

Hi Mike,

As promised, please find a short email below as a comment on the proposed NSW Koala Strategy as per the Chief Scientist and Engineer's Report. Apologies it's a bit rushed, I am leaving for fieldwork tomorrow but could provide some citations or more info if needed next week, if that is not too late.

The Report by the Chief Scientist and Engineer deals with genetic diversity to a very limited extent with a mention and a suggestion of a sample repository in Section 3.2.4. To conserve the species at a state or nation-wide level, the existing levels of genetic diversity need to be maintained and/or improved. There is a focus throughout the Report on collecting data and modelling threats, population viability and persistence, and on habitat modelling, but all too often these modelling processes are focused only on demographic and ecological data. The longer-term threat of a potential loss of genetic diversity should be integral to any assessments that consider threats and population viability or persistence. As briefly mentioned in the report the lack of consideration of inbreeding depression and other impacts from loss of genetic diversity has caused a lot of problems for populations in Victoria and these issues need to be avoided. Landscape genetics is a holistic approach that can integrate habitat connectivity and threats together with gene flow, genetic variation and local adaptation to ensure a robust and long term approach to ensuring population persistence.

As well as informing metapopulations and connectivity as mentioned in the Report, testing for genetic diversity levels using new technology tools (genomics) can provide information to help prioritise populations for management and ensure a coordinated approach that aims to maintain maximum genetic diversity of the species, rather than just for individual regions or populations. For example, the report recognises that in some cases not all koala populations might be able to be saved - considering genetic diversity and associated local adaptations, including disease resistance, is critical for guiding management decisions and ensuring that we maximize the fitness of the species for the long term and its ability to adapt to change. Overall it would be good to see recommendations for collection and analysis of genetic data wherever that information is lacking, the same as for ecological and demographic data. That would result in a holistic approach for a whole of NSW strategy.

Our paper (in prep) uses a genomic sequencing method to provide the most comprehensive genome- and species-wide analysis of population genomics and phylogenetics in the koala, to date. This would be a good start point, it includes 7 regions from NSW, 21 from across Australia and we aim to provide a tool for ongoing rapid assessment of population genetic diversity using SNPs from across the genome.

Lastly, a note on section 3.2.4 which states "That Government establish the Australian Museum as a preferred repository for koala genetic samples in NSW". I don't know if you are aware of it but that same concept was suggested at a koala research forum last year at the University of Sydney and it met with considerable opposition from many different research groups (interstate and local). Creating a central repository that other researchers are not willing to submit samples to might be counterproductive. One concern that was raised was that the Museum has had a policy that when samples are submitted to them, they then own the samples, which can create conflicts for researchers (I don't know the specifics of it but it seemed to be a well-recognized issue). I would recommend that this concept be further discussed amongst research groups and that a central repository is created by agreement with all stakeholders. A university might be more neutral ground than the Museum. Or perhaps a policy or agreement could be put in place at the Museum that deals with people's concerns.

Many thanks.

Cheers

Kellie



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