Results of acoustic surveys conducted for the Night Parrot (*Pezoporus occidentalis*) at Matuwa – June/July 2021

Report to:

Wiluna Martu Rangers

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1. Summary

During June and July 2021, autonomous recording units (ARUs) were deployed at Matuwa, Western Australia, to survey for Night Parrots (*Pezoporus occidentalis*). Resulting acoustic data was analysed using signal parameters optimised for detecting Night Parrot calls. No Night Parrot calls were detected during the analysis.

2. Survey effort

Research in western Queensland has demonstrated Night Parrots occupy long-term stable roost sites for periods of up to several years. These long-term stable roost sites support both roosting and breeding. The birds also have predictable year-round calling periods at dusk and dawn (Murphy *et al.* 2017a; Leseberg *et al.* 2019). This ensures that if Night Parrots are roosting at a particular site, the likelihood of detecting them using ARUs is very high, provided the ARU is placed for a minimum of four nights in calm weather, and the recorder is set to record during the peak calling periods. During breeding, and following large rain events, calling is more frequent, extends throughout the night (Murphy *et al.* 2017a), and the likelihood of detection is increased. Preliminary results from research in central Western Australia suggest patterns of behaviour in that region are similar (Jackett *et al.* 2017).

Night Parrots are also known to call during the night at feeding and drinking sites (S. Murphy, N. Leseberg, N. Jackett unpubl. data). Anecdotal evidence suggests they may call when moving between these sites (N. Leseberg, N. Jackett, S. Murphy unpubl. data). However, the detection of birds away from roosting sites is likely to be a chance event given the large area over which birds range at night (Murphy *et al.* 2017b). Night Parrots are known to drink, and modelling suggests they may be reliant on free-standing water (or succulent food containing >55% water) during hot weather (Kearney *et al.* 2016). Birds have been detected in the Great Sandy Desert by focusing survey effort at water sources (J. Brown pers. comm.). It is likely this technique will be most effective during periods of water scarcity, when survey effort can focus on just a few possible locations.

The likelihood of detection is also influenced by the type of ARU being used. In calm conditions, Song Meter 4s are known to be capable of reliably detecting 95% of Night Parrot calls out to a range of around 205 m (Leseberg *et al.* in-prep).

Wiluna Martu Rangers conducted sampling for the Night Parrot in June and July 2021. Nine Song Meter 4 (Wildlife Acoustics, MA, USA) bioacoustic recording units were deployed and recorded a combined total of 237 nights of data (Table 1). The analysed dataset comprised 5,791 sound files (wav format) totalling 459.1 GB. Each unit recorded continuously from sunset until sunrise (approx. 13.5 hours).

Table 1. Bioacoustic recordings analysed from the June/July 2021 survey

Site name	Recording start date (PM)	Recording end date (AM)	Total recording nights	Nights with calm conditions
BS01	09/06/21	09/07/21	30	29
BS02	09/06/21	09/07/21	30	30
BS03	No data recorded			
BS04	09/06/21	09/07/21	30	29
BS05	09/06/21	09/07/21	30	30
DSS01	09/06/21	08/07/21	29	28
DSS02	09/06/21	08/07/21	29	29
DSS09	08/06/21	08/07/21	30	30
DSS11	09/06/21	08/07/21	29	28
		Total	237	233

3. Data analysis

The analysis was undertaken using the software Kaleidoscope Pro v5.2.1, targeting the frequency range of 1000 – 4000 Hz for which all known calls of the Night Parrot are distributed within (Leseberg *et al.* 2019). Searching for calls over a large frequency range such as this is likely to produce a high number of false-positive results due to many other bird species calling at similar frequencies but is a necessary procedure in order to capture the potential repertoire of Night Parrot.

Potential Night Parrot calls detected during the analysis were compared to a reference library comprising 897 Night Parrot calls from Western Australia. This library consists of calls recorded at sites where Night Parrots have been confirmed using visual means and is therefore considered of high reliability. The library also comprises multiple examples of all known call types from Western Australia (Leseberg *et al.* 2019).

Kaleidoscope Pro search parameters were tested using a random selection of 250 Night Parrot call examples manually detected from both Great Sandy Desert and East Murchison datasets,

of which 205 (82.0%) were automatically detected. Calls not detected were typically extremely faint. The probability of non-detection of a true-positive call was 18.0%; two true-positive calls was 3.2%; three true-positive calls was 0.6%; etc. Of the data tested, the median number of consecutive (spaced at <5 minutes apart) calls in a sequence when Night Parrots were recorded was 5 (1–34, n=29). The probability of at least one call being detected within a sequence of median length, assuming there was variation in the location of the source of the call, was >99.9%.

4. Survey results

A total of 29,325 Kaleidoscope detections were manually assessed for Night Parrot vocalisations. No calls attributable to Night Parrots were detected during the analysis.

The recordings conditions were considered excellent, with calls of non-target species readily detected, and were clear in the spectrogram. Insect and wind noise was minimal.

A total of 19 bird species and one mammal species were detected during the analysis and are shown for each site in Appendix 1.

5. Conclusion

It is very unlikely a long-term stable Night Parrot roost exists within two hundred metres of any of the surveyed points where four or more non-windy recording nights were made. Additionally, it is unlikely that Night Parrots were foraging in proximity to these surveyed points during the survey. It is important to note that these results pertain specifically to that area immediately surrounding the survey points, and do not necessarily support conclusions about the presence or absence of Night Parrots in the wider landscape.

6. References

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Appendix 1 – Species detected during the analysis

Species	BS01	BS02	BS04	BS05	DSS01	DSS02	DSS09	DSS11
Birds								
Australian Shelduck							•	
Grey Teal				•				
Horsfield's Bronze-Cuckoo	•	•	•	•	•	•	•	•
Black-eared Cuckoo	•		•	•	•	•	•	•
Pallid Cuckoo	•	•	•	•	•	•	•	•
Australian Owlet-nightjar	•	•	•	•	•	•	•	
Little Button-quail							•	•
Brown Falcon	•			•				
Galah		•	•	•	•	•		
Bourke's Parrot			•			•		
White-winged Fairy-wren	•							•
Rufous-crowned Emu-wren	•							
Spiny-cheeked Honeyeater	•							
Singing Honeyeater	•			•	•	•		
White-fronted Honeyeater	•	•						
Australian Magpie	•	•			•			
Crested Bellbird	•				•			
Willie Wagtail				•				
Corvus sp.	•							
Total	13	6	6	9	8	7	5	5

Mammals								
Dingo					•	•	•	•