

Madigan Estate Construction Compound: Clearing Referral Supporting Information



Prepared For:	DevelopmentWA Mia Yellagonga Tower 2 Level 7, 5 Spring Street PERTH WA 6000
Report Number:	AP2025-065
Report Version:	V1
Report Date:	28 April 2025

DISCLAIMER

This document has been produced in accordance with and subject to an agreement between Aurora Environmental (“Aurora”) and the client for whom it has been prepared (“Client”). It is restricted to those issues that have been raised by the Client in its engagement of Aurora and prepared using the standard of skill and care ordinarily exercised by Environmental/Occupational Health and Safety consultants in the preparation of such documents.

Any person or organisation that relies on or uses the document for purposes or reasons other than those agreed by Aurora and the Client without first obtaining the prior written consent of Aurora, does so entirely at their own risk and should not alter their position or refrain from doing so in reliance of this document. Aurora denies all liability in tort, contract or otherwise for any loss, damage or injury of any kind whatsoever (whether in negligence or otherwise) that may be suffered as a consequence of relying on this document for any purpose other than that agreed by Aurora.

QUALITY ASSURANCE

Aurora Environmental has implemented a comprehensive range of quality control measures on all aspects of the company’s operation.

An internal quality review process has been applied to each project task undertaken by us. Each document is carefully reviewed and signed off by senior members of the consultancy team prior to issue to the client.

Document No: DVW-PP03891-NVCP-002-PZ_V01

Report No: AP2025-065

DISTRIBUTION

NO. OF COPIES	REPORT FILE NAME	REPORT VERSION	DATE	PREPARED FOR	INITIALS
1	DVW-PP03891-NVCP-002-PZ_V01	V1	28 April 2025	DevelopmentWA	PZ

TABLE OF CONTENTS

DISCLAIMER	2
DISTRIBUTION	3
TABLE OF CONTENTS	4
ATTACHMENTS	5
1 PROJECT OVERVIEW AND LOCATION	6
1.1 PROJECT BACKGROUND	6
1.2 THE REFERRAL AREA	7
2 REFERRAL CRITERIA	8
2.1 CRITERION ONE – THE AREA PROPOSED TO BE CLEARED IS SMALL RELATIVE TO THE TOTAL REMAINING VEGETATION	8
2.2 CRITERION TWO – THERE ARE NO KNOWN OR LIKELY SIGNIFICANT ENVIRONMENTAL VALUES WITHIN THE AREA	9
2.3 CRITERION THREE – THE STATE OF SCIENTIFIC KNOWLEDGE OF NATIVE VEGETATION WITHIN THE REGION IS ADEQUATE	16
2.4 CRITERION FOUR – CONDITIONS WILL NOT BE REQUIRED TO MANAGE ENVIRONMENTAL IMPACTS	16
3 SUMMARY AND CONCLUSIONS	17
4 REFERENCES	18

TABLES IN TEXT

- A. Assessment Against Criterion One
- B. Assessment Against Criterion Two

ATTACHMENTS

LIST OF FIGURES

1. Location
2. Site Context
3. Significant Fauna
4. Significant Ecological Communities
5. Significant Flora

LIST OF APPENDICES

1. Vegetation Mapping
2. Historical Aerial Photographs
3. Site Photographs
4. Significant Fauna Likelihood of Occurrence Assessment – Taxa Within 10 km
5. Significant Flora Likelihood of Occurrence Assessment – Taxa Within 10 km
6. Subdivision Approval
7. Health, Environmental and Safety Management Plan

1 PROJECT OVERVIEW AND LOCATION

1.1 PROJECT BACKGROUND

In August 2024, DevelopmentWA executed a Memorandum of Understanding with Perdaman for the acquisition of 85 residential lots in Karratha, Western Australia (WA) with the contract of sale executed shortly thereafter. Of these, 69 lots are to be delivered in Madigan Estate Stages 2B, 2C and 2D, a residential subdivision at Baynton West, Karratha (**Figure 1**).

Perdaman will be building houses on these lots for key workers at their \$6 billion urea plant on the Burrup, which is due to commence operations in 2027.

This culminated in a formal State Government announcement on 12 August 2024:

[Cook Government unlocks more than 170 lots for Karratha housing | Western Australian Government](#)

Perdaman advised the current program dates will impact their housing delivery program and are meeting with the Premier and Minister regularly to ensure their housing construction timeframes are understood and prioritised by WA Government. As a result this is an important and time-sensitive project.

To date, the construction contractor building Madigan Estate has utilised a temporary construction compound within the area designated as Stage 2C. When civil works commence within Stage 2C for the Perdaman housing project, the temporary compound will need to be relocated to a new area that will also be used to stockpile construction materials. Related to the subdivisional works, the construction of Wagari Drive will involve battering from the road edge into adjacent land.

The total disturbance area for the construction compound and extent of the batter is 2.805 ha (the 'referral area'; within Crown Lot 9508 on Deposited Plan 421589 (Certificate of Title LR3175/66) (**Figures 1 and 2**).

Given the project's alignment with State Government priorities – particularly its role in supporting the Perdaman housing initiative – maintaining momentum will be essential to meeting program commitments. DevelopmentWA recognises that the proposed clearing, particularly for the construction compound, may require authorisation via a clearing referral determination notice from the Department of Water and Environmental Regulation (DWER) indicating that a native vegetation clearing permit (NVCP) is not required, or that a NVCP is required where clearing activities do not meet the criteria listed in section 51DA(4) of the *Environmental Protection Act 1986* (EP Act) .

The proposed clearing for the construction compound is not considered an exempt purpose under Schedule 6 of the EP Act or Regulation 5 of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Regulations). Clearing for road batters associated with the construction of Wagari Drive, may be exempt under Schedule 6, Item 9 (Clearing under the *Planning and Development Act 2005*), notwithstanding that the clearing will occur outside of the subdivision area. For this reason, the referral area includes the land required for road construction and the construction compound.

The DWER provides an option for project proponents to refer a proposed low environmental impact clearing activity for assessment to determine whether a clearing permit is required. DWER (2021) provides four criteria that must be satisfied to provide an exemption from requiring a clearing permit that is not covered by the Schedule 6 or Regulation exemptions. The criteria are:

- 1) The area proposed to be cleared is small relative to the total remaining vegetation.
- 2) There are no known or likely significant environmental values within the area.
- 3) The state of scientific knowledge of native vegetation within the region is adequate.
- 4) Conditions will not be required to manage environmental impacts.

If it cannot be demonstrated that each of these criteria do not apply, then a NVCP will be required. To determine whether a clearing permit is required for the project, DevelopmentWA engaged Aurora Environmental (Aurora) to conduct a desktop assessment to review the proposed clearing against these four criteria for use in support of a referral to the DWER.

1.2 THE REFERRAL AREA

The referral area is located on the western outskirts of Karratha within the suburb of Baynton and is south of Wagari Drive, within the City of Karratha Local Government Authority (LGA) (**Figure 1**). The referral area is located within the Roebourne subregion of the Interim Biogeographic Regionalisation of Australia (IBRA) version 7 (**Figure 2**). The City of Karratha's Local Planning Scheme No. 8 maps the Site for Urban Development.

The referral area is within a location where clearing has been undertaken to the north, east and west for residential development and worker accommodation. The northern section of the referral area is adjacent to Wagari Road, which will be extended east.

The location proposed for the construction compound is within Crown Lot 9508, which will be subject to a future subdivision and urban development. DevelopmentWA is the process of acquiring this land from the Crown for future development.

2 REFERRAL CRITERIA

2.1 CRITERION ONE – THE AREA PROPOSED TO BE CLEARED IS SMALL RELATIVE TO THE TOTAL REMAINING VEGETATION

Criterion One in the DWER's (2021) guideline on native vegetation clearing referrals has three criteria and thresholds against which the proposed clearing must be considered. An assessment of the proposed clearing against these criteria is provided in Table A.

TABLE A: ASSESSMENT AGAINST CRITERION ONE

CRITERION	THRESHOLD	ASSESSMENT
Extent of proposed clearing area.	If more than 5 ha is proposed to be cleared (or more than 10 ha if north of the 26° South latitude line), a permit is required.	Compliant The proposed clearing (2.805 ha; Figure 2) is less than the 10 ha threshold for locations north of 26° South latitude line.
Threshold for remaining extent of that native vegetation association or complex in the relevant IBRA bioregion.	If less than 30% of that native vegetation association or complex is remaining within the relevant IBRA bioregion, a permit is required.	Compliant The referral area is mapped as Vegetation Association 589: Abydos Plain – Roebourne: a mosaic comprising Short bunch grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex. The current remaining extent of this association within the Pilbara IBRA bioregion (PIL) is 724,695.82 ha, which is 99.44% of the inferred pre-European extent (Government of Western Australia 2019). The proposed reduction in remaining extent is negligible.
Threshold for remaining native vegetation surrounding the boundary of the proposed clearing.	If less than 30% of native vegetation is remaining within a 10 km buffer of the proposed clearing, a permit is required.	Compliant There is 21,446.14 ha of native vegetation remaining (Department of Primary Industries and Regional Development [DPIRD] 2023) within 10 km of the referral area, which represents 69% and exceeds the 30% threshold. The proposed reduction in remaining extent is negligible due to the small extent of clearing proposed and the remaining extent will remain at 69%.

2.2 CRITERION TWO – THERE ARE NO KNOWN OR LIKELY SIGNIFICANT ENVIRONMENTAL VALUES WITHIN THE AREA

Criterion Two of the DWER (2021) guideline on native vegetation clearing referrals has 12 categories against which the proposed clearing is considered. An assessment of the proposed clearing against these categories is provided in Table B.

TABLE B: ASSESSMENT AGAINST CRITERION TWO

ENVIRONMENTAL VALUE	ASSESSMENT
Vegetation condition	<p>Information from a historical environmental assessment and a supplementary letter report prepared by Coffey Environments (2010a & 2010b) has been reviewed to inform this assessment. The environmental assessment and supplementary work was completed in support of a native vegetation clearing application (originally CPS 4062/1 and then CPS 4172/1) for 37.5 ha within the former Lot 500 Madigan Road. The information collected for the environmental assessment and supplementary work covered the entire extent of the former Lot 500, including the referral area that is the subject of this application, not just the area for CPS 4172/1.</p> <p>The vegetation within the referral area was mapped as Good to Poor (see Appendix 1) using the condition scale developed by M.E. Trudgen due to obvious signs of human disturbance which have impacted vegetation structure and the presence of weeds, including the aggressive Buffel grass (<i>*Cenchrus ciliaris</i>). The former Department of Environment and Conservation's (DEC) decision report for CPS 4172/1 converted the Trudgen condition rating to the Keighery (1994) scale, noting that vegetation in the south of the CPS 4172/1 application area (i.e. immediately to the north of the referral area) was in Good to Very Good condition. The vegetation structured had been altered with obvious signs of disturbance including the presence of the Buffel grass (<i>*Cenchrus ciliaris</i>).</p> <p>Aerial photographs of the referral area (refer to Appendix 2) have been reviewed and appear to show evidence of disturbance (construction of tracks, road, uncontrolled access and fly-tipped waste) within or near the referral area. Site photographs provided by DevelopmentWA (Appendix 3) taken from the road / track adjacent to the referral area support this assertion. At the very best, the vegetation within the referral area is in a Good to Very Good condition.</p>
Significant fauna	<p>A Department of Biodiversity, Conservation and Attractions (DBCA) database search within a 50 km radius of the referral area (reference 66-0325FA, DBCA 2025a) was undertaken. The results from this search have been narrowed to those that occur within 10 km of the referral area.</p> <p>Within 10 km of the referral area there are 366 records of conservation significant fauna species representing 38 taxa (34 species of birds, 3 species of mammals and one reptile species) (Figure 3), comprised of:</p> <ul style="list-style-type: none"> • Seven threatened (T) species; • 27 specially protected (migratory; MI), species; • four Priority 4 (P4) species including one species which is also listed as a Specially Protected species (migratory). <p>A likelihood of occurrence assessment (LOA) was completed for the species with records occurring within 10 km of the referral area (Appendix 4).</p>

TABLE B: ASSESSMENT AGAINST CRITERION TWO

ENVIRONMENTAL VALUE	ASSESSMENT
	<p>It was noted that some records are old and listed as being of unknown certainty and may be inaccurate in terms of location. Most of these are related to the Specially Protected (Migratory) species, which generally have been identified as unlikely to occur within the referral area.</p> <p>A total of six species were considered as possibly occurring within the referral area. This comprises four species of birds which are unlikely to rely on the habitat in the referral area and only may occur opportunistically. Some of these species, such as <i>Apus pacificus</i>, are known to forage aerially (i.e. hunt for insects above ground) and therefore are unlikely to be impacted by the proposed clearing.</p> <p>Two terrestrial dwelling species were identified as possibly occurring in the habitat surrounding the referral area, these being the Northern Quoll (Threatened) and the Lined soil-crevice skink (Priority 4).</p> <p>The nearest record of the Northern Quoll is dated 2018 and was an opportunistic sighting of a dead specimen in Gap Ridge, approximately 2 km west of the referral area. Multiple other records occur within 10 km of the referral area, with the majority being concentrated around hilly/rocky terrain such as Karratha Hills in Mulataga or near Mount Regal. The referral area does not have rocky or structurally diverse areas that would be suitable for shelter or denning by this species. At best, the grasslands within the referral area may be used for foraging and dispersal. As only one record (a dead specimen) is within 2 km of the referral area and given the home range of individuals (approximately 450 ha for females and 1,100 ha for males i.e. approximately a maximum of 2 km radius), the likelihood of the species using habitat within the referral area is considered low. Further, the small clearing area compared with extent of remaining vegetation within 10 km of the referral area supports the assertion that the proposed clearing will not adversely impact this species.</p> <p>The Lined soil-crevice skink (Dampier) has been recorded in spinifex dominated areas near creek and river margins. The referral area may contain suitable habitat for the species due to the presence of spinifex and its proximity to Madigan Creek. The species has not been recorded within or close to the referral area. A total of seven records exist from within 10 km of the referral area. Six of these are from 2004 and one is undated. All records occur from two locations east-southeast of the referral area, 5.5 km and 7.8 km respectively. The proposed disturbance associated with the referral is unlikely to significantly impact this species (if present) to the extent that its conservation status would change. Further, there is a significant extent of similar habitat in the areas surrounding the referral area.</p>
Fauna habitat	<p>The referral area is within an area that is well represented with intact native vegetation within 10 km. Interpretation of aerial photography indicates the habitat within the referral area does not appear to be unique or likely to contain values that are not represented in nearby areas of vegetation. As such, the referral area is likely to be habitat for a range of volant and non-volant terrestrial vertebrate fauna as well as habitat for a range of invertebrates that could be found in adjacent areas. The size of the referral area is considered too small to constitute critical habitat for any specific invertebrate and vertebrate fauna and its clearing is unlikely to constitute a significant impact.</p>

TABLE B: ASSESSMENT AGAINST CRITERION TWO

ENVIRONMENTAL VALUE	ASSESSMENT
Significant ecological linkage	The referral area does not form a part of a critical link within an ecological corridor. It is contiguous with other areas of vegetation. The proposed clearing will not disrupt any ecological corridors, or materially impact fauna movement.
Mapped ecological community	<p>Two Priority Ecological Communities (PECs) have been recorded within a 10 km radius of the referral area (search ref 55-0325EC, DBCA 2025b). The buffered extents of these ecological communities are shown in Figure 4.</p> <p>The closest occurrence of the Priority 1 ecological community Roebourne Plains Coastal Grasslands with gilgai microrelief on deep cracking clays (Roebourne Plains gilgai grasslands) is located 2.2 km northwest and 2.7 km west of the referral area.</p> <p>The closest occurrence of the Priority 3 ecological community Horseflat Land System of the Roebourne Plains is approximately 1 km north of the referral area, on the northern side of Dampier Highway.</p> <p>The site assessment by Coffey Environments (2010a) noted only one Priority 1 PEC as occurring within the vicinity of the former Lot 500 Madigan Road, being 'Stony Chenopod association of the Roebourne Plains area'. The site assessment concluded that this PEC was not present.</p> <p>It is acknowledged that the DBCA's ecological communities database may have been updated since the 2010 assessment, and additional ecological communities may have been added to the database.</p> <p>The vegetation within the referral area was mapped as Tall Open Shrubland of <i>Acacia inaequilatera</i>, <i>A. pyrifolia</i>, <i>A. xiphophylla</i> and <i>A. bivenosa</i> to 3 m over Hummock to mid-dense Hummock Grassland of <i>Triodia wiseana</i> and <i>T. epactica</i> to 1 m.</p> <p>Eco Logical Australia (ELA 2024) noted that the vegetation described by Coffey Environments (2010a) on the former Lot 500 Madigan Road was a very uniform shrub steppe community of <i>Acacia</i> spp. and <i>Triodia wiseana</i>. Based on this vegetation description (i.e. a shrub steppe), ELA (2024) concluded that the vegetation is not representative of the Priority 1 or Priority 3 PECs identified in the database search.</p>
Significant flora	<p>A DBCA database search within a 50 km radius of the referral area (reference 67-0325FL, DBCA 2025c) was undertaken. This search includes records from the DBCA's Threatened and Priority Flora (TPFL) database and records from the Western Australian Herbarium. The TPFL records have been validated and considered the most reliable data source. The Herbarium records have not been validated and are of variable reliability, but provide an indication species potentially present.</p> <p>The results from the DBCA database search have been narrowed to those that occur within 10 km of the referral area. Within 10 km of the referral area there are seven conservation significant flora species which have been recorded (Figure 5), comprised of:</p> <ul style="list-style-type: none"> • One Priority 1 taxon;

TABLE B: ASSESSMENT AGAINST CRITERION TWO

ENVIRONMENTAL VALUE	ASSESSMENT
	<ul style="list-style-type: none"> • Five Priority 3 taxa; and • One Priority 4 taxon. <p>A LOA was completed for the above species (Appendix 5) by considering information from Florabase, the Australian Virtual Herbarium, taxonomic texts and information provided in the spatial datasets from the DBCA in addition to soil landscape mapping, geology and surface water features spatial data. Based on the LOA, two Priority 3 taxa (<i>Dolichocarpa sp. Hamersley Station (A.A. Mitchell PRP 1479)</i> and <i>Neptunia longipila</i>) were considered as possibly occurring within the referral area due to the potential presence of suitable soils and known records of the species within 10 km having been recorded within the same soil landscape mapping unit (Appendix 5).</p> <p>This assessment has concluded that if the above Priority 3 taxa were present within the referral area, the potential impacts associated with clearing are not considered significant. This assertion is made based on the small clearing area, vegetation condition, the remaining extent of Vegetation Association 589 (99.44% of its pre-European extent in the Pilbara IBRA bioregion) and the remaining extent of native vegetation within 10 km of the referral area (69% of the land within 10 km is native vegetation).</p>
Mapped wetland	There are no wetlands within the referral area. The Directory of Important Wetlands in Western Australia dataset indicates that there are no significant wetlands within or near the referral area. The nearest significant wetland is more than 200 km from the referral area.
Mapped watercourse	The referral area is approximately 160 m west of the closest surface water feature, a non-perennial creek, Madigan Creek (Figure 2).
Water resources	<p>The referral area does not intersect any of the following areas:</p> <ul style="list-style-type: none"> • Watercourses; • Public Drinking Water Source Areas; or • Catchments proclaimed under the <i>Country Areas Water Supply Act 1947</i> (CAWS Act). <p>The nearest watercourse is Madigan Creek, a non-perennial natural creek approximately 160 m east of the referral area. The proposed clearing will not directly impact this watercourse.</p> <p>The referral area is located within the Pilbara Surface Water Area (Karratha Coast surface water sub-area) and Pilbara Groundwater Area (Ashburton sub-area), proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act).</p> <p>Works will not require dewatering, and thus no change to surface or groundwater level or quality are expected. No deterioration in surface or groundwater quality is anticipated due to the nature and scale of clearing.</p>

TABLE B: ASSESSMENT AGAINST CRITERION TWO

ENVIRONMENTAL VALUE	ASSESSMENT
Conservation reserve	<p>A search of the Collaborative Australian Protected Areas Database (CAPAD) for terrestrial environments and the DBCA Legislated Lands and Waters dataset was undertaken to determine if the referral area intersects with, or is adjacent to, any government, Indigenous or privately protected areas. The search confirmed that the referral area is not within any area identified for conservation. The nearest conservation area is more than 8.2 km east of the referral area.</p> <p>No environmentally sensitive areas, as defined in the Environmental Protection (Environmentally Sensitive Areas) Notice 2005 under section 51B of the EP Act, intersect the referral area.</p>
Land and soil quality	<p>The referral area is situated over the Pilbara Craton Formation which comprises a mid-Archaeon granite greenstone terrane and an over-lying late-Archaeon volcano-sedimentary sequence called the Hamersley Basin (GSWA 2001).</p> <p>The referral area is mapped within the Soil Landscape Mapping Unit described as <i>Red/brown non-cracking clay</i>. Soil Landscape Mapping prepared by the Department of Primary Industries and Regional Development (DPIRD), provides an inventory and condition survey of lands at a 1:250,000 scale (DPIRD 2022). The survey area intersects one soil landscape system, namely 281 Hf - Horseflat System. The Horseflat System is described as “Gilgaied clay plains supporting Roebourne Plains grass grasslands and minor grassy snakewood shrublands”.</p> <p>A geotechnical investigation (Coffey Geotechnics 2010) across the former Lot 500 described the underlying stratigraphy as broadly following:</p> <ul style="list-style-type: none"> • Layer/Unit 1: Surface (layer thickness of 0 to 1.2 m) being Clay / Sandy clay, medium to high plasticity, red/brown friable; • Layer/Unit 2: Surface to 1.2 m (layer thickness of 0.5 to 2 m) being Clayey gravel / Gravelly clay, medium to coarse grained, brown/dark brown, friable with medium to high plasticity clayey fines; • Layer/Unit 3: 0.5 to 2.1 m, grading into fresh rock at greater depths, Weathered rock, material has weathered to soil like material comprising sand/gravel/cobbles in a medium to high plasticity clayey matrix, grey/light grey/brown. <p>No registered contaminated sites have been mapped within or in the vicinity of the referral area.</p>
Heritage-related values and native title matters	<p>The referral area is within an area in which native title is held by the Ngarluma / Yindjibarndi (Landgate 2018). However, the referral area is outside of the land covered under an Indigenous Land Use Agreement. The referral area is part of the Burrup Maitland Industrial Estates Agreement (BMIEA) with Murujuga Aboriginal Corporation, with Aboriginal heritage lying with the determined Ngarluma Aboriginal Corporation.</p> <p>The former Lot 500, which includes the referral area, was surveyed by Anthropos Australis in June 2010 with Ngarluma Aboriginal Corporation. The survey confirmed that there are no registered or lodged Aboriginal heritage sites (Department of Planning, Lands and</p>

TABLE B: ASSESSMENT AGAINST CRITERION TWO

ENVIRONMENTAL VALUE	ASSESSMENT
	Heritage [DPLH] 2023a; 2023b) within or immediately adjacent to the referral area. The nearest lodged sites are 200 m north and south of the referral area, and a registered site approximately 260 m southwest. The proposed clearing will not impact on these sites.

2.3 CRITERION THREE – THE STATE OF SCIENTIFIC KNOWLEDGE OF NATIVE VEGETATION WITHIN THE REGION IS ADEQUATE

The referral area is located in a region in which there is a substantial amount of knowledge regarding the ecological values of natural ecosystems. The flora and fauna collections date back to more than 100 years and as recently as 2024.

2.4 CRITERION FOUR – CONDITIONS WILL NOT BE REQUIRED TO MANAGE ENVIRONMENTAL IMPACTS

The proposed clearing area is 2.805 ha and is currently situated adjacent to an existing road/track. The referral area will be used in part for the construction of Wagari Drive, which is identified for construction in the subdivision approval (**Appendix 6**) as well as a construction compound for the storage of equipment, machinery and materials. The proposed clearing area is situated within an area that has been identified for future urban development.

As a contractor to DevelopmentWA, the construction contractor is expected to complete the Project with minimal impact. Impacts to threatened flora and fauna are considered to be highly unlikely, as are effects in the surrounding landscape. Project activities will be managed through the implementation of the Health, Environmental and Safety Management Plan (**Appendix 7**).

Section 11.3 of the Management Plan commits to minimising disturbance to land in a manner consistent with the client's specifications. This will include clearing controls such as:

- Obtaining authorisation from the client to conduct clearing and ensuring relevant permits are in place;
- Surveying and pegging the permitted clearing extents;
- Ensuring machinery and equipment are free from weeds and soil prior to entering the proposed clearing area;
- Undertaking directional clearing to allow fauna to move away into adjacent vegetation;
- Establishing contact with a Wildlife Carer in the event of injury to fauna; and
- Maintaining records of clearing activities including the dates clearing was conducted, confirming the extent of clearing and noting fauna injuries or mortalities.

3 SUMMARY AND CONCLUSIONS

DevelopmentWA is overseeing the development of Stages 2B, 2C and 2D of Madigan Estate in Baynton West, Karratha, Western Australia. The construction of the Project will require clearing of 2.805 ha of native vegetation for the establishment of a construction compound for the storage of materials, machinery and equipment, as well as the construction of Wagari Drive. The proposed clearing area is within an area that is planned to be developed in the future for urban development as an extension of Karratha. DevelopmentWA is in the process of acquiring this land from the Crown for future development.

Due to the relatively small extent of clearing required, Aurora Environmental has prepared this native vegetation clearing referral. The proposed clearing has been assessed by Aurora Environmental against the criterion outlined in the DWER's (2021) guidelines on native vegetation clearing referrals. The assessment found:

- The clearing area is small and significantly less than the 10 ha threshold for areas north of the 26° South latitude line.
- The clearing impacts will not alter the remaining extent of Vegetation Association 589, or remaining extent of vegetation within 10 km of the referral area.
- The proposed clearing is unlikely to significantly impact any conservation significant ecological communities.
- The proposed clearing is highly unlikely to impact any threatened flora or threatened fauna. Several Priority flora species may occur near the referral area. The likelihood of significantly impacting Priority taxa is considered low due to the small extent of clearing proposed and the proximity of the referral area to existing disturbances.
- The proposed clearing will not alter ecological linkage values within the local area.
- The referral area is not within or adjacent to any significant areas such as wetlands, watercourses, drinking water source areas, conservation reserves and known heritage sites.

Based on the assessment, Aurora Environmental considers that the proposed clearing is low impact and that potential impacts to the environment can be adequately managed through the implementation of an environmental management plan. As a result of this assessment, Aurora Environmental considers a clearing permit is not required.

4 REFERENCES

Bean, A.R. (2022) A revision of *Neptunia* Lour. (Leguminosae: subfamily Caesalpinioideae, Mimosoid clade) in Australia and Malesia. In: *Austrobaileya* 12: 59-106. Published online 16 November 2022. Queensland Herbarium.

Coffey Environments (2010a) Preliminary Environmental Assessment Madigan, Karratha. Unpublished report prepared for LandCorp. Reference: EP2010/098, Version 1. Report date: 28 May 2010.

Coffey Environments (2010b) Application for Amendment to Clearing Permit and Response to Preliminary Assessment – Madigan Road Karratha – reference CPS 4062/1. Unpublished letter to the Department of Environment and Conservation. Dated 11 April 2011.

Coffey Geotechnics (2010) Geotechnical Report Madigan Road Development Site. Unpublished report prepared for Cossill & Webley Consulting Engineers. Report GEOTPERT02828AS-AC. 25 November 2010.

Davis, R.W, Palmer, J., Hammer, T.A. (2021) *Gomphrena axillaris* and *G. longistyla* (Amaranthaceae), new species of *Gomphrena* from central and northern Australia. In: *Swainsona* 35: 59-64 (2021). Published online 16 August 2021. Board of the Botanic Gardens & State Herbarium. Adelaide, South Australia.

Department of Biodiversity, Conservation and Attractions (DBCA) (2025a) Threatened and Priority Fauna Database Search (ref:66-0325FA). Department of Biodiversity, Conservation and Attractions.

Department of Biodiversity, Conservation and Attractions (DBCA) (2025b) Threatened and Priority Ecological Communities (ref: 55-0325EC). Department of Biodiversity, Conservation and Attractions.

Department of Biodiversity, Conservation and Attractions (DBCA) (2025c) Threatened and Priority Flora List (ref: 67-0325FL). Department of Biodiversity, Conservation and Attractions.

Department of Climate Change, Energy, the Environment and Water (2024) Conservation Advice for *Calidris acuminata* (sharp-tailed sandpiper), Canberra. Accessed from <https://www.environment.gov.au/biodiversity/threatened/species/pubs/874-conservation-advice-05012024.pdf> April 2025.

Department of Planning, Lands and Heritage (DPLH) (2023a) Aboriginal Cultural Heritage – Lodged (DPLH-100). Perth, Department of Planning, Lands and Heritage. Accessed from: [Aboriginal Cultural Heritage - Lodged \(DPLH-100\) - Datasets - data.wa.gov.au](https://data.wa.gov.au/dataset/aboriginal-cultural-heritage-lodged-dplh-100). Accessed April 2025.

Department of Planning, Lands and Heritage (DPLH) (2023b) Aboriginal Cultural Heritage – Register (DPLH-099). Perth, Department of Planning, Lands and Heritage. Accessed from: [Aboriginal Cultural Heritage - Register \(DPLH-099\) - Datasets - data.wa.gov.au](https://data.wa.gov.au/dataset/aboriginal-cultural-heritage-register-dplh-099). Accessed April 2025.

Department of Primary Industries and Regional Development (DPIRD) (2022) Soil Landscape Mapping Unit (DPIRD-027). Accessed from: <https://catalogue.data.wa.gov.au/dataset/soil-landscape-mapping-best-available>. Accessed April 2025.

Department of Primary Industries and Regional Development (DPIRD) (2023) Native Vegetation Extent (DPIRD-005). Accessed from: [Native Vegetation Extent \(DPIRD-005\) - Datasets - data.wa.gov.au](https://data.wa.gov.au/dataset/native-vegetation-extent-dpi-005). Accessed April 2025.

Department of Water and Environmental Regulation (DWER) (2021) Guideline: Native Vegetation Clearing Referrals. Native vegetation clearing activities regulated under the *Environmental Protection*

Act 1986 and Environmental Protection (Clearing of Native Vegetation) Regulations 2004. Department Water and Environmental Regulation, WA.

Dunlop, J.N. and Pound, I.R. (1981) Observations on the Pebble-Mound Mouse *Pseudomys chapmani* Kitchener, 1980. Published in records of the Western Australian Museum, 1981, Volume 9, Issue 1, pages 1-5.

Eco Logical Australia (2024) Structure Plan Environmental Due Diligence Review – Madigan Estate Stages 2C and 2D, Karratha. Unpublished letter to DevelopmentWA, dated 11 July 2024.

Geological Survey of Western Australia (GSWA) (2001) 1:250,000 Dampier Urban Geology, Sheet SF50-2 and part of Sheet SF 50-1, 2nd Edition.

Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. Perth, WA Department of Biodiversity, Conservation and Attractions. Accessed from <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>. Accessed April 2025.

Keighery, B.J. (1994) Bushland Plant Survey: a Guide to Plant Community Survey for the Community. Nedlands, Wildflower Society of WA (Inc.).

Landgate (2018) Native Title (NNTT) (LGATE-004). Perth, Landgate. Accessed from: [Native Title \(NNTT\) \(LGATE-004\) - Datasets - data.wa.gov.au](https://native-title.nntt.lgate.wa.gov.au/datasets). Accessed April 2025.

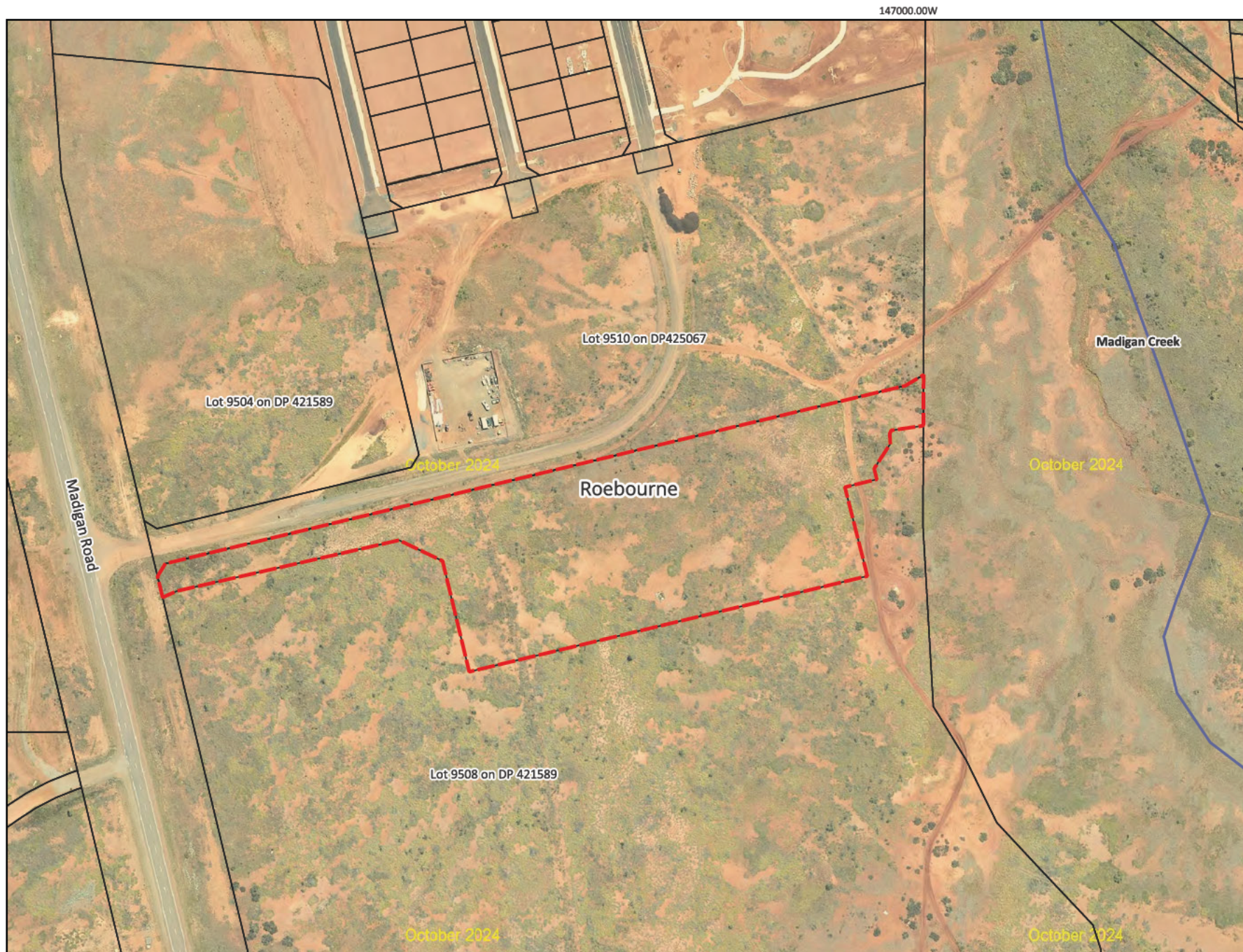
Raymond, O.L., Liu, S., Gallagher, R., Zhang, W. and Highet, L.M. (2012) Surface Geology of Australia 1:1 million scale dataset 2012 edition. Geoscience Australia.

Western Australian Herbarium (WAH) (1998 -) Florabase – the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. <https://florabase.dbca.wa.gov.au> (Accessed April 2025).

Wilson, S. and Swan, G. (2010) A complete guide to reptiles of Australia, 3rd ed. Chatswood: New Holland, 558 pp.

FIGURES





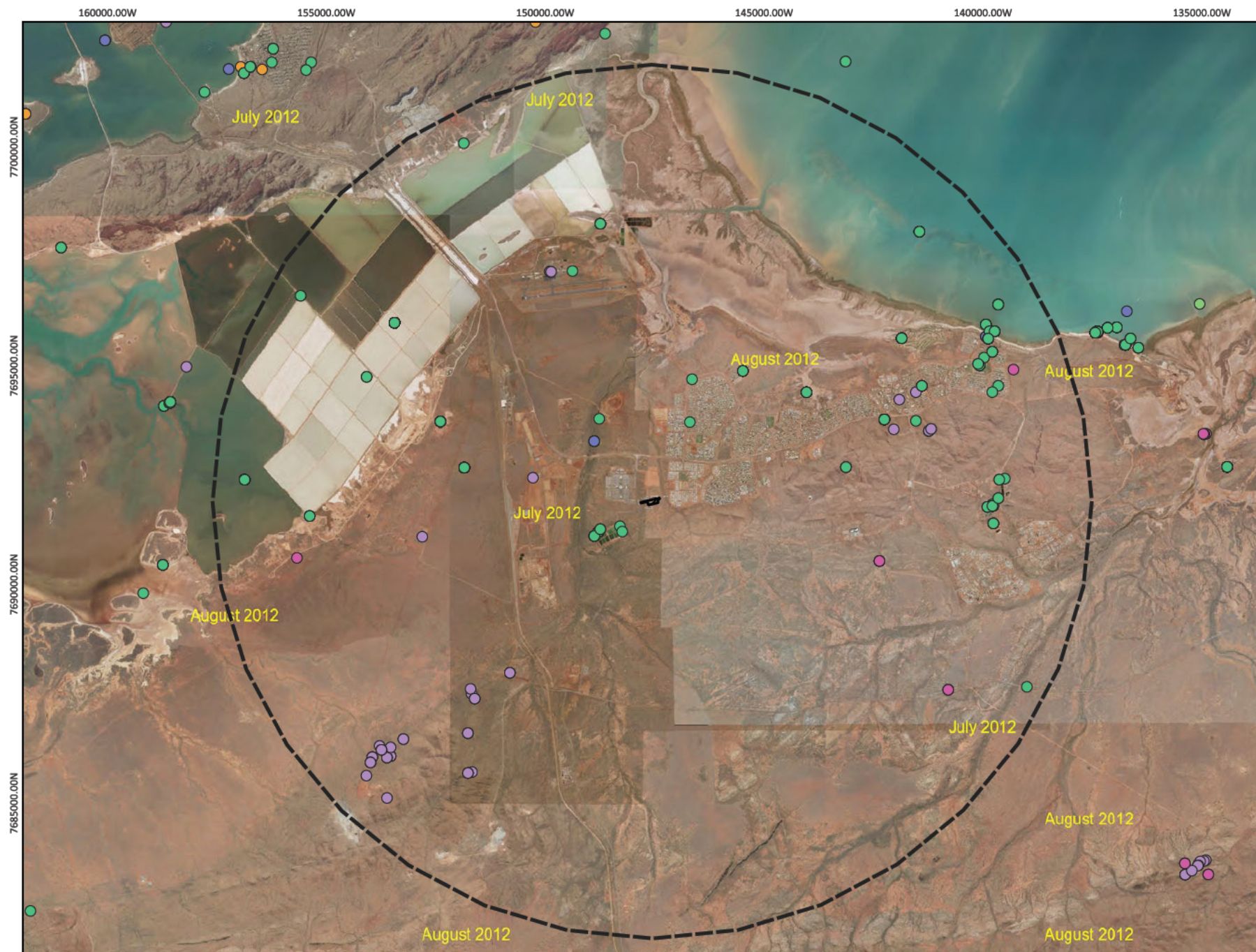
LEGEND

- Clearing Referral Area
- Cadastre
- IBRA Region
- Surface Hydrology

FIGURE 2
Site Context

Project number: DVW-PP03891
 Author: PZ
 Date: 24/04/2025
 Ver: 01
 Report: AP2025-065
 Scale: 1:3000 @A4
 CRS: GDA2020 / MGA zone 50





LEGEND

- 10 km Buffer
- Clearing Referral Area

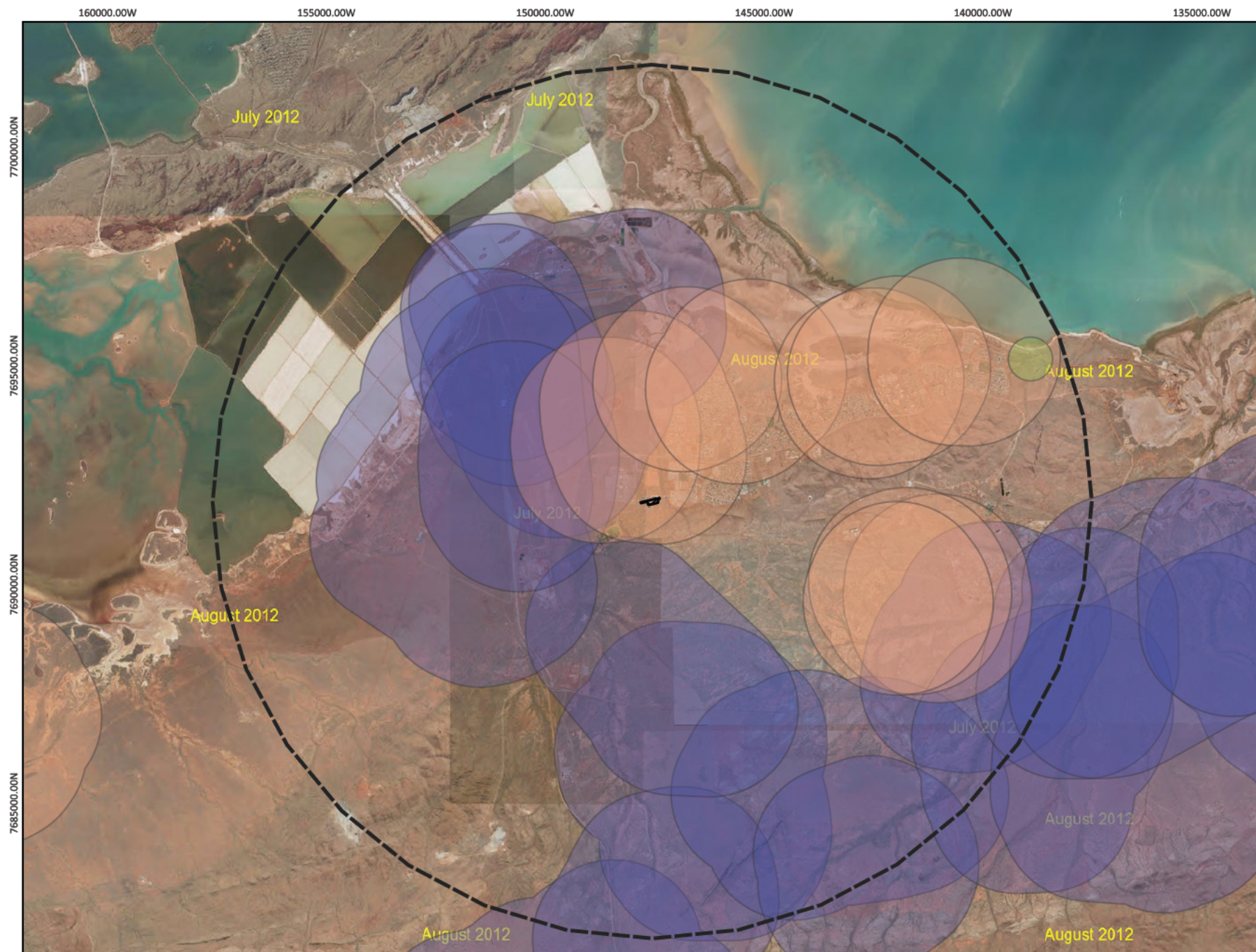
DBCA Threatened & Priority Fauna

- Threatened - Critically Endangered
- Threatened - Endangered
- Threatened - Vulnerable
- Priority
- Specially Protected - Migratory & Priority
- Specially Protected - Migratory
- Specially Protected - Other Specially Protected



FIGURE 3 Significant Fauna

Project number: DVW-PP03891
 Author: PZ
 Date: 25/04/2025
 Ver: 01
 Report: AP2025-065
 Scale: 1:120000 @A4
 CRS: GDA2020 / MGA zone 50





LEGEND

-  10 km Buffer
-  Clearing Referral Area

DBCA Threatened & Priority Ecological Communities (Buffered)




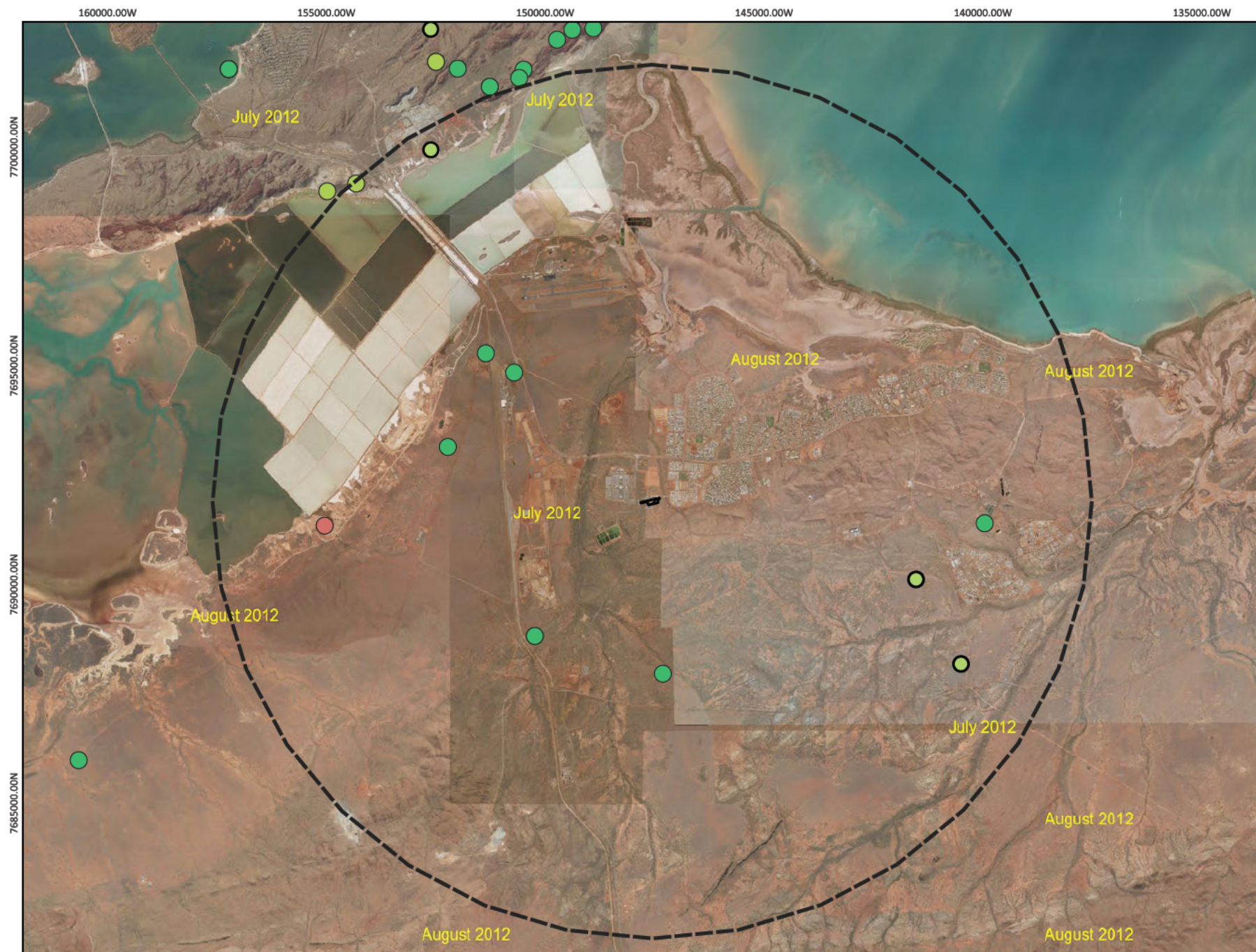
-  Coastal dune tussock grassland dominated by *Whiteochloa airoides*
-  Horseflat Land System of the Roebourne Plains
-  Roebourne Plains coastal grasslands with gilgai microrelief on deep cracking clays (Roebourne Plains gilgai grasslands)

FIGURE 4

Significant Ecological Communities

Project number: DVW-PP03891
 Author: PZ
 Date: 25/04/2025
 Ver: 01
 Report: AP2025-065
 Scale: 1:120000 @A4
 CRS: GDA2020 / MGA zone 50





LEGEND

- 10 km Buffer
- Clearing Referral Area

DBCA Threatened & Priority Flora

DBCA TPFL

- 3

WA Herbarium

- 1
- 3
- 4

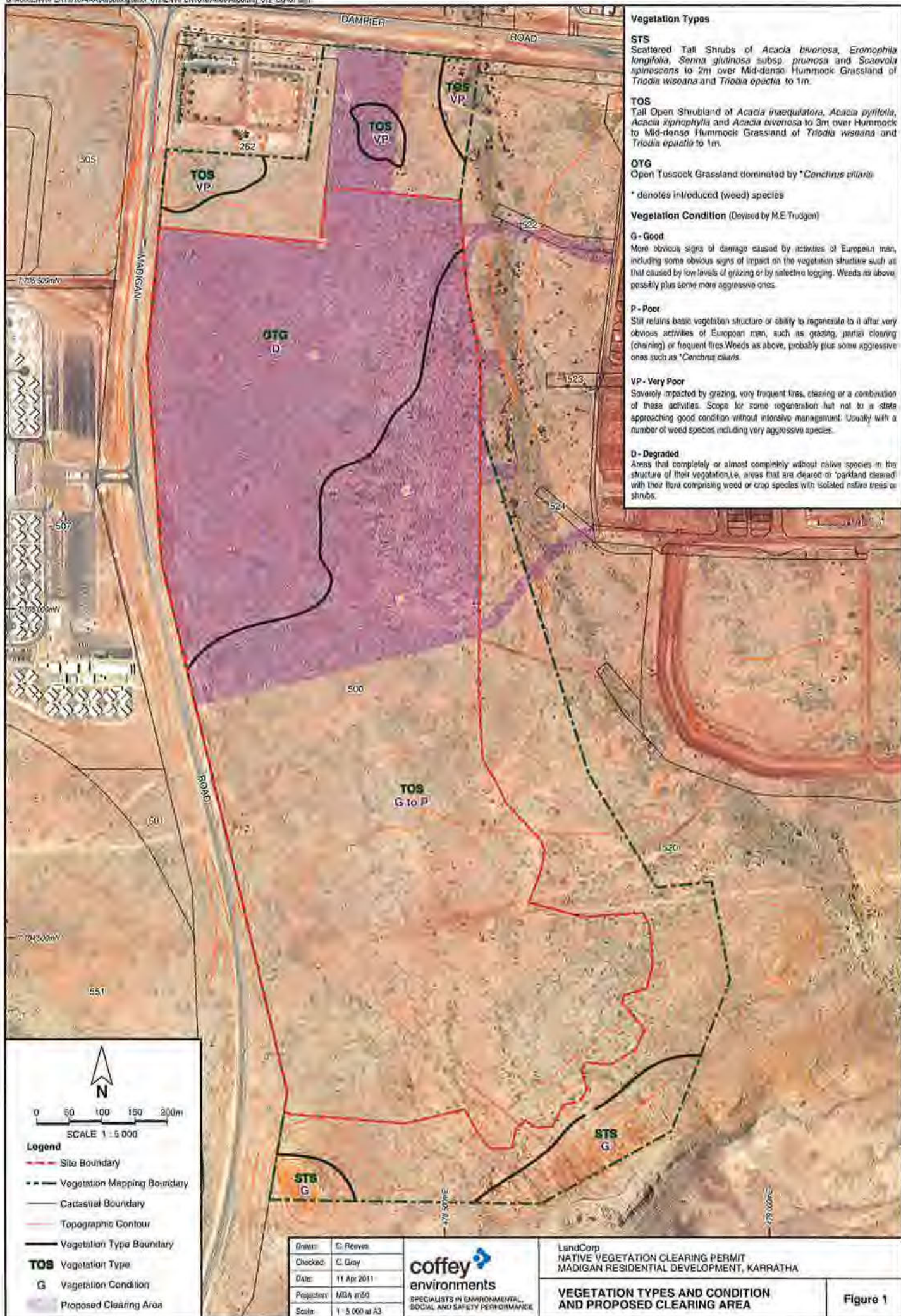
FIGURE 5
Significant Flora

Project number: DVW-PP03891
 Author: PZ
 Date: 25/04/2025
 Ver: 01
 Report: AP2025-065
 Scale: 1:120000 @A4
 CRS: GDA2020 / MGA zone 50



APPENDIX 1

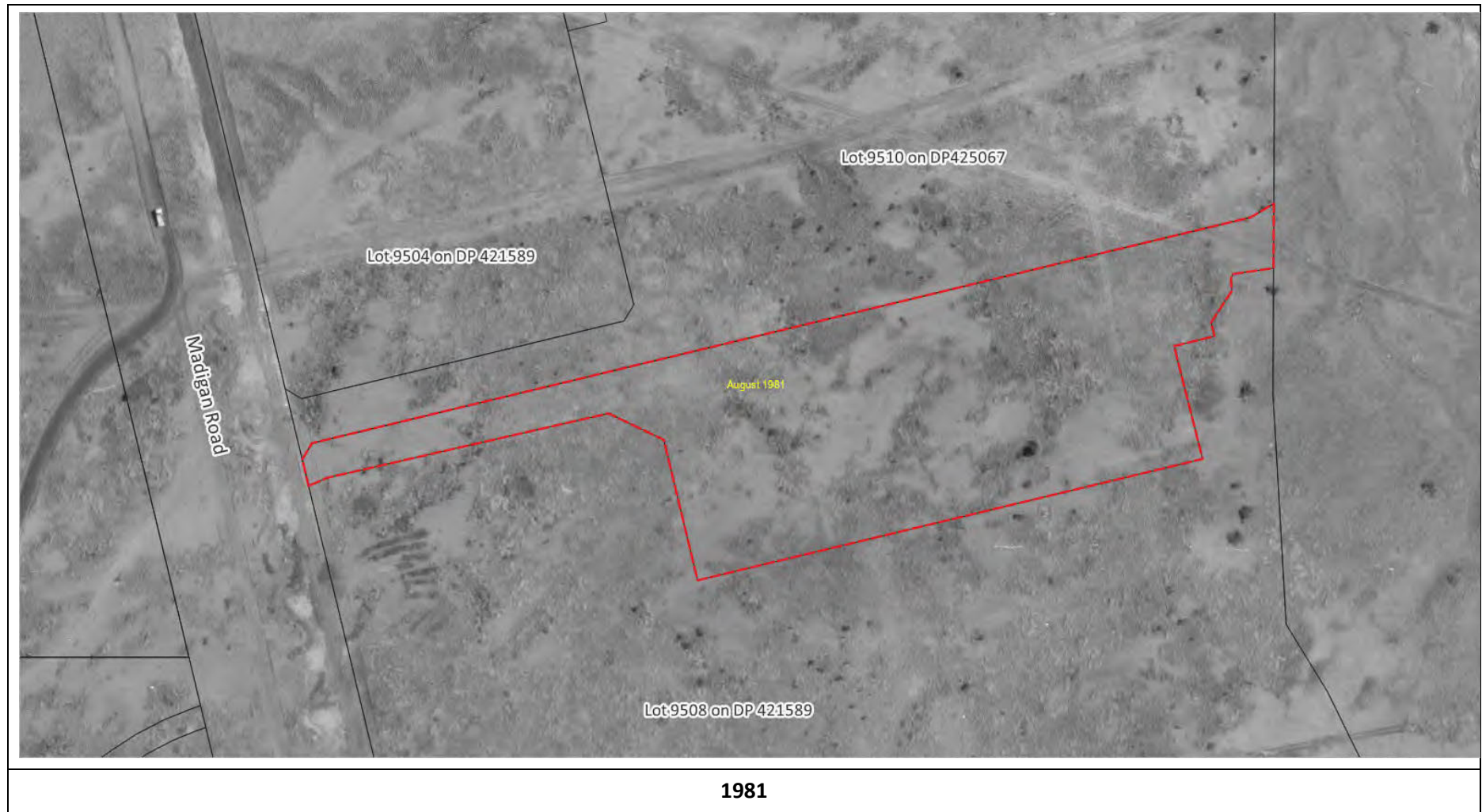
Vegetation Mapping



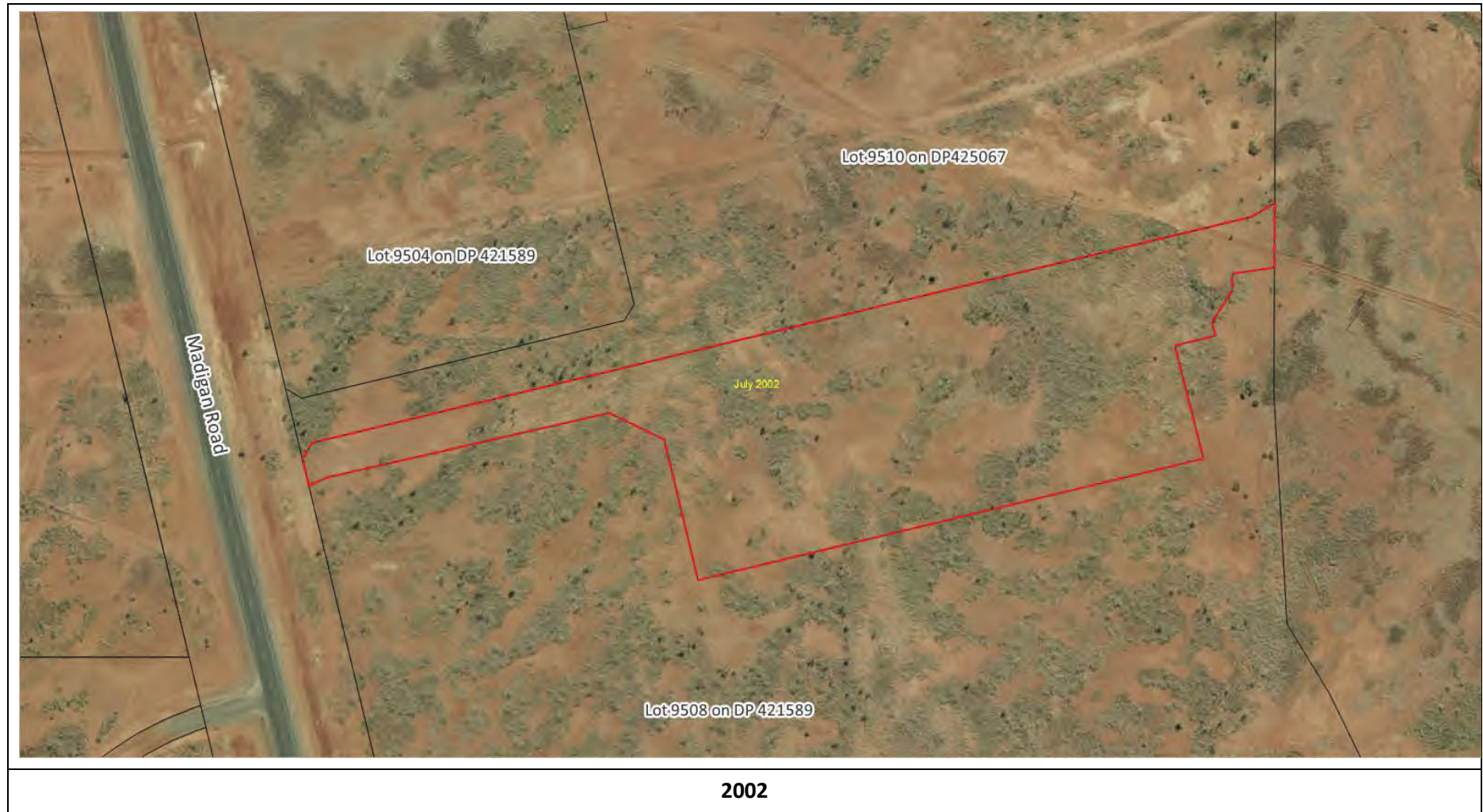
APPENDIX 2

Historical Aerial Photographs

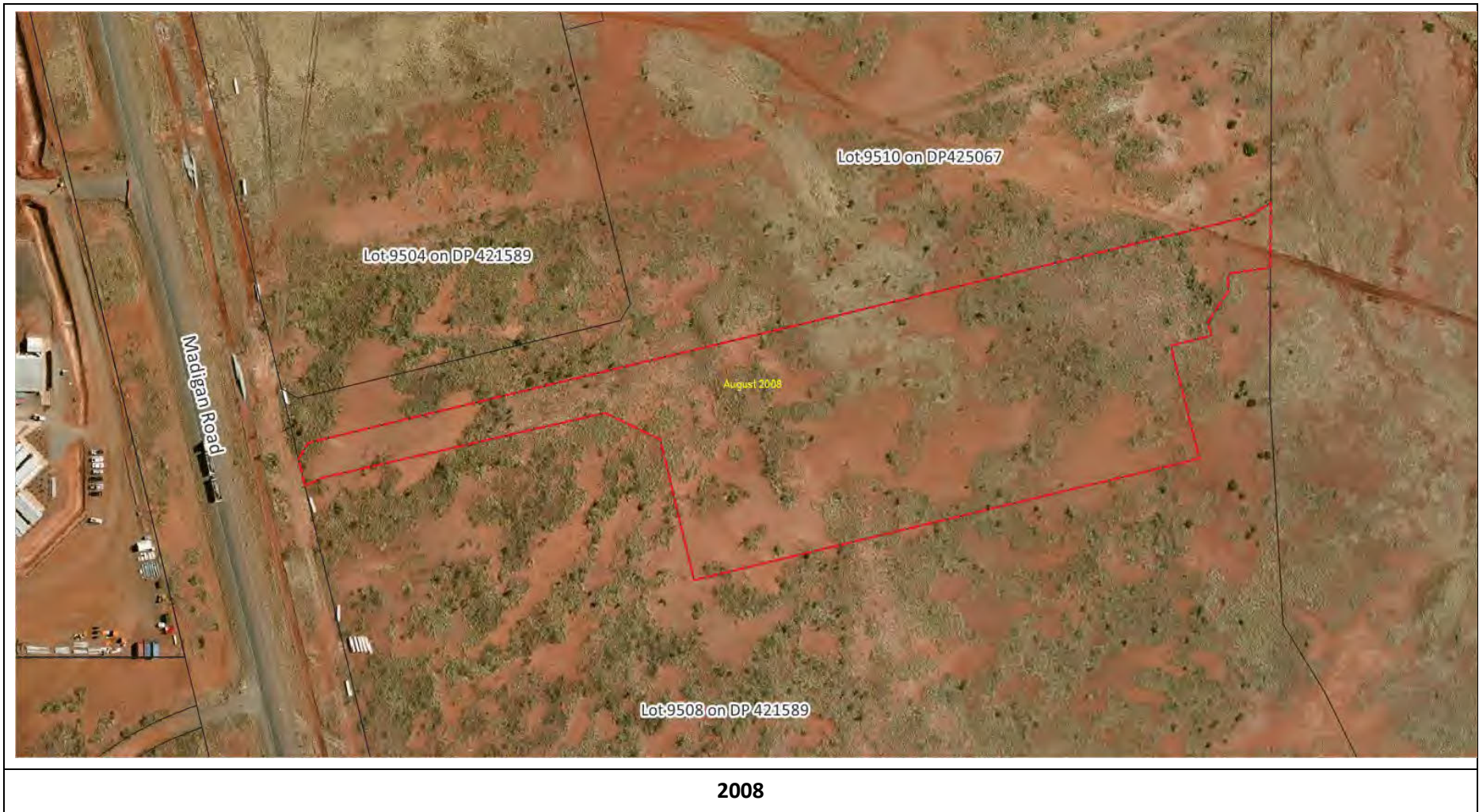
Appendix 2 – Historical Aerial Photographs (Landgate)



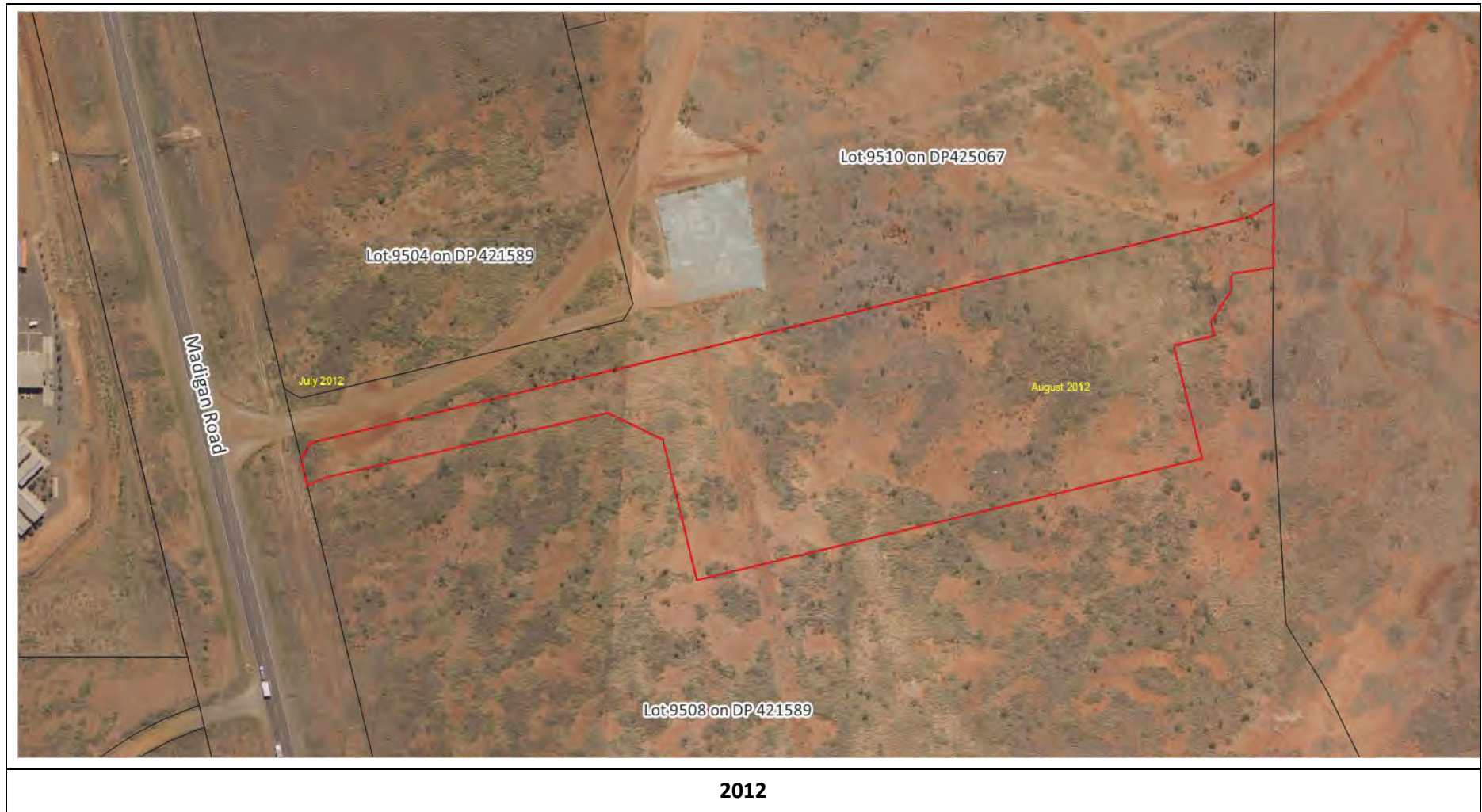
Appendix 2 – Historical Aerial Photographs (Landgate)



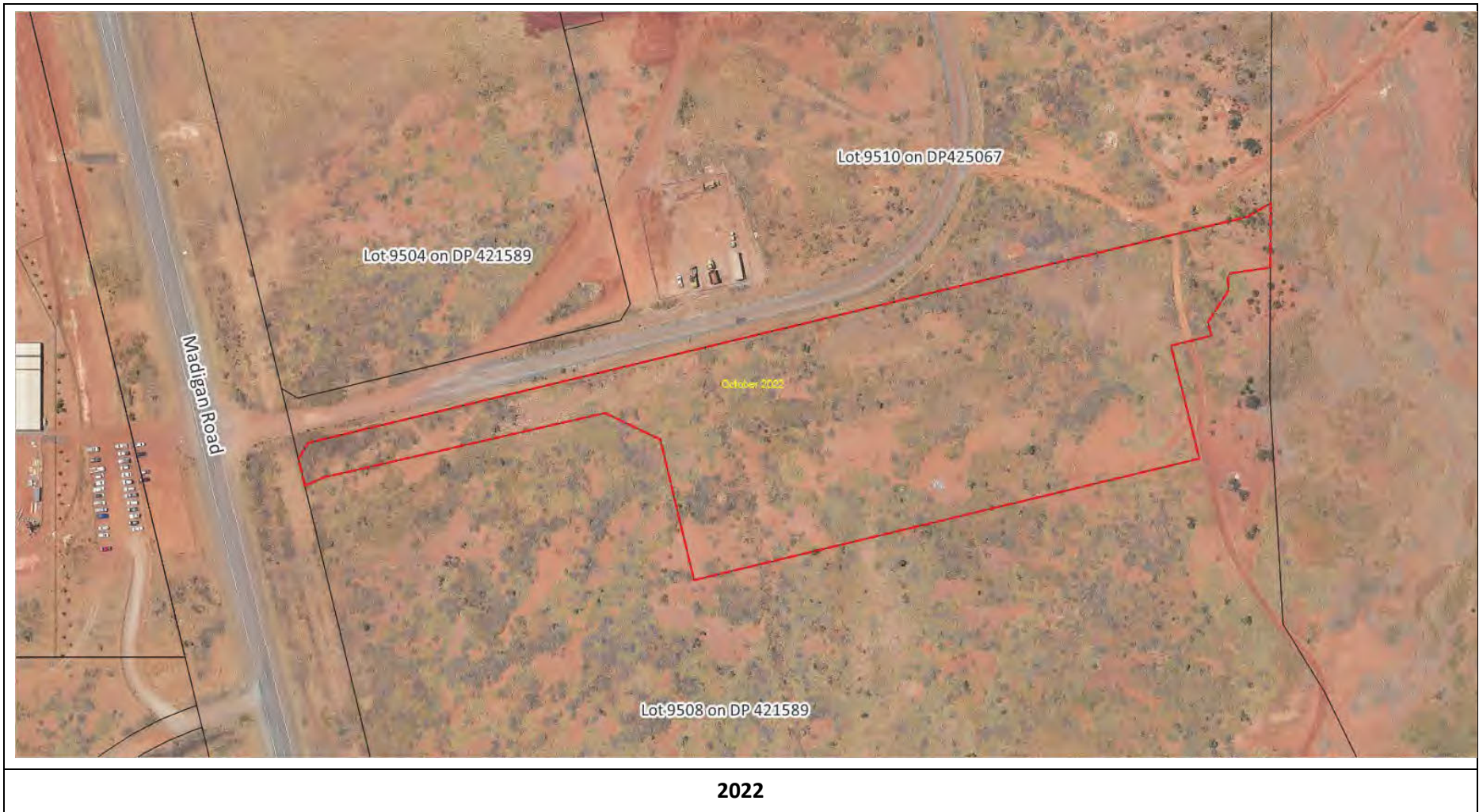
Appendix 2 – Historical Aerial Photographs (Landgate)



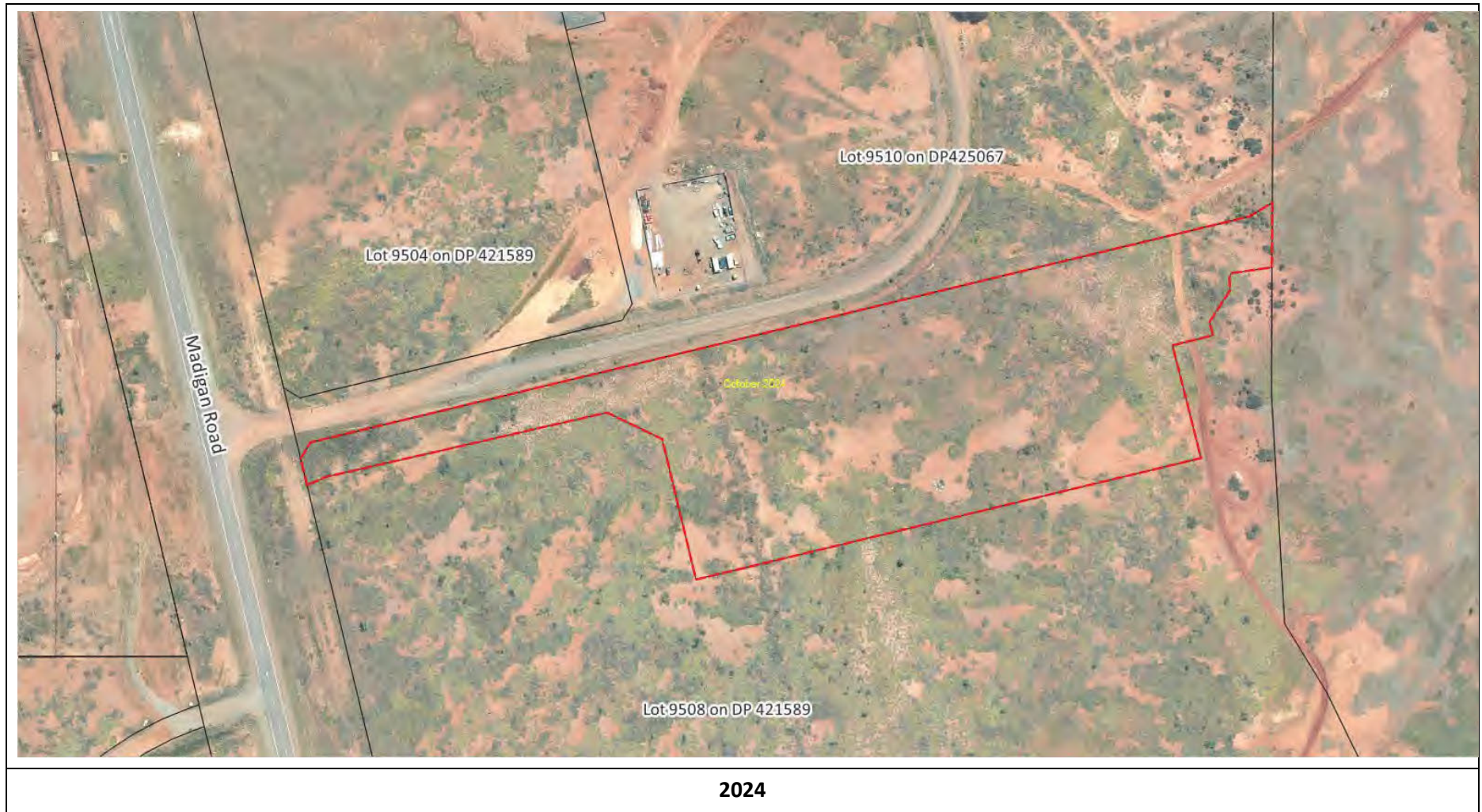
Appendix 2 – Historical Aerial Photographs (Landgate)



Appendix 2 – Historical Aerial Photographs (Landgate)



Appendix 2 – Historical Aerial Photographs (Landgate)



APPENDIX 3

Site Photographs

Appendix 3 – Site Photographs



Appendix 3 – Site Photographs



Appendix 3 – Site Photographs



Appendix 3 – Site Photographs



Appendix 3 – Site Photographs



Appendix 3 – Site Photographs



APPENDIX 4

Significant Fauna Likelihood of Occurrence Assessment – Taxa Within 10 km

APPENDIX 4: SIGNIFICANT FAUNA LIKELIHOOD OF OCCURRENCE ASSESSMENT – TAXA WITHIN 10 KM

CLASS	TAXON	BC ACT / DBCA CONSERVATION CODE	NEAREST RECORD (KM)	HABITAT	COMMENT	LIKELIHOOD ASSESSMENT
Bird	<i>Calidris ferruginea</i> Curlew Sandpiper	Threatened (Critically Endangered)	4.1 km west-northwest	Intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. Less often, recorded inland around ephemeral and permanent lakes, dams,	The referral area does not contain coastal and wetland environments that provide suitable habitat for migratory shorebirds such as the Curlew Sandpiper.	Unlikely
Bird	<i>Calidris tenuirostris</i> Great Knot	Threatened (Critically Endangered)	4.1 km northeast	Sheltered coastal habitats, with large intertidal mudflats or sandflats including inlets, bays, harbours, estuaries and lagoons. Occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast,	The referral area does not contain coastal and wetland environments that provide suitable habitat for migratory shorebirds such as the Great Knot.	Unlikely
Bird	<i>Numenius madagascariensis</i> Eastern Curlew	Threatened (Critically Endangered)	3.4 km northeast	Intertidal mudflats and sandflats, often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours, lagoons, coastal saltworks and sewage farms.	The referral area does not contain coastal and wetland environments that provide suitable habitat for migratory shorebirds such as the Eastern Curlew.	Unlikely
Bird	<i>Calidris canutus</i> Red Knot	Threatened (Endangered)	5.4 km east-northeast	Intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. Occasionally on terrestrial saline wetlands	The referral area does not contain coastal and wetland environments that provide suitable habitat for migratory shorebirds such as the Red Knot.	Unlikely
Bird	<i>Charadrius mongolus</i> Lesser Sand Plover	Threatened (Endangered)	6.9 km northwest	Coastal littoral and estuarine environments. Large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. Occasionally in short saltmarsh or among	The referral area does not contain coastal and wetland environments that provide suitable habitat for migratory shorebirds such as the Lesser Sand Plover.	Unlikely
Mammal	<i>Dasyurus hallucatus</i> Northern Quoll	Threatened (Endangered)	2.5 km west	The northern quoll occupies a variety of habitats across its range including rocky areas, eucalypt forest and woodlands, dry rainforests and vine thickets, sandy lowlands and beaches, shrublands, grasslands and deserts. Habitat usually includes some form of rocky area or structurally diverse woodland or forest used for shelter purposes with surrounding vegetated habitats used for foraging and dispersal. Little is understood about the characteristics of foraging or dispersal habitat for the northern quoll. However, on current knowledge, foraging or dispersal habitat is recognised to be any land comprising predominantly native vegetation in the immediate area (i.e. within 1 km) of shelter habitat, quoll records or land comprising predominately native vegetation that is connected to shelter habitat within the range of the species. Females den in tree hollows, hollow logs and rock crevices.	The nearest record of the Northern Quoll is dated 2018 and was an opportunistic sighting of a dead specimen in Gap Ridge. Multiple other records occur within 10 km of the referral area. Most of these records are concentrated around hilly/rocky terrain such as Karratha Hills in Mulataga or near Mount Regal. The referral area comprises grassland habitat with no rocky or structurally diverse areas suitable for shelter or denning by this species. At best, the referral area may provide habitat that is suitable for foraging and dispersal by this species. As only one record (a dead specimen) occurs within 2 km of the referral area and given the home range of individuals (approximately 450 ha for females and 1,100 ha for males i.e. approximately a 2 km radius), the likelihood of the species using habitat within the referral area is considered low. Notwithstanding this, the relatively small clearing area compared with extent of remaining vegetation within 10 km of the referral area supports the assertion that the proposed clearing will not adversely impact this species.	Possible
Bird	<i>Charadrius leschenaultia</i> Greater Sand Plover, Large Sand Plover	Threatened (Vulnerable)	4.1 km northeast	Occurs in coastal areas of all states, especially the north-west. Non-breeding habitat is coastal, inhabiting littoral and estuarine habitats including sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, sandy estuarine lagoons, inshore	The referral area does not contain coastal and wetland environments that provide suitable habitat for migratory shorebirds such as the Greater Sand Plover.	Unlikely
Mammal	<i>Leggadina lakedownensis</i> Northern short-tailed mouse, Lakeland Downs mouse, Kerakenga	Priority 4	7.9 km west	Known to occur of Sandy Soils and Cracking Clays in Western Australia, and tropical tussock grasslands or woodlands in Queensland. On Thevenard Island it occupies <i>Acacia</i> shrublands and low shrubs on deep sandy soils (DBCA no date).	The referral area does not contain suitable habitat for this species. Only one record from 2006 occurs within 10 km of the referral area.	Unlikely
Reptile	<i>Notoscincus butleri</i>	Priority 4	5.5 km east-southeast	This species is associated with spinifex-dominated areas near creek and river margins (Wilson and Swan 2008).	The referral area may contain suitable habitat, being grasslands near Madigan Creek. However, no records occur within close to the referral	Possible

APPENDIX 4: SIGNIFICANT FAUNA LIKELIHOOD OF OCCURRENCE ASSESSMENT – TAXA WITHIN 10 KM

CLASS	TAXON	BC ACT / DBCA CONSERVATION CODE	NEAREST RECORD (KM)	HABITAT	COMMENT	LIKELIHOOD ASSESSMENT
	Lined soil-crevice skink (Dampier)				area. There are seven records in total within 10 km of the referral area. Six of these are from 2004 and one is undated and all records are from two locations east-southeast of the referral area, 5.5 km and 7.8 km respectively.	
Mammal	<i>Pseudomys chapmani</i> Western pebble-mound mouse, Ngadji	Priority 4	8.5 km west- northwest	Pebbly soils in arid tussock grassland and <i>Acacia</i> woodland. Rocky, hummock grassland areas with little or no soil in which to burrow but with plentiful supply of pebbles (Dunlop and Pound 1981).	The referral area comprises tussock grassland, but contains soils that are not rocky like the Western Pebble-mound Mouse prefers. While the local soils may exhibit surficial rocks, the soils are dominated by sediments with a high clay content. One record dated 1979 occurs within 10 km of the referral area. This record was based on an observation of secondary evidence of the species' presence and was assigned a moderate level of certainty. Given the lack of recent records and rocky substrate, it is considered unlikely this species occurs within the referral area.	Unlikely
Bird	<i>Tringa brevipes</i> Grey-tailed tattler	Priority 4 & Specially Protected - Migratory	1.1 km southwest	Sheltered coasts with reefs and rock platforms or with intertidal mudflats. Intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. Around shores of rock, shingle, gravel or shells and also on intertidal mudflats in embayments,	The referral area does not contain coastal and wetland environments that provide suitable habitat for migratory shorebirds such as the Grey-tailed tattler. A total of 18 records from 1998 to 2014 occur within 10 km of the referral area. All of these are associated with coastal/estuary areas, saltworks or wastewater treatment ponds.	Unlikely
Bird	<i>Actitis hypoleucos</i> Common Sandpiper	Specially Protected – Migratory	1.1 km southwest	Coastal wetlands and some inland wetlands, with varying levels of salinity. Mostly found around muddy margins or rocky shores and rarely on mudflats.	The referral area does not contain coastal and wetland environments that provide suitable habitat for this species. The nearest record was recorded at a wastewater treatment plant.	Unlikely
Bird	<i>Apus pacificus</i> Fork-tailed Swift	Specially Protected - Migratory	5.4 km east- northeast	Mostly inland plains but sometimes above foothills or in coastal areas. Cliffs, beaches and islands. Also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh, treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. Occasionally above rainforests, wet sclerophyll forest or open forest or plantations of pines.	The Fork-tailed Swift is a non-breeding migrant to Australia with records widespread across the continent. It is almost exclusively aerial (1 m to 1,000 m above ground level) and generally observed over inland plains in Australia but sometimes recorded over coastal cliffs, beaches and urban areas. The species may be observed above the referral area on occasions. However, given its foraging habits, it is unlikely to be found on the ground.	Possible
Bird	<i>Arenaria interpres</i> Ruddy turnstone	Specially Protected - Migratory	4.8 km west	Coastal regions with exposed rock coast lines or coral reefs or near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. Occasionally found on sand, coral or shell beaches, shoals, cays and dry ridges of sand or coral and in estuaries, harbours, bays and coastal lagoons, among low saltmarsh or on exposed beds of seagrass, around sewage ponds and on mudflats. In south-west Australia, it may occur on pebble-strewn shores of saltlakes near the coast. Occasionally live away from coastal areas in habitats such river beds, and on inland lakes and adjacent farmland. Forage between supralittoral and lower littoral foreshore zones often in banks of seaweed or other tide-wrack.	The referral area does not contain coastal and wetland environments that provide suitable habitat for this species. The nearest records (4.8 km west of the referral area) are dated 1978 and 1980. These are considered potentially erroneous given most other records of the species within 10 km of the referral area are from coastal or saltworks.	Unlikely
Bird	<i>Calidris acuminata</i> Sharp-Tailed Sandpiper	Specially Protected – Migratory	1.1 km southwest	Fresh and hypersaline environments, feeding along the edge of water on mudflats, coastal and inland wetlands, and sewage ponds. After rainfall events, the species may also feed on areas of agricultural pasture. On migration, forages and roosts on rocky and sandy beaches, freshwater habitats, and inland saltwater habitats (DCCEEW, 2024).	The referral area does not contain coastal or wetland environments that provide suitable habitat for this species. The nearest record was recorded at a wastewater treatment plant.	Unlikely
Bird	<i>Calidris alba</i> Sanderling	Specially Protected – Migratory	7 km northwest	Almost always found on the coast, mostly on open sandy beaches exposed to open sea-swell, and also on exposed sandbars and spits, and shingle banks. Forage in the wave-wash zone and amongst rotting seaweed.	The referral area is not situated along the coast. The nearest record was recorded at a saltworks.	Unlikely

APPENDIX 4: SIGNIFICANT FAUNA LIKELIHOOD OF OCCURRENCE ASSESSMENT – TAXA WITHIN 10 KM

CLASS	TAXON	BC ACT / DBCA CONSERVATION CODE	NEAREST RECORD (KM)	HABITAT	COMMENT	LIKELIHOOD ASSESSMENT
Bird	<i>Calidris falcinellus</i> Broad-billed Sandpiper	Specially Protected - Migratory	7 km northwest	This species is often found in coastal mudflats and estuaries during migration and winter.	The referral area is not situated along the coast or estuarine areas. The nearest record was recorded at a saltworks.	Unlikely
Bird	<i>Calidris ruficollis</i> Red-Necked Stint	Specially Protected - Migratory	5 km northwest	Coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and occasionally protected sandy or coralline shores. Have been recorded on exposed or ocean beaches, stony or rocky shores, reefs or shoals. Also occur in saltworks and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in saltflats. Sometimes use flooded paddocks or damp grasslands. Occasionally recorded on dry gibber plains, with little or no perennial vegetation.	The referral area does not contain coastal, estuarine or wetland environments that provide suitable habitat for this species. The nearest record was recorded adjacent to a surface water body.	Unlikely
Bird	<i>Calidris subminuta</i> Long-toed Stint	Specially Protected – Migratory	1.1 km southwest	Found mainly along the coast with a few scattered inland records. Shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. Also, areas of muddy shoreline, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire. Also observed at open, less vegetated shores of larger lakes and ponds and on muddy fringes of drying ephemeral lakes and swamps. Permanent wetlands such as reservoirs and artificial lakes. They are uncommon, but occasionally known from tidal estuaries, saline lakes, saltponds and bore swamps.	The referral area does not contain coastal, estuarine or wetland environments that provide suitable habitat for this species. The nearest record was recorded at a wastewater treatment plant.	Unlikely
Bird	<i>Charadrius veredus</i> Oriental Plover	Specially Protected - Migratory	6.8 km northwest	This species is often found in grasslands, salt fields, and coastal areas during migration.	Although the referral area is not situated along the coast, it does contain grassland habitat. The nearest record was recorded at a saltworks in 2008. The species may be observed within the referral area on occasions. However, given its foraging habits when inland (i.e. aerial foraging for insects), it is unlikely to be found on the ground.	Possible
Bird	<i>Chlidonias leucopterus</i> White-Winged Black Tern	Specially Protected - Migratory	4 km west-northwest	White-winged Black Terns are found in small to large flocks on mostly coastal or sub-coastal wetlands including tidal estuaries, lagoons, grassy swamps, and sewage ponds.	The referral area does not contain coastal, estuarine or wetland environments that provide suitable habitat for this species.	Unlikely
Bird	<i>Gelochelidon nilotica</i> Gull-billed Tern	Specially Protected - Migratory	3.5 km northeast	Found mainly along the coast with a few scattered inland records. Shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. Also, areas of muddy shoreline, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire. Also observed at open, less vegetated shores of larger lakes and ponds and on muddy fringes of drying ephemeral lakes and swamps. Permanent wetlands such as reservoirs and artificial lakes. They are uncommon, but occasionally known from tidal estuaries, saline lakes, saltponds and bore swamps.	The referral area does not contain coastal, estuarine or wetland environments that provide suitable habitat for this species. The nearest record was recorded at a wastewater treatment plant.	Unlikely
Bird	<i>Glareola maldivarum</i> Oriental Pratincole	Specially Protected - Migratory	1.1 km southwest	Usually inhabits open plains, floodplains or short grassland (including farmland or airstrips), often with extensive bare areas. They often occur near terrestrial wetlands, such as billabongs, lakes or creeks, and artificial wetlands such as reservoirs, saltworks and sewage farms, especially around the margins. The species also occurs along the coast, inhabiting beaches, mudflats and islands, or around coastal lagoons.	A medium-sized tern-like shorebird found in small to very large flocks on open plains, bare grounds and around the margins of wetlands and on mudflats. It can be seen hunting in flight, capturing insects. The referral area does not contain coastal, estuarine or wetland environments but does contain grasslands which may provide foraging habitat. However, given the species' foraging habits (i.e. aerial foraging for insects), it is unlikely to be found on the ground.	Possible
Bird	<i>Hydroprogne caspia</i> Caspian Tern	Specially Protected - Migratory	1.1 km southwest	Sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) with preference for sandy or muddy margins. Near-coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes	The referral area does not contain coastal, estuarine or wetland environments that provide suitable habitat for this species. The nearest record was recorded at a wastewater treatment plant.	Unlikely

APPENDIX 4: SIGNIFICANT FAUNA LIKELIHOOD OF OCCURRENCE ASSESSMENT – TAXA WITHIN 10 KM

CLASS	TAXON	BC ACT / DBCA CONSERVATION CODE	NEAREST RECORD (KM)	HABITAT	COMMENT	LIKELIHOOD ASSESSMENT
				(including ephemeral lakes), waterholes, reservoirs, rivers and creeks. Artificial wetlands, including reservoirs, sewage ponds and saltworks. Forage in open wetlands, including lakes and rivers.		
Bird	<i>Limosa lapponica</i> Bar-tailed Godwit	Specially Protected – Migratory	4 km west	Coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. Often around beds of seagrass and, sometimes, in nearby saltmarsh. Occasionally coastal sewage farms and saltworks, salt lakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats.	The referral area does not contain coastal, estuarine or wetland environments that provide suitable habitat for this species. The nearest record was from 1978 and therefore of low confidence in terms of its location (accuracy set as +/- 1.8 km) and potentially its identification.	Unlikely
Bird	<i>Numenius minutus</i> Little Curlew	Specially Protected - Migratory	4 km west	This species is often found in open fields, grasslands, and coastal mudflats during the non-breeding season.	Although the referral area is not situated along the coast, it does contain grassland habitat. The nearest record was from 1981 and therefore of low confidence in terms of its location (accuracy set as +/- 1.8 km) and potentially its identification. The species may be opportunistically observed within the referral area on occasions.	Possible
Bird	<i>Numenius phaeopus</i> Whimbrel	Specially Protected - Migratory	4 km west	Intertidal mudflats of sheltered coasts, harbours, lagoons, estuaries and river deltas, often those with mangroves, but also open, unvegetated mudflats. Occasionally found on sandy or rocky beaches, on coral or rocky islets, or on intertidal reefs and platforms. Use saline or brackish lakes near coastal areas and also salt flats with saltmarsh, or saline grasslands with standing water left after high spring-tides, and in similar habitats in sewage farms and salt fields.	The referral area does not contain coastal, estuarine or wetland environments that provide suitable habitat for this species. The nearest record was from 1978 and therefore of low confidence in terms of its location (accuracy set as +/- 1.8 km) and potentially its identification.	Unlikely
Bird	<i>Oceanites oceanicus</i> Wilson's storm-petrel	Specially Protected – Migratory	8 km northwest	Spends most of life at sea. Breeds on Antarctic Continent and Peninsula, and peri-Antarctic and Subantarctic islands.	The referral area is inland from the coast.	Unlikely
Bird	<i>Pandion haliaetus</i> Osprey	Specially Protected - Migratory	2. 8 km northeast	Littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. Mainly coastal areas but occasionally inland along major rivers. Wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes.	The referral area does not contain coastal, estuarine or wetland environments that provide suitable habitat for this species.	Unlikely
Bird	<i>Plegadis falcinellus</i> Glossy Ibis	Specially Protected - Migratory	7 km northwest	Generally, occurs east of the Kimberley. Fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. Occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons.	The referral does not contain this species preferred habitats. This species was recorded in association with saltworks within 10 km of the referral area.	Unlikely
Bird	<i>Pluvialis fulva</i> Pacific Golden Plover	Specially Protected - Migratory	7.7 km west	Coastal habitats, though occasionally around inland wetlands. Beaches, mudflats and sandflats (sometimes in vegetation such as mangroves, low saltmarsh, or beds of seagrass) in sheltered areas including harbours, estuaries and lagoons, and in evaporation ponds in saltworks. Occasionally recorded on islands, sand and coral cays and exposed reefs and rocks as well as terrestrial wetlands such as fresh, brackish or saline lakes, billabongs, pools, swamps and wet claypans, especially those with muddy margins and often with submerged vegetation or short emergent grass, short (or, occasionally, long) grass in paddocks, crops or airstrips, or ploughed or recently burnt areas. Very occasionally recorded well away from water.	The referral does not contain this species preferred habitats. This species was recorded in association with saltworks within 10 km of the referral area.	Unlikely
Bird	<i>Pluvialis squatarola</i> Grey Plover	Specially Protected - Migratory		Coastal areas including sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally rocky coasts with wave-cut platforms or reef-flats, or reefs within muddy lagoons. Also occur around terrestrial wetlands such as near-coastal lakes and swamps, or salt-lakes. Very occasionally recorded further inland around wetlands or salt-lakes.	The referral does not contain this species preferred habitats. This species was recorded in association with saltworks within 10 km of the referral area.	Unlikely

APPENDIX 4: SIGNIFICANT FAUNA LIKELIHOOD OF OCCURRENCE ASSESSMENT – TAXA WITHIN 10 KM

CLASS	TAXON	BC ACT / DBCA CONSERVATION CODE	NEAREST RECORD (KM)	HABITAT	COMMENT	LIKELIHOOD ASSESSMENT
Bird	<i>Sternula albifrons</i> Little Tern	Specially Protected - Migratory	7 km northwest	In Australia, Little Terns inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand-spits, and also on exposed beaches.	The referral area does not contain suitable habitat for this species. This species was recorded in association with saltworks within 10 km of the referral area.	Unlikely
Bird	<i>Thalasseus bergii</i> Crested Tern	Specially Protected - Migratory	3.5 km northeast	Islands and coastlines of tropical and subtropical areas. Nest in flat open sites on offshore islands, low-lying coral reefs, sandy or rocky coastal islets, coastal spits, lagoon mudflats or islets in saltpans and sewage works.	The referral area does not contain suitable habitat for this species.	Unlikely
Bird	<i>Tringa glareola</i> Wood Sandpiper	Specially Protected - Migratory	1.1 km southwest	Well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. Typically associated with emergent, aquatic plants or grass, dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees. Inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops. Small wetlands only when they are drying. Rarely found at brackish wetlands, or dry stunted saltmarsh. Occasionally stony wetlands. Artificial wetlands, including open sewage ponds, reservoirs, large farm dams, and bore drains.	The referral area does not contain suitable habitat for this species. The nearest record was from a wastewater treatment site.	Unlikely
Bird	<i>Tringa nebularia</i> Common Greenshank	Specially Protected – Migratory	4 km west- northwest	Coastal and inland environments, in estuaries and mudflats, mangrove swamps and lagoons, and in billabongs, swamps, sewage farms and flooded crops.	The referral area does not contain coastal, estuarine or wetland environments that provide suitable habitat for this species.	Unlikely
Bird	<i>Tringa stagnatilis</i> Marsh Sandpiper	Specially Protected - Migratory	1.1 km southwest	Permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. Occasionally at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes.	The referral area does not contain suitable habitat for this species. The nearest record was from a wastewater treatment site.	Unlikely
Bird	<i>Xenus cinereus</i> Terek sandpiper	Specially Protected - Migratory	8.3 km northeast	Soft wet intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons. Also recorded on islets, mudbanks, sandbanks and spits, and near mangroves and occasionally in samphire (<i>Halosarcia</i> spp.). Occasionally, on sandy beaches, among seaweed and other debris and in rocky areas and around drying sewage ponds and saltpans if surrounded by mudflats. Brackish coastal swamps, lagoons and dune-lakes; and gravel or rocky edges of estuarine pools and freshwater river-pools. Very occasionally, swampy, grassy or cultivated paddocks near the coast	The referral area does not contain suitable habitat for this species. All records of the species within 10 km of the referral area are from a coastal location.	Unlikely

APPENDIX 5

Significant Flora Likelihood of Occurrence Assessment – Taxa Within 10 km

APPENDIX 5: SIGNIFICANT FLORA LIKELIHOOD OF OCCURRENCE ASSESSMENT – TAXA WITHIN 10 KM

TAXON	BC ACT / DBCA CONSERVATION CODE	SOURCE	NEAREST RECORD (KM)	HABITAT	COMMENT	LIKELIHOOD ASSESSMENT
<i>Gomphrena axillaris</i>	Priority 1	WA Herbarium	7.2 km west	Subsaline habitats or margins of salt lakes and hummock or tussock grasslands on sand, known from locations near Karratha and Dampier Island (Davis et al., 2021).	<i>Gomphrena axillaris</i> is currently known from several localities in Western Australia (near Karratha, the Dampier Peninsula and Lake Disappointment) and from the Northern Territory and central Queensland (Davis et al., 2021). One record of this species occurs within 10 km of the referral area, and only one record within the 50 km radial search area. The single record of this species was recorded as growing in a tidal stream zone of a saline drainage area into a salt crystalliser pond. The species' preferred habitat, i.e. subsaline habitats are not present within the referral area.	Unlikely
<i>Dolichocarpa</i> sp. <i>Hamersley Station</i> (A.A. Mitchell PRP 1479)	Priority 3	WA Herbarium	3.8 km south	Gentle slope, plains, in claypan, red-brown sandy clay. Typically, on cracking clay plains.	This species has been recorded across four subregions within Pilbara, ranging from Dampier to approximately 30 kilometres north of Fortescue Marsh and 15 southeast of Karijini National Park (Western Australia Herbarium, 1998-). Two records of this species occur within 10 km of the referral area, and 11 records within the 50 km radial search area. The records occur around Karratha and southwest towards Mardie, as well as a concentration of five records near Millstream National Park. Based on potentially suitable soils and the proximity of the referral area to historical records, it is possible that this species occurs.	Possible
<i>Neptunia longipila</i>	Priority 3	DBCA TPFL & WA Herbarium	6.1 km southeast	This species is endemic to Western Australia and is confined to the Pilbara bioregion, from Karratha to Newman (Bean, 2022). It grows in reddish-brown to orange-brown cracking clay, or red to brown gravelly loam, on flat or very gently sloping terrain, in grassland or open shrubland (Bean, 2022).	Two records occur within 10 km of the referral area and a further seven records within the 50 km radial search area, with most of these near Millstream National Park. The two locations at which the species was recorded closest to the referral area, were from 2002 and 2005. These were recorded from the same soil landscape mapping unit (Red-brown non-cracking clay). Based on potentially suitable soils and the proximity of the referral area to historical records, it is possible that this species occurs.	Possible
<i>Stackhousia clementii</i>	Priority 3	WA Herbarium	4.9 km northwest	In Western Australia the species is found on sandstone hills scattered across the Kimberley, northern Goldfields-Esperance and Pilbara regions where it grows in skeletal soils.	One record occurs within 10 km of the referral area and a further two records within the 50 km radial search area to the northwest of the referral area. The locations of the known records are within tidal soils and calcareous loamy earths, which are different to the soils of the referral area (red/brown non-cracking clays). Based on soil mapping unit and the absence of nearby records, it is considered unlikely that this species occurs within the referral area.	Unlikely
<i>Terminalia supranitifolia</i>	Priority 3	DBCA TPFL & WA Herbarium	3.8 km southwest	Sandy soils. Among basalt rock.	Most records for this species are from the Burrup Peninsula. Only one record from the DBCA's TPFL occurs within 10 km of the referral area. The WA Herbarium records lists an additional two locations of this species within 10 km of the referral area. However, the WA Herbarium records are not necessarily validated or reliable. Based on the absence of suitable soils, it is considered unlikely that this species occurs within the referral area.	Unlikely
<i>Themeda</i> sp. <i>Hamersley Station</i> (M.E. Trudgen 11431)	Priority 3	WA Herbarium	4.1 km northwest	Red clay. Clay pan, grass plain	Only one record of this species occurs within 10 km of the referral area from the WA Herbarium records. The record was from 1992. The next nearest record is more than 20 km from the referral area, with most records being near Millstream National Park. Based on known occurrences and the number of surveys conducted within the vicinity of Karratha, it is considered unlikely that this species occurs in the referral area.	Unlikely
<i>Rhynchosia bungarensis</i>	Priority 4	WA Herbarium	3.8 km southwest	Pebbly, shingly coarse sand amongst boulders. Banks of flow line in the mouth of a gully in a valley wall.	Most records for this species are from the Burrup Peninsula and have been identified from the WA Herbarium records.	Unlikely

APPENDIX 5: SIGNIFICANT FLORA LIKELIHOOD OF OCCURRENCE ASSESSMENT – TAXA WITHIN 10 KM

TAXON	BC ACT / DBCA CONSERVATION CODE	SOURCE	NEAREST RECORD (KM)	HABITAT	COMMENT	LIKELIHOOD ASSESSMENT
					<p>The WA Herbarium records include two locations of this species within 10 km of the referral area. However, the WA Herbarium records are not necessarily validated or reliable. These two locations are from a different soil landscape map unit than what is present in the referral area.</p> <p>Based on the absence of suitable soils, it is considered unlikely that this species occurs within the referral area.</p>	