
Eramurra Solar Salt Project

Revised desktop assessment of potential Night Parrot (*Pezoporus occidentalis*) habitat within the project area

Report to:

Leichhardt Salt Pty. Ltd

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1. Introduction

Between December 2019 and December 2021, a series of acoustic surveys to detect Night Parrots (*Pezoporus occidentalis*) were conducted within the development envelope of the Eramurra Solar Salt Project, within the Roebourne bioregion on the Pilbara coast of Western Australia. A combination of limited deployments and ARU malfunctions meant the results of these ARU deployments were inconclusive. To obtain a more conclusive result, a desktop analysis to determine the likelihood of Night Parrots occurring in the project area was recommended, and whether further acoustic surveys would be required. This desktop assessment comprises the following sections:

- (1) assessment of historical reports to determine whether Night Parrots could occur within the project area;
- (2) a summary of known Night Parrot ecology to outline what habitat is required to support Night Parrots;
- (3) an analysis of high-resolution imagery and existing on-site photographs to determine whether suitable Night Parrot habitat exists within the project area; and

2. Historical distribution of the Night Parrot

The ‘project area’ for this report is the development envelope of the Eramurra Solar Salt Project. The project area is located within the Roebourne subregion of the Pilbara bioregion, on the Pilbara coast of Western Australia, approximately 60 km southwest of Karratha. There are numerous historical reports of Night Parrot from the Pilbara region, although most of these do not have enough supporting information to be considered conclusive (Leseberg *et al.* 2021a). However, the volume of reports from the region, including at least two high veracity reports (Fig. 1; Leseberg *et al.* 2021a), suggest the Pilbara was once a relative stronghold for the species. There is a recent high veracity report from the Fortescue Marsh, approximately 350 km southeast of the project area (Leseberg *et al.* 2021b).

It is noteworthy that the majority of reports, including all high veracity reports, are from inland areas of the Pilbara. While there are some reports from the coast, including a 1966 report from Yarraloola Station, approximately 50 km southwest of the project area, these reports are unverified and may not be records of Night Parrot. Given there are so few historical records from coastal areas when compared with the areas further inland, and that these coastal areas

are likely to have been relatively well travelled, it is possible that these areas have never represented critical Night Parrot habitat.

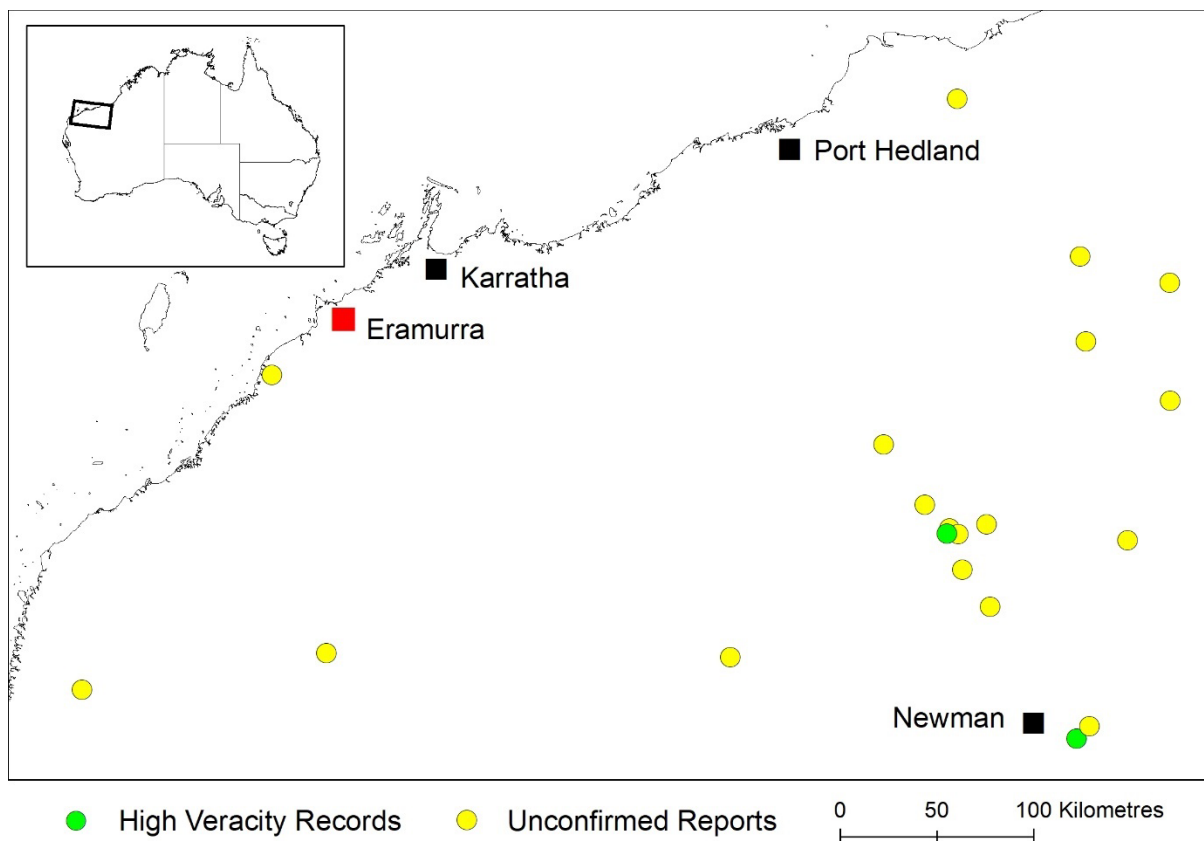


Fig. 1. The location of all reports of the Night Parrot from the Pilbara region of Western Australia (data from Leseberg *et al.* 2021a). Note there are no high veracity reports from coastal areas.

3. Ecology of the Night Parrot

Research from western Queensland (QLD), and emerging research from Western Australia (WA), has demonstrated that Night Parrots occupy long-term stable roost sites for periods of up to several years (Murphy *et al.* 2017). This site fidelity persists through years that may vary significantly in terms of rainfall (N. Leseberg, unpub. data). These long-term stable roost sites support both roosting and breeding, and are typically established in low, dense vegetation such as *Triodia*, and samphire (Sturt 1849, Andrews 1883). All currently known Night Parrot populations have been found roosting in *Triodia* (see i.e. Jakkett *et al.* 2017, Murphy *et al.* 2017). The only reports of birds roosting in samphire are historical, and all come from north-eastern South Australia. Whether it is an important habitat association elsewhere is unknown.

A key feature of the areas where Night Parrots have been found roosting in QLD and WA is the long-term stability of cover (Jackett *et al.* 2017, Murphy *et al.* 2017). For *Triodia* systems, fire is the main disturbance agent that can influence the stability and extent of cover. Indeed, fire regimes that retain cover across localised scales through fostering the establishment and subsequent protection of multiple long unburnt patches of *Triodia*, seem to be a feature of occupied sites in QLD and WA (Murphy and Murphy 2016; Fig. 2). These fire regimes may be the result of planned burning aimed at maintaining a variety of age classes or may result from inherent features of the landscape such as topography that ensures patches of *Triodia* are naturally isolated, and therefore protected from fire (Murphy *et al.* 2018).



Fig. 2. Four different sites where Night Parrots have established long-term stable roosts. The *Triodia* is not necessarily extensive, but has complex structure and at least some large hummocks. Sites are invariably open with few trees or shrubs.

Another apparently important factor in the suitability of roosting habitat is the extent and scale over which it occurs. In western QLD there are important roosting sites that are very small in extent; in some cases, only a dozen or so widely separated clumps of *Triodia* on an otherwise bare stony surface that extends for tens of hectares (Murphy *et al.* 2017). While it is unlikely

Night Parrots would persist if this was the total sum of all suitable roosting habitat at a landscape scale, the presence of multiple similar areas of roosting habitat nearby gives this resource a stability at that landscape scale which is apparently a requirement for Night Parrots to persist. This landscape scale availability of suitable roosting habitat has also been noted at sites where the birds occur in WA (Jackett *et al.* 2017, Leseberg pers. obs.).

In addition to suitable roosting habitat, Night Parrots require suitable feeding habitat. Unpublished DNA analyses of faecal samples show that Night Parrots in western QLD eat a relatively broad array of food plants including grasses (e.g. *Triodia longiceps*, *Uranthoecium truncatum*, *Brachyachne ciliaris*, *Astrebla lappacea*, *Dactyloctenium radulans*) and forbs (e.g. *Trianthema triquetra*) (N. Leseberg unpub. data). The nightly foraging activity of Night Parrots in western QLD focuses on productive patches where these food plants are relatively abundant (Murphy *et al.* 2017). These productive patches are characterised by their hydrology, relative floristic diversity within an unproductive landscape, and the quick growth response of their vegetation following inundation. These run-on zones may be small, and only inundated after local rain (e.g. gilgai formations), or extensive, and inundated by large flood events which may result from rain far upstream (e.g. floodplains). It is the presence of topography which creates these productive patches, that in turn supports the presence of Night Parrots. Preliminary research in WA suggests Night Parrots rely on similar habitat.

Overlaying this requirement for distinct feeding and roosting habitats is the Night Parrot's physical ability to access the resources it requires. A Night Parrot tracked using a GPS tag over several nights in western QLD was travelling to feeding and drinking sites up to 10 km from its roost site, and moved a minimum of 40 km on one of those nights while accessing these resources (Murphy *et al.* 2017). The mean distance moved each night (noting that this is a minimum given limitations in the way tracking data is obtained) was around 30 km. Over a period of several nights the bird moved within an area of nearly 3500 ha, although the nightly mean was around 800 ha. Given the small sample size, it is not known whether these distances and areas are typical for the species – it may be capable of covering much larger distances – but they provide a starting point for assessing the species' ability to access resources within a wider landscape.

4. Potential Night Parrot habitat in the project area

High resolution satellite/aerial imagery was examined to identify potential patches of suitable roosting habitat. Long unburnt *Triodia* of the ring-forming kind preferred by Night Parrots for roosting has a distinct visual appearance that can be identified via such imagery. Several areas of potential habitat were identified (Fig. 3).

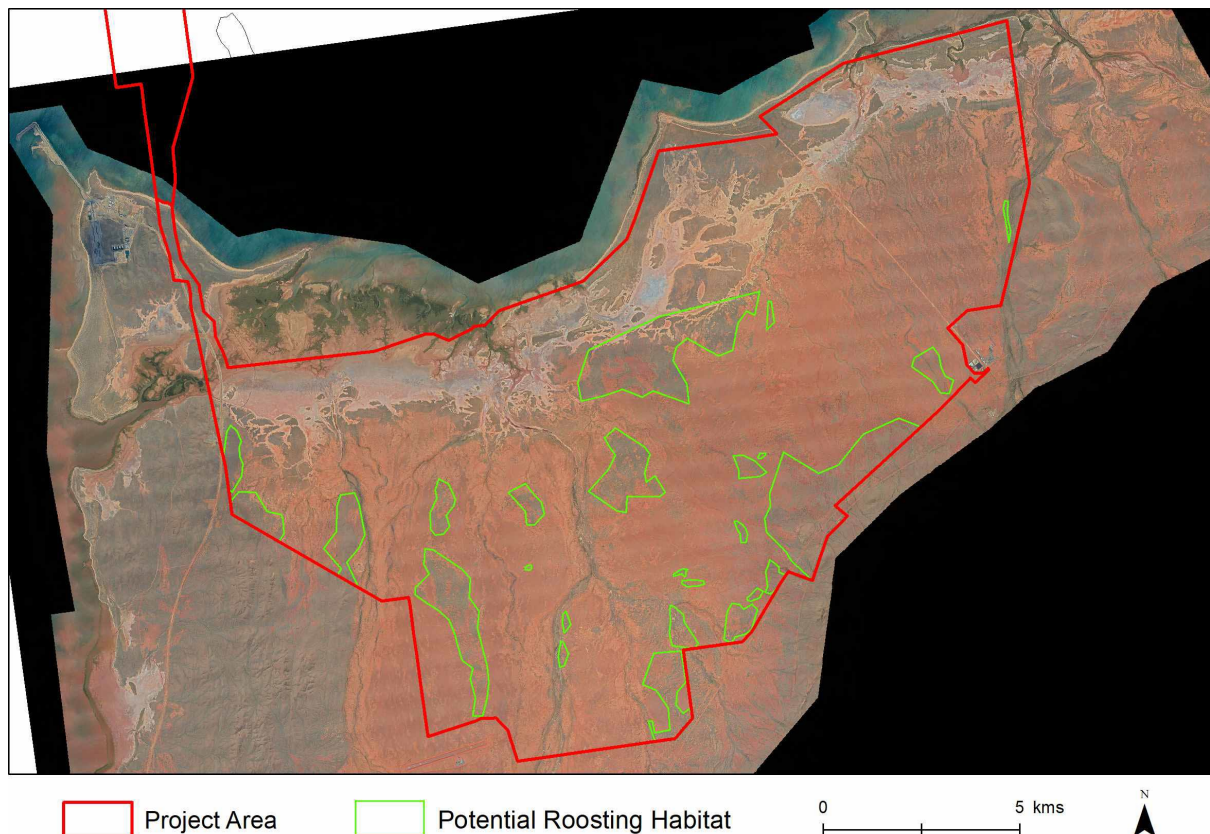


Fig. 3. Areas of potential roosting habitat identified from high resolution satellite imagery.

Although *Triodia* may be long unburnt and have the appearance of suitable habitat from aerial or satellite imagery, attributes that are not apparent from such imagery, such as the height and vertical structure of the *Triodia*, and the structure of other vegetation within the *Triodia*, need to be assessed on-site to determine if it is suitable habitat. Photographs taken on-site within these areas of potential habitat were examined to assess these attributes.

Multiple on-site photographs and some drone footage for each area of potentially suitable habitat, were examined to determine whether suitable roosting habitat existed (Fig. 4). Most areas for which on-site photographs were available appeared unsuitable as Night Parrot

roosting habitat. The *Triodia* was typically very low in height and homogenous in structure, without the variation in hummock size notable at sites where the bird is known to occur. Additionally, many sites appeared to have an overstorey of small shrubs, which is thought to render habitat unsuitable for Night Parrots.

One small area of potentially suitable roosting habitat was identified in the south of the project area (Fig. 4). The photographs and drone footage from this site depicted open, practically treeless areas, supporting at least some larger hummocks with the structure necessary for Night Parrots.

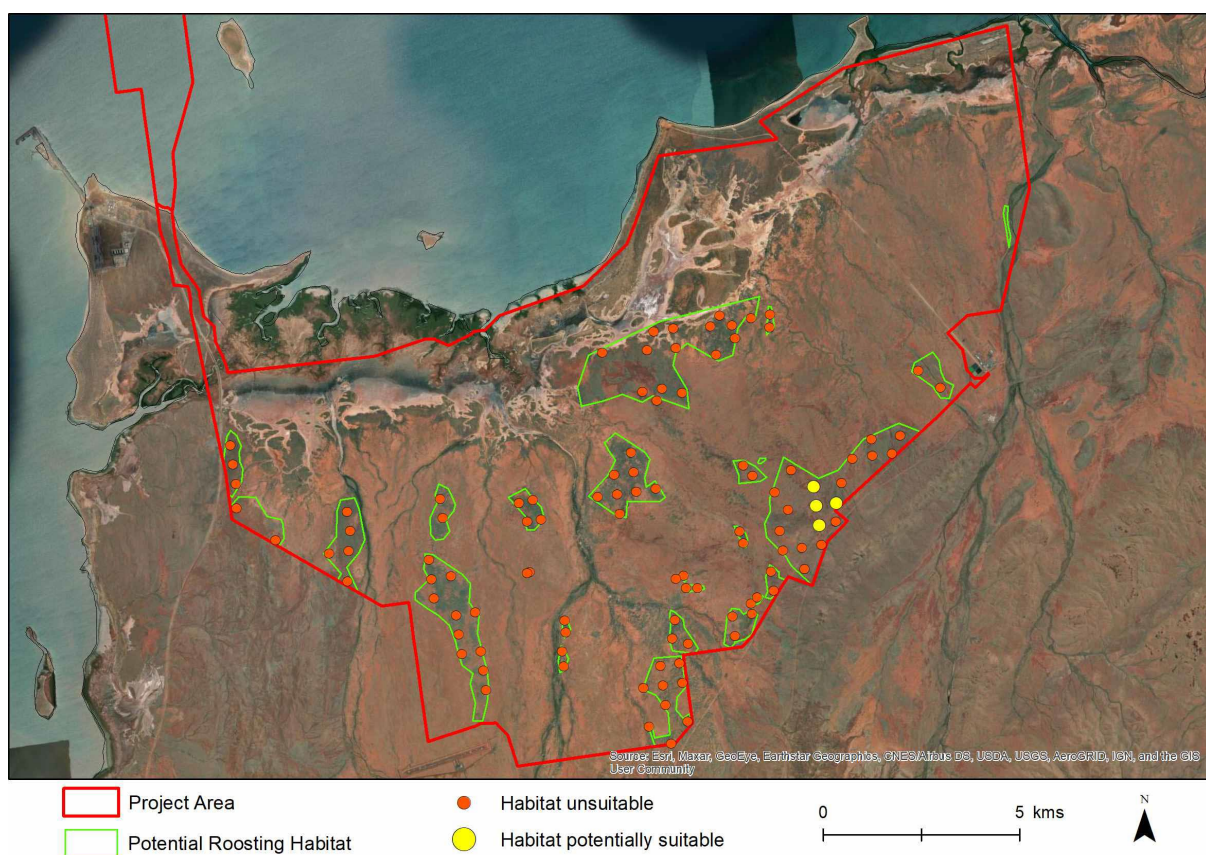


Fig. 4. Sites where photographs were examined for potential habitat, and where potential habitat was identified within the project area.

Although suitable roosting habitat is limited within the project area, there is large tracts of apparently suitable foraging habitat. Based on reports prepared by Phoenix Environmental Services (Phoenix Environmental Services 2022), the Horseflat System covers a significant proportion of the project area, and on-site photographs suggest large areas of this system are suitable foraging habitat for the Night Parrot.

As noted earlier, at all contemporary sites where Night Parrots have been found, multiple patches of suitable roosting and foraging habitat exist at the landscape scale. These results suggest that within the project area, while potentially suitable foraging habitat is widespread, suitable roosting is very limited. It is unlikely that the amount of suitable roosting habitat within the project area itself is enough to sustain a population of Night Parrots.

While it is unlikely the project area itself contains enough habitat to sustain a population of Night Parrots, it is possible sufficient habitat exists in the wider landscape to support a population of Night Parrots which may occasionally use the habitat within the project area. Determining whether sufficient habitat exists at the landscape scale is beyond the scope of this report, although a very brief examination of imagery from the surrounding area suggests the habitat matrix is likely to be similar to that within the project area.

5. Summary

An assessment of historical records of the Night Parrot and of the habitat within the project area suggests it is unlikely Night Parrots occur there. There are no high veracity historical records of Night Parrot from the region, and although this does not mean Night Parrots never occurred in the area, it is possible the area was never a stronghold for the species.

All sites where Night Parrots have been found in the last decade are notable for the availability of significant amounts of suitable roosting and foraging habitat at the landscape scale. Although there are significant amounts of foraging habitat available, an analysis of potential roosting habitat suggests it is of very limited extent within the project area. It is unlikely this small area of roosting habitat is critical to supporting a population of Night Parrots at the landscape scale. It would be possible with a limited program of acoustic surveys (three ARUs deployed for approximately two weeks) to determine if Night Parrots are currently resident in the small area of suitable roosting habitat that was identified within the project area.

If a population of Night Parrots does exist in the wider landscape, it is possible that the foraging habitat within the project area is used occasionally by this population. To determine whether such a population exists would be very difficult, requiring an extensive multi-year program of habitat analysis and acoustic surveys within the wider landscape. Although beyond the scope of this report, a brief examination of available imagery does suggest that similar foraging

habitat as occurs within the project area is widespread at the landscape scale, and that the expected disturbance of such habitat within the project area will not significantly impact the availability of foraging habitat at the landscape scale.

6. References

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