadic movements through eastern Australia. Some microbats also migrate; the White-striped Freetail Bat moves south ahead of the hot summer weather and first appeared in Tasmania in 2012, possibly in response to climate change. Dragonflies also migrate; the Globe Wanderer occurs in eastern Australia and is known elsewhere as a long-distance migrant.

For many species, these migrations are more complex than shown in the analyses. In part this is due to the seasonal shifts in primary productivity - and hence food resources - in different parts of the country (north vs south, coastal vs. inland) at different seasons and places. Records of Grey-headed Flying-foxes and other nectivores show that areas of high nectar production shift at different times of the year. This raises questions about how well these resources are protected. Eastern Australia has a good network of protected areas, particularly along the Ranges. But for the nectivores, these protected areas do not provide food during winter. So security of resources for different species throughout the year is a real concern. Those resources are under increasing pressure from a whole range of landscape issues. One of those issues is climate change.

Modelling of vegetation condition by Michael Drielsma highlights the relationship between the better areas and protected areas. Looking forward 20 years and assuming the same pressures will continue, the model shows a marked decline in vegetation condition, and fragmentation and islanding of the better protected areas. Add the impact of climate change and the situation for birds moving and using resources particularly along migratory pathways is dire.

GER is trying to counteract these types of impacts. A report\* developed by ANU highlighted that, to address and reverse these impacts, we need to be thinking at the large landscape scale. This means continuing to mobilise the range of efforts like Central Victorian Biolinks. We need to advocate and support connectivity conservation at this large landscape scale as an approach that applies the principles from science to on-ground works. The Central Victorian Biolinks area ticks the boxes for a globally significant area under the IUCN classification of connectivity conservation areas.

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*Note: the last 11 slides in the powerpoint were not discussed in the talk but many of the points were covered in the talk by Kylie Durant.*

**Q&A:** *Question about data sets and the role of citizen science:* The Atlas of Living Australia is a good source of data although it needs a lot of working up. Data for some taxa is very good, for others there are gaps. For example, 10-15% of Australian butterflies are said to migrate but the data is not available to fully track and understand this movement. There is a big need for citizen science to help fill in the details of movements and tell the great stories of animal movements in Australia.

\* Mackey B, Watson J and Worboys GL of ANU Enterprises Pty Ltd 2010, *Connectivity conservation and the Great Eastern Ranges corridor*, an independent report to the Interstate Agency Working Group (Alps to Atherton Connectivity Conservation Working Group) convened under the Environment Heritage and Protection Council/Natural Resource Management Ministerial Council. Download link [here](#).