

Examiner Report Summaries

Examiner 1: Dr. Mark Eldridge, Evolutionary Biology Unit, The Australian Museum,
6 College St, Sydney 2010

This thesis represents a truly enormous amount of high quality research, both in the field and laboratory. In this regard, the candidate is to be congratulated for operating so successfully in these two very different environments. The work reported here will revolutionize our understanding of southern hairy-nosed wombat biology and makes an internationally significant contribution to the fields of molecular ecology, behavioural ecology, population biology and mammalogy. This thesis is a marvellous demonstration of the utility of non-invasive sampling, and shows that with planning, care and appropriate safeguards, high quality molecular data can now be obtained even from species that are almost impossible to study via more traditional means. The data analysis in this thesis is 'state of the art' and exemplary, setting a very high standard for future studies. This thesis is clear, logical, well written and remarkably free of typographical errors. I look forward to seeing these data published in the international scientific literature and encourage the candidate to do so as soon as possible. I have no hesitation in recommending that the candidate be awarded the degree of Doctor of Philosophy, once the two minor points raised below are clarified.

Examiner 2: Professor Mike W. Bruford, Cardiff School of Biosciences, University of
Cardiff, Cardiff CF10 3TL, UK

This is an excellent piece of work, seemingly characterized by a strong motivation to use molecular markers as *tools* to answer real ecological questions and involving a very logical approach and methodology. The study seeks to investigate the sociobiology of a comparatively poorly known marsupial species (the southern hairy-nosed wombat, hereafter SHNW) under both 'normal' conditions (i.e. in continuous habitat, but under different ecological conditions – here soil type) and 'perturbed' conditions where both resources and population demography depart from the norm. The perturbed populations were identified partially through aberrant genetic structure and the methods employed were both appropriate and contemporary. This is therefore a thesis centred around a good set of questions – especially the focus on socio-ecology and genetics of structured populations in both continuous and fragmented habitat, a much overlooked issue, using a feasible set of methods and it generates some important data. The results are both novel and significant. The confirmation (as for other wombat species) of female-biased dispersal, post-breeding is both unusual and interesting. The effect of soil type in continuous habitat on group size is also interesting and adds to the relatively few other studies in this area. As expected, but rarely shown, habitat fragmentation altered dispersal patterns in the dispersing sex with evidence for more acute inbreeding avoidance – perhaps suggesting that the fragmentation has been ongoing for enough time to have elicited an adaptive response. In sum this thesis shows a great use of genetic markers to service genuinely interesting and important ecological questions – a refreshing change! The thesis is also virtually error-free and the presentation is first class.