CHAPTER 3 META-ANALYSIS OF CORPORATE DATA

3.1. Meta-analysis overview

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Meta-analyses of existing medium-sized mammal data from past and present research and monitoring was used to capitalise on the available data to determine and characterise the attributes and associations of woylie population change. This investigative approach was considered an efficient and potentially critically-important means of providing supporting circumstantial and associative evidence that directly assists in the diagnosis of the woylie declines. The meta-analyses at the Upper Warren regional scale have been addressed and are reported here. Meta-analyses at the southwestern Australian scale have not yet been systematically conducted. The framework for the Upper Warren region meta-analysis investigations included;

1) Fauna data aggregation from multiple isolated datasets into a centralised relational database to enable subsequent analyses (Section 3.2).
2) Assessment of whether the woylie capture rates are indicative of real woylie population declines (Volume 2. Appendix 1)
3) Temporal characterisation of the woylie population changes (Section 3.3)
4) Spatial characterisation (preliminary only) of the woylie population changes (Section 3.4)
5) Demographic changes associated with woylie population changes (Section 3.3), including;
   Sex ratio
   Age structure
   Weight
   Hindfoot length
   Condition index (biometric algorithm based on size and weight)
   Proportion of breeding adult females
6) Associative changes in other sympatric fauna. To date, only the medium-sized mammals for which there is readily available and directly comparable trapping data have been investigated (i.e. koomal, *Trichosurus vulpecula*; quenda, *Isoodon obesulus*; and chuditch, *Dasyurus geoffroii*). These represent potentially comparable resource competitors, similarly-sized prey species and a potential native predator of woylies (Section 3.3).
7) Direct human interference - principally whether there are possible population-scale effects of live trapping and live harvesting for translocations (Section 3.5).
8) Fire – i.e. whether woylie declines were associated with fire regime and/or history differences (Section 3.6).
9) Climate – i.e. whether woylie declines throughout the southwest were associated with the primary climate and weather attributes (Section 3.7)

Some of the meta-analyses (temporal, demographic and sympatric fauna associations) were conducted under contract with 'Data Analysis Australia' statistical consultants. These components are presented together in Section 3.3.