

Progress Report

Infectious pathogens (e.g., *Trypanosoma* spp.) may play a role the recent >90% declines of the woylie; thus, characterising factors influencing pathogen transmission is a priority and the focus of this project.

Research will occur in two semi-free-ranging populations near Perth (high density Karakamia Sanctuary and Whiteman Park, which will shift from high-to-low density due to enclosure expansion) and in free-ranging woylie populations in the Upper Warren region. At the *community* level, validated methods will be applied to identify and evaluate the prevalence of gastrointestinal and hemopathogens in woylies and sympatric marsupials. Multi-host (vector-borne, where applicable) transmission models will be used to evaluate the contribution of various co-host species to the basic reproductive number (R_0) of targeted pathogens. At the *population* level, woylies at Whiteman Park and Karakamia Sanctuary will be fitted with GPS collars to monitor movements; then social network analysis will be used to map pathogen transmission pathways and their relationship with density. These data will be used to develop networks that reflect potential transmission pathways for contagious, refuge-based, or environmental pathogens. In addition, the effects of translocation will be assessed by looking at members of the donor and recipient woylie populations before, during, and after translocation. Finally, at the *individual* level, screening for pathogens while assessing health, reproduction, and behavioural attributes will allow assessment of risk factors and potential fitness effects of pathogens in isolation or combination. Furthermore, network transmission models can facilitate the identification of behavioural traits (e.g., connectedness) or demographic factors (e.g., age, sex) key to pathogen propagation.

In this first year of the project, collection of field data has begun, with successful sampling at all sites and collar deployment at the two northern sites. Data collection will continue through 2015, as well as initial laboratory and data analysis.