

Pre-clearance assessment of proposed sites for a construction camp and fibre cable corridor, a contractor compound and access road, and an emergency airstrip for the Square Kilometre Array project

1.0 Introduction

The Square Kilometre Array (SKA) Project is a large international radio telescope project proposed by CSIRO which aims to answer key cosmological questions using radio waves from across the universe to look back into the cosmic dark ages. As with all big science projects, the SKA project will draw on the skills, experiences and support of 14 countries working collaboratively to construct and operate elements of the SKA project, with the first phase of the project being hosted by South Africa and Australia. Australia will host the SKA1-Low Frequency Aperture Array (SKA1-Low).

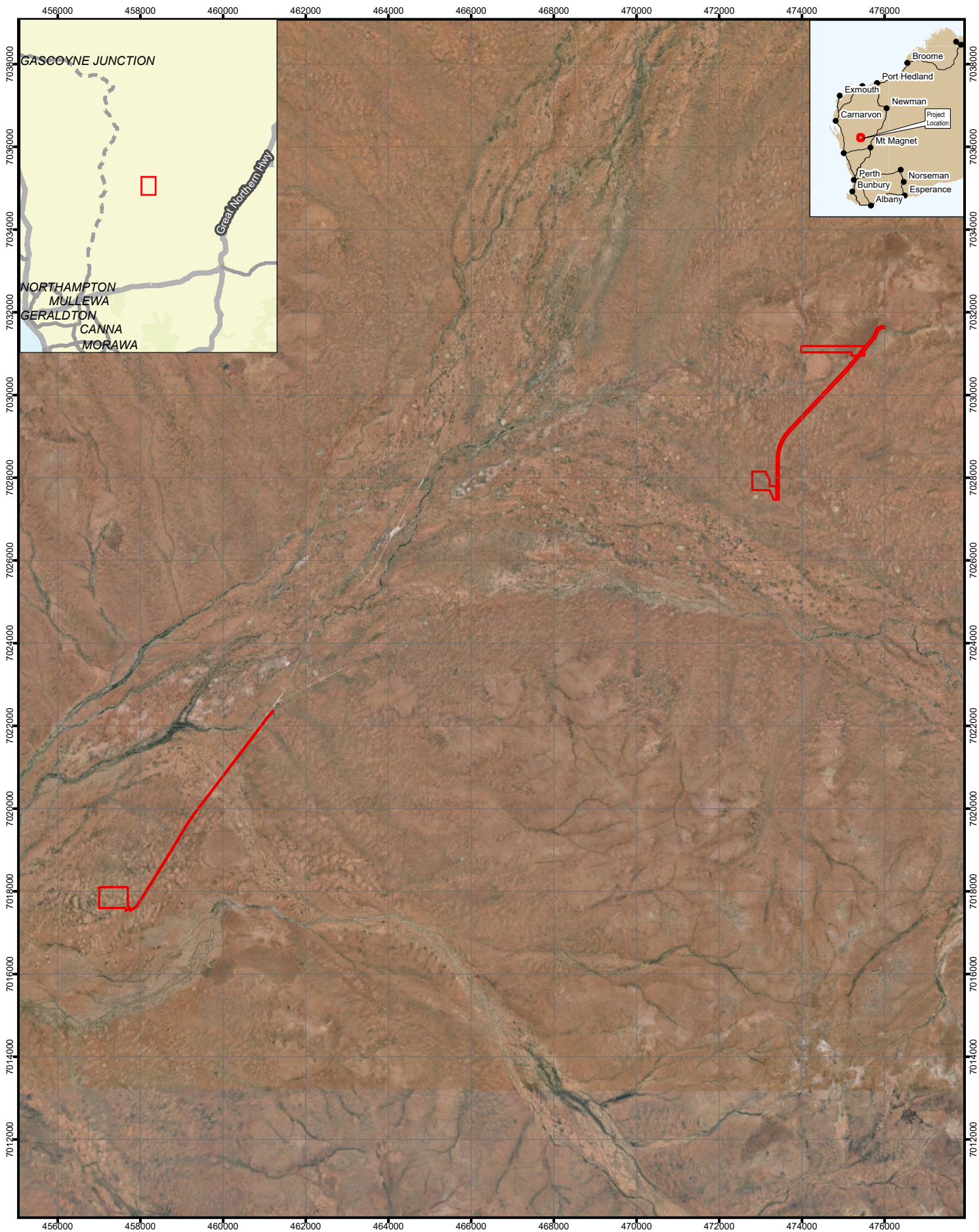
CSIRO proposes native vegetation clearing areas to accommodate the following components as part of the SKA1-Low project:

- Construction camp.
- AARNET fibre cable to Construction Camp.
- SKA core access road.
- Contractor compound on Kalli road.
- Emergency airstrip.

A native vegetation clearing permit (NVCP) for the SKA infrastructure will be submitted to the Department of Water and Environment Regulation (DWER). Previous surveys identified several conservation significant flora and fauna values including habitat for the Threatened Western Spiny-tailed Skink and several Priority flora species.

All areas included in a NVCP will require a survey to verify the presence of these environmental values.

AECOM Australia Pty Ltd (AECOM) was engaged to undertake targeted flora and fauna surveys to support the NVCP. The objective was to determine whether defined survey areas included significant flora species or suitable habitat for significant fauna species known to occur on Boolardy Station. The survey areas included the construction camp, fibre corridor, contractor compound, access road and emergency airstrip (Figure 1).



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LEGEND
 Survey Area

Survey Area

**DEPARTMENT OF INDUSTRY,
 SCIENCE, ENERGY AND RESOURCES**
 TARGETED FLORA AND FAUNA
 ASSESSMENT – SQUARE KILOMETRE
 ARRAY (SKA) PROJECT

Figure
1

2.0 Methods

2.1 Desktop Assessment

The 2022 desktop assessment utilised information from previous surveys undertaken for SKA along with public databases and government records. Sources used to inform the desktop assessment included:

- DBCA threatened species and communities database.
- Western Australian Herbarium (WAH) records.
- EPBC Act Protected Matters Search Tool (PMST) database.
- Alexander Holm & Associates (2008) Radio Astronomy Project Environmental Assessment.
- AECOM (2014) Square Kilometre Array Ecological Assessment.
- AECOM (2021) Square Kilometre Array Ecological Assessment.
- Atlas of Living Australia.
- Birdlife Australia.

All flora and fauna of conservation significance identified in the desktop assessment was assessed for their likelihood of occurrence in the survey area (Table 1). Significant flora species likelihood of occurrence was assessed systematically using a point-based system which takes into account proximity and date of known records, presence within the Local Government Area (LGA) and habitat suitability (Table 2).

Prior to commencing the field survey, all species identified as likely and known to occur were reviewed and field guide booklets made. This included photographs, habitat, and identification details of the plant, flower and/or fruit.

Table 1 Categories of likelihood of occurrence for fauna species and vegetation communities of conservation significance identified in the desktop assessment

Category	Fauna	Communities
Likely	Survey areas are within the known distribution of the species, habitat is present in the survey area and it has been recorded in close proximity previously.	Known occurrences of the community in close proximity to the Survey area. Vegetation looks the same within the known occurrence and survey area based on aerial imagery. Geographic location is similar to the survey area.
May	Survey area are within the known distribution of the species, marginal habitat may be present and/or it has been previously recorded in close proximity.	Known occurrence of the community in the local area, and/or vegetation looks the same within known occurrence and survey area based on aerial imagery. Geographic location is similar to the survey area.
Unlikely	Survey areas are outside known distribution for that species, or no suitable habitat is present and there have been no recent recorded locations in close proximity to the survey areas.	Known occurrence of the community in close proximity to the Survey area however geographic location does not occur in survey area.

Table 2 Categories of likelihood of occurrence for flora species

Likelihood of Occurrence	Score	Definition
Known	6	Species is known to occur in the survey area.
High (Likely)	5	Not known to occur in the survey area however there are records nearby and suitable habitat for the species is known or likely to be present within the survey area.
Moderate (Possible)	4 (if suitable habitat may be present within the survey area) 3 (if suitable habitat is known to be, or likely to be present)	Species is not known to occur within the survey area however there are nearby records AND/OR recent records OR records within the LGA AND suitable habitat for the species is known or likely to be present within the survey area. OR Not known to occur within the survey area but there are records nearby AND recent records AND records within the LGA, and suitable habitat for the species may be present (marginal habitat).
Low (Unlikely)	2,3	Species is not known to occur within the survey area but there are records nearby OR recent records OR within the LGA AND suitable habitat for the species may be present (marginal habitat).
Negligible (Suitable Habitat not Present)	1,2,3	Despite records nearby OR being present within the LGA OR recent records, no suitable habitat is present within the survey area and therefore the likelihood of the species occurring is negligible.

2.2 Field Assessments

2.2.1 Flora

Targeted flora searches were undertaken in accordance with EPA Flora and Vegetation Survey Technical Guide (2016) on 14 September 2022 by Celia Mitchell (Flora collection licence FB62000077-2) and Cassandra House (Flora collection licence FB62000118-2). Targeted flora searches focused on significant flora that are considered likely to occur. These species included:

- *Hemigenia tysonii* (P3)
- *Gunniopsis divisa* (P3)
- *Frankenia confusa* (P4)
- *Eremophila muelleriana* (P3)
- *Eremophila simulans* subsp. *megacalyx* (P3)
- *Ptilotus beardii* (P3)
- *Sauropus* sp. Woolgorong (M. Officer s.n. 10/8/94) (P3)
- *Calandrinia butcherensis* (P1)
- *Calandrinia* sp. Boolardy Station (P. Jayasekara 719-JHR-01) (P1).

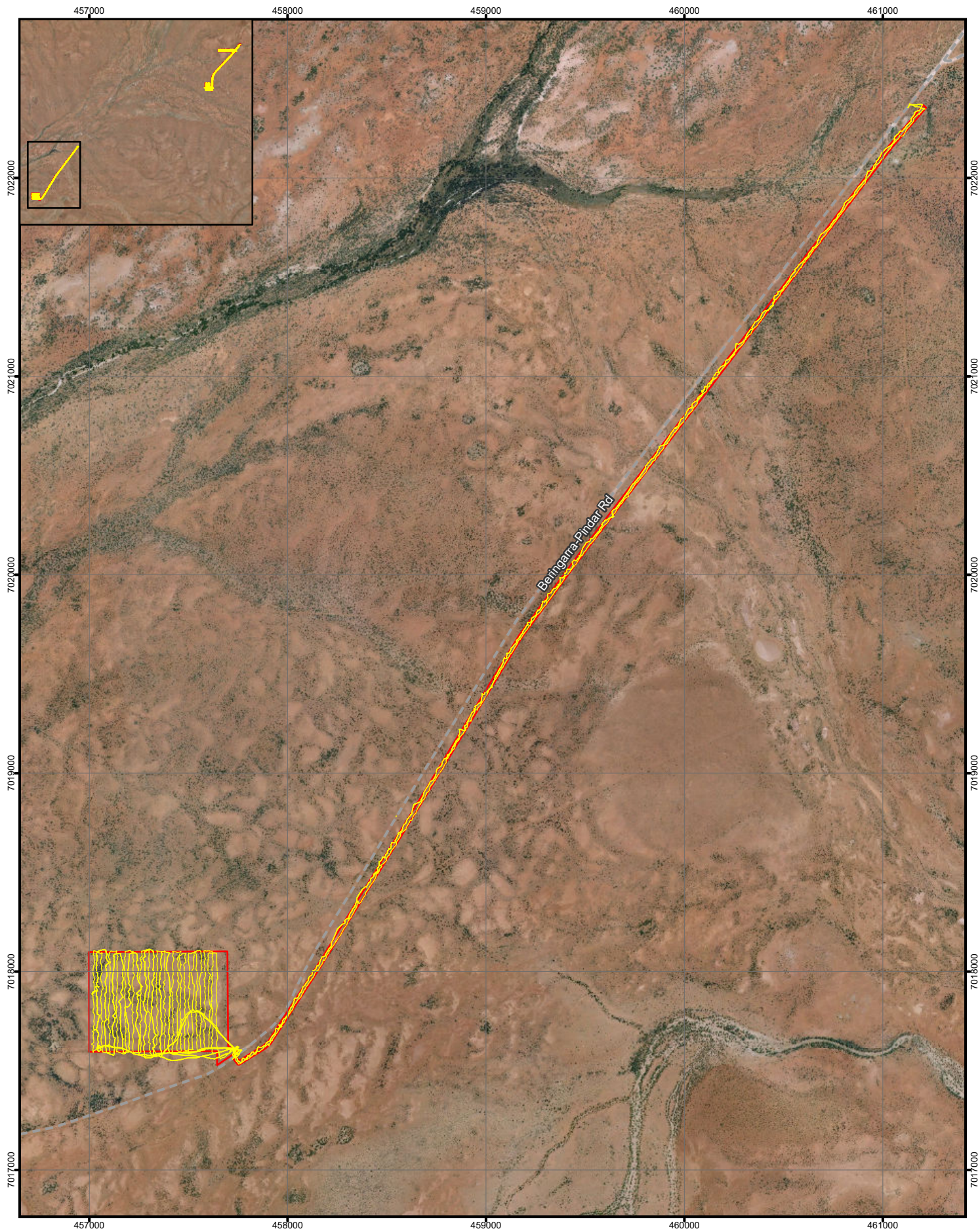
Linear traverses 20-40 m apart were walked across the entire survey area. Where potentially significant flora was encountered, data was collected at 10 m intervals including species count and reproductive state. The locations of Priority flora were recorded using a tablet and GIS software.

2.2.2 Fauna

A targeted fauna survey was undertaken which focused on identifying any potentially significant fauna species utilising a burrow previously recorded within the survey area. The burrow contained an animal of unconfirmed species.

A camera trap was deployed facing the entrance of the burrow and left in place for four nights. Photos captured were reviewed and any species identified following the field survey.

Survey effort is shown in Figure 2.



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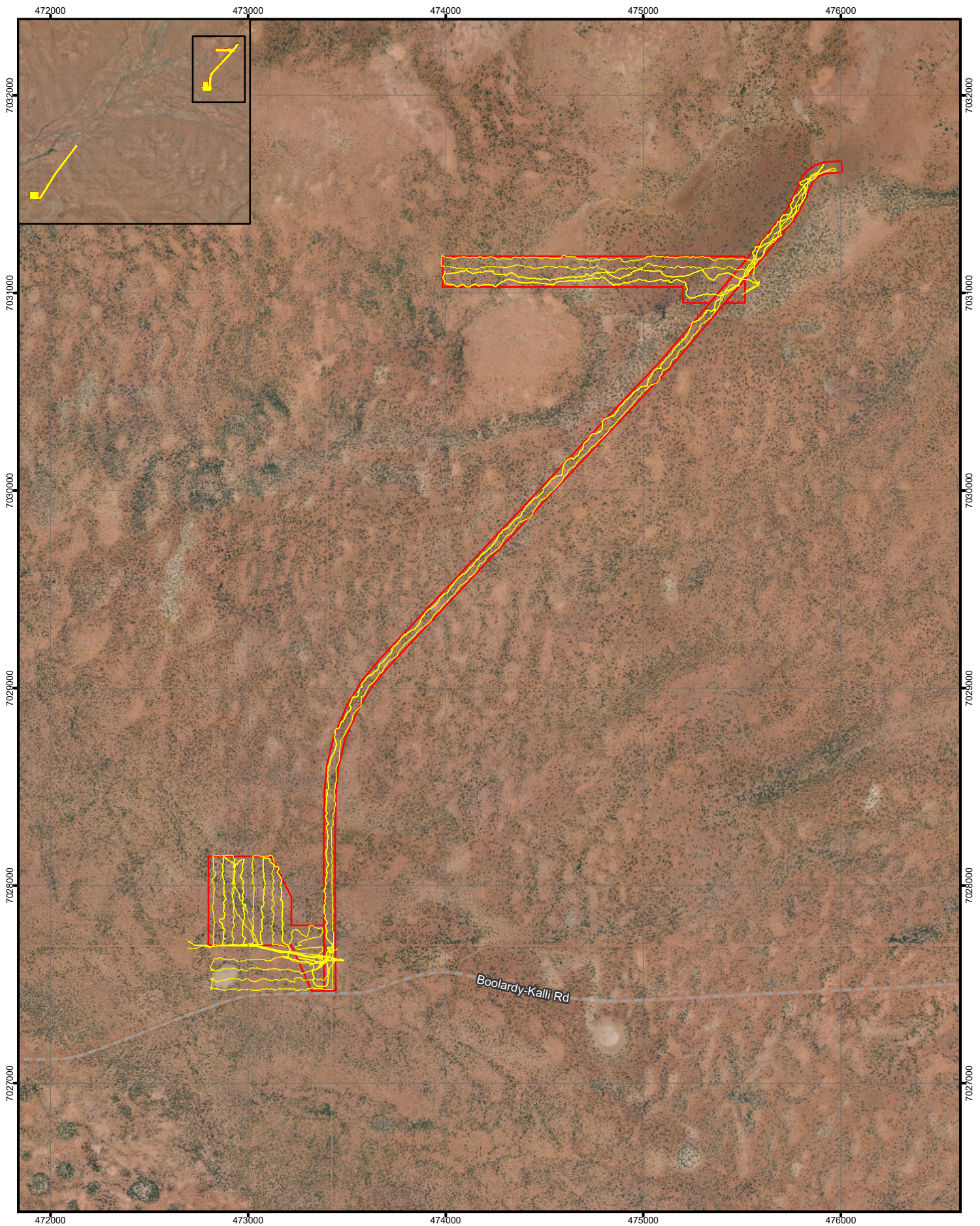
- ▭ Survey Area
- Tracklog

Survey Effort

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Figure 2.1



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- ▭ Survey Area
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Survey Effort

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Figure 2.2

3.0 Field Assessment Results

3.1 Flora

No species listed as threatened under the EPBC Act or BC Act were recorded within the survey areas. None were anticipated to occur following the desktop assessment.

One Priority flora species was recorded, *Gunniopsis divisa* (P3). The locations are mapped in Figure 3 and discussed below.

Gunniopsis divisa (P3)

Gunniopsis divisa is a prostrate annual succulent herb that grows up to 10 cm high. The stems radiate from the base and are fleshy and hairless. The flowers are a pale yellow, fading to white and flowers occur in August. This species is commonly found on colluvial outwash associated with banded ironstone formations.

At the time of survey 448 *G. divisa* individuals were recorded throughout the survey area. As this is an annual species, the population count is likely to be flexible rather than constant and is more a representation of extent. This species was observed in flower (Plate 1) at the time. It was collected at 51 locations and confirmed at the WA Herbarium as the Priority 3 species.

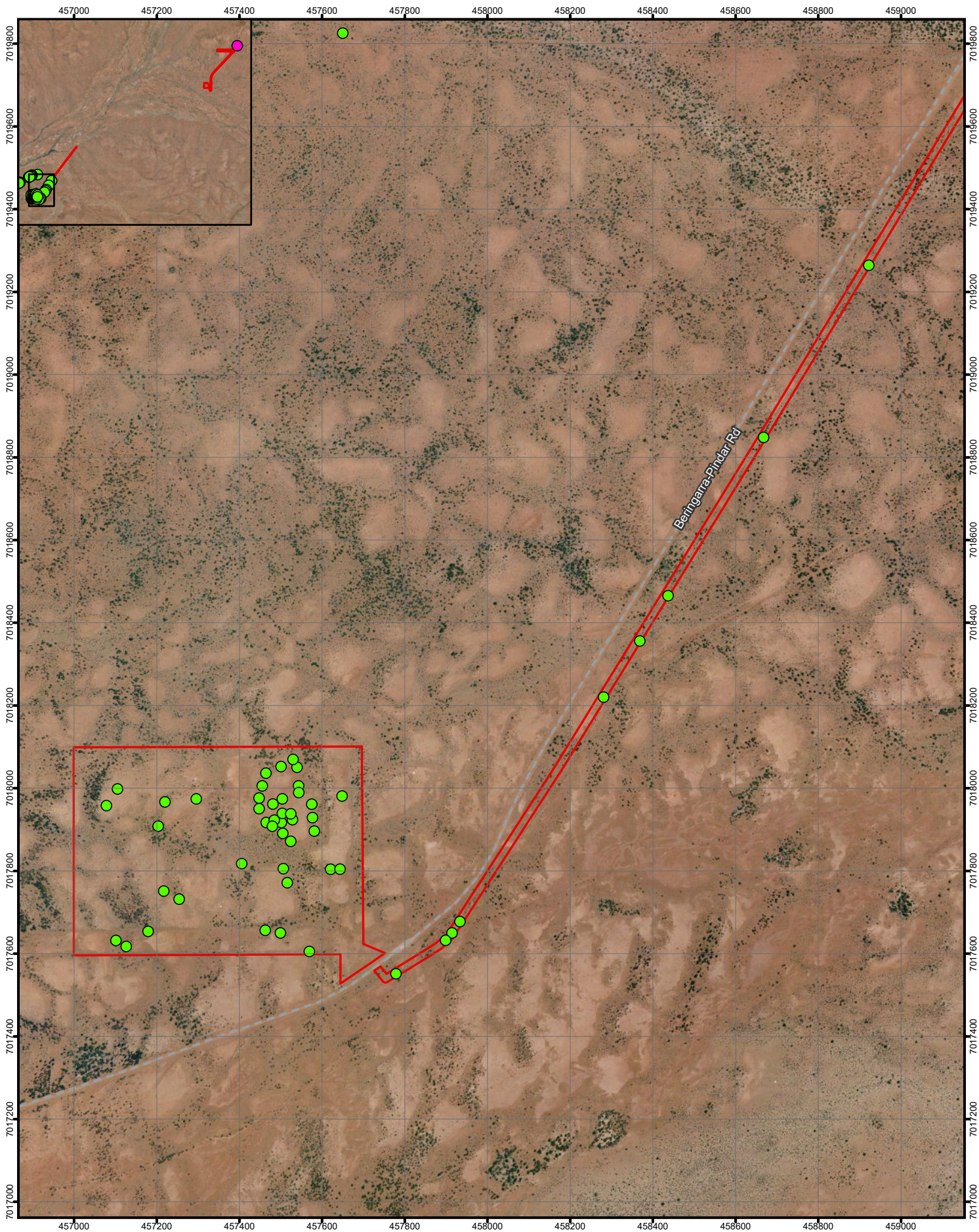
One *Calandrinia* species was identified by the WA Herbarium as *Calandrinia* sp. Boolardy Station (P1). This species was observed in flower (Plate 2). One individual was recorded and collected at one location within the survey area (Figure 3). This location was revisited on 12 November 2022 and no further individuals were located.



Plate 1 *Gunniopsis divisa* (P3) in flower during the September survey



Plate 2 *Calandrinia* sp. Boolardy Station in flower during the September survey



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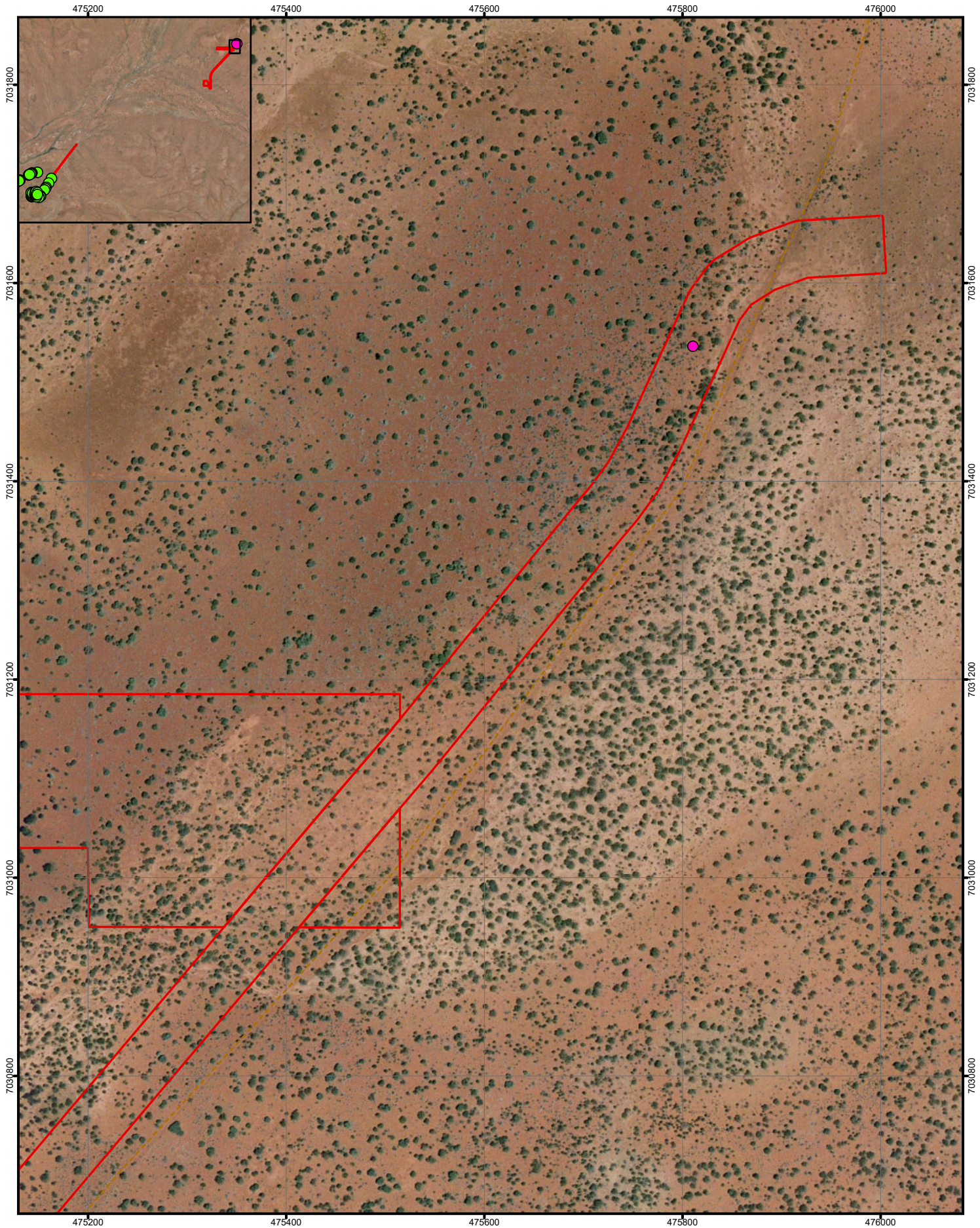
- Survey Area
- Priority Flora
 - *Calandrinia sp. Boolardy Station P1*
 - *Gunniopsis divisa P3*

Priority Flora Locations

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**Figure
 3.1**



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- Survey Area
- Priority Flora
 - *Calandrinia sp. Boolardy Station P1*
 - *Gunniopsis divisa P3*

Priority Flora Locations

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Figure 3.2

3.2 Fauna

No conservation significant fauna species were observed during the field survey.

The burrow location was visited and appeared to be unoccupied with no signs of recent activity and cobwebs across the entrance. A juvenile Red Kangaroo was the only animal captured on the motion-sensor camera.

Based on the proximity of known records and species recorded in previous surveys, it is considered likely that the animal was a Fat-tailed Dunnart *Sminthopsis crassicaudata*. Individuals of this species will often utilise empty burrows belonging to other species for short periods.

4.0 Discussion and Conclusions

Targeted flora and fauna surveys were undertaken for two defined survey areas on Boolardy Station.

No Threatened flora species listed under the EPBC Act were recorded. A total of 448 individuals of *Gunniopsis divisa* (P3) and one individual of *Calandrinia* sp. Boolardy Station (P1) were recorded in the survey area.

The *Calandrinia* sp. Boolardy Station plant was collected in its entirety in September for identification (all parts of this plant are required to confidently identify the species). The location was revisited on 12 November 2022 and no other individuals were located. *C. sp.* Boolardy Station is a short-lived annual species. Its absence in November does not necessarily reflect the species absence from the survey area. The seed bank is likely to contain seeds of this species, which will germinate during favourable conditions likely to coincide with the 2022 flowering period (September). Future surveys should consider September as the ideal survey timing to coincide with the germination and flowering of both the *Gunniopsis* and the *Calandrinia* species.

A burrow identified during the previous survey was reassessed and monitored using a camera trap. No activity was detected, and the burrow is now considered vacant. No conservation significant fauna species or suitable habitat for conservation significant fauna species were observed within the survey area.

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