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Putting Conservation Medicine into Practice: Examples from Three Endemic New Zealand Bird Species

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From the moment I picked your book up until I laid it down I was convulsed with
laughter. Someday I intend reading it.

Groucho Marx

Abstract

Conservation medicine is increasingly being viewed as an important component of conservation biology. While programmes focussing on wildlife health are generally limited to controlling the spread of infectious diseases, there is a need to evaluate the impacts of non-infectious diseases: in particular, a critical examination of invasive management practices is overdue. Marking or tagging animals for identification is one of the most common management tools employed by conservation managers, and yet their impacts have rarely been quantified. In the kakapo, *Strigops habroptilus*, metallic bands applied to the tarsus were implicated in joint problems in the banded leg: in contrast to this, subcutaneously implanted passive integrated transponders appear to be safe and effective in both adults and chicks. In the North Island robin, *Petroica longipes*, leg bands were directly implicated in leg injuries at a rate of 2% of adults per year. The most common injury was a result of the birds trapping their hallux (back toe) between a band and their leg; this forced the leg into a flexed position and resulted in tissue damage.

To accurately interpret clinical pathology data collected in wildlife health assessments, reference ranges for haematological and biochemical data should be generated for each species. In the kakapo, blood samples from 1996 and 2002 allowed these references to be produced; however, this exercise highlighted limitations that are often underappreciated in conservation medicine. Many factors can influence the results: two of these being sample storage and laboratory processing methods. Many conservation programmes cannot collect, store and process samples in an ideal environment and, thus, comparisons between ideally generated reference ranges and data from individuals collected in the field may be spurious. Similarly, opportunistic carcass collection and post-mortem examination provides valuable identification of disease agents, but the findings are difficult to interpret in terms of their importance or prevalence within populations. The description of aspergillosis in a North Island robin is a case in point.

The movement of animals for conservation purposes – translocations – is becoming widespread, and has the potential to introduce diseases into disease-free areas; the stitchbird, *Notiomystis cincta*, is currently the focus of conservation efforts that rely on translocations. Two poorly-understood diseases were examined: facial dermatitis and sub-lingual oral fistulas. The prevalence of facial dermatitis was influenced by season and sex, with males showing a higher prevalence of the condition than females during the breeding season. Histopathology, mite isolation and a therapeutic drug trial all suggest that a burrowing mite, *Knemidocoptes* spp is responsible for the condition. Sub-lingual oral fistulas are more widespread than previously thought, as they are not limited to birds with obvious tongue protrusions through the tissue deficit in the lower mandible. Evidence supports the hypothesis that these fistulas are acquired after fledging, and have a limited impact on bird productivity and survival.

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Note on text

Each chapter is set out in the style of the journal in which it has been published or submitted. Consequently, there are some minor stylistic differences between the chapters, differences in the language used (American versus Australian English) as well as some repetition. For all chapters, with the exception of chapter 2, my input into the study design, data collection, analysis and write-up of the manuscript was greater than that of my co-authors. For chapter 2, Åsa Berggren and I worked equally on all aspects of the study and manuscript. All photos reproduced in this thesis are mine.