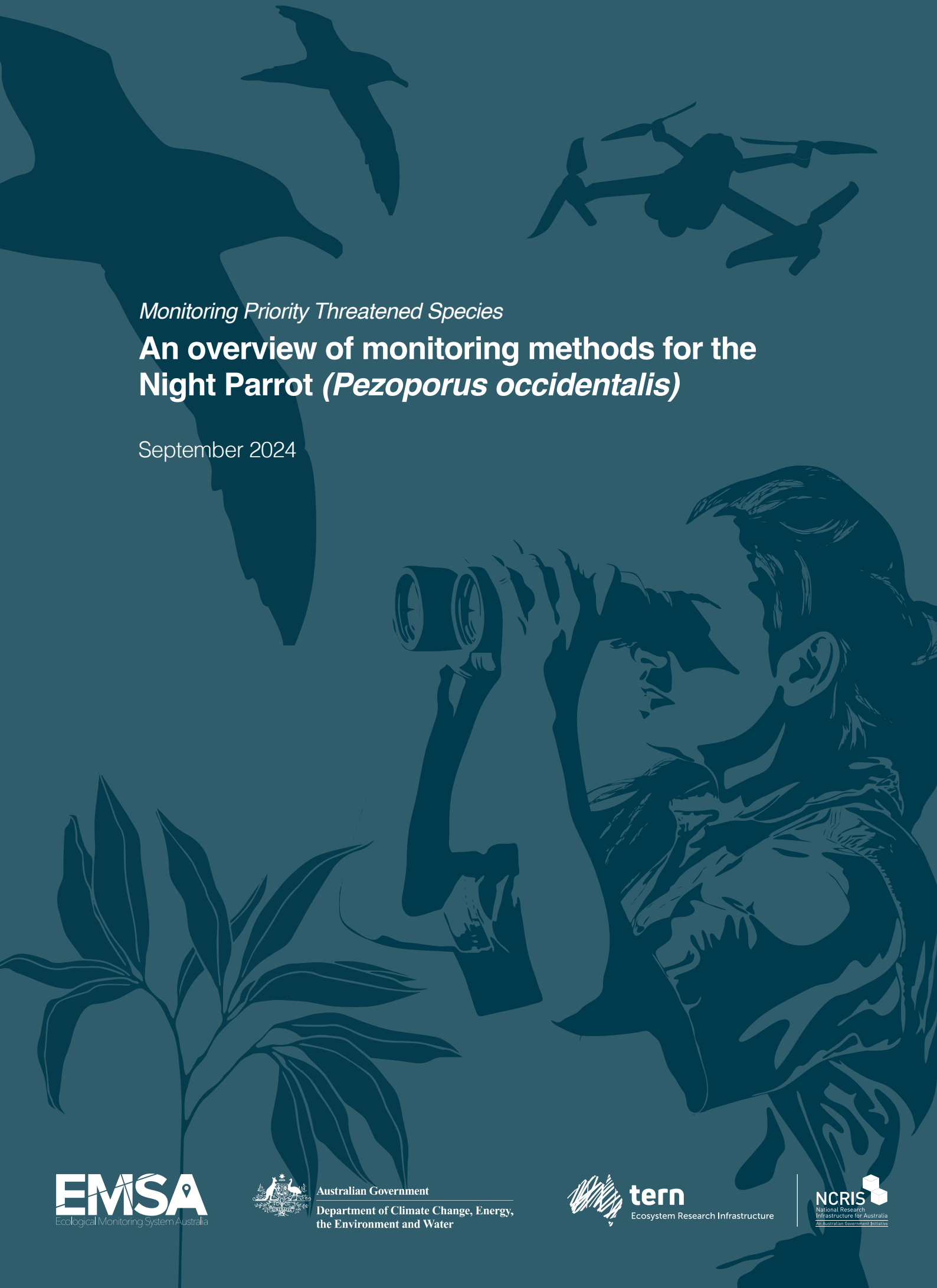

Monitoring Priority Threatened Species

An overview of monitoring methods for the Night Parrot *(Pezoporus occidentalis)*

September 2024

EMSA
Ecological Monitoring System Australia

Australian Government
Department of Climate Change, Energy, the Environment and Water

tern
Ecosystem Research Infrastructure

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Acknowledgement of Country

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

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About

This literature overview collates information on one of the 110 priority threatened species identified in the *Threatened Species Action Plan 2022-2032* and has been reviewed by invited practitioners experienced in monitoring the species.

The *Survey Guidelines for Monitoring Threatened Species* project, a collaboration of the Department of Climate Change, Energy, the Environment, and Water (DCCEEW) and the Terrestrial Ecosystem Research Network (TERN), aims to improve our knowledge of threatened species by enhancing accessibility and sharing of quality scientific threatened species data. By developing best practice field survey guidelines and recommendations, practitioners will be better equipped to conduct standardised, repeatable surveys.

By identifying the monitoring methods typically implemented by practitioners, documenting and assessing the techniques known to work, and identifying opportunities to standardise the methods, we can move towards ensuring all monitoring is species-appropriate, comparable between practitioners and populations, and repeatable over time. Further, together with consistent terminology, guidelines, instructions, and data collection, we can refine efforts and resources to measure and share information. Data collected using robust, standardised methods will improve our knowledge of threatened species and underpin threatened species recovery at scale. This project is essential to establishing monitoring protocols and data repositories to enhance the accessibility and sharing of threatened species data.

TERN has prepared the literature overviews for the Department of Climate Change, Energy, the Environment, and Water. For further information, please visit the EMSA Threatened Species Survey Guidelines website. Additional information, particularly monitoring methods and techniques not included that should be considered, can be brought to the author's attention by emailing tern@adelaide.edu.au for consideration for future updates.

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1 Background

1.1 Conservation status and species trajectory

1.1.1 Current EPBC Act status

- Endangered

1.1.2 Summary of data held in the Threatened Species Index

The Threatened Species Index (TSX) provides reliable and robust measures of change in the relative abundance of Australia's threatened and near-threatened species at national, state and regional levels. Understanding these changes in species populations is crucial for monitoring Australia's conservation progress and allows users to measure and report on the benefits of conservation investments, and to justify and design targeted management responses. Currently, the index is restricted to birds, plants and mammals, with new groups to be added in the near future.

The TSX does not hold data on the Night Parrot. More information on the TSX, including how to contribute threatened species monitoring data to the index, can be found at tsx.org.au

1.2 Distribution

- The current distribution of the Night Parrot is not well understood and current populations are known only from isolated populations in southwestern Queensland and inland Western Australia.
- An analysis by (Leseberg *et al.* 2021a) using anecdotal, historical and museum records to track the species decline since 1845, indicates that the species range once covered much of central Australia.
- In 2013 a population was discovered in southwestern Queensland, more than 100 years after the last confirmed sighting of the species. Research including anecdotal reports suggests that in the intermitting years, the Night Parrot persisted in low numbers across parts of its former range (Leseberg *et al.* 2021a).
- Despite numerous unverified sightings, several dedicated searches and public campaigns, to date there have been only two areas (western Queensland and the Pilbara in Western Australia) where current populations have been identified.
- One probable record from near Innamincka in north-eastern South Australia in 1999 suggests the Night Parrot could still persist in far north-eastern South Australia (Leseberg *et al.* 2021b).

1.3 Habitat

- There is limited information available regarding the breadth of habitat that the species relies on for survival as there are still few records to base these inferences on.
- Recent records of the night parrot have occurred where productive habitats (e.g. ephemeral grasslands, herb fields, samphire, gilgias and saltlake systems) are interspersed with dense, old growth, hummock forming spinifex with fire-isolated patches of ironstone, rocky bars salt lakes or samphire flats (Burbidge 2020). These occur within 50 km. of ephemeral or permanent sources of water.
- Food resource habitat include areas of high vegetative and seed productivity. These may be variable in size from a few square meters to several or hundreds of hectares and will often be relatively fertile with high floristic diversity (Murphy *et al.* 2017).

- The Night Parrot utilises old-growth spinifex (*Triodia*) for roosting and nesting, they are known to use areas with a mix of *Triodia*, alluvial and stony pavement (sometimes called gibber) habitats. All recent Night Parrot records have been associated with *Triodia longiceps* but other *Triodia* species might also be important (Night Parrot Recovery Team 2018).
- *Triodia longiceps* growing near escarpments and without high densities of trees or shrubs might be favoured. However, some Night Parrots have been found living in *Triodia* areas a long way from escarpments. The actual spatial extent of *Triodia* patches does not necessarily need to be large (Night Parrot Recovery Team 2018).
- At the local (site) level, roosting and nesting sites are in clumps of dense vegetation, primarily old and large spinifex clumps (often >50 years unburnt), especially hummocks that are ring-forming (DPaW 2017).
- Habitat requires a source of gastrolith stones such as ironstone plains or rocky breakaways (Murphy *et al.* 2017).
- An equally important aspect of habitat is the level of fox and cat predation occurring across these features (Burbidge 2020).

1.4 Ecology

- The Night Parrot is a. medium-sized (22-25 cm), nocturnal, ground feeding parrot. Adults are mostly bright green with extensive black and yellow markings.
- The Night Parrot is secretive and nocturnal, concealed beneath vegetation during the day beneath dense clumps of spinifex or in thick patches of shrubby samphire or chenopods. They may sometimes roost in caves or shelter in tunnels dug into sand (DEWHA 2010)
- Calls are distinctive (Jackett *et al.* 2017; Night Parrot Recovery Team 2018; Leseberg *et al.* 2019).
- Two Night Parrots radio tracked for a short time at Pullen Pullen Special Wildlife Reserve were found to spend the majority of foraging time in highly diverse but ephemeral habitats, including seasonally inundated plains and depressions associated with the outer Diamantina floodplain and gilgais on ironstone plains. Prolifically seeding ephemeral species dominate these feeding grounds, most notably the annual grass *Uranthoecium truncatum* (Murphy *et al.* 2017) . Although the small sample size of this study requires caution in interpreting the data it indicates behaviours that may be a baseline for future monitoring and studies.

1.5 Threats

- Primary threats to the night parrot include:
  - Predation by feral cats
  - Altered fire regimes; (Murphy *et al.* 2018) found that where Night Parrots have persisted their habitat does not undergo large, hot, single fire events that characterise contemporary fire patterns elsewhere in central Australia and throughout the species historical range. When fires do occur, their spread is limited and devoid of fuel.
  - The incursion of Buffel grass into their current range increases potential fuel loads and threatens more intense and damaging wildfires.
  - Habitat degradation associated with, clearing, over grazing and changing climate conditions.

2 Existing monitoring methods

2.1 Summary of existing methods used

- Direct observation: special techniques (spotlighting)
- Signs (feathers)
- Call surveys

2.2 Existing survey requirements

- Optimal time of year/season/climate conditions (timing with resource availability etc)
  - Rainfall may induce breeding, however breeding is known to occur throughout the year in the Pullen Pullen population.
  - Few months following significant rainfall events, when breeding is more likely to be occurring and therefore detectability of the species is expected to be higher" (DPaW 2017).
  - "There was a peak period of calling from February-June 2014 that coincided with a significant rainfall event. Outside of this wet period, most calls were detected within the first hour after sunset, with calling less frequently detected pre-dawn." (Murphy 2016).
- Optimal location of surveys
  - "The apparent strongholds for the species, western Queensland and central northern Western Australia, should be the primary focus of conservation funding and intervention, given the evidence of continuous occurrence in these areas" (Leseberg *et al.* 2021a).
- Minimum survey effort
  - "A considerable undefined amount of effort would be required" (DEWHA 2010)
- Survey personnel
  - Information not available.
- Other factors:
  - Targeting waterholes in suitable habitats in evening and spotlighting in dense, seeding spinifex (DEWHA 2010)
- Detector dog surveys have been suggested (DEWHA 2010)
- Call surveys (see Night Parrot Recovery Team (2018))
- For non-breeding birds, peak calling periods occur in the two hours after sunset and the two hours before sunrise. However, during breeding events, calls can occur any time during the night, and peak calling may occur outside the post-sunset and pre-sunrise periods (DPaW 2017).
- No available survey technique can irrefutably demonstrate that night parrots are absent from a site. Habitat assessment is critically important (DPaW 2017).

2.3 Existing protocols

Existing protocols identified are identified in Table 1.

Table 1. Survey guidelines, protocols, and key resources that identify Night Parrot monitoring methods

Protocol	Comments	Reference
Survey guidelines for Australia's threatened birds	Suggests targeted searches, area searches, and sniffer dog surveys and describes how to perform method	(DEWHA 2010)

2.4 Methods to consider (for further literature review)

The methods listed below have been identified as potential methods and techniques to survey for the species, either to identify presence or absence, or to assist determining population size and status. Further review of the literature and consultation with experts is required, particularly to identify and assess specific techniques for examining population ecology factors.

2.4.1 Available methods

- Targeted searches at isolated waterholes and subsequent evening watches.
- Area searches for feathers around waterholes and in the nests of other birds.
- Area searches from camels may improve habitat access and coverage whilst providing the observer with a higher vantage point and greater field of view.
- Acoustic monitoring using autonomous recording units (ARUs)
- Team of detector dogs may also be useful in seeking this species, but highly trained dogs and handlers would be essential (DEWHA 2010).

2.4.2 Additional methods

- eDNA
- Detector dogs.

2.4.3 Methods to rule out

- Camera traps have proved not to be effective in some surveys of roosting or feeding areas but could be used as a supplementary technique at potential drinking sites, especially during times of high temperatures and high water stress, such as droughts (DPaW 2017).
- Murphy (2016) found that "More than 11,000 'camera trap nights' showed that their use to detect Night Parrots is an unreliable survey technique" (Murphy 2016)
- Transect foot surveys that seek to flush out birds are not recommended as this has a very low chance of success and may disturb nesting or roosting birds, degrade their habitat and potentially make them more prone to predation if they are unable to rapidly find new cover (DPaW 2017).
- Call playback is discouraged (see Night Parrot Recovery Team (2018)).

2.4.4 Relevant Ecological Monitoring Standards Australia (EMSA) modules

The following EMSA modules developed by TERN should be considered for surveying the Night Parrot:

- Vertebrate Fauna

In addition, the Plot description, Floristics, Cover, Soils, Condition and Vegetation mapping modules may be beneficial for assessing the suitability of a location against the species' habitat preferences.

2.4.5 Other 110 priority species with potential links

- Similar monitoring methods and distribution:
  - Princess Parrot - distribution is also poorly known and species may be sympatric in some regions.

3 Considerations for survey guidelines and/or protocols development

Key considerations should a full literature review and/or survey guidelines be developed for the Night Parrot are highlighted below.

- Special equipment required:
  - No special equipment is required.
- Estimated time and surveyor effort:
  - A considerable undefined amount of effort would be required (DEWHA 2010)
- Vegetation communities or landscapes of the species' preferred habitat not suitable for the optimal survey methods:
  - None have been identified to date.

3.1 Key documents for further review

The documents listed below have been identified as key documents to review should a full literature review and/or survey guidelines be developed for the Night Parrot.

- DEWHA (2010) Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999. Commonwealth Department of Environment, Water, Heritage and the Arts.

Scientific papers and reports:

- Action Plan for Australian Birds 2020 – Night Parrot Chapter.
- A consolidated list or resources is available on the Night Parrot Recovery Team website https://nightparrot.com.au/index.php/resources/
- Department of the Environment (2022). *Pezoporus occidentalis* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat.
- DPaW (2017)Interim guideline for preliminary surveys of night parrot (*Pezoporus occidentalis*) in Western Australia, WA Department for Parks and Wildlife
- Leseberg, N.P., McAllan, I.A., Murphy, S.A., Burbidge, A.H., Joseph, L., Parker, S.A., Jackett, N.A., Fuller, R.A. and Watson, J.E., 2021. Using anecdotal reports to clarify the distribution and status of a near mythical species: Australia's Night Parrot (*Pezoporus occidentalis*). Emu 121(3): 239-249.

3.2 Key agencies and organisations involved in the species research and recovery

- Night Parrot Recovery Team
- Bush Heritage Australia, owners and managers of Pullen Pullen Reserve
- Federal, State and Territory Governments
- Indigenous Desert Alliance
- Indigenous Rangers including: Kanyirninpa Jukurrpa (KJ) Indigenous Rangers, Paruku Indigenous Rangers and Birriliburu Indigenous Rangers.

4 References

Burbidge, A (2020) Night Parrot habitats. Interim Night Parrot Habitat Statement, Leading Night Parrot Conservation. Available from https://nightparrot. com. au/index. php/2022/04/05/night-parrot-habitats

DEWHA (2010) Survey guidelines for Australia's threatened birds. Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999. Department of the Environment, Water, Heritage and the Arts, Canberra.

DPaW, 2017. Interim guideline for preliminary surveys of night parrot (Pezoporus occidentalis) in Western Australia. Department of Parks and Wildlife, Perth, Western Australia.

Jackett, N, Greatwich, B, Swann, GEA, Boyle, A (2017) A nesting record and vocalisations of the Night Parrot Pezoporus occidentalis from the East Murchison, Western Australia. Australian Field Ornithology **34**, 144-150.

Leseberg, NP, McAllan, IAW, Murphy, SA, Burbidge, AH, Joseph, L, Parker, SA, Jackett, NA, Fuller, RA, Watson, JEM (2021a) Using anecdotal reports to clarify the distribution and status of a near mythical species: Australia's Night Parrot (Pezoporus occidentalis). Emu **121**, 239-249.

Leseberg, NP, Murphy, SA, Burbidge, AH, Jackett, NA, Olsen, P, Watson, J, Garnett, ST (2021b) Night Parrot Pezoporus occidentalis. In 'The Action Plan for Australian Birds 2020.' (Eds ST Garnett, GB Baker.) pp. 444-447. (CSIRO Publishing: Melbourne)

Leseberg, NP, Murphy, SA, Jackett, NA, Greatwich, BR, Brown, J, Hamilton, N, Joseph, L, Watson, JEM (2019) Descriptions of known vocalisations of the Night Parrot Pezoporus occidentalis. Australian Field Ornithology **36**, 79-88.

Murphy, S, 2016. Night Parrot (Pezoporus occidentalis) Research Plan Annual Report 2015. Map IT, Yungaburra,

Murphy, SA, Paltridge, R, Silcock, J, Murphy, R, Kutt, AS, Read, J (2018) Understanding and managing the threats to Night Parrots in south-western Queensland. Emu - Austral Ornithology **118**, 135-145.

Murphy, SA, Silcock, J, Murphy, R, Reid, J, Austin, JJ (2017) Movements and habitat use of the night parrot Pezoporus occidentalis in south-western Queensland. Austral Ecology **42**, 858-868.

Night Parrot Recovery Team (2018) 'Looking and Listening for Night Parrots ' Available at https://nightparrot.com.au/index.php/advice/#dodont

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