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Ecology and management of the northern quoll in the Pilbara

Animal Science

Project Core Team

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Update requested

Document endorsements and approvals as of Aug. 22, 2018, 8:44 p.m.

Project Team	granted
Program Leader	granted
Directorate	required

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Context

The northern quoll *Dasyurus hallucatus* is listed as an threatened species under the Commonwealth's *Environment Protection and Biodiversity Conservation Act* 1999. Funding from mining offset conditions are being used to gain a better understanding of quoll distribution, ecology, demographics and management requirements in the Pilbara. There are two major components of the project: regional monitoring and ecological research. Regional survey and monitoring of Pilbara northern quoll populations over 10+ years will provide a regional context for understanding population dynamics. Researching northern quoll ecology will provide information related to impacts, such as loss of known or potential habitat critical to the survival of the species, loss of known or potential foraging/dispersal habitat, and introduction of barriers restricting dispersal opportunities and genetic flow.

Aims

- Improve understanding of northern quoll population distribution, ecology and demography in the Pilbara.
- Provide information to resource development companies that will allow appropriate management of mining sites to ensure the persistence of resident northern quoll populations.
- Plan, establish and implement a regional northern quoll monitoring program in the Pilbara.
- Develop an understanding of quoll habitat requirements and model predicted distribution in the Pilbara.

Progress

- Research priorities for the Pilbara northern quoll (as determined at 2013 workshop) were published in *Australian Mammalogy*.
- Quoll distributional data continued to be added to the Pilbara Threatened Species portal in NatureMap. Additional records from the Great Sandy Desert - Karlamilyi National Park have expanded the known range of northern quolls by several hundred kilometres.
- Predictive species distribution modelling was undertaken in collaboration with Edith Cowan University. Distribution maps have been produced, and expanded to include scenarios of climate change and cane toad invasion.
- Northern quoll distribution model paper has been published in *Nature Conservation*.
- Dietary analysis was undertaken on 500 northern quoll scats from throughout the Pilbara, and a paper was published in *Journal of Mammalogy*.
- Northern quoll spatial use and home range estimates were generated from an Honours project in association with Edith Cowan University.
- Multiple paternity and genetic spread of dispersing young was examined in an Honours project in association with Murdoch University, where northern quolls were found to have up to eight fathers per litter of eight kittens.
- A PhD program is currently examining the interactive threats of introduced predators and fire on northern quolls in the Pilbara.

Management implications

- Enhanced distributional data that is publicly availability in an online repository will enhance decision-making relating to northern quolls in the Pilbara. Future monitoring of northern quolls can be aligned with the methods of the regional program, to enable regional comparisons of population trends and change.
- Sophisticated northern quoll population distribution maps can be used to predict the likelihood of occurrence, and inform management decisions. Areas without data collection have been identified as priorities

for ground-truthing, and key populations likely to be impacted by future threatening processes have been determined.
- Results from GPS tracking of northern quoll suggests that impacts can be limited if known quoll habitat is not fragmented or destroyed by infrastructure developments.
- Modelling the changes in mortality of different cohorts of northern quolls has enabled best-practise baiting regimes to be implemented for feral cats in the Pilbara.

Future directions

- Regional monitoring will continue, including collection of additional presence records.
- Population genetics for Pilbara northern quolls will be assessed with a further 500 DNA samples to be analysed. This will reveal information about the important northern quoll conservation units, genetic diversity within the region and effective home range size.
- Paternal genetics of northern quoll offspring will be examined, to inform on relatedness and paternity of litter-mates.
- Investigation into the interactions between northern quolls and introduced species (including predators: feral cat, red fox, wild dog, and the invasive cane toad) will continue.
- Characterisation of northern quoll denning requirements will be undertaken with the view to protecting these key habitat features, or recreating them with artificial habitat.