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Conservation and management of the bilby in the Pilbara

BCS Animal Science

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Project Team	granted
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Context

The greater bilby (*Macrotis lagotis*) is listed as Vulnerable under the *Commonwealth's Environment Protection and Biodiversity Conservation Act 1999*. Increases in threats, including pressure from mining activities across the Pilbara, means that greater understanding of the distribution, abundance and ecology of the bilby is necessary to ensure appropriate conservation and management measures are implemented. This project will aim to increase our understanding of the bilby in the Pilbara Bioregion of Western Australia and allow for the development of a regional survey and monitoring program. The current focus is to determine the distribution of the bilby in the Pilbara and to establish appropriate survey and monitoring techniques, including genetic approaches.

Aims

- Improve our understanding of the distribution and demographics of bilbies in the Pilbara.
- Provide information to environmental regulators, resource development companies and contractors that will allow appropriate management to ensure the long-term persistence of the greater bilby in the Pilbara.
- Design, establish and implement a long-term monitoring program for bilbies in the Pilbara.

Progress

- An extensive data set of bilby records in the Pilbara continues to be collated from existing sources and field surveys. Bilbies in the Pilbara were found to be associated with stands of particular plant species, especially some *Acacias* that provide the major food resource in the form of cossid moth larvae (grubs) from their root systems.
- Preliminary distribution modelling identified soil type and depth, and elevation as major relative contributing variables to predict likely bilby habitat.
- The type of sign that can be used to confirm the presence of the bilby in comparison to sign that should only be used to flag potential presence was described. A protocol to assess potential activity and verify bilby presence and a sampling technique was outlined.
- A set of interim guidelines for occupancy surveys and surveys to detect the presence or absence of bilbies, and assess the importance of habitat, was developed to promote standardisation and comparability. These interim guidelines are based on best practice techniques used nationally and form a template to be reviewed by researchers, consultants and traditional owner rangers.
- A study on detectability of bilby sign from remotely piloted aircraft (RPA) showed altitude and speed had significant effects on the proportion of bilby diggings detected, and it was found that an altitude of 12 m at 6-8 km/h resulted in increased detection rates. A number of other variables need to be examined including different vegetation types and lighting conditions.
- A study of the effect of storage technique for bilby scats on DNA degradation found no difference in amplification or error rates between dried or frozen samples. Storing samples dry is more practical in the field, and it is recommended that samples are stored and transported in tubes with silica gel beads and cotton wool to protect the sample.
- The population abundance monitoring technique using DNA extracted from scats quantitatively collected at populations in the field continues to be implemented.
- Parks and Wildlife sponsored the Ninu (Bilby) Festival that was held at Kiwirrkurra in the Gibson Desert. The festival was hosted by the Kiwirrkurra Rangers, Kiwirrkurra Community and facilitated by Central Desert Native Title Services.

Management implications

- Development of refined survey and monitoring techniques for bilbies in the Pilbara bioregion will enable standardisation and comparability in occupancy surveys and monitoring, and surveys to detect the

presence or absence of bilbies, and provides a means of assessing the importance of habitat. The protocol can be used for broader state and national applications.
- Improved understanding of bilbies in the Pilbara and elsewhere in Western Australia enables improved habitat modelling and predictions of bilby distribution. This will inform future management of bilby populations and assist in the assessment of mining and development proposals.
- Use of a standardised technique for examining abundance of bilbies will provide reliable and comparable measures of numbers of animals within populations. It is recommended that scat samples for DNA extraction be stored and transported in tubes with silica gel beads and cotton wool to protect the sample, to ensure increased sample viability.
- This work has found that populations in the Pilbara are geographically isolated and consist of a small number of individuals. This means that they are likely to be vulnerable to threats, a key one being unmanaged fire regimes, indicating that fire management is an important aspect of managing habitat for bilbies.
- It is recommended any surveys using RPA require ground-truthing of both positive and no detections to determine false positive and false negative error. This technique shows future potential and will be further developed.

Future directions

- Continue development of modelling of the distribution of bilbies in the Pilbara, and ground truth sites to validate the resulting models.
- Continue to optimise RPA technology to survey for bilbies.
- Commence implementation of threat management with initial focus on fire management at selected populations with community and stakeholder engagement and support.
- Initiate population genetics project using existing bilby DNA library collected from population monitoring and opportunistically collected scats.
- Initiate diet analysis of surplus scats collected during population monitoring and opportunistically collected scats.