Science for Saving Species

Research findings factsheet

Project 2.5

Threatened Species Recovery Hub

National Environmental Science Programme

Finding and conserving the night parrot

In brief

Night parrots are a nocturnal species formerly found throughout arid central Australia. After undergoing a severe decline in the late 19th and early 20th centuries, the species all but disappeared. Despite several plausible reports throughout the 20th century, it was 2013 before a surviving population was found in western Queensland and field research on the species could take place.

The initial research sought to understand the night parrot's ecology and drivers of decline as well as determining methods of detecting this cryptic parrot. We aimed to build upon this knowledge base, continuing research into the night parrot's breeding ecology, methods of detection, and trying to determine its distribution in western Queensland.

We defined robust and repeatable survey protocols for locating the night parrot that are applicable to other parts of its possible range. Our detection methods were used to discover multiple populations of night parrots in central Western Australia, and that region is now thought to be the species' stronghold. We also confirmed the suspected presence of night parrots in Diamantina National Park in Queensland.

Our research into the species' breeding ecology found that under ideal conditions, when resources are plentiful, night parrots will attempt to breed continually. Despite this high reproductive rate, young parrots are vulnerable and it seems that most perish in the months after fledging. Young birds that do survive past fledging seem to have an extended period of reliance on adults. It is not clear whether adults will breed while they still have dependent young.

Our findings are important for conservation managers and regulators determining the conservation priority of the night parrot. Our research into how to detect night parrots has provided information regulators can use to assess whether searches for the parrot conducted as part of environmental impact assessment, for example, have been performed to the necessary standards. Our research into breeding biology suggests that protecting habitat and managing threats at known parrot roosting and nesting sites are priorities for conserving the night parrot into the future.

Night parrot. Image: Steve Murphy

The University Of Queensland AUSTRALIA

BUSH HERITAGE AUSTRALIA

LEFT: Night parrot roosting habitat.
Image: Nick Leseberg

Background

The night parrot (*Pezoporus occidentalis*) is a nocturnal parrot that only occurs in arid central Australia. Despite occasional anecdotal reports, there were no definitive records of the bird for almost a century. In 1990, however, a dead night parrot was found in western Queensland, providing irrefutable proof of its continued survival in the region. Following the discovery of another dead bird on Diamantina National Park in 2006, a surviving population of the bird was discovered finally in 2013.

Given the bird had never been studied thoroughly in the wild, very little was known about the night parrot. Research conducted between 2013 and 2016 focused on improving our overall understanding of this cryptic species. The research investigated the night parrot's general ecology, determined how to detect the elusive parrot, and identified what threats might have driven its decline. It found night parrots to be relatively sedentary birds, maintaining long-term, stable roost sites for extended periods of time.

The parrots roost in low, dense vegetation either in pairs or small groups. At night, they travel up to 10 km from their roost sites to feed and drink throughout the landscape, concentrating their foraging on productive floodplains and run-on areas.

The night parrots were also found to be predictably vocal. While at their roost sites, the parrots called for a short period each dusk and dawn. They also sometimes called while feeding and drinking. Given the predictability of this calling behaviour, acoustic monitoring was established as the most efficient technique for night parrot population monitoring.

Fortunately, numbers of feral cats were relatively low in the western Queensland landscape where the parrots were known to occur, and foxes were absent.

By late 2016, night parrots were still known from only the one site in western Queensland.

What we did

For this project, researchers from The University of Queensland partnered with the Queensland Parks and Wildlife Service, Bush Heritage Australia and several private landholders in the western Queensland region where the night parrot is known to occur.

We conducted the majority of the research on Bush Heritage Australia's Pullen Pullen Reserve, with some research also taking place on surrounding properties including Mount Windsor Station and Diamantina National Park. We searched for further populations of the species both on Pullen Pullen Reserve and in the surrounding region. We also conducted a review of all (largely anecdotal) contemporary and historical records of night parrot sightings.

We investigated the breeding ecology of the night parrot in its currently known western Queensland distribution. We wanted to know whether these known night parrots were successfully recruiting to the population, and how widespread their population was across the landscape. This information could give us necessary insight into the parrot's population dynamics and inform us about how it could be conserved.

Based on what we learnt of habitat preferences in western Queensland, we were able to suggest which parts of Western Australia, historically a stronghold for the species, were considered the most likely for further populations to be found. We supported several workshops for Indigenous rangers of desert country in Western Australia, that facilitated two-way ecological and Traditional Knowledge exchange. At the workshops we shared what had been learnt in western Queensland including how to search for night parrots using automated recording units. We also provided other ongoing technical assistance to these groups including in the analysis of acoustic recording data.

Research aims

We aimed to build on knowledge of the night parrot, by continuing to research its ecology and determine how widespread night parrots are in western Queensland. We aimed to define robust and repeatable survey protocols and then employ these methods to survey for the night parrot at new locations.

RIGHT: Nick Leseberg talking about what has been learnt in western Queensland about night parrot habitat preferences and acoustic monitoring methods at a 2018 workshop on night parrots hosted by Paruku Indigenous Rangers and elders for other rangers and conservation groups from the southern Kimberley and northern Western Deserts. Image: Jaana Dielenberg

Key findings

Breeding ecology

Our new research into the breeding biology of the night parrot resulted in a number of key findings. Over several years, we found evidence that night parrots were able to breed throughout the year and would attempt to breed almost continuously while conditions are good. Previously, breeding was thought to be closely dependent on rain events; our research has shown that rather than relying specifically on rain events, breeding is more likely to depend on general resource availability. While rain events do drive the availability of resources in the arid zones where the birds occur, those resources can remain available for a significant period of time after rain events, potentially up to several years. As long as adequate resources are available, night parrots will attempt to breed.

We found that while many nesting attempts successfully produce young birds that subsequently fledge, few birds survive past this stage, which is limiting recruitment to the population. While the reasons for this are difficult to determine, they appear to be tied to the behaviour of the young birds. In the weeks after the night parrots fledge, they spend much of their time on the ground, begging for food from their parents. This noisy behaviour could be making them vulnerable to cat predation.

Research has suggested that night parrots lack some specific traits that would be expected in a specialist nocturnal species, such as good night vision. It is possible that while these birds are able to produce a high number of potential offspring, offspring take a long time to become independent and are vulnerable in that time. This means that recruitment to the population through breeding is slow. This could be significantly affecting the species' ability to recover from population declines.

Detection methods

Our acoustic monitoring work has been highly successful for detecting the species further afield than Pullen Pullen. Use of our detection methods resulted in the discovery of new populations of night parrots in both Western Australia and elsewhere in western Queensland.

We defined a series of survey protocols using data collected at Pullen Pullen Reserve. These protocols inform the use of automated recording units and automated signal recognition algorithms. In helping Australian Wildlife Conservancy analyse data collected in Diamantina National Park, where night parrots were previously unknown, we were able to confirm the presence of the species in the park.

So far, we have not detected any further populations of the night parrots in the wider western Queensland region despite significant survey effort. The lack of detections suggest that the birds occur at very low densities, and perhaps in only a relatively small area of western Queensland.

Conversely, application of our survey methods by Indigenous ranger groups and some ecological consultants in Western Australia has led to the detection of several new populations of night parrot in that state. Detections have occurred on Paruku, Ngururrpa and Martu Country. These populations range northward from central Western Australia to the southern edge of the Kimberley. It now appears that Western Australia is the likely stronghold for the night parrot, and therefore for its recovery.

Although our survey methods have been applied throughout the species' former range, it has not led to the confirmed discovery of populations anywhere except in western Queensland and Western Australia. There has been a potential detection in north-eastern South Australia, but this is yet to be confirmed.

Review of records of sightings

Our review of all historical and contemporary records of sightings of the night parrot identified clear patterns of decline. These patterns match those of ecologically similar small-to-medium sized mammals from Australia's arid zone, and are likely to have occurred for similar reasons (habitat degradation, competition with introduced herbivores, changed fire regimes reducing cover, and the spread of introduced carnivores, especially cats). Further, the patterns confirm our finding that central and northern Western Australia and western Queensland are probably the only remaining strongholds for the species, with it likely extinct throughout the remainder of its former range in central Australia.

BELOW: An audio recorder powered by a solar panel. Image: Nick Leseberg

Implications and recommendations

Our findings are important for two specific groups: regulators charged with determining the conservation priority of the night parrot, and conservation managers responsible for conserving the night parrot where it occurs.

Our research has demonstrated that the majority of the night parrot population is likely to occur in arid central and northern Western Australia and western Queensland. Where it occurs, it does so at very low densities, but is also likely to experience some form of natural protection there from the threats that have driven the species' decline. This means that those sites where the species does occur are critical to its continued survival.

In the short term, it is probably not possible to restore habitat in a way that can immediately support night parrots. Rather, priority should be placed on conserving known night parrot sites while examining how currently unoccupied but apparently suitable habitat can be restored so that the birds can use it.

Our research defining survey protocols for the species will not only support surveys for the species at new locations but also permit regulators to robustly assess efforts by developers to account for the night parrot as part of any environmental impact assessment process, something not possible until now.

For conservation managers, our research points to some clear priorities for known night parrot sites. The focal point for conservation should be the long-term, stable sites where night parrots roost and breed. At these sites, protection from fire and feral cats will be critical. This will give the parrots the best chance of continuing to occupy these sites, while supporting their attempts to breed and recruit to the population.

A focus on these activities will give the populations of night parrot that remain the best opportunity to persist and grow, contributing to the ultimate recovery of the species.

Further reading

Leseberg, N. P., I. A. W. McAllan, S. A. Murphy, A. H. Burbidge, L. Joseph, S. A. Parker, N. A. Jackett, R. A. Fuller, and J. E. M. Watson. (in press.) Using anecdotal reports to clarify the distribution and status of a near mythical species: Australia's Night Parrot (Pezoporus occidentalis). *Emu*.

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Leseberg, N. P., W. N. Venables, S. A. Murphy, and J. E. M. Watson. (in prep). Developing an acoustic survey protocol that accounts for both automated recording unit and automated signal recognition performance: A case study using the cryptic and critically endangered night parrot (*Pezoporus occidentalis*).

RIGHT: Roosting habitat in old spinifex. Image: Nick Leseberg

Further Information

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