

Symposium Presentation No. 1

# *The hope of biolinks and practical guidelines for making the dream a reality*

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*Summarised by Peter Mitchell*

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We all know that connectivity and biolinks are needed to maintain large diverse populations and ecosystems and that they are critical for climate change. But why and how?

CSIRO has looked at how assemblages of species might change with climate change. The analysis began with how and why species composition varies from one place to another, then used models of climate change to see how species composition might change in the future. This analysis showed that there is pressure for massive shifts of 60-70% in the composition of vascular plant communities in Victoria with climate change. It will include local extinctions, immigration and big changes in the relative abundance of species. Our task is to facilitate and to make sure we don't get in the way of these natural process.

The CSIRO analysis was supported by another wide study that showed massive changes in the centres of species distribution of 200-400km over the past 60 years, generally polewards and eastwards to higher elevations as predicted by with climate change.

What does it mean for the basic principles of biodiversity conservation? We always knew that connectivity was about dispersal, migration and other large landscape processes and maintaining viable populations of species in a way that also keeps people in the landscape with productive properties and vibrant regional towns. But these analyses show that we now need to look at movement areas and habitat for range shifts of more than 200km.

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What features in the landscape facilitate movement and how can that fit in with current land use? Studies of woodland birds showed that they maintained a core habitat area for foraging and breeding but also forayed out looking for other suitable habitat. During these forays, birds used scattered trees as well as corridors. This was confirmed by many other studies of birds and mammals (including tree-dwelling and many ground dwelling species such as *Antechinus*), and led to the CSIRO Functional Connectivity Model: at least 10ha of habitat is needed for a good complement of species, with patches within 1.1km of each other to allow dispersal and gaps of less than 100 m between the stepping stones of corridors or scattered trees. This recognition of the importance of scattered trees changes our idea of connectivity from corridors to broader biolinks that have a mix of features - forest and woodland patches, corridors and scattered trees - that can be used by specialist species travelling between patches and generalists living in what may be a very open woodland. This wider concept of biolinks provides an opportunity for more diversity such as native grasses and forbs in open areas and rocky areas for reptiles – a landscape mosaic.

So the design principles for connectivity are: an inter-patch distance less than 1.3km and gaps less than 150m. If a landscape does not have this, then new habitat needs to be added in the middle. How this is achieved depends on how landholders want to work their land, but this new knowledge of the flexibility of animals allows flexibility in the implementation of biolinks. It allows us to provide connectivity over more than 200km scales and to realise the big hope of biolinks.

## Further reading

Dispersal behaviour of Brown Treecreepers predicts functional connectivity for several other woodland birds. Veronica A. J. Doerr, Erik D. Doerr and Micah J. Davies.

<https://publications.csiro.au/rpr/download?pid=csiro:EP10050&dsid=DS3> Published in *Emu* 111, 71-83.

<https://doi.org/10.1071/MU09118>

Flyways & Byways: Guiding restoration of wildlife corridors. Monitoring connectivity restoration in the Australian Capital Territory. Erik D. Doerr, Veronica A.J. Doerr, Micah J. Davies, Chris Davey and Jaslyn Allnutt. 30 April 2014. Australian Capital Territory Environment and Sustainable Development Directorate (Serena Farrelly).

[http://www.environment.act.gov.au/\\_data/assets/pdf\\_file/0005/672233/FlywaysByways\\_FinalReport\\_Doerr-et-al-2014-A10059895.pdf](http://www.environment.act.gov.au/_data/assets/pdf_file/0005/672233/FlywaysByways_FinalReport_Doerr-et-al-2014-A10059895.pdf)

Does structural connectivity facilitate movement of native species in Australia's fragmented landscapes?: a systematic review protocol, Erik D Doerr, Veronica AJ Doerr, Micah J Davies and Heather M McGinness. *Environmental Evidence* The official journal of the Collaboration for

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Environmental Evidence 20143:9.

<https://environmentalevidencejournal.biomedcentral.com/articles/10.1186/2047-2382-3-9>

Connectivity, dispersal behaviour and conservation under climate change: a response to Hodgson *et al.* Veronica A. J. Doerr, Tom Barrett and Erik D. Doerr. Journal of Applied Ecology Volume 48, (1): pp143-147, February 2011. <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2664.2010.01899.x/full>