

Submission for Senate Committee Inquiry: **Status, health and sustainability of Australia's koala population**

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Executive Summary

The Australia Zoo Wildlife Hospital (AZWH) is a major program of Australia Zoo Wildlife Warriors Worldwide (AZWWW), a charity inspired and supported by the late Steve Irwin. The hospital is the foremost facility offering treatment for sick, injured and orphaned wildlife in Australia, with approximately 7000 admissions each year, of which around 10% are koalas. Approximately 50% of koalas admitted to our hospital are suffering from disease, particularly chlamydiosis; however conditions including an AIDS-like syndrome and some cancers, which are thought to be caused by the Koala Retrovirus (KoRV), are also regularly encountered.

Our concerns about the impact of disease continue to be validated by both koala admissions to our hospital (from both Queensland and New South Wales) and also our investigations of koala health in a number of wild koala populations. It is irrefutable that disease in koalas is a critical threat to population health and survival. This submission outlines some of the main findings of our investigation into the health of wild koala populations in south-east Queensland (SEQ).

Health of Wild Koala Populations in SEQ

In mid-2008, AZWWW initiated an investigation into the health of wild koala populations in SEQ (in collaboration with leading koala researchers from universities nationwide including Queensland University of Technology, The University of Queensland, Griffith University, University of Sydney and Murdoch University, and the Gold Coast City Council). This investigation transpired in response to the significant number of diseased koalas that were being (and still are) admitted to our wildlife hospital each year (in addition to the severity of disease seen in a large proportion of these koalas). Although disease in koalas has been well-studied in individual animals, little quantitative information has been

previously available on the health of wild koala populations. Reports of disease are generally limited to chlamydiosis, and prevalence has mostly been estimated by the presence of overt physical signs. Furthermore, very few studies have reported on disease in wild koalas using a comprehensive and thorough veterinary health examination, but clearly this is necessary to accurately estimate disease prevalence.

Using a standardised veterinary protocol, health examinations were conducted on koalas under general anaesthesia, together with ancillary tests designed to detect most known conditions in koala (eg ultrasound, cystocentesis, blood and bone marrow analysis).

To date, we have investigated the prevalence and nature of disease in koala populations from:

- Brendale -Moreton Bay Local Government Area (LGA) (37 koalas)
- Narangba- Moreton Bay LGA (22 koalas)
- East Coomera- Gold Coast LGA (47 koalas); and
- Clagiraba -Gold Coast LGA (7 koalas)

In the Brendale and Narangba koala populations, longitudinal monitoring of the koalas in-situ using radio-telemetry allowed follow-up health examinations to be performed, and the incidence of new disease cases/lesions per year to be calculated.

Results:

(*based on health examinations conducted up until November 2010)

The following table compares the proportion of healthy koalas vs diseased koalas in each koala population:

Koala Population	No. Koalas	Healthy	Diseased (chlamydiosis and/or other disease)
Narangba	22	59% (13/22)	41% (9/22)
Brendale	37	51% (19/37)	49% (18/37)
East Coomera	47	68% (32/47)	32% (15/47)
Clagiraba	7	14% (1/7)	86% (6/7)

Interestingly, a large proportion of koalas from these populations had no overt physical signs of illness and it was only by using thorough veterinary investigative techniques that disease was detected. We found that the observation of overt signs of chlamydial disease

(detected by usual survey techniques without capture of the koala), was found to underestimate true disease prevalence by a factor of five (approximately).

Of the sexually mature females in each population, the prevalence of reproductive disease causing infertility in females was:

- 60% in the Brendale population (9/15 sexually mature females were infertile).
- 45.5% in the Narangba population (5/11 sexually mature females were infertile),
- 32% in the East Coomera population (6/19 sexually mature females were infertile); and
- 67% in the Clagiraba population (2/3 sexually mature females were infertile).

The combined annual incidence of newly developed infertility in previously healthy female koalas in the Brendale and Narangba populations was 32%. This means that 32% of the sexually mature females have a chance of becoming infertile each year.

The proportion of koalas with detectable reproductive disease in each of these populations is remarkably high. This would unquestionably have serious implications for the viability of these koala populations.

NOTE: A more detailed summary of the findings from this study can be found in Jo Loader's Honours thesis entitled, 'An investigation of the health of wild koala populations in south-east Queensland' (Appendix 1).

Over the past 6 months we have also commenced the veterinary health examinations of koalas from the Petrie, Mango Hill and Victoria Point populations.

To date, of the 26 koalas (12 male: 14 female) that have been examined from these populations:

- 46% (12/26) of the koalas were healthy, while 54% (14/26) had detectable disease (predominantly chlamydial disease).
- 10 of the 14 koalas with detectable disease were admitted to the Australia Zoo Wildlife Hospital for treatment, while the remaining 4 koalas were euthanased at their first health examination due to the severity of disease.

- Of the 13 sexually mature females, 4 (31%) had reproductive disease, hence were infertile.

In summary:

- The prevalence of disease in each of our koala study populations is higher than has been estimated in koala populations investigated in previous studies
- Chlamydiosis was the most common and important disease affecting koalas in each of the study populations.
- The incidence of new cases of infertility caused by chlamydial infection in female koalas is high when compared with other species (eg human females)
- The long-term viability of these koala populations is diminished due to the high levels of infertility caused by chlamydial infection in sexually mature females

Conclusion:

It is becoming quite clear that the SEQ koala population is **NOT** a healthy, robust population. The level and severity of disease in the koala populations examined in our study is almost unprecedented compared to other species, with >50% of koalas in some populations affected. This has ramifications for individual animal welfare, due to the severity of the diseases affecting these koalas, as well as population viability, because of the high level of infertility from chlamydiosis. In addition to anthropogenic impacts, it is no wonder that SEQ koalas are in rapid decline.

This study has confirmed that disease is a critical threatening process impacting koala populations in SEQ. If the data on disease prevalence and incidence derived from this study is indicative of the situation for koalas more broadly, the reduction in fecundity and death of koalas caused by chlamydiosis (and other diseases), is significantly contributing to their decline. Further investigations into the health of koala populations throughout Queensland are necessary to validate this hypothesis. It is also imperative that we achieve a better understanding of the epidemiology and pathogenesis of chlamydiosis and KoRV-associated disease in koalas and the interaction of these infections. They are clearly significant epizootics, and a failure to better understand them may hamper future conservation efforts.

It is our view that both KoRV and *Chlamydia* are highly significant in both their potential impacts on individuals, and on populations. We believe that, in respect of Queensland and NSW koala populations, both should be considered critical threats to long-term viability. It is likely that it is only a matter of time before the same can be said of the Victorian and South Australian koala populations.

Recommendations:

Without a significant and meaningful elevation of the koalas' level of legislative protection, we cannot honestly assure that koalas will survive in the wild. Even if this was to occur (and it must), the pervading threat of unmanaged disease may still result in the same adverse outcome, that is: extinction of koalas from the wild.

Perhaps the most crucial recommendation arising from our research is that all levels of government must recognise the magnitude of the problems facing koalas in SEQ and the consequences of failure to respond adequately. The application of more funding for disease research is critical, and it must be sufficient to address the important deficiencies in our knowledge (when compared to the response of Tasmanian devil facial tumour disease which has received \$22 million of government funding committed to date (Lunney *et al.* 2008), the response to the threat of koala disease has been minimal. Barely a fraction of that amount has been spent on infectious disease in koalas in the past decade, in spite of the fact that arguably the risks to population survival are as great as those faced by the Tasmanian devil). Only then can effective conservation management plans be developed and implemented.

References:

Lunney, D., Jones, M. & McCallum, H. 2008, 'Lessons from the Looming Extinction of the Tasmanian Devil', *Pacific Conservation Biology*, vol. 14, no. 3, pp. 151-153.