Review of Northern Quolls within Detailed Terrestrial Fauna and Migratory Shorebird Surveys for the Eramurra Solar Salt Project

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Curtin would like to pay respect to the Aboriginal and Torres Strait Islander members of our community by acknowledging the Traditional Owners of the land on which the Perth campus is located, the Whadjuk people of the Noongar Nation; and the Wongutha people of the North-Eastern Goldfields on which our Kalgoorlie campus is located. We acknowledge the Traditional Owners, their ancestors, Elders, and emerging for their stewardship of Country.

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REPORT INFORMATION

- Title of report: Detailed terrestrial fauna and Migratory shorebird surveys for the Eramurra Solar Salt Project
- Project Name: Eramurra Solar Salt Project
- Date of EIA Submission:
- Report Author(s): Phoenix Environmental Services
- Project Proponent(s): Leichhardt Salt Pty Ltd

INTRODUCTION

The purpose of this review is an evaluation of the findings on northern quolls by Phoenix Environmental Services in their report "Detailed terrestrial fauna and Migratory shorebird surveys for the Eramurra Solar Salt Project" as a result of work undertaken on behalf of Leichhardt Salt Pty Ltd.

The presence of northern quolls was identified at six sites in and around the indicative project disturbance footprint (as identified from Leichhardt Salt Pty Ltd online GIS portal) during fieldwork activities undertaken by Phoenix Environmental Services. As a result of these records, some areas within the project footprint have been identified as critical habitat for the survival of northern quolls.

This review is intended to evaluate information and findings presented in the report on northern quolls, and the habitat identified as critical habitat, and make recommendations for further work and explore mitigation measures to limit impacts to northern quolls.

DATA COLLECTION

The report details a combination of methods that were used to determine northern quoll presence. These were spotlighting and head torching, infrared PIR-triggered camera traps (Figure 1 shows a Reconyx PC900 camera trap), and daytime searches for secondary signs such as scats and tracks. While the report identifies field work primarily took place between 15 to 17 April 2020, camera imagery indicates that camera traps detected quolls between 1 to 5 December 2021 and that one observational record also occurred in December 2021. No targeted trapping was undertaken for this species.

From the report, daytime searching totalled 19 person-hours of which 2.6 hours were specifically targeted at northern quolls across three sites (Table 4-4 Terrestrial fauna survey effort). Nocturnal searching totalled a further 15.4 hours with 1.6 hours targeted towards northern quolls, but only at a single site. Only daytime searching and camera traps revealed any evidence of the presence of northern quolls. Scats and/or tracks were recorded at three locations, two in the proposed project footprint and one outside. Six separate encounters were recorded from three camera trap sites, all of which were located along a creek on the eastern margin of the project area.

There is some inconsistency within the report regarding the number of sites where camera traps were deployed and the ensuing camera trap effort with Table 4-4 identifying 16 sites and 178 camera trap nights, Table 4-3 indicating only seven sites and Section 4.2.3.7 reporting 15 sites with five cameras each, and set for at least of four nights. For the latter statement, it is likely that what was meant was that five cameras were used to survey 15 sites with at least four camera trap nights at each site, but that is not how the text reads and if taken at face value indicates at least 20 camera trap nights occurred at each of the 15 sites which would have meant

collectively over 300 camera trap nights took place. One site, NP04, is identified as having had a camera deployed for three nights in Table 4-4 but the site details in Appendix 2, Terrestrial fauna survey site descriptions, do not record camera use at that location. This camera was one source of positive northern quoll imagery.

Figure 4.1 presents a map detailing the fauna survey effort, and indirectly identifies observational sites of presence for northern quolls, although this has to be interpreted from symbols rather than any species locations being explicitly identified. Figure 5-3a identifies the three locations at which cameras recorded the presence of northern quolls. However, neither this figure nor any other details where all targeted northern quoll camera trap locations were, although a list of locations and their coordinates is provided in Appendix 1.

There is mention of the use and replacement of baits in conjunction with camera traps, but it is not clear whether baits were used or lures (Figure 2. Shows a camera trap with a PVC lure container), the latter involving scent as an attractant rather than direct access to food. This aspect is relevant in determining whether an attractant was continually available to optimise detection or sometimes available, depending on consumption and how palatable or attractive baits/lures might be.

Northern quoll records were captured for a 40km buffer surrounding the project area from sources including the Atlas of Living Australia (ALA), the Department of Biodiversity, Conservation and Attractions (DBCA) threatened species database, DBCA's NatureMap and from relevant consultant reports, including Phoenix Environmental Services own work near Mardie. Records within this buffer are relatively few and sparse, with the majority to the northeast of the project area, some 40km away and near the city of Karratha. Most other records are generally to the south of the project area within the adjoining Chichester subregion, which has greater topographic relief and is considerably more rugged than the Roebourne subregion.

Spatial fauna habitat polygons were defined using Phoenix Environmental Services own vegetation mapping and this was intersected with the publicly available GIS layers of soil types and landforms. Areas identified as critical habitat and foraging habitat for northern quolls were graphically identified in the report and available on Leichhardt Salt Pty Ltd online GIS portal. Most of the major creek/drainage lines within, and immediately adjacent to the project area are identified as northern quoll foraging/dispersal habitat while an area of granitic rocky outcropping along the edge of 40-mile beach road is identified as critical denning/shelter habitat.

ANALYSIS

The amount of data collected for the presence of northern quolls precludes any formal statistical analysis and as such, the interpretation of information within the report is largely qualitative rather than quantitative.

The production of spatial information identifying critical habitat and dispersal/foraging habitat was based on intersections of species presence with GIS layers of habitat for two polygons, and then largely extrapolated for others based on similarity of environmental attributes.

RESULTS

Data for this report were presented as presence only, either from camera images or from secondary sign of scats and/or tracks. While images of northern quolls were captured on six occasions and at three locations, all of these were close to one another (<600m overall, and for two, < 100m from one another) and all along the same creek, Devil Creek. Nothing was reported on how many individuals may have contributed to these images and for much of the imagery differentiation of individuals would not be possible due to quality and whiteout by infrared flash, primarily with the Bushnell cameras used. However, examination of northern quoll spot patterns on images

taken with a vertically orientated Reconyx camera at site NQ08 indicates the same individual was photographed on each of three successive nights and no other individuals were present. Given animals may move more than 4 km between dens (e.g. Cook 2010, Cowan et al. 2020), and the comparatively short distances between cameras on the same creek where northern quolls were detected, it is feasible that these records represent no more than a single individual.

While all photographs were captured within the defined terrestrial fauna study area (TFSA), they were all along the eastern margin, and by design of the project, they are outside of the proposed development footprint.

At least 11 cameras were deployed within the development envelope however there were no reported detections of northern quolls from any of these.

DISCUSSION

It is not entirely clear what aerial extent is required to be considered a critical habitat for the northern quoll, particularly in the case of a relatively small, isolated rock pile, and where it remains unknown as to whether the presence of northern quolls are transient or resident. The area mapped as critical habitat within the disturbance footprint for this project is based on the presence of a single scat and only covers an area of approximately 7.5 ha. Numerous studies have examined home range size for northern quolls in the Pilbara (eg. Henderson, 2015; Cowan et al, 2020, Hernandez-Santin et al. 2020; Moore et al, 2021; Cowan et al, 2022) and the average smallest home range documented for female northern quolls was 13 ha (Cowan et al 2020), but otherwise, the area used was greater than 35 ha. For males, the area was much larger and generally over 100 ha. Habitat utilisation by 14 GPS-tracked northern quolls was assessed by Cowan et al. (2022) where they found activity of animals was also directed towards areas that were more topographically rugged than other parts of the surrounding landscape such as spinifex sandplains.

While there has been confirmation of the presence of northern quolls at several locations in this report, there is little support for the statement “Northern Quoll (EN) appears to be resident throughout the study area, based on presence at six sites” as four of these sites were on the eastern periphery of the project area and the other two sites, from which there was secondary evidence only are not representative of the entire project area. Indeed, targeted camera trapping within other parts of the project area considered suitable for northern quolls, and intersecting a large part of the project area, did not reveal any presence. Similarly, discussion around populations would also seem a little premature before a more rigorous and systematic appraisal, particularly when independence between existing detections can’t be established.

As noted in the report, there are extensive areas of topographically rugged terrain immediately west and to the south and southeast of the project. These link through to the even more rugged and complex landscapes of the Chichester subregion. These environments constitute what is considered high-quality and core habitat for northern quoll populations in the Pilbara. These adjacent landscapes may be the primary source of animals detected in the project area through dispersal rather than a long-term and viable resident population. Given the isolated nature of the outcrop present in the project area, its small aerial extent and the distance to other similar environments, it is difficult to envisage how this site would be contributing more generally to population persistence elsewhere, or genetic diversity. However, these are the questions that might be addressed if a population is found to exist.

RECOMMENDATIONS

At present it would seem the most appropriate action is to undertake a more detailed assessment identifying whether northern quolls are resident in the area identified as critical habitat and if they are, determine how many. This is consistent with the EPBC Act referral guideline (Commonwealth of Australia 2016) for species after their presence is confirmed within a project area.

The timing of this assessment would largely determine the most appropriate methodology. Cameras can be used at any time of the year, although there can be limitations in understanding landscape use for dispersing individuals. Cage trapping (typical cage trap is shown in Figure 4.) is effective for targeted areas as it provides more detail around population structure for age, sex and certainty for individual identification, but is only recommended between April and September to avoid females having large pouch young or denned young. Trapping may also be used as a follow-up method leading on from cameras to provide more detail if required, for where species presence has been confirmed but difficulty in ascertaining information on numbers remains. Identification of individuals is also possible with cameras vertically orientated (e.g. Hohnen et al. 2013; Moore et al. 2020), albeit sometimes with less certainty than trapping, depending on animal behaviour, the quality of the camera, particularly the flash, and camera positioning and placement. The use of cameras also involves fewer welfare considerations than cage traps however if baits/lures are used with cameras, animal ethics approval is still required (Figure 3 diagrammatically shows a lure cannister in relation to a vertical and horizontal orientated camera. Cameras can also be used efficiently over large areas for extended periods to capture temporal information across an entire landscape, provided enough cameras are available. There is less cost associated with field time for cameras but far greater cost in the initial purchase of equipment and for the processing of imagery.

While potential mitigation options for project design could also be considered, this would seem premature at this stage without first assessing and corroborating the importance of areas identified as supporting northern quolls.

Options for consideration are therefore:

OPTION A

Activity 1 Develop and implement a systematic camera trapping program to determine the number of individuals and spatial use within the area identified as ‘critical habitat’.

Activity 2 If animals are determined to be resident in this area, extend camera placements to capture information on local landscape usage/dependence.

Activity 3 Concurrently with Activity 1, establish a systematic camera array in major drainage systems where northern quolls detections were confirmed to establish whether use is transient, or animals are resident.

Or

OPTION B

Activity 1 Depending on the timing and resource constraints, camera trapping could be delayed and cage trapping undertaken post-April 2024 instead. This would have fewer costs and provide

more information on animal status. Camera trapping in peripheral areas could occur concurrently to provide some detail of landscape use.

Irrespective of Option, camera deployments of at least 30 days would be preferable with upwards of 20 cameras divided between “critical habitat” and foraging/dispersal landscapes.

Ten cage traps would likely be adequate to assess “critical habitat” if Option B was to be pursued.

LITERATURE CITED

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FIGURES

Figure 1. Reconyx PC900 camera trap mounted on peg

Figure 2. Camera directed towards PVC lure container

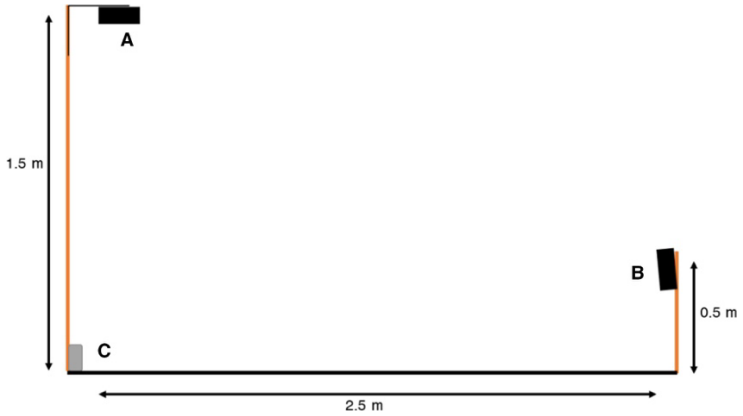

Figure 3. Diagram showing (A) vertically orientated camera, (B) horizontally orientated camera and (C) bait canister arrangements at each site. (from Moore et al. 2020)

Figure 4. Sheffield-type cage trap suitable for northern quolls