

Spatial modelling and planning for koalas in south east Queensland

Information sheet



Introduction

The koala (*Phascolarctos cinereus*) is an iconic Australian marsupial and is listed in Queensland as vulnerable under the *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

A recent report on the status of koalas in coastal south east Queensland (SEQ) found that despite existing protection strategies, koala numbers have decreased by 50–80% in key habitat areas over the last 20 years (Rhodes et al. 2015). Given the uncertainty in our ability to halt declines in coastal areas, a new approach will investigate koala habitat areas across the broader SEQ region, and attempt to identify areas where conservation measures are likely to have the most success.

This project aims to identify conservation values and management options that will enhance the long term viability of koalas within the southern portion of the SEQ bioregion. The project, due for completion in June 2017, is being undertaken by the Biodiversity Assessment team from the Department of Environment and Heritage Protection. The project is in line with the announcement by the Minister for Environment and Heritage Protection and for National Parks and the Great Barrier Reef in May 2016 in relation to setting up a koala expert panel and exploring ways to better protect koalas.

The mapping will be developed from a koala habitat model representing the habitat niche or most suitable habitat for the species. The strengths of previous landcover-centred and vegetation-centred approaches will be incorporated into the mapping, and will include a suite of biophysical, habitat and threat drivers of koala distribution and density.

Outputs from the project will include the identification of conservation values and management options that enhance the long term viability of koalas within southern SEQ. The study area is defined by the SEQ planning region, represented by the 12 local government areas (Figure 1).

Habitat mapping and modelling

The project team, in consultation with the koala expert panel have developed a conceptual model, with 2 key phases, to help guide the project (Figure 2).



Figure 1: The project study area

The Spatial Modelling phase

This phase will utilise the best available data to represent the habitat requirements of koalas and draw on previous mapping approaches used to develop habitat models for koalas and other threatened species.

A number of regionally specific datasets with known or likely links to koala habitat utilisation will be used, to model the relationship between the koalas' spatial distribution and environmental variables. Datasets at varying scales (tree, habitat patch and landscape) will be incorporated into the analysis along with indicators of vegetation suitability (such as regional ecosystems, tree species etc.), soil suitability (such as soil fertility and moisture), terrain, climate and habitat resilience. In addition to the habitat mapping, the modelling will incorporate a number of threats, constraints and opportunities for koala conservation across the landscape that could impact on the successful adoption of the projects outcomes.

Key to the project's success is the integration of both quantitative (measurable) and qualitative information (expert opinion) through targeted consultation with koala experts to produce an objective, tenure-blind assessment of koala conservation values.

Expert elicitation will be used in the development and validation of the mapping and modelling, the identification of the key set of explanatory variables, the elucidation of the relationships between variables and habitat quality, and to validate the model outputs.

A repeatable and transparent approach

A repeatable method will be developed to ensure outputs are as up to date as possible. The data outputs will allow users to drill down through the attributes and values from each phase resulting in a transparent mapping product. In addition, the method will be developed in such a way as to be adaptable to other regions, through the inclusion of relevant regionally specific datasets and rules.

Data availability

Outcomes and data from the project will be publically available on the following websites;

- **QSpatial and the Queensland Globe** - Qspatial provides public access to a variety of spatial and non-spatial data. The Queensland Globe allows you to view and explore spatial data about Queensland through Google Earth.
<http://qldspatial.information.qld.gov.au/catalogue/custom/index.page>
- **Environmental reports online** - These reports provide an easy to read summary of specific environmental values for a particular location.
<https://environment.ehp.qld.gov.au/report-request/environment/>

References

Rhodes, J.R., Beyer, H.L., Preece, H.J. and McAlpine, C.A. 2015. South East Queensland Koala Population Modelling Study. UniQuest – internal report for EHP, Brisbane, Australia
www.ehp.qld.gov.au/wildlife/koalas/pdf/seq-koala-population-modelling-study.pdf

For further information

For further information on the project, please send enquiries to NC.Act@ehp.qld.gov.au

Further information on koalas can be found at www.ehp.qld.gov.au/wildlife/koalas/index

The Decision Framework phase

The decision framework phase of the project will combine the spatial modelling components with expert knowledge using a combination of analytical and decision filtering techniques. An evaluation component of the project will include a mapping accuracy assessment to quantify uncertainty. The resulting deliverables will then be used in planning and conservation mechanisms and to guide future koala protection measures and research.

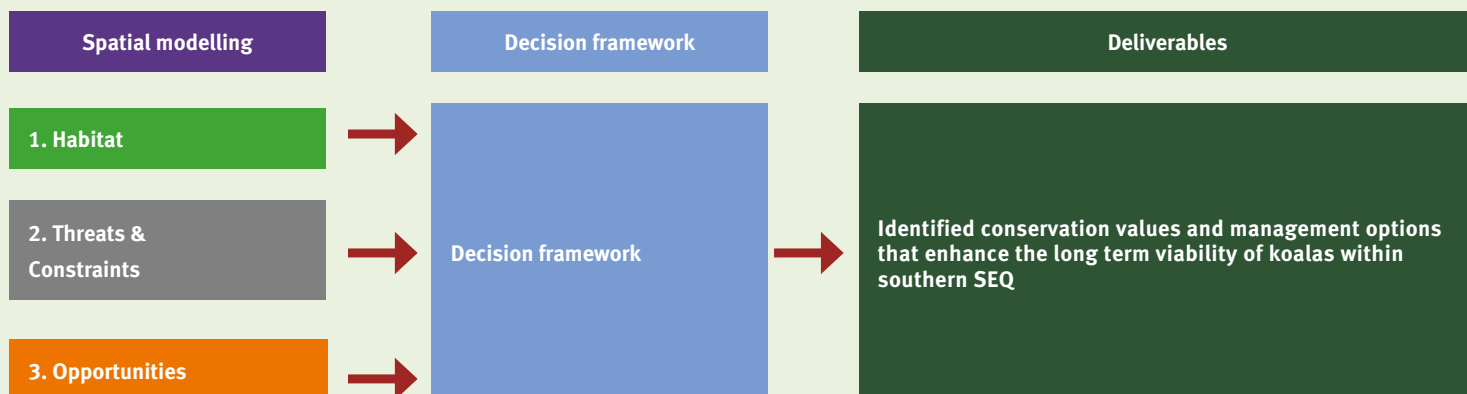


Figure 2: Conceptual model