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ENVIRONMENTAL

CBH Perenjori Rail Out-loading

Native Vegetation Clearing Permit
Supporting Documentation

Western Environmental Pty Ltd
(08) 6162 8980
PO Box 437, Leederville, WA 6903
enquiries@westenv.com.au
westenv.com.au

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Report No:
A23.074-RPT-NVCP_2
Issue Date:
6-Mar-2024
Status
FINAL

Prepared for:
CBH
Level 6, 240 St Georges Tce
PERTH WA 6000

Prepared by
Western Environmental Pty Ltd
Unit 5, 162 Colin Street
West Perth WA 6005
westenv.com.au

Internal Review

Author	Reviewed by	Approved by
Andrew Fry Senior Environmental Scientist	**Dale Newsome** Director	**Dale Newsome** Director
6-Mar-2024	**6-Mar-2024**	**6-Mar-2024**

Distribution Record

Copies	Document ID / Version	Date	Received by
01 (E)	A23.074-RTP-NVCP_2_FINAL	06-March-2024	Andrew Black - CBH
01 (E)	A23.074-RTP-NVCP_1_FINAL	03-Nov-2023	Andrew Black - CBH
01 (E)	A23.074-RTP-NVCP_0_DRAFT	8-Sep-2023	Andrew Black – CBH

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WEPL will not be liable to update or revise this report to take into account any events or circumstances or facts becoming apparent after the date of this report.

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1. Introduction

1.1 Background

Co-operative Bulk Handling Limited (CBH) proposes to expand its existing Perenjori Rail Out-loading infrastructure (the Project) located approx. 40km south of Bowgada (Figure 1-1) in the Wheatbelt region of Western Australia (WA).

The record 2022-23 harvest of over 22.7 Mt delivered to the CBH network highlighted the need for improvements to move grain efficiently to ports to meet market demand and maximise economic output for the State and CBH grower members. To improve the capacity and efficiency of rail loading, the Project will involve installation of a suite of upgrades at the Perenjori North Receival Site including new out-loading infrastructure and rail infrastructure including approximately 1300 metres of rail siding that will tie into the mainline.

1.1.1 Clearing overview

The Project will result in clearing up to 2.503 ha of native vegetation (the Disturbance Footprint) within a Development Envelope of 21.45 ha (Figure 1-1).

Through avoidance and minimisation, predicted impact on native vegetation has been reduced as far as practicable for the safety and viability of the Project. Biological surveys undertaken within the 94 ha Bamford Consulting Ecologist (Bamford) Survey Area (Fauna) and 124 ha AECOM Survey Area (flora and vegetation) identified 18.45 ha of extant native vegetation The Development Envelope for these upgrades includes the current Perenjori North Receival Site and the rail reserve to the east, that runs parallel to the Wubin - Mullewa Road. Following the analysis of design options during early phases of the Project, the final design reduced the extent of the clearing area, resulting in the retention of over 86% of the native vegetation identified in the Survey Area. Flora, vegetation and fauna surveys have identified the presence of native vegetation within the Development Envelope that is required to be removed to facilitate development.

1.1.2 Purpose

The Project requires a Native Vegetation Clearing Permit (NVCP), Purpose Permit, prior to vegetation being removed. This document provides the supporting documentation to facilitate the NVCP application under Part V of the Environmental Protection Act 1986 (EP Act).

To support the NVCP application, four biological surveys were commissioned by CBH covering the Development Envelope and immediate surrounds. These comprised:

- Reconnaissance Flora, Vegetation and Basic Fauna Survey Report (undertaken out of season; winter 2022) (Bio Diverse Solutions, 2022);

- Perenjori-Flora and Vegetation Assessment (Detailed and Targeted spring season survey) (AECOM, 2023):
- Perenjori Fauna Assessment (Bamford Consulting Ecologists, 2023): and
- Follow up Perenjori - Targeted Flora Survey (AECOM, 2024)

In addition, this Native Vegetation Clearing Permit Supporting Document includes:

- An overview of the existing physical environmental conditions of the site;
- An evaluation of the environmental impacts associated with the Project;
- Evidence of avoidance of clearing through site selection and design, reduction of impacts to better quality vegetation or larger populations of Priority flora, and mitigation of impacts during clearing and construction through application of management plans; and
- An assessment against the 10 Clearing Principles for proposed clearing within the Development Envelope.

In addition to immediate impacts to native vegetation, the project planning process has considered broader impacts and approvals with complementary activities and approvals processes underway including:

- Undertaking Aboriginal Heritage Site Identification Survey and consultation with Traditional Owners from the Yamatji Southern Regional Corporation (Sticks and Stones Cultural Management, 2022);
- Engagement with key stakeholder groups in progressing designs;
- Lodgement of Development Application with Shire of Perenjori;
- Environmental Noise Assessment; and
- Preparation of a Bushfire Management Plan.

1.2 Project Location and Ownership

The Perenjori North Receival Site is located on Lot 101 (DP 65758) on the Wubin - Mullewa Road in the Shire of Perenjori, approximately 2 km northwest of the Perenjori Townsite (Figure 1-1) and approximately 327 km north east of the Perth CBD. Lot 101 is located immediately west of a railway reserve (Land ID 3124047) and south of a public road reserve (Land ID 3692162) and adjacent to railway that runs parallel to the Wubin - Mullewa Road. Lot 101 comprises the majority of the Development Envelope for the Perenjori North expansion project (Table 1-1), with a minor portion within railway reserve (Land ID 3124047) and public road reserve (Land ID 3692162).

Lot 101 has been extensively cleared and contains several open grain storage bulkheads and infrastructure associated with existing CBH operations, along with numerous hardstand areas, ground conveyors, and sealed and unsealed vehicle accessways. The vegetation within the rail corridor adjacent to the CBH lands where a rail siding is required is generally low, shrubby and degraded; and was selected as a preferred location as it was considered less likely to contain key values such as occurrences of the Eucalypt Woodlands of the Western Australian Wheatbelt TEC or potential Black Cockatoo nesting and roosting sites.

A design drawing of the indicative footprint of the Project can be found in Figure 1-2.

A Certificate of Title for Lot 101 Wubin - Mullewa Road on Deposited Plan 65758, Perenjori is presented in Attachment A. Lot on Plan A RAIL WAY - Land ID 3124047 is owned by the Government of Western Australia Public Transport Authority and an authority to access and clear native vegetation has been given to CBH subject to granting of a clearing permit from DWER. The owner of Lot P ROAD- Land ID 3692162 has also provided an authority to access and clear native vegetation. See Letters of Authority in Attachments B and C.

Table 1-1: Site Identification

Identifier	Details
Lot Number(s)	• Lot 101 on Deposited Plan 65758 • Lot on Plan A RAIL WAY - Land ID 3124047 • Lot P ROAD- Land ID 3692162
Local Government Authority	• Shire of Perenjori
Zoning	• Lot 101 on Deposited Plan 65758- Rural • Lot on Plan A RAIL WAY - Land ID 3124047- Railway • Lot P ROAD- Land ID 3692162- Public Road

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Locate Mosaic (LGATE-322)
Cadastre (LGATE-002)

Figure 1-1 - Perenjori Development Envelope & Disturbance Footprint

LEGEND

Boundaries

🟦 Survey Area
🟥 Development Envelope
🟧 Cadastre (LGATE-002)

Areas

▨ Disturbance Footprint
◼ Bulkhead

Development Envelope Area	21.5 ha
Disturbance Footprint	2.50 ha

0 200 400 600 800
Metres

N

Publication Date: 20/03/2024 1:40 PM
Map Scale: 1:12,500 (when printed at A3)
Spatial Reference System: GDA2020 MGA Zone 50
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CBH Group
240 St Georges Terrace
Perth WA 6000
Ph (08) 9237 9600
Fax (08) 9322 3942

Project Path: L:\Environment & Sustainability\GIS_DATA\Project _work\Perenjori\GIS2024020_Perenjori_Figures\Pro_Project\GIS2024020 Perenjori.aprx
Layout: F01 Development Envelope and DF

1.3 Project Justification

Due to the economic, and supply chain advantages associated with using rail, CBH is planning to expand its rail infrastructure at key receival sites, such as Perenjori. The Project specifically addresses issues with loading of trains including excessive splitting and shunting of trains, low or poor out-loading performance, limited ability to store a train load of product on demand and safety implications with trains blocking roads and mainline. The site is currently split between two locations:

- The Perenjori town site; and
- The Perenjori North Receival site – where the majority of tonnes are stored and will be received in the future as grower receivals are migrated away from the constrained town site.

The Perenjori town site is located on the Latham line to Geraldton, which has a narrow gauge and a 16-tonne axle load (TAL). Approximately 95% of the tonnes from Perenjori are transported via rail. To facilitate this currently, a significant amount of tonnes needs to be transported by road from the Perenjori North Receival Site where this Project is situated, to the Perenjori town site, where the existing siding and rail loading infrastructure are located.

The existing siding has a length equivalent to 26 wagons, and the current rail loading infrastructure has a capacity of 150 tonnes above rail, with a load rate of 250 tonnes per hour (TPH). Loading a 52-wagon train with two locomotives (current standard) takes approximately 12 hours, including 3 hours for shunting.

Upon the implementation of this project, there will be a substantial reduction in road out-loading requirements. This will result in fewer trucks on the road, specifically in the Perenjori town area and close to the school adjacent to the Town Site thereby improving safety and amenity. The estimated capacity of the Perenjori North facility is 400-500 tonnes per hour (TPH).

Alternative Project Options

CBH analysed multiple options to improve rail loading performance at Perenjori. There were several inter-related constraints to consider, including the ideal placement of the facility relative to the existing site, entrance road and rail, the rail siding placement and the facility storage size and performance capabilities.

Trade-offs included overall loading and train schedule performance, capital cost, operational cost & operability, construction impact to operations, schedule to deliver including approvals lead time, electrical power supply in the region, enabling future expandability and ability to be mechanically tied into the existing site to enable outloading efficiencies in the future.

A range of possible rail sidings and facility placements were explored to meet the requirements of the Project and the constraints of the sites. Land ownership, land re-zoning, geography, environmental, heritage and future proofing were considered.

The preferred option is to upgrade the rail infrastructure at the Perenjori North Receival site, including installation of ~1,300m siding adjacent to the mainline to store and load 54 wagon trains. This will deliver the shortest site dwell time due to shunting and splitting efficiency gains, best safety outcomes for rail operation, provide no blocking of CBH and public roads and delivers optimum train scheduling options. Rail Infrastructure will include the following:

- Approx 1,300m of rail for new rail siding.
- 2 new 1:12 60kg/m NG motorized turnouts (mainline).
- 2 new catchpoints

1.4 Clearing of Native Vegetation

Excluding activities that are exempt under the Clearing Regulations (Section 5 – Prescribed Clearing), all native vegetation clearing completed by CBH should be undertaken in accordance with a Native Vegetation Clearing Permit (NVCP).

1.4.1 Impact avoidance through design

Following the site selection phase, several concept designs were developed. The design process aimed to minimise the requirement for clearing. The initial winter 2022 Reconnaissance flora and vegetation survey (BDS, 2022) vegetation condition and Priority flora location mapping was utilised to allow avoidance of environmental values to be considered earlier in the design process with values confirmed by spring flora and vegetation and fauna surveys (AECOM 2023, Bamford Consulting Ecologists, 2023). An additional targeted flora survey was undertaken in October 2023 to confirm the presence of suspected Priority flora species (*Baeckea* sp. Perenjori and *Enekbatus longistylus*) (AECOM, 2024). These species had been sterile during the first AECOM survey and species were identified from collected samples, but populations could not be counted. The targeted species were still sterile during the follow-up survey (AECOM, 2024).

The biological Survey Area encompassed approximately 125 ha with the 21.5 ha Development Envelope contained within this area. A larger Survey Area was targeted to allow for design changes to avoid areas with higher environmental values.

A summary of key avoidance through design decisions and avoidance outcomes are provided below in Table 1-2. and shown in Figure 1-3, Figure 1-4 and Figure 1-5.

Table 1-2: Avoidance Summary

Avoidance Through Design Consideration	Avoidance Outcome
Identified from Reconnaissance survey that an area contains a contiguous patch of intact vegetation in Good and Very Good condition. **Siting of infrastructure to avoid vegetation in Good, Very Good or Excellent condition**	A contiguous patch of Very Good (approx. 2 ha) and Good (approx. 1 ha) vegetation immediately on the northeast side of the rail was removed from consideration for siting of the rail siding infrastructure due to environmental values (Figure 1-3). The selected location on the south side of rail mainly intersects vegetation in a Degraded condition, with clearing limited to combined 0.59 ha of Good and Very Good condition vegetation. Avoidance of areas of better condition vegetation achieved.

Avoidance Through Design Consideration	Avoidance Outcome
Siting of infrastructure to avoid priority species.	Avoidance of 60 locations of priority flora from five species by siting rail siding on south side of main rail. Impacts limited to 47 individuals from 14 record locations for *Grevillea granulosa* (P3) and 6 individuals from 3 locations of *Apectospermum exsertum* (P3) (Figure 1-4). Design prepared which avoids siting any infrastructure in the rail corridor on the northeast side of the rail main line. This design option was pursued as it avoids populations of several priority species immediately to northeast of selected Development Envelope including: • *Apectospermum exsertum* P3 (29 locations, 105 plants). • *Baeckea* sp. Perenjori P2 (1 location, unknown plants). • *Enekbatus longistylus* P3 (16 locations, 22 plants). • *Grevillea asparagoides* P3 (7 locations, 41 plants). • *Grevillea granulosa* P3 (22 locations, 150 plants).
Achievement of business objective through train and siding configurations.	Revision of planned siding length led to reduction from planned 58 wagons to 54 wagons, reducing length of siding required. Clearing for siding subsequently reduced at northwest end of design in polygon of Very Good condition vegetation. Reduction in siding length reduced the area of Very Good condition vegetation in the Development Envelope.
Avoid disturbance of clusters of priority flora.	Design prepared deliberately to not extend siding any further southeast than current Development Envelope. This avoids a cluster of priority flora locations including: • *Apectotospermum exsertum* P3 (11 locations, 35 plants). • *Grevillea asparagoides* P3 (5 locations, 10 plants). • *Enekbatus longistylus* P2 (7 locations, 9 plants). The result is avoidance of 23 locations of priority flora.

Avoidance Through Design Consideration	Avoidance Outcome
Avoid clearing of vegetation in Very Good Condition	Design prepared deliberately to not extend siding any further northwest than current Development Envelope. This avoids further clearing of vegetation in Very Good condition. In addition, the design cut off point at this location was chosen to minimise impacts to as the fauna habitat mapped as VSA 2 Complex Shrublands, extending to the northwest. VSA 2 was assessed as having the highest value for Black Cockatoo foraging with a quality score of 4/10 (Bamford Consulting Ecologists, 2023) of habitats in the Development Area. Disturbance of this habitat type was restricted to 0.053 ha (Figure 1-5). Impacts to areas of habitat with higher (4/10) Black Cockatoo foraging habitat scores were minimised. Development Envelope designed to maximise use of habitat type VSA 1, scored as 1/10 for foraging habitat quality.
Avoidance of additional clearing along siding by siting in existing cleared land.	Location of all laydowns and infrastructure supporting construction in existing cleared CBH land.
Avoidance of clearing along edges of rail corridor.	Construction access to siding area designed within existing cleared paddocks to the south and to utilise existing breaks in vegetation to access rail corridor tracks. Avoided additional clearing along edges of rail corridor by utilising adjacent paddocks and existing breaks in vegetation.

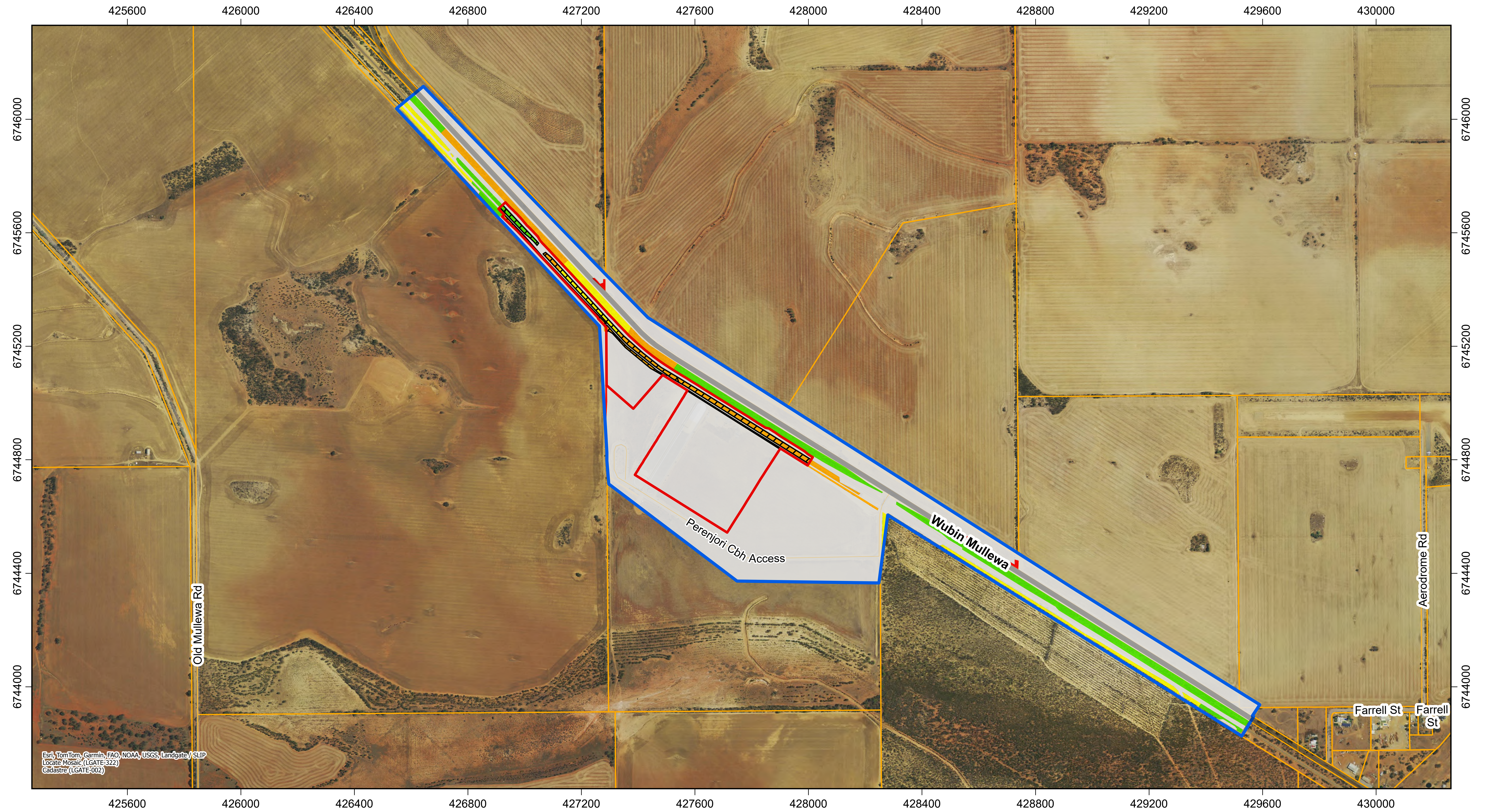

Figure 1-3 -Avoidance Through Design- Vegetation Condition

LEGEND

Boundaries

- ▭ Survey Area
- ▭ Development Envelope
- ▨ Disturbance Footprint
- ▭ Cadastre (LGATE-002)

Vegetation Condition

- 🟥 Completely Degraded
- 🟧 Degraded
- 🟨 Good
- 🟩 Very Good

⬜ Cleared

0 200 400 600 800
Metres

N

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Map Scale: 1:12,500 (when printed at A3)
Spatial Reference System: GDA2020 MGA Zone 50
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CBH Group
240 St Georges Terrace
Perth WA 6000
Ph (08) 9237 9600
Fax (08) 9322 3942

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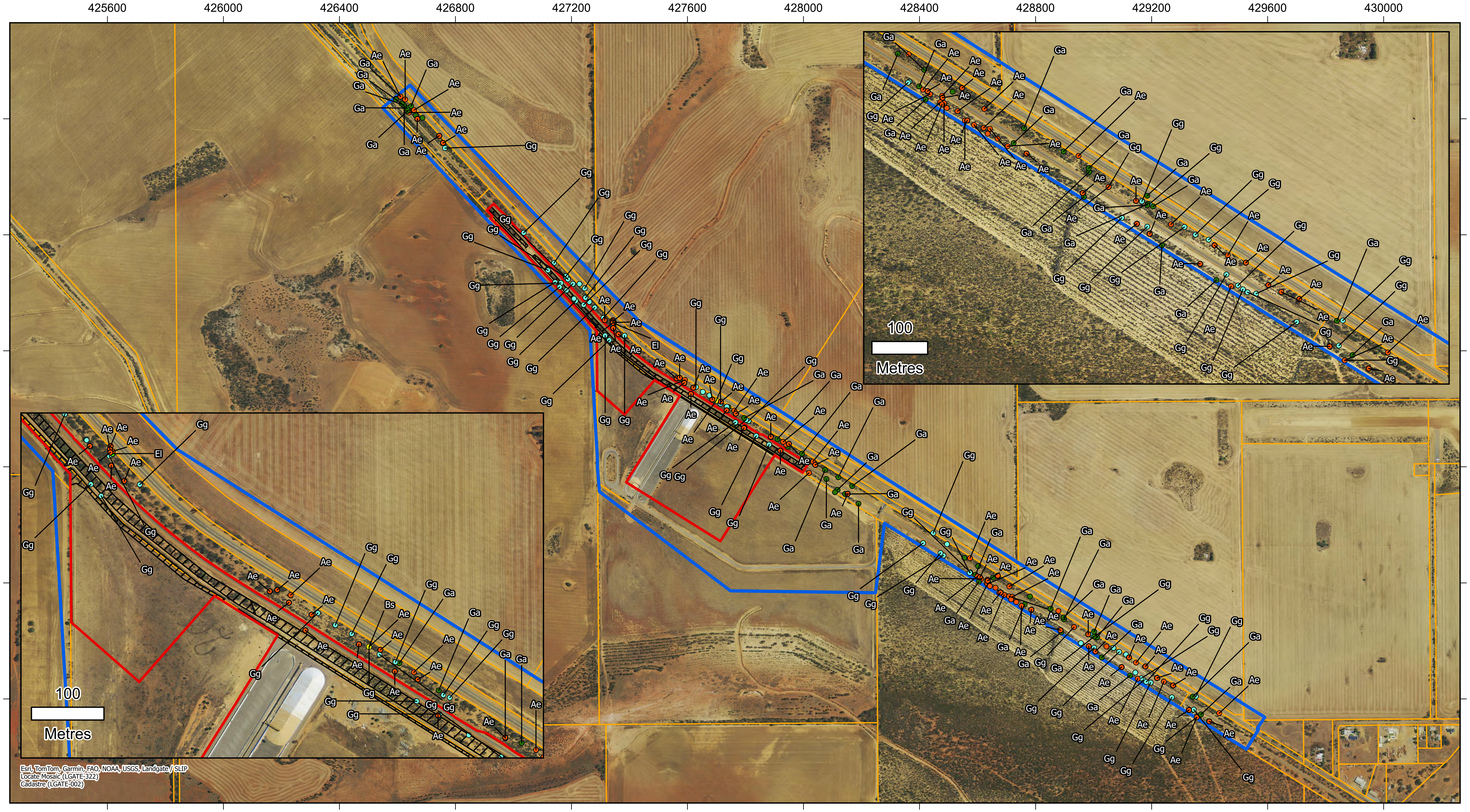

Esri, TomTom, Garmin, FAO, NOAA, USGS, Landgate / SLIP
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Cadastre (LGATE-002)

Figure 1-4 -Avoidance Through Design- Priority Flora

LEGEND

Boundaries

- ▭ Survey Area
- ▭ Development Envelope
- ▨ Disturbance Footprint
- ▭ Cadastre (LGATE-002)

Priority Flora

- ● P2 - Baeckea sp. Perenjori (J.W. Green 1516)
- ● P3 - Apectospermum exsertum
- ● P3 - Enekbatus longistylus
- ● P3 - Grevillea asparagoides
- ● P3 - Grevillea granulosa

0 200 400 600 800
Metres

N

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CBH Group
240 St Georges Terrace
Perth WA 6000
Ph (08) 9237 9600
Fax (08) 9322 3942

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Layout: F03b Priority Flora

Esri, TomTom, Garmin, FAO, NOAA, USGS, Landgate / SLIP
Locate Mosaic (LGATE-322)
Cadastre (LGATE-002)

Figure 1-5 -Avoidance Through Design- Fauna Habitat

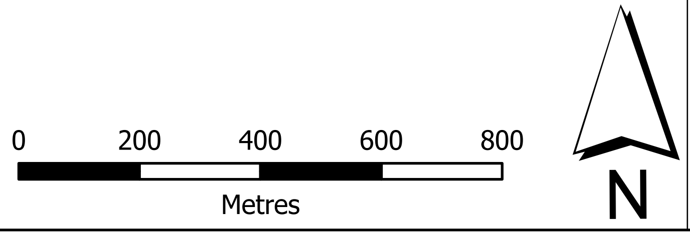
LEGEND

Boundaries

- ▭ Survey Area
- ▭ Development Envelope
- ▨ Disturbance Footprint
- ▭ Cadastre (LGATE-002)

Fauna Habitat

- ⬜ VSA 1 Cleared Paddocks
- 🟨 VSA 2 Complex Shrubland
- 🟩 VSA 3 Planted Trees



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Spatial Reference System: GDA2020 MGA Zone 50
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CBH Group
240 St Georges Terrace
Perth WA 6000
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Fax (08) 9322 3942

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Layout: F03c Fauna Habitat

1.5 Proposed clearing extent

The Project will result in clearing up to 2.503 ha of native vegetation in Very Good to Degraded condition (Figure 1-6). Additionally, 47 individuals from 14 record locations of Priority 3 species *Grevillea granulosa* and 6 individuals from three locations of Priority 3 species *Apectospermum exsertum* will be removed (Figure 1-7). See below for clearing extents. Vegetation or habitat values that occur adjacent to the Disturbance Footprint, will be managed to avoid and minimise indirect impacts.

1.6 Measures to avoid and minimise clearing

The mitigation hierarchy consists of four steps - Avoid, Minimise, Rehabilitate, and Offset, as outlined in the Statement of environmental principles, factors, objectives and aims of EIA (EPA, 2021).

Avoid – avoid the adverse environmental impact altogether. This may include reducing the footprint or changing the location of the footprint to avoid areas with high environmental values.

Minimise – limit the degree or magnitude of the adverse impact. This may include reducing the footprint or carefully selecting technologies, processes (such as re-use of waste products) and management measures (such as bunding or dust and noise control measures) to reduce the impact.

Rehabilitate – repair, rehabilitate or restore the impacted site as soon as possible. Adequate rehabilitation information is integral to the mitigation hierarchy to ensure early identification of knowledge gaps and risk as well as development of criteria and research to meet objectives.

Offset – undertake a measure or measures to provide a compensatory environmental benefit or reduction in environmental impact to counterbalance significant adverse environmental impacts from implementation of a project. The measure(s) are taken after all reasonable mitigation measures have been applied and a significant environmental risk or impact remains.

These steps have been applied by CBH at several stages during the planning process to ensure the impacts are as low as reasonably practicable. The proposed avoidance and minimisation measures are described in detail below.

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Locate Mosaic (LGATE-322)
Cadastre (LGATE-002)

Figure 1-6 -Clearing Impact- Vegetation Condition

LEGEND

- ☐ Development Envelope
- ▨ Disturbance Footprint
- ☐ Cadastre (LGATE-002)

Priority Flora

- ● P3 - Apectospermum exsertum
- ● P3 - Grevillea granulosa

Vegetation Condition

- ⬜ Cleared
- 🟥 Completely Degraded
- 🟧 Degraded
- 🟨 Good
- 🟩 Very Good

Publication Date: 27/03/2024 8:48 AM
Map Scale: 1:6,000 (when printed at A3)
Spatial Reference System: GDA2020 MGA Zone 50
Datum: GDA2020
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240 St Georges Terrace
Perth WA 6000
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Fax (08) 9322 3942

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Layout: F04a Clearing Impact VegCond

Figure 1-7 -Clearing Impact- Vegetation Communities

LEGEND

- 🟥 Development Envelope
- ▨ Disturbance Footprint
- 🟧 Cadastre (LGATE-002)

Priority Flora

- ● P3 - Apectospermum exsertum
- ● P3 - Grevillea granulosa

Vegetation

- ⬜ Cleared
- 🟥 EeMhAe: Melaleuca Tall Open Shrubland
- 🟩 ElsEttCe: Eucalyptus Mid Open Woodland
- 🟦 GofWaa: Grevillea Tall Open Shrubland
- 🟩 Planted

Vegetation	Clearing Required (ha)
EeMhAe	1.22
ElsEttCe	0.03
GofWaa	1.24
Planted	0.02
Total	**2.50**

0 100 200 300 400
Metres

N

Publication Date: 27/03/2024 8:53 AM
Map Scale: 1:6,000 (when printed at A3)
Spatial Reference System: GDA2020 MGA Zone 50
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CBH Group
240 St Georges Terrace
Perth WA 6000
Ph (08) 9237 9600
Fax (08) 9322 3942

1.6.1 Impact avoidance through alternative project options

A series of workshops were conducted involving CBH staff to assess the options for this Project. Four concepts were proposed and assessed against a number of criteria including the extent of the Development Envelope and Disturbance Footprint. The Perenjori North Receival Site was selected as a preferred location over expanding the Perenjori Receival Site in the town, as it avoided the need to clear vegetation for the expansion of the grain storage facility due to the lack of remnant vegetation on the CBH owned land. Additionally, the site was selected as it was identified that the vegetation within the rail corridor adjacent to the CBH land, where a rail siding would be required, was generally low, shrubby and degraded; and was therefore considered less likely to contain key values such as occurrences of the Eucalypt Woodlands of the Western Australian Wheatbelt TEC or potential Black Cockatoo nesting and roosting sites (Figure 1-5).

1.6.2 Impact avoidance through environmental management

Methods that will be used during construction to minimise impacts on surrounding vegetation include:

- Utilisation of existing cleared land for the storage of materials;
- Using existing track and road systems for access;
- Driving over areas of scrub instead of clearing track for access where practicable; and
- Prune rather than clearing where possible.

A Construction Environmental Management Plan (CEMP) will be prepared by CBH prior to construction which will build on CBH's standard CEMP and will detail procedures to minimise impacts to vegetation during clearing and construction works and minimise risk of indirect impacts to adjacent vegetation.

2. Existing Environment

2.1 Biogeographic and regional setting

The Development Envelope is located in the northeast part of the Merredin subregion of the Avon Wheatbelt Interim Biogeographical Regionalisation for Australia (IBRA) bioregion (DoEE 2018). The Avon Wheatbelt bioregion is described as a dissected plateau of Tertiary laterite in the Yilgarn Craton with a semi-arid (dry) warm Mediterranean climate (AECOM, 2023). The Merredin subregion is further described as having no connected drainage and streams, which are remnants of ancient drainage systems flow only during wet years and drain to chains of salt lakes (AECOM, 2023).

The climate of Perenjori can be characterised by hot and dry summers, long and cold winters, and is typically windy and mostly clear year-round. The closest Bureau of Meteorology (BOM) weather station is the Morawa Airport Weather Station (ID 008296), approximately 36 km from the township of Perenjori. The mean rainfall for the station is 290 mm with most rainfall occurring during the moths of June, July and August. The average temperatures are between 6o C and 39o C with the hottest months being December, January and February.

2.2 Geology, landform and soils

The Development Envelope is situated across one land system as mapped and described in DPIRD (2022) The Granada 1 Sub-system. The Granada 1 Sub-system, which characterised by undulating plain to low rises with broad convex gently inclined slopes; yellow and brown deep sands and loamy earths and some shallow loams over red-brown hardpans (AECOM, 2023).

2.3 Acid sulfate soils

Acid Sulfate Soils (ASS) are naturally occurring, iron-sulphide rich soils, sediments or organic substrates formed under waterlogged conditions. If exposed to oxygen, these sulphides can oxidise and release sulphuric acid and mobilise heavy metals. This process can occur in response to drainage, dewatering or excavation.

The Australian Soil Resource Information System (ASRIS) ASS risk mapping indicates that there is a ‘low’ risk of ASS occurring within 4 m of natural soil surface within the Project Area (CSIRO 2019). Soils sampling undertaken by WPS in 2023 indicated that none of the samples indicated the presence of Potential Acid Sulfate Soils and that it is unlikely to be encountered within the Development Envelope (WSP, 2023).

2.4 Hydrology

2.4.1 Groundwater

The Development Envelope does not lie within any Public Drinking Water Source areas (DWER, 2020a).

A groundwater monitoring well installed within the Development Envelope in 2023 reported the groundwater depth to be 10.5 m below ground level (WSP, 2023).

2.4.2 Surface water

The Development Envelope lies within the Northern Zone of Ancient Drainage (HZ07_NAD) hydrological zone (DPIRD, 2018b). The Northern Zone of Ancient Drainage zone is described as “An ancient plain of low relief & lateritic uplands on weathered granite. Ranges & stony plains in the north-east. No connected drainage, remnant salt lake chains occur in ancient drainage systems which now only function in very wet years.” (DPIRD, 2018b). The Development Envelope lies within the Yarra Monger Hydrographic Catchment (DWER, 2018a) and within the Yarra Hydrographic Sub-catchment (DWER, 2018b).

2.5 Pre-European Vegetation

Pre-European Vegetation mapping (DPIRD, 2013) indicates that the vegetation within the Development Envelope was classified as Wheatbelt, Goldfields, Riverine and Tropical.

Beard (1990) characterises the area as Vegetation Association 352, characterised by Medium woodland; York gum (*Eucalyptus loxophleba*) & salmon gum (*Eucalyptus salmonophloia*). Vegetation Association 352 has been largely cleared within Western Australia, the Avon Wheatbelt IBRA Regions, and the Shire of Perenjori.

2.6 Environmentally Sensitive Areas

The Development Envelope is not mapped as an Environmentally Sensitive Area (ESA) (DWER, 2021).

2.7 Areas of Conservation Significance

There are no areas of conservation significance, such as National Parks, Regional Parks, Conservation Reserves or Wetlands mapped within the Development Envelope.

3. Biological Environment

3.1 Biological Surveys

CBH commissioned four biological surveys comprising Reconnaissance level flora and vegetation, Detailed level flora and vegetation, Targeted threatened and priority flora, Basic fauna and Targeted Black Cockatoo surveys. The biological surveys are summarised below:

- Reconnaissance Flora, Vegetation and Basic Fauna Survey Report (undertaken out of season; winter 2022) (Bio Diverse Solutions, 2022);
- Perenjori-Flora and Vegetation Assessment (Detailed and Targeted spring season survey) (AECOM, 2023);
- Perenjori Fauna Assessment (Bamford Consulting Ecologists, 2023); and
- Perenjori – Targeted Flora Survey (AECOM, 2024).

The Survey Area encompassed approximately 125 ha with the 21.5 ha Development Envelope contained within this area. A larger Survey Area was targeted to allow for design changes to avoid areas with higher environmental values.

3.2 Flora and Vegetation

As the AECOM (2023) spring season Detailed and Targeted level survey in combination with the follow up Targeted Flora Survey (AECOM, 2024) are more recent and comprehensive it is considered to supersede the previous Reconnaissance level survey. A combined dataset of Priority flora locations from the Bio Diverse Solutions (2022), AECOM (2023) and AECOM (2024) was utilised for Priority flora assessment to allow for multi season (winter and spring) targeted assessment.

3.2.1 Desktop Assessment

The desktop study identified 105 significant flora species including 27 species listed as Threatened under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and Biodiversity Conservation Act 2016 (BC Act), and 78 species listed as Priority by Department of Biodiversity, Conservation and Attractions (DBCA). Of these 105 species, three were ‘known’ to occur and one was ‘likely’ to occur based on habitat presence, proximity of known records, and age of records (AECOM, 2023). See detailed pre and post survey likelihood of occurrence assessment in Appendix A of AECOM (2023).

One Threatened Ecological Community (TEC) was “likely to occur” based on DBCA extrapolated mapping using aerial imagery. The Eucalypt Woodlands of the WA Wheatbelt TEC is listed as Critically Endangered under the EPBC Act (AECOM, 2023).

3.2.2 Flora

Field surveys undertaken by Bio Diverse Solutions (2022) and AECOM (2023) identified a total of 97 native flora species. Families best represented include Myrtaceae (14 species) and Protaceae (10 species). No flora species representing significant range extensions were recorded.

Nine weed species were recorded, of which *Leontodon rhagadioloides* (Cretan Weed) was the most common in quadrats. Based on observations, *Avena barbata* (Bearded Oat) was the most common weed species causing displacement of native vegetation.

3.2.3 Conservation Significant Flora

No threatened flora species were recorded within the Development Envelope (AECOM, 2023).

Five Priority flora species were reported by AECOM (2023, 2024). One species underwent a taxonomic revision and change to Priority listing in the interval between the 2023 spring season Detailed and Targeted level survey and the targeted follow up survey (AECOM, 2024):

- *Baeckea* sp. Perenjori (J.W. Green 1516) (P2) collected at quadrat 3, not counted at the time, sample was sterile;
- *Enekbatus longistylis* (P3, previously listed as P1) collected at quadrat 2, not counted at the time due to inability to confidently identify species in the field; during the targeted survey 22 individuals were counted;
- *Grevillea asparagoides* (P3) known to occur, represents common understorey species, 67 individuals counted;
- *Grevillea granulosa* (P3) known to occur, sterile at time of survey so confident identification was difficult. Seven individuals were counted in the survey. More than 60 individuals were counted in previous surveys (BDS, 2020); and
- *Apectospermum exsertum* (P3) (previously known as *Leptospermum exsertum*, listed as P1) known to occur, common understorey species, more than 150 individuals counted during the detailed survey. During the targeted survey, 97 individuals were counted at 26 locations during the targeted survey.

Of these only two species *Grevillea granulosa* (P3) and *Apectospermum exsertum* (P3) have been found to occur within the Development Envelope.

- *Grevillea granulosa* (P3): 47 individuals from 14 locations; and
- *Apectospermum exsertum* (P3): six individuals at three locations.

3.2.4 Vegetation

Four native vegetation communities which intersect the Development Envelope were described and mapped By AECOM (2023). These are:

- Eucalyptus Mid Open Woodland – ElsEttCe;
- Grevillea Tall Open Shrubland – GofWaa;
- Melaleuca Tall Open Shrubland – EeMhAe; and
- Planted and Cleared.

Table 3-1: Vegetation Type Extent Summary in Disturbance Footprint (AECOM, 2023)

Vegetation Type	Extent (ha)	% of Disturbance Footprint
EeMhAe- Melaleuca Tall Open Shrubland	1.223	48.86
GofWaa- Grevillea Tall Open Shrubland	1.235	49.34
ElsEttCe-Eucalyptus Mid Open Woodland	0.028	1.12
Cleared	0.016	0.64
Total	2.503	100%

Presence of the Eucalypt Woodland of the WA Wheatbelt TEC was assessed. No patches of vegetation were assessed as meeting the key diagnostic characteristics to be considered part of the federally protected TEC (AECOM, 2023).

Majority of land within the Development Envelope is cleared. The remaining area is vegetated, with varying vegetation conditions ranging between Very Good to Degraded. Decline in condition was evident in the form of weed invasion, historical disturbance (buried pipeline), and gravel extraction. The Survey area is intersected by several infrastructure corridors (road, rail and rail access road) resulting in edge effects including clearing (vehicle turnaround points) and erosion (sedimentation) (AECOM, 2023) impacting the Development Envelope.

Within the Disturbance Footprint 0.64% is Completely Degraded, 75.75% is Degraded, 14.42% is Good condition and 9.14% is in Very Good condition vegetation see Table .

Table 3-2: Vegetation Condition Extent Summary in Disturbance Footprint

Vegetation Condition	Area (ha)	Percentage of Disturbance Footprint
Very Good	0.229	9.15%
Good	0.361	14.42%
Degraded	1.896	75.75%
Completely Degraded	0.016	0.64%
Total	2.503	100%

3.3 Terrestrial Fauna

As the Bamford Consulting Ecologists (2023) fauna assessment and Targeted Black Cockatoo survey is more recent and comprehensive it is considered to supersede the previous Basic level fauna survey (Bio Diverse Solutions, 2022). Only the results of the Bamford Consulting Ecologists (2023) assessment are presented in the following sections.

3.3.1 Fauna assemblage

A total of 218 vertebrate fauna species were identified through the Desktop Survey by Bamford Consulting Ecologists (2023) as potentially occurring comprising:

- Six frogs;
- 50 reptiles;
- 144 birds;
- 13 native mammals; and
- Five introduced mammals.

Many of the expected species, particularly among the birds, would occur only irregularly. The high number of reptile species cannot be quantified, as the persistence of reptiles in fragmented landscapes is poorly-understood. Twenty-nine native vertebrates species that would have once been present are now extinct (3 mammal species), or considered locally extinct (3 reptiles, 5 birds, and 18 mammals) (Bamford Consulting Ecologist, 2023).

3.3.2 Conservation Significant Fauna

Seven vertebrate species that are listed under the EPBC and BC Acts or publications are expected to potentially occur in the Development Envelope, they are expected to occur mostly as irregular visitors (3 species), or vagrants (3 species), with only one (Peregrine Falcon) expected as a regular visitor. No invertebrate species of conservation significance are considered likely to occur in the Development Envelope.

Species reported by Bamford Consulting Ecologists (2023) as potentially occurring and comments on habitat suitability below:

- Western Spiny-tailed Skink (*Egernia stokesii badia*)- Irregular visitor. The species is present in the general area, with two known records less than 2km from the southern end of the Survey Area (one from 2008 and the other from 1998), and several additional known records in patches of remnant vegetation within 15km. The Development Envelope does not provide favoured habitat for the species (large trees with crevices and hollows), but individuals may occasionally move through the area.

- Fork-tailed Swift (*Apus pacificus*) Irregular visitor. Largely aerial species of unpredictable occurrence. Being aerial, it is effectively independent of terrestrial ecosystems when in Australia.

- Peregrine Falcon (*Falco peregrinus*) Regular visitor. The Peregrine Falcon is known from the general region. The Survey Area does not contain suitable habitat for nesting (tall trees or cliff faces).

- Malleefowl (*Leipoa ocellata*) Irregular visitor. Species would almost certainly have been resident in the area historically, and there are multiple records in the general region; these are mostly confined to large reserves, but clearing and feral predators have reduced its population in the region. Individuals may still disperse through the project area infrequently, but it is not expected to be resident due to the small area of native vegetation present. No nesting mounds were found.

- Carnaby’s Black-Cockatoo (*Zanda (Calyptorhynchus) latirostris*). Vagrant. The species would almost certainly have been at least an irregular visitor to the project area historically, as Perenjori lies on the edge of its known range. There are records of the species, mostly to the west of Perenjori. Due to extensive habitat loss, it is now likely to occur only as a vagrant. There is limited foraging habitat and no nesting habitat in the Survey Area.

- Grey Wagtail (*Motacilla cinerea*) Vagrant. The Grey Wagtail is a vagrant to the south-west region, and when reported tends to be close to the fringe of shallow wetlands or on irrigated grasslands. The Survey Area thus lacks habitat for a species that is not expected to occur regularly within the greater region.

3.3.3 Fauna Habitat

Overall, the assemblage of vertebrate fauna expected in the Development Envelope is typical of degraded and fragmented vegetation in the Wheatbelt region, characterised by species loss (particularly mammals), a high proportion of species expected only irregularly, and uncertainty as to the status of many species (likely to be irregular visitors or absent). Due to the scarcity of vegetation in and around the survey area, several species that would typically be expected as residents in wheatbelt locations may actually be locally extinct in the Perenjori area.

Two vegetation and substrate associations (VSAs) were identified in the Development Area:

- VSA 1. Cleared Paddocks. Weedy grasses and herbs; some cereal crops; and
- VSA 2. Complex Shrubland. Diverse shrubland consisting of *Acacia, Hakea, Allocasuarina, Calothamnus* and *Melaleuca* and occasional mallee eucalypts, over mixed shrubs including *Verticordia, Jacksonia, Ptilotus*, over mixed herbs and grasses on sandy loam.

The fauna habitat type occurring within the Development Envelope were assessed as unlikely to be of significant value for fauna except for widespread species that occur on farmland. With the exception of Peregrine Falcon, habitat use by other potentially occurring conservation significant species is limited to infrequent visitation or dispersal (Bamford Consulting Ecologists, 2023).

VSA extent within the Disturbance Footprint (areas where native vegetation is to be removed) are summarised below in Table .

Table 3-3: Fauna Habitat Type Extent Summary in Disturbance Footprint (Bamford Consulting Ecologists, 2023)

Fauna Habitat Type	Extent (ha)	% of Disturbance Footprint
VSA 1 Cleared Paddocks	2.45	97.88%
VSA 2 Complex Shrubland	0.053	2.12%
Total	2.503	100%

3.3.4 Black Cockatoo Habitat

The Development Envelope is outside of the modelled distribution of the Forest Red-tailed and Baudin's Black-Cockatoos, however, is within the modelled distribution of Carnaby's Black-Cockatoo (Bamford Consulting Ecologists, 2023). Carnaby's Black-Cockatoo was not recorded during Bamford Consulting Ecologists (2023) fauna survey, and there was no evidence of foraging by this species.

3.3.5 Breeding habitat

There were no recorded trees that met the potential nest-tree criteria, as all were too small. There are no known breeding sites within 15 km of the Survey Area. There are two known breeding sites within 40 km of the Survey Area; these are located c. 24 km and c. 28 km west of the Survey Area (Bamford Consulting Ecologists, 2023).

3.3.6 Roosting habitat

It is unlikely that any trees in the Development Envelope would be used for roosting by Carnaby's Black-Cockatoo as they are generally small, and there are no known black-cockatoo roost sites within 40 km of the Survey Area (Bamford Consulting Ecologists, 2023).

3.3.7 Foraging habitat

Habitat for Carnaby's Black-Cockatoo within the Development Envelope was assessed as in general of low foraging value. The assessment scored habitat types on a 1-10 scale for quality, see Bamford Consulting Ecologists (2023) for methodology. The foraging habitat types intersecting the Development Envelope are summarised Table in below.

Table 3-4: Black Cockatoo Foraging Habitat Scores

VSA Name	Foraging Habitat Description	Extent in Development Envelope	Bamford Foraging Habitat Score
VSA 01	Weedy grasses and herbs	2.449	1/10
VSA 02	Contains some shrubs that are likely to be suitable for foraging by the species e.g. *Hakea, Allocasuarina*.	0.053	4/10
Total	-	2.503	-

4. Assessment Against the 10 Clearing Principles

An assessment of the 2.503 ha of native vegetation clearing against the Ten Native Vegetation Clearing Principles contained in Schedule 5 of the EP Act is provided in Table .

The proposed clearing is likely to be at variance with Clearing Principles (a) and (e).

Table 4-1: Assessment Against 10 Clearing Principles

Assessment Results	Data Source/Tools for Assessment	Conclusion
Principle (–) - Native vegetation should not be cleared if it comprises a high level of biological diversity.		
The Disturbance Footprint occurs within the Geraldton to Shark Bay sandplains biodiversity hotspot identified by the Threatened Species Scientific Committee (TSSC). A total of 105 significant flora species were identified as potentially occurring within 40 kms of the Disturbance Footprint based on a desktop assessment completed by AECOM (2023). A search of the Department of Biodiversity, Conservation and Attractions (DBCA) Database identified no Priority Ecological Communities (PECs) likely to occur within the area. A search of the DBCA TEC spatial datasets identified one Threatened Ecological Community (TEC) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), The Eucalypt Woodlands of the WA Wheatbelt as likely to occur on or within 20 km of the Disturbance Footprint. **T**he field survey, in November 2022 and subsequent assessment completed by AECOM (2023), confirmed that none of the mapped vegetation communities within the Development Envelope resemble known TECs and PECs. A total of 97 native flora species were recorded during the survey. No flora species representing significant range extensions were recorded AECOM (2023). The occurrence of Priority species was assessed using a combined dataset of AECOM’s October 2023 Targeted flora survey, AECOM's November 2022 Detailed level survey and the Bio Diverse Solutions June 2022 Reconnaissance level survey records. Two Priority flora species, *Grevillea granulosa* (Priority 3) and *Apectospermum exsertum* (P3) were identified within the Disturbance Footprint**.** Two Priority flora species *Baeckea* sp. Perenjori (Priority 2) and *Enekbatus longistylis* (Priority 3) were not recognised as a Priority species in the field during the detailed	DBCA TEC spatial datasets: Protected Matter Search Tool (DCCEEW, 2023). Western Australian Herbarium (WAH, 1998) records. WA Threatened & Priority Flora List under WC Act (DPaW, 2018). Priority Ecological Communities List for WA (DPaW, 2021). Australia's Bioregions (DCCEEW, 2021). Field survey: Perenjori - Targeted Flora Survey (AECOM, 2024). Perenjori - Flora and Vegetation Assessment (AECOM, 2023). Reconnaissance Flora, Vegetation and Basic Fauna Report	Likely to be at variance.

<table>
<tr><th>Assessment Results</th><th>Data Source/Tools for Assessment</th><th>Conclusion</th></tr>
<tr><td>level survey and were subsequently identified from quadrat collections. Individuals were therefore not marked, and records are from quadrat locations only. AECOM concluded that both occurrences are considered under representations of their actual extent and abundance in the area. *Enekbatus longistylus* was recorded outside the Disturbance Footprint during the targeted survey in 2023. Given that both species were still sterile at the time of the targeted survey and the level of difficulty to identify small-leafed Myrtaceae without flowers, AECOM (**2024**) concluded that the survey did not provide accurate population information. One other species, *Grevillea asparagoides* (Priority 3) was recorded in the flora and vegetation survey area**,** however in areas outside of the Disturbance Footprint.

Majority of land within the Development Envelope is cleared. Within the Disturbance Footprint vegetation condition varying between Very Good and Completely Degraded. Decline was evident in the form of weed invasion, historical disturbance (buried pipeline), and gravel extraction. Numerous infrastructure corridors (road, rail and rail access road) intersect the survey area resulting in edge effects including clearing (vehicle turnaround points) and erosion (sedimentation).

Vegetation Condition Extent Summary in Disturbance Footprint

<table>
<tr><th>Condition</th><th>Extent (ha)</th><th>% of Site</th></tr>
<tr><td>**Very Good**</td><td>0.229</td><td>9.15%</td></tr>
<tr><td>**Good**</td><td>0.361</td><td>14.42%</td></tr>
<tr><td>**Degraded**</td><td>1.896</td><td>75.75%</td></tr>
<tr><td>**Completely Degraded**</td><td>0.016</td><td>0.64%</td></tr>
<tr><td>**Total**</td><td>2.503</td><td>100</td></tr>
</table>
The presence of good quality, intact native vegetation in the Wheatbelt region is rare, despite this vegetation being interspersed with infrastructure corridors and worse quality vegetation.

Based on this assessment, it is considered that the Good (0.361 ha) and Very Good (0.229 ha) condition vegetation within Disturbance Footprint may represent a high level of biological biodiversity and the proposed clearing is likely to be at variance with this principle.</td><td>(BioDiverse Solutions 2022).</td><td></td></tr>
<tr><td colspan="3">**Principle (b) - Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia**</td></tr>
<tr><td>Bamford Consulting Ecologists (2023) identified 218 vertebrate fauna species as potentially occurring in the overall Survey Area comprising:</td><td>• Perenjori Fauna Assessment (Bamford</td><td>Unlikely to be at variance</td></tr>
</table>

Assessment Results	Data Source/Tools for Assessment	Conclusion
- six frogs. - 50 reptiles. - 144 birds. - 13 native mammals. - five introduced mammals. Many of the expected species, particularly among the birds, would occur only irregularly. The high number of reptile species cannot be qualified as the persistence of reptiles in fragmented landscapes is poorly-understood. Twenty-nine native vertebrate species that would have once been present are now extinct (3 mammal species), or considered locally extinct (3 reptiles, 5 birds, and 18 mammals). Overall, the assemblage of vertebrate fauna expected in the Disturbance Footprint is typical of degraded and fragmented vegetation in the Wheatbelt region, characterised by species loss (particularly mammals), a high proportion of species expected only irregularly, and uncertainty as to the status of many species (likely to be irregular visitors or absent. Due to the scarcity of vegetation in and around the survey area, several species that would typically be expected as residents in wheatbelt locations may actually be locally extinct in the Perenjori area. Seven vertebrate species that are listed under EPBC and EP Act or publications are expected to potentially occur in the Disturbance Footprint, they are expected to occur mostly as irregular visitors (3 species), or vagrants (3 species), with only one (Peregrine Falcon) expected as a regular visitor. No invertebrate species of conservation significance are considered likely to occur in the Disturbance Footprint. The fauna habitat type occurring within the Disturbance Footprint was assessed as unlikely to be of significant value for fauna except for widespread species that occur on farmland. With the exception of Peregrine Falcon, habitat use by other potentially occurring conservation significant species is limited to infrequent visitation or dispersal. The Disturbance Footprint is outside of the modelled distribution of the Forest Red-tailed and Baudin's Black-Cockatoos, however, is within the modelled distribution of Carnaby's Black-Cockatoo. Carnaby's Black-Cockatoo was not recorded within the Disturbance Footprint and there was no evidence of foraging by this species. The foraging value for Carnaby's Black-Cockatoo within the Disturbance Footprint was assessed as low. The two-fauna habitat types occurring within the Development Envelope (VSA 1 and VSA 2) were given a total score of	Consulting Ecologists, 2023) - DBCA fauna spatial datasets - Protected Matters Search tool (DCCEEW, 2023)	

Assessment Results	Data Source/Tools for Assessment	Conclusion
1/10 and 4/10 respectively for foraging value. Clearing of VSA 2 is limited to (0.053 ha). No trees in the Disturbance Footprint were suitable for black-cockatoo breeding, as they were all too small to contain hollows. It is unlikely that any trees in the Disturbance Footprint would be used for roosting by Carnaby's Black-Cockatoo as they are generally small, and there are no known black-cockatoo roost sites within 40 km of the project area. The fauna habitat occurring within the Disturbance Footprint is not considered to form a significant habitat for fauna indigenous to Western Australia. Clearing of VSA 2 is limited to (0.053 ha), due to the very small extent this is considered unlikely to form a significant foraging habitat for Black Cockatoo. Therefore, the proposed clearing is unlikely to be at variance with this principle.		
Principle (c) - Native vegetation should not be cleared if it includes or is necessary for the continued existence of, rare flora		
A desktop assessment using the DBCA flora database identified a total of 105 significant flora species as potentially occurring within 40 km of the Disturbance Footprint. Of these, one species was listed as Critically Endangered under the EPBC and BC Act, *Dasymalla axillaris*. No threatened flora species are recorded in the Disturbance Footprint. The native vegetation proposed to be cleared does not contain any Threatened or rare flora species and is unlikely to be necessary for the continued existence of threatened flora.	• DBCA TEC spatial datasets • Protected Matters Search tool (DCCEEW, 2023) • WA Threatened & Priority Flora List under WC Act (DPaW, 2015) • Priority Ecological Communities List for WA (DPaW, 2016) • Field survey • Perenjori – Flora and Vegetation Assessment (AECOM, 2023)	Unlikely to be at variance
Principle (d) - Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a Threatened Ecological Community		
An examination of DBCA TEC spatial database indicates that the Eucalypt Woodlands of the WA Wheatbelt TEC may occur in the Disturbance Footprint. No PECs are likely to occur on or within the vicinity of the Disturbance Footprint. The field survey conducted by AECOM in 2023 however, confirmed the absence of TEC or PEC occurrence within the Disturbance Footprint.	• DBCA TEC spatial datasets • Field survey • Perenjori – Flora and Vegetation Assessment (AECOM, 2023)	Unlikely be at variance

<table>
<tr><th>Assessment Results</th><th>Data Source/Tools for Assessment</th><th>Conclusion</th></tr>
<tr><td>The native vegetation present within the Disturbance Footprint does not comprise whole or part of, nor is it likely to be necessary for the maintenance of a TEC. Consequently, the clearing is not likely to be at variance with this principle.</td><td></td><td></td></tr>
<tr><td colspan="3">Principle (e) - Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been significantly cleared</td></tr>
<tr><td>The Disturbance Footprint is not within a constrained area (Swan Coastal Plain, Greater Bunbury Region Scheme, Peel Region Scheme and/or within the Bush Forever Study Area). The high-level vegetation association in this area has been mapped by Beard (1990) as the Vegetation Association 352, characterised by Medium woodland; York gum (<i>Eucalyptus loxophleba</i>) & salmon gum (<i>Eucalyptus salmonophloia</i>). Vegetation Association 352 has been largely cleared within Western Australia, the Avon Wheatbelt IBRA Regions, and the Shire of Perenjori. The status of the remaining pre-European vegetation is shown in the table below.

Beard et al. (1990) Vegetation Associations and Percent Remaining (Govt. of WA, 2019).

<table>
<tr><th>Vegetation Association</th><th>Description</th><th>% Remaining Western Australia</th><th>% Remaining Avon-Wheatbelt IBRA Region</th><th>% Remaining Shire of Perenjori</th></tr>
<tr><td>352</td><td>Medum woodland, York Gum</td><td>19.61</td><td>17.27</td><td>29.99</td></tr>
</table>

The National Objectives and Targets for Biodiversity Conservation 2001-2005 (Commonwealth of Australia, 2001) recognised the retention of 30% or more of the pre-clearing extent of each ecological community is necessary at a state level to protect Australia’s biodiversity.

According to figures obtained the Government of Western Australia (2019), none of the remaining native vegetation exceeds the acceptable minimum 30% retention objective of existing pre-European vegetation at a state level. The local target of 10% retention is satisfied, with 29.99% of the pre-European vegetation remaining in the Shire of Perenjori. Clearing of the remaining vegetation at the Disturbance</td><td>• Beard (1990).
• Field Survey.
• Perenjori – Flora and Vegetation Assessment (AECOM, 2023).</td><td>Likely to be at variance.</td></tr>
</table>

Assessment Results	Data Source/Tools for Assessment	Conclusion
Footprint will reduce the remaining extent further below the identified trigger level at a state level. The scarcity of remnant vegetation in the region renders any remaining remnant vegetation ecologically important. The Project is therefore likely to be at variance with this principle.		
Principle (f) - Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or a wetland		
There are no surface water features or vegetation associated with watercourses noted on or in the vicinity of the Disturbance Footprint. There are no wetlands within a 50 km radius of the Disturbance Footprint The native vegetation within the Disturbance Footprint is not growing in association with, a watercourse and therefore the Project is not at variance to this principle.	• Protected Matters Search Tool (DCCEEW, 2023). • Field survey. • Perenjori – Flora and Vegetation Assessment (AECOM, • 2023).	Is not at variance.
Principle (g) - Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation		
The Disturbance Footprint is situated on the Granada 1 Sub-system, which is characterised by undulating plains to low rises with broad convex gently inclined slopes; yellow and brown deep sands and loamy earths and some shallow loams over red-brown hardpans. Soils of this nature generally have a high permeability and therefore are unlikely to contribute to on site/off-site run-off. As the soil type is predominantly sand, it is less likely to be prone to water and/or wind erosion due to the particle size. Additionally, waterlogging is unlikely due to the nature of these soils. The mapped average annual rainfall in the local area, according to the Australian Bureau of Meteorology, is 334.8 mm. The Site is approximately 325 mAHD, with a generally gentle slope. As the area has relatively low rainfall and a small slope, is unlikely to heavily contribute to a potential for wind/water erosion and on-site/off-site runoff. The Disturbance Footprint mapped as having an extremely low probability of Acid Sulfate Soils (ASS) occurring. Localised soil acidity is unlikely to occur as a result of exposure of pyritic material to air and rainfall as a result of clearing. The closest groundwater conductivity reading to the Disturbance Footprint 600-2200 mS/m, therefore, with the rise of the water table	• Perenjori – Flora and Vegetation Assessment (AECOM, 2023). • Australian Bureau of Meteorology (2023). • Australian Soil Resource Information System (ASRIS, 2014). • Department of Primary Industries and Regional Development (DPIRD,2021).	Unlikely to be at variance.

Assessment Results	Data Source/Tools for Assessment	Conclusion
there is the risk of salinisation. Salinisation, as noted in onsite drainage networks, is often associated with clearing in this area. Therefore, the rise in groundwater in the creek, has the potential to increase the salinity of the surrounding soils. The proposed clearing will expose a large amount of land to erosion, however the locality and conditions render the eventuation of serious erosion, nutrient transport to sensitive receptors or alteration to any surrounding surface water regimes (none noted in Disturbance Footprint vicinity) are unlikely. Given the area of proposed clearing and the nature of the Disturbance Footprint it is unlikely that appreciable land degradation will result and therefore the Project is unlikely to be at variance with this clearing principle.		
Principle (h) - Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area		
The Disturbance Footprint is not located on a Conservation Reserve or Environmental Sensitive Area. The nearest conservation area to the Disturbance Footprint is an Un-named Nature Reserve, 5.8 km to the southwest and not ecologically linked. The large distance to a conservation reserve or an Environmental Sensitive Area means the Project is unlikely to be at variance to this principle.	• Perenjori – Flora and Vegetation Assessment (AECOM, 2023). • Site visit. • Aerial photographs.	Unlikely to be at variance.
Principle (i) - Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water		
There are no surface water features or vegetation associated with watercourses noted on or in the vicinity of the Disturbance Footprint. There are no wetlands within a 50 km radius of the Disturbance Footprint. Given the extensive clearing for agricultural use that already surrounds the Disturbance Footprint, the additional clearing is unlikely to result in significant changes to the water table and there for the Project is unlikely to be at variance with this principle.	• Perenjori – Flora and Vegetation Assessment (AECOM, 2023). • Field survey.	Unlikely to be at variance.
Principle (j) - Native vegetation should not be cleared if the clearing of the vegetation is likely to cause or exacerbate the incidence or intensity of flooding.		
There are no surface water features or vegetation associated with watercourses noted on or in the vicinity of the Disturbance Footprint. There are no wetlands within a 50 km radius of the Disturbance	• Site visit. • Perenjori – Flora and Vegetation	Unlikely to be at variance.

Assessment Results	Data Source/Tools for Assessment	Conclusion
Footprint. The soils and conditions onsite are not prone to waterlogging or generating surface water run-off. The Department of Environment and Regulations document “a guide to the assessment of applications to clear native vegetation” states the following for Principle (j): “Consideration of this principle may require extensive modelling of the whole catchment and should only be considered for large clearing projects. For smaller applications, clearing should not cause waterlogging (localised flooding).” Clearing of vegetation within the Disturbance Footprint is unlikely to increase or exacerbate the incidence of waterlogging or localised flooding.	Assessment (AECOM, 2023). • A guide to the assessment of applications to clear native vegetation (DER,2014). • Protected Matters Search Tool (DCCEEW, 2023).	

5. Assessment of Direct Impacts to Priority Flora Within Disturbance Footprint

To provide contextual information on species distribution and potential abundance, a regional assessment of known location records of Priority Flora *Grevillea granulosa, Apectospermum exsertum, Enekbatus longistylus* and *Baeckea* sp. Perenjori were undertaken. This assessment utilised the DBCA WA Herbarium database records and recent Threatened and Priority Flora Report Forms (not currently added to WA Herbarium Database).

The assessment identified the land use and tenure for each location record. An intersect between location records and land zoning (Landgate Map viewer 2023) and DBCA managed lands and reserves (DBCA - 011 (2023)) was undertaken. Due to limitations in the accuracy of locations, in particular pre 2000s GPS or pre GPS era, the location notes and descriptions for each record location were manually reviewed. Where a location description clearly describes the land use (e.g. northwest corner of reserve, along verge of road) this description has been used to assign land use.

5.1 Impacts to *Grevillea granulosa*

The species distribution range covers some 40,000 sq km and extends from Watheroo in the south, Nunierra in the north, Eradu in the west and Paynes Find in the east. There are 47 location records dispersed across the estimated species range (DBCA search record ID 63-0823FL). Two of these records were identified as re recordings or duplicates of existing known locations and have been treated as a single location record in assessment (Figure and Table in Appendix A). Removing duplicates leaves 45 location records. A breakdown of location records by land use and tenure is provided below in Table . The majority of location records (35 of 45) fall within Road, Rail or Rural land use. Nine records fall within a nature reserve or lands assumed to be managed as reserve.

A populations size estimate was undertaken for each location record. Due to majority of the location records (32 of 45) having no abundance information an accurate estimate of population could not be confidently undertaken.

Table 5-1: Locations of *Grevillea granulosa* within 40km of the Disturbance Footprint

Row Labels	Location records	Comments
Foreshore	1	Assume managed as reserve
Rail	4 (one duplicate of location removed)	
Nature Reserve	8 (one duplicate of location removed)	Five records fall within DBCA managed reserves, three are Shire or other.
Road	12	
Rural	19	

Row Labels	Location records	Comments
unknown	1	
Grand Total	45 (two duplicates removed)	

The assessment identified that 8 of the location records fall within nature reserves:

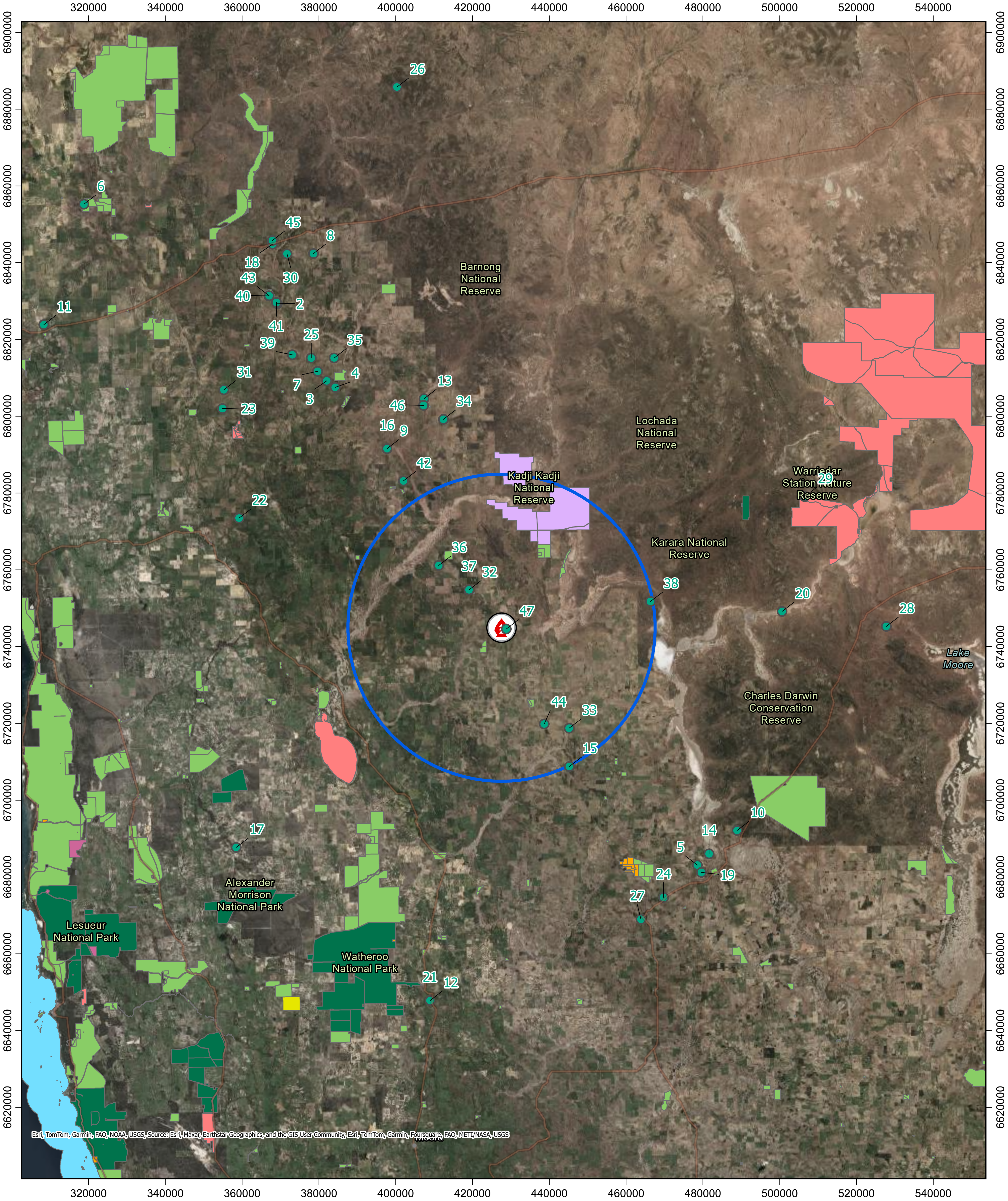
- Wilroy Nature Reserve;
- Bowgada Nature Reserve;
- McGauran Nature Reserve;
- Coalseam Conservation Park;
- Bowgada Nature Reserve;
- Bunjil (Non DBCA Land);
- Reserve 15565, Morawa-Yalgoo Road (Non DBCA land); and
- Doutha Soak Nature Reserve (Non DBCA reserve).

Each location record falls within a separate reserve. The presence of the species in multiple separate reserves across the estimated range decrease the risk of species decline.

Within the areas covered by biological surveys (AECOM, 2023 and Biodiverse Solutions, 2022) a total of 274 plants from 66 points were recorded. The records were occurring as a single continuous population along the road verge and rail corridor.

The Disturbance Footprint intersects with 47 plants from 14 points. These plants comprise 17.15 % of the 274 plants recorded from the population identified by the biological surveys occurring within the Development Envelope and immediate surrounds. The clearing of 47 plants within the Disturbance Footprint will result in the removal of a proportion of one population. The regional assessment identified 45 location records of individual populations over an estimated 40,000 sq km species range. Of the 45 location records eight were assessed as occurring within separate area with reserve land use.

Among the eight reserves identified five had population estimates totalling 139 individual plants. These records occurred in survey areas ranging from 0.25 ha to 0.5 ha. There was an increase in each population estimate as the survey area increased. The only comparable survey area to the one undertaken for this Project was found at a rural site, where over 1000 mature plants were identified over a 5 km distance. Within a 40 km radius of the survey area (Figure), seven points were identified. Two reserves, Caron National Park (295 ha) and Bowgada Nature Reserve (148 ha), occur within the 40 km radius of the site. These two points had records of "common" and 50+ mature plants, over a 0.5 ha survey area respectively.



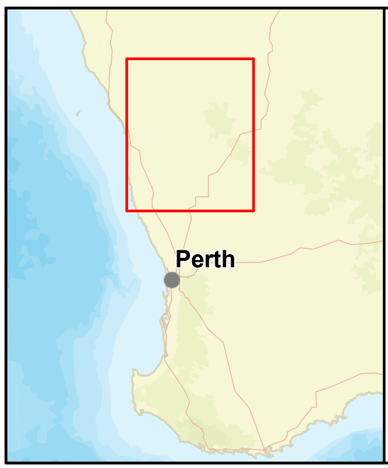


Figure 5-1 Regional Population Assessment of *Grevillea granulosa*

Legend

- ◉ Development envelope
- ○ Penrenjori 40km radius

Priority Flora

- ● Grevillea granulosa

Legislated Lands and Waters (DBCA-011)

- 🟥 Conservation Park
- 🟦 Marine Park
- 🟩 National Park
- 🟩 Nature Reserve
- 🟨 Section 34A Freehold
- 🟪 Section 5(1)(g) Reserve
- 🟧 Section 5(1)(h) Reserve
- 🟪 Timber Reserve

0 10 20

Kilometres

N

Map Scale: 1:900,000 (when printed at A3)
Reference System: GDA2020 MGA Zone 50
Datum: GDA2020
Map Units: Metres

CBH Group
240 St Georges Terrace
Perth WA 6000
Ph (08) 9237 9600
Fax (08) 9322 3942

Publication Date: 20/03/2024 2:10 PM
Project Name: L:\Environment & Sustainability\GIS_DATA\Project _work\Perenjori\GIS2024020_Perenjori_Figures\Pro_Project\GIS2024020 Perenjori.aprx
Layout Name: F05 Population Gg

5.2 Impacts to *Apectospermum exsertum*

The species distribution range covers some 17,000 sq km and extends from Maya in the southeast to Mullewa in the northwest. There are 21 location records dispersed across the estimated species range (DBCA search record ID 52-0224FL). Six of these records were identified as re recordings or duplicates of existing known locations and have been treated as a single location record in assessment (Figure and Table 8-2in Appendix B). Removing duplicates leaves 15 location records. A breakdown of location records by land use and tenure is provided below in Table . The majority of location records (11 of 15) fall within Road, Rail or Rural land use. Two records fall within a nature reserve or lands assumed to be managed as reserve.

A populations size estimate was undertaken for each location record. Due to majority of the location records (12 of 15) having no abundance information an accurate estimate of population could not be confidently undertaken.

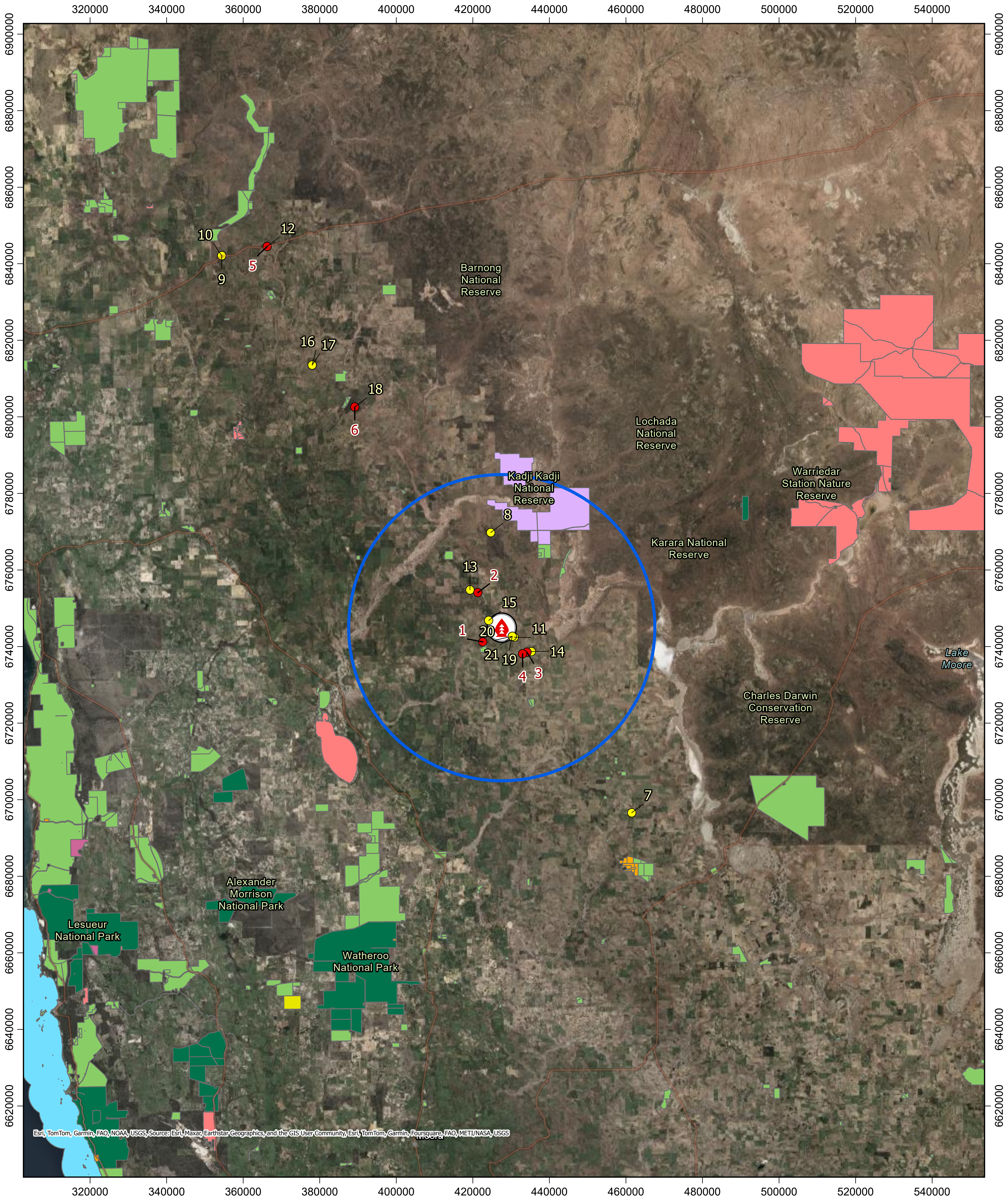
Table 5-2: Locations of *Apectospermum exsertum* within 40km of the Disturbance Footprint

Row Labels	Location records	Comments
Rail	3 (two duplicates of location removed)	
Nature Reserve	2	One records falls within DBCA managed reserves, the second record is classed as Crown reserve.
Native Vegetation	1	Unknown if within reserve
Road	5	
Rural	3 (three duplicates removed)	
Residential	1 (one duplicate of location removed)	
Grand Total	15 (six duplicates removed)	

The assessment identified that one of the location records falls within the Bowgada Nature Reserve.

Within the areas covered by biological surveys (AECOM, 2023 & 2024) a total of 260 plants from 61 points were recorded. The records were occurring as a single continuous population along the road verge and rail corridor.

The Disturbance Footprint intersects with six plants from three points. These plants comprise 2.3% of the 260 plants recorded from the population identified by the biological surveys occurring within the Development Envelope and immediate surrounds. The clearing of six plants within the Disturbance Footprint will result in the removal of a proportion of one population. The regional assessment identified 15 location records of individual populations over an estimated 17,000 sq km species range. Of the 15 location records two were assessed as occurring within separate area with reserve land use.



Esri, TomTom, Garmin, FAO, NOAA, USGS, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

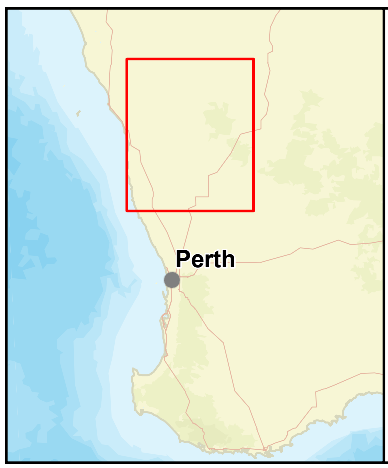


Figure 5-2 Regional Population Assessment *Apectospermum exsertum*

0 10 20 Kilometres

N

Map Scale: 1:900,000 (when printed at A3)
Reference System: GDA2020 MGA Zone 50
Datum: GDA2020
Map Units: Metres

Legend

- Development envelope
- Penrenjori 40km radius

Priority Flora

- 🟡 Apectospermum exsertum - WAHerb Data
- 🔴 Apectospermum exsertum - TPFL Data

Legislated Lands and Waters (DBCA-011)

- 🟥 Conservation Park
- 🟦 Marine Park
- 🟩 National Park
- 🟩 Nature Reserve
- 🟨 Section 34A Freehold
- 🟪 Section 5(1)(g) Reserve
- 🟧 Section 5(1)(h) Reserve
- 🟪 Timber Reserve

CBH Group
240 St Georges Terrace
Perth WA 6000
Ph (08) 9237 9600
Fax (08) 9322 3942

Publication Date: 27/03/2024 9:08 AM
Project Name: L:\Environment & Sustainability\GIS_DATA\Project _work\Perenjori\GIS2024020_Perenjori_Figures\Pro_Project\GIS2024020 Perenjori.aprx
Layout Name: F06 Population Ae

6. Analysis of Priority Species Found Sterile Outside Disturbance Footprint

6.1 Analysis of Regional Distribution of *Baeckea* sp. Perenjori

The species distribution range covers some 6,000 sq km and extends from Perenjori in the south, Nullewa Lake in the north, Koolanooka in the west and Mongers Lake (Rothsay) in the east. There are 20 location records dispersed across the estimated species range (DBCA search record ID 63-0823FL). Two of these records were identified as re-recordings or duplicates of existing known locations and have been treated as a single location record in assessment (Figure and Table 8-3 in Appendix C). Removing duplicates leaves 18 location records. A breakdown of location records by land use and tenure is provided below in Table . The majority of location records (13 of 18) fall within Native Vegetation. One of those records falls within a nature reserve or lands assumed to be managed as reserve.

A populations size estimate was undertaken for each location record. Due to majority of the location records having no abundance information an accurate estimate of population could not be confidently undertaken.

Table 6-1: Locations of *Baeckea* sp. Perenjori within 40km of the Disturbance Footprint

Row Labels	Location records	Comments
Nature Reserve	1	DBCA managed Bowgarder Nature Reserve
Native Vegetation	12 (one duplicate of location removed)	
Road	2	
Rural	3	
Salt Lake	1 (one duplicate of location removed)	
Grand Total	18 (two duplicates removed)	

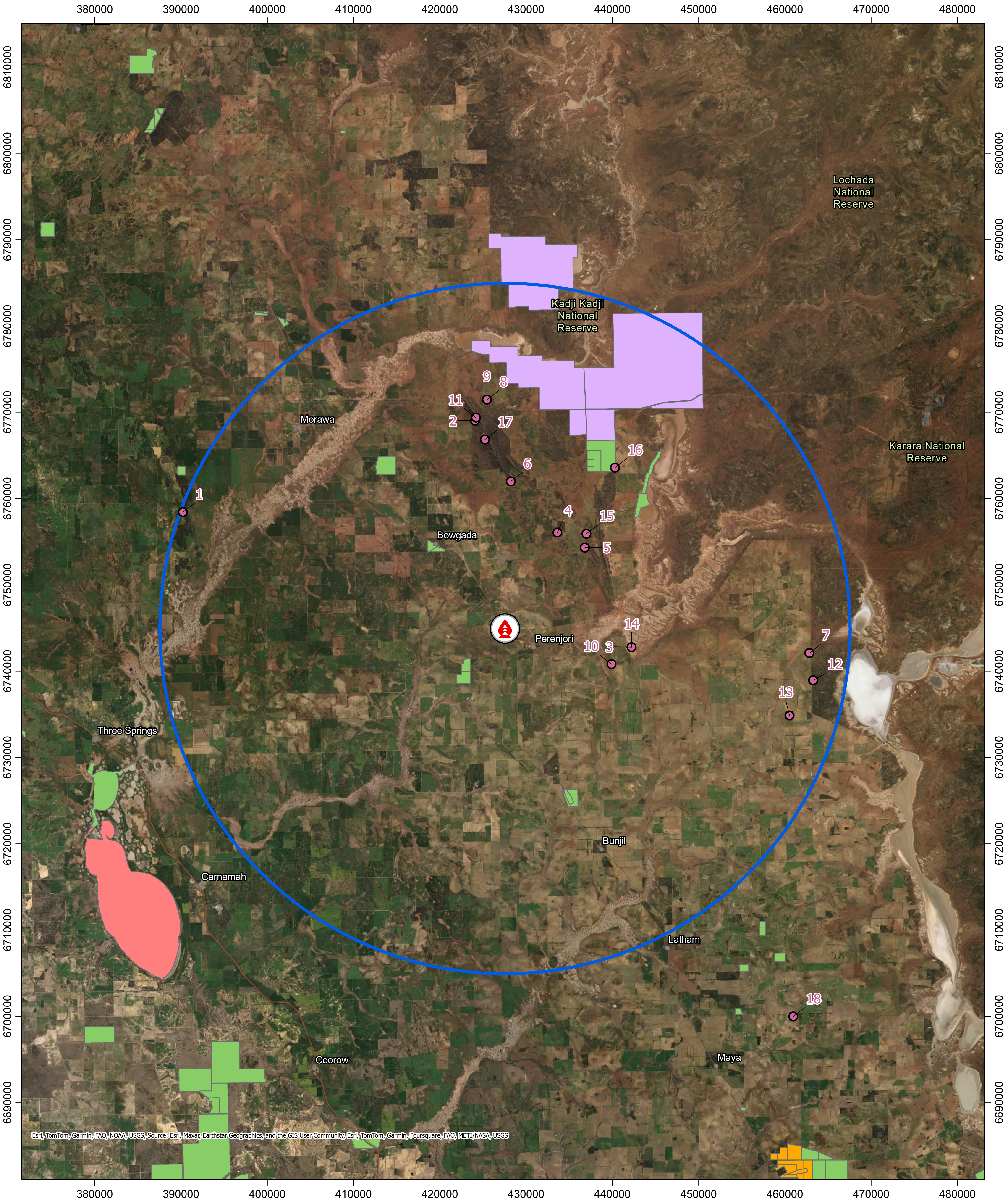
The assessment identified that one of the location records falls within the Bowgarder Nature Reserve.

The presence of the species within one separate reserve across the estimated range is not considered to significantly decrease the risk of species decline.

Within the areas covered by biological surveys (AECOM, 2023 & 2024) one sterile sample was collected, which was confirmed later at the WA Herbarium by Mike Hislop. The population was not counted at the time of the survey.

The Disturbance Footprint does not intersect with recorded or known locations of the species. Two of the 18 records were found in road loaction, while the majority of locations records fall within the Native vegetation (Table 6-2), making the species less likely be present in the Disturbance Footprint.

The regional assessment identified 18 location records of individual populations over an estimated 6,000 sq km species range. Of the 18 location records one was assessed as occurring within separate area with reserve land use.



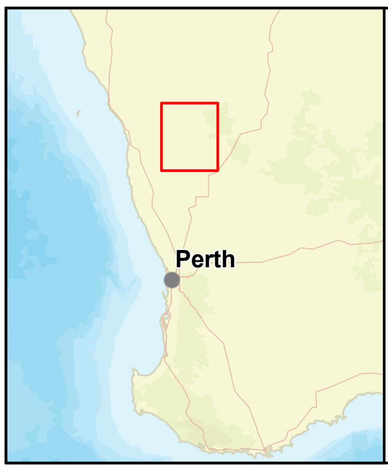


Figure 6-1 Regional Population Assessment *Baeckea sp.* Perenjori

0 5 10 N

Kilometres

Legend

Development envelope

Penrenjori 40km radius

Priority Flora

● Baeckea sp. Perenjori (J.W. Green 1516)

Legislated Lands and Waters (DBCA-011)

- 🟥 Conservation Park
- 🟩 Nature Reserve
- 🟧 Section 5(1)(h) Reserve
- 🟪 Timber Reserve

Map Scale: 1:400,000 (when printed at A3)
Reference System: GDA2020 MGA Zone 50
Datum: GDA2020
Map Units: Metres

CBH Group
240 St Georges Terrace
Perth WA 6000
Ph (08) 9237 9600
Fax (08) 9322 3942

Publication Date: 20/03/2024 2:15 PM
Project Name: L:\Environment & Sustainability\GIS_DATA\Project _work\Perenjori\GIS2024020_Perenjori_Figures\Pro_Project\GIS2024020 Perenjori.aprx
Layout Name: F07 Population Baeckea

6.2 Analysis of Regional Distribution of *Enekbatus longistylus*

The species distribution range covers some 22,000 sq km and extends from Mongers Lake in the south, Tardun in the west and Cooladar Hill as its most northern and western point. There are 16 location records dispersed across the estimated species range (DBCA search record ID 63-0823FL). Five of these records were identified as re recordings or duplicates of existing known locations and have been treated as a single location record in assessment (Figure 6-2 and Table 8-4 in Appendix D). Removing duplicates leaves eleven location records. A breakdown of location records by land use and tenure is provided below in Table . The majority of location records (8 of 11) fall within Road, Rail or Rural land use. Three records fall within native vegetation or salt lake surroundings.

A populations size estimate was undertaken for each location record. Due to majority of the location records (8 of 11) having no abundance information an accurate estimate of population could not be confidently undertaken.

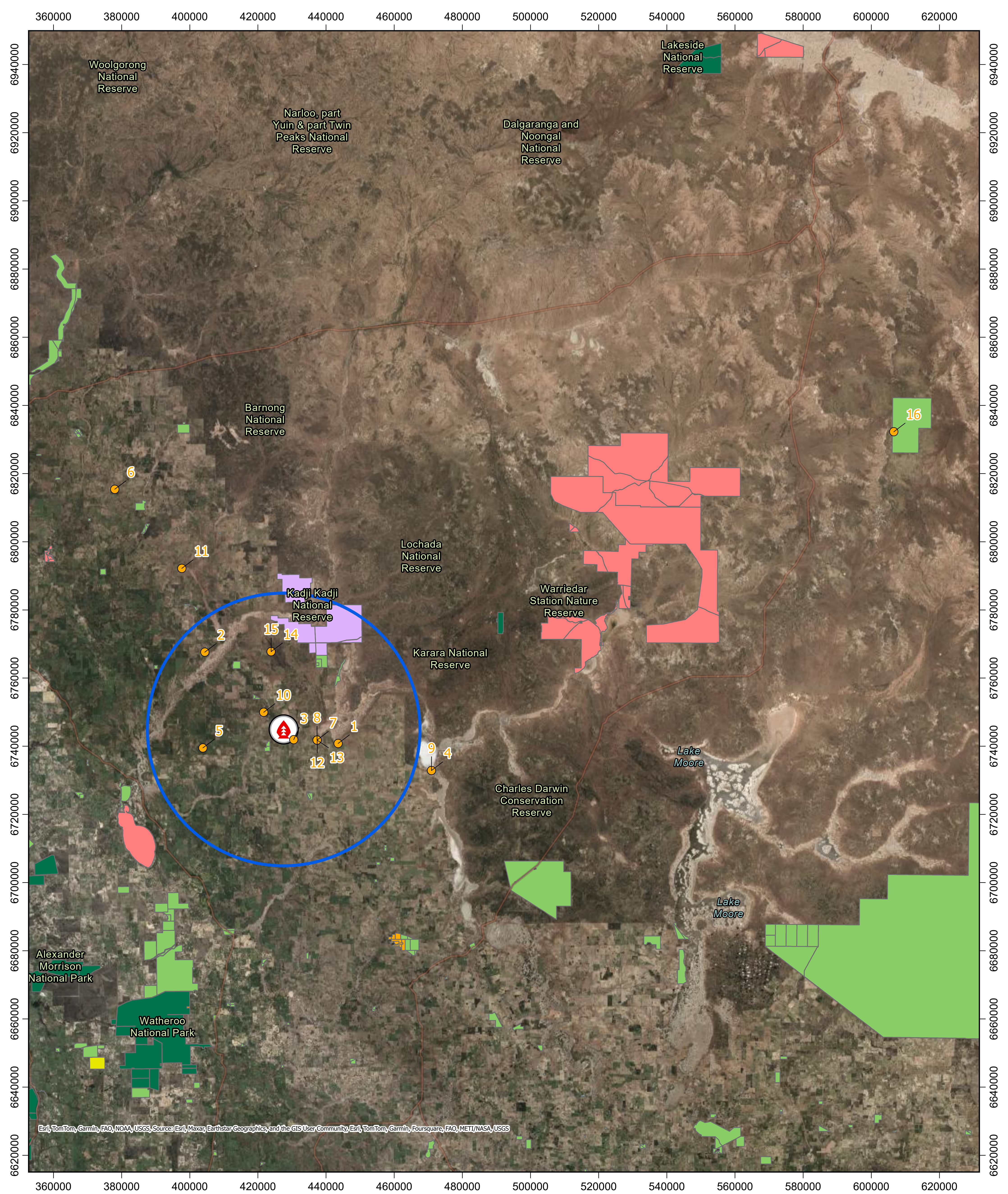
Table 6-2: Locations of *Enekbatus longistylus* within 40km of the Disturbance Footprint

Row Labels	Location records	Comments
Rail	1	
Native Vegetation	1 (one duplicate of location removed)	
Nature Reserve	1	Gagarlagu Nature Reserve
Salt Lake	1 (one duplicate of location removed)	
Road	4	
Rural	3 (three duplicates removed)	
Grand Total	11 (five duplicates removed)	

The assessment identified that one of the location records falls within the Gagarlagu Nature Reserve.

Within the areas covered by biological surveys (AECOM, 2023 & 2024) a total of 22 plants from 16 points were recorded. The records were occurring as a single continuous population along the road verge and rail corridor. All records were sterile at the time of the survey.

The Disturbance Footprint does not intersect with recorded or known locations of the species. 22 plants that were recorded in the survey area, were found sterile, in vegetation with good and very good condition. The majority (75%) of the vegetation within Disturbance Footprint is in degraded condition, making it less likely for the species to occur in Disturbance Footprint.



Esri, TomTom, Garmin, FAO, NOAA, USGS, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

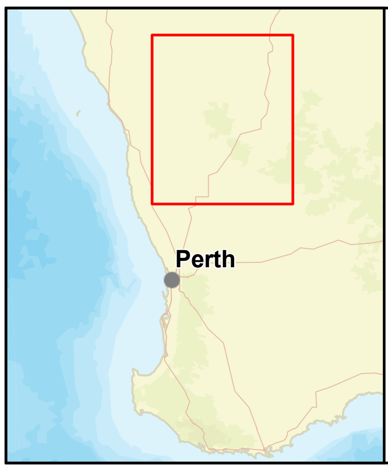


Figure 6-2 Regional Population Assessment
Enekbatus longistylus

0 12.5 25 N
Kilometres

Legend

Development envelope
Penrenjori 40km radius

Priority Flora
● Enekbatus longistylus

Legislated Lands and Waters (DBCA-011)
🟥 Conservation Park
🟩 National Park
🟩 Nature Reserve
🟨 Section 34A Freehold

🟧 Section 5(1)(h) Reserve
🟪 Timber Reserve

Map Scale: 1:1,000,000 (when printed at A3)
Reference System: GDA2020 MGA Zone 50
Datum: GDA2020
Map Units: Metres

CBH Group
240 St Georges Terrace
Perth WA 6000
Ph (08) 9237 9600
Fax (08) 9322 3942

Publication Date: 20/03/2024 2:17 PM
Project Name: L:\Environment & Sustainability\GIS_DATA\Project _work\Perenjori\GIS2024020_Perenjori_Figures\Pro_Project\GIS2024020 Perenjori.aprx
Layout Name: F08 Population Enekbatus longistylus

7. Other Approvals

7.1 Environmental Impact Assessment (Part IV of the EP Act)

This project is not considered a 'significant proposal' action under the *Environmental Protection Act 1986* (EP Act) and will not be referred to the Environmental Protection Authority.

7.2 Pre-Application Meeting

A scoping meeting was held with DWER and CBH on 15 August 2023.

7.3 Key Stakeholder Engagement

A summary of engagement with key stakeholders is provided in Attachment D

7.4 Other Approvals

No other approvals, i.e., Works Approval, Licence or Registration under Part V Division 3 of the EP Act have been sought for this development.

A Development Application has been lodged with the Shire of Perenjori and is currently being processed.

7.5 Heritage

A Site Identification Survey of the Development Envelope was undertaken in 2022 by Sticks and Stones Cultural Resources Management (SandS CRM) (Attachment E) under the CBH Yamatji Proponent Standard Heritage Agreement (YPSHA) with the Yamatji Southern Regional Corporation (YSRC). Traditional Owners from the Yamatji Nation ILUA (YSRC representatives) participated in all aspects of the fieldwork for this survey.

Background research undertaken as part of the Site Identification Survey identified that the Development Envelope is not located within a registered heritage site and that the closest Aboriginal heritage site is the Mongers Lake Waterway (Site 24380) located approximately 1.3 km to the southeast of the survey area. During the Site Identification Survey no new sites of cultural significance were identified nor were any isolated artefacts recorded. Recommendations were made to implement a ‘Site Discovery Procedure’ and for cultural monitors to be present during ground-breaking activities (Sands CRM, 2022).

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Appendix A

Regional *Grevillea granulosa* Records

Table 8-1: Regional *Grevillea granulosa* Location Records (DBCA 2023 WA Herbarium Records)

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
1	8416605	1 mature plant.		Geraldton to Mullewa Rail Corridor, 2.5 km NE of Kojarena	GPS	18/09/2010		1	Rail	
2	8416591	1 mature plant.		Mullewa to Morawa Rail Corridor, 2.5 km SE of Wilroy Nature Reserve	GPS	18/09/2010		1	Rail	Same pop as location 41.
3	8416583	1 mature plant.		Mullewa to Morawa Rail Corridor, 5.5 km NW of Leda Nature Reserve	GPS	18/09/2010		1	Rail	
4	8591245			[N of Canna] City of Geraldton-Greenough	GPS	7/10/2011		unknown	Rural	
5	2344459			182 mile peg Paynes Find Road [20 km NE of Wubin towards Paynes Find on Great Northern Highway]	AUTO	12/08/1970		unknown	Road	
6	2344491			East Yuna Reserve, NE of Geraldton	MAN	13/08/1967	McGauran Nature Reserve	unknown	Reserve	

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
7	4109864		Abundance: 30 + plants.	4.6 km & 8.1 km S of Tardun on road to Wubin	MAN	22/07/1994		30	Road	
8	1576852			Geraldton to Mount Magnet Road, 14 miles E of Mullewa	AUTO	10/09/1966		unknown	Road	
9	2344424			Near Gutha	AUTO	29/08/1945		unknown	Rural	
10	2344289			Jibberding	AUTO	2/10/1959		unknown	Rural	
11	2344467			Eradu	AUTO	12/07/1965		unknown	Foreshore	
12	2344343			Watheroo [Rabbit Proof Fence E of Watheroo]	AUTO	//1905		unknown	Rural	
13	5237262		Abundance: estimated 10+ mature plants, vegetative.	Doutha Soak, at junction of McWhite Road & Morris Road, E of Canna, SE corner of reserve	MAN	15/02/1995	Doutha Soak Nature Reserve (Non DBCA reserve)	10	Reserve	
14	2406772			15 miles NE of Wubin	AUTO	9/08/1963		unknown	Rural	
15	1824953			Latham water tower	AUTO	18/09/1979		unknown	Rural	
16	1802380		Abundance: occasional.	Water Reserve, McWhirter Road, East Gutha	AUTO	20/06/1988		unknown	Rural	

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
17	4741471			NW side of Coalseam Conservation Park, at 2 km N of road, along track at side of paddock, on uncleared native vegetation E of fenceline, above cliffs,	MAN	16/08/1996	Coalseam Conservation Park	unknown	Reserve	Think point location inaccurate. Appears in paddock. Pre GPS location
18	2283166		Abundance: occasional. No plants in flowers owing to dry winter.	17 km E of Mullewa on road to Mount Magnet	MAN	14/06/1976		unknown	Rural	
19	1766627			Jibberding Reserve, 24.4. km ca NE of Wubin along the Great Northern Highway	MAN	21/09/1985		unknown	Rural	
20	1802445			Prope lacum [near Lake] Monger	AUTO	10/1963		unknown	Rural	
21	2344335			Watheroo RF [Rabbit Proof Fence]	AUTO	1905		unknown	Rural	

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
22	4400569		Abundance: 2 mature, flowering.	Old Pindar Road, ca 16 km E of Mullewa on narrow S road verge	MAN	7/07/1995		2	Road	
23	2344483			25 miles S of Mullewa; Irwin Botanical District	AUTO	20/08/1965		unknown	Rural	
24	2344440			5 miles NE of Wubin on Great Northern Highway	AUTO	30/07/1963		unknown	Road	
25	2344475			1 mile N of Tardun	AUTO	23/08/1957		unknown	unknown	
26	5237106		Abundance: estimated 1000+ mature pants with flowers, over ca 5 km area.	21.9 km S of Yuin Station Homestead turnoff on road to Pindar on rocky outcrop	MAN	5/08/1995		1000+ plants over 5km area	Rural	
27	2344270			Prope [near] Paynes Find [actually collected at Rabbit Proof Fence, Wubin]	AUTO	/10/1963		unknown	Rural	

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
28	2344386			White hills, Ninghan [Homestead]	AUTO	//		unknown	Rural	
29	2344408			Prope lacum [near Lake] Monger	MAN	/10/1963		unknown	Rural	
30	2344416			10 miles E of Mullewa on Pindar Road	AUTO	1/10/1962		unknown	Road	
31	8297304	2 plants.		Coalseam Reserve Road N of the Reserve, Mingenew	GPS	23/07/2010		2	Road	
32	5949092			Bowgada Nature Reserve, NE side around gravel pit, E side of road junction	MAN	1/10/1995	Bowgada Nature Reserve	unknown	Reserve	
33	6489729			33 miles (53 km) N of Wubin - Perenjori	MAN	8/10/1972		unknown	Rural	
34	5713218	ca 5+ mature plants with flowers.		Reserve 15565, Morawa-Yalgoo Road just S of intersection with Madden Road, N of Morawa,	GPS	17/08/1996	Reserve 15565, Morawa-Yalgoo Road (Non DBCA land)	5	Reserve	
35	1447408			24 miles S of Mullewa	AUTO	20/07/1971		unknown	Rural	
36	3708829	infrequent.		Along railway line adjacent to Wubin/Mullewa Rd	MAN	19/08/1994		unknown	Rail	

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
				9.5 km south of Mullewa						
37	4210859		Abundance: estimated 50+ mature plants with flower, over 100 x 50 m area.	Bowgada Nature Reserve 29745	MAN	19/06/1995	Bowgada Nature Reserve	50	Reserve	
38	3708381	infrequent.		Along the Perenjori Road to Rothsay	MAN	18/08/1994		unknown	Road	
39	4106733		Abundance: estimated 10+ mature plants in flower.	Mullewa-Wubin Road ca 5 km WNW of Tardun	GPS	22/07/1994		10	Road	

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
40	4106717		Abundance: estimated 30+ mature plants in flower over 50 x 50 m area.	SE side of Wilroy N.R. on road to Mingenew-Mullewa Road ca 16.5 km SE of Mullewa	GPS	22/07/1994	Wilroy Nature Reserve	30	Reserve	same pop as 43
41	4106725	20+ mature plants in flower.		1.8 km SW of Wilroy Nature Reserve on the Mullewa - Wubin Road between road and railway	GPS	22/07/1994		20	Rail	same pop as location 2
42	4308999			75 m SW of Reserve 22125, located on Pintharuka Dam Road,	MAN	21/08/1994		unknown	Road	
43	8991863	>44 plants.		Wilroy Nature Reserve, N fork of Wilroy-Kockatea Road in W portion of reserve	GPS	23/11/2017	Wilroy Nature Reserve	44	Reserve	same pop as 43
44	1802453	common.		Bunjil	AUTO	15/10/1981		unknown	Reserve	
45	2344432			Half way between Mullewa and Pindar	AUTO	2/08/1965		unknown	Rural	

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
46	4751396			Ca 3 km W of McWhirter Road on Morris Road, ca 35 km N of Morawa,	GPS	27/07/1996		unknown	Road	
47	6939031	2 to 5 adult plants.	Population structure: 100% in bud, 100% flowering and 100% fruiting.	2 km from Perenjori on Morawa Road	GPS	1/10/2003		5	Road	

Appendix B

Regional *Apectospermum exsertum* Records

Table 8-2: Regional *Apectospermum exsertum* Location Records (DBCA 2024 WA Herbarium Records)

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
1	4910486	infrequent		10 km E of Maya on Chislom Road, S side	GPS	6/11/1997		unknown	Road	
2	8807779	1 live plant		Koolanooka Hills, ca 22 km W of Morawa	TOPO	20/09/2013		1 plant	Native Vegetation	
3	2401819			Mullewa Shire	AUTO	/10/1989		unknown	Residential	Same location as Record ID 4
4	2401827			Mullewa	AUTO	21/08/1964		unknown	Residential	Same location as Record ID 3
5	6747388	frequent		Perenjori rubbish tip, 4.1 km SE from Disturbance Footprint	TOPO	18/08/1994		unknown	Rural	
6	7132549	2-5 plants		Old railway reserve on Geraldton-Mount Magnet Road, 13 km E of Mullewa	GPS	9/07/2005		2-5 plants	Rail	
7	7292724			Road verge next to railway at 1.8 km S of road intersection in centre of Bowgada Reserve	TOPO	1/10/1995	Bowgada Nature Reserve	unknown	Reserve	

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
8	9061185	locally uncommon, 10 plants along road verge area.		Adjacent to Sellner Road, 2.1 km E of Mullewa-Wubin Road, 5.8 km SE of Perenjori townsite	GPS	8/10/2003		10 plants	Road	
9	8778892	frequent		Intersection of Grant Road and Mullewa-Wubin road, 8.2 km NW by road from Perenjori	GPS	27/08/2011		unknown	Road	
10	1638246			Gerber's farm, E of Tardun	AUTO	27/09/1973		unknown	Rural	Duplicate of record ID 11
11	1638254			Gerber's farm, E of Tardun	AUTO	27/09/1973		unknown	Rural	Duplicate of record ID 10
12	7748787	frequent		50 m along track to Canna dam, rail reserve next to Canna Station, 2.3 km SE from Canna Nature Reserve	GPS	10/09/2007		unknown	Rail	Duplicate of record ID 21
13	2400715			Perenjori, on rural residential property	AUTO	20/09/1931		unknown	Rural	Same as Record ID 14 & 15

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
14	4739779			Perenjori, on rural residential property	MAN	20/09/1931		unknown	Rural	Same as Record ID 13 & 15
15	2401835			Perenjori, on rural residential property	AUTO	20/09/1931		unknown	Rural	Same as Record ID 13 & 14
16				Perenjori Rubbish Tip (Crown Reserve 26386), [next to West Perenjori Nature Reserve (26819), ca 8.5 km west of Perenjori along Carnamah Perenjori Road].		18/08/1994		unknown	Reserve	
17				Back Bowgada Road reserve, adjacent Northam to Geraldton Railway, at 1.8 km from intersection with Bowgada East Road, [ca 3 km east of Mullewa Wubin Road].		1/10/1995		unknown	Rail	
18				Lot 6319, Perenjori. 1.2 km east along Sellner Road from Mullewa Wubin Road.	GPS	1/10/2003		unknown	Road	No info about geo method available, method was assumed based on date of record

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
19				Mullewa Wubin Road reserve, 450 m south of Sellner Road.	GPS	1/10/2003		unknown	Road	No info about geo method available, method was assumed based on date of record
20		4 live plants, flowering		UCL, old Mullewa Pindar Railway reserve, along Geraldton Mount Magnet Road, [1.8 km] west of Beatty Siding, [12.8 km ENE of Mullewa.	GPS	9/07/2005		4 plants	Rail	Duplicate of record ID 6 No info about geo method available, method was assumed based on date of record
21				Road Reserve, 50 m along track north of [Offszanka Road, ca 500 m] SE of Canna dam, [2.9 km NE of Mullewa Wubin Road].	GPS	10/09/2007		unknown	Rail	Duplicate of record ID 12 No info about geo method available, method was assumed based on date of record

Appendix C
Regional *Baeckea* sp. Perenjori Records

Table 8-3: Regional *Baeckea* sp. Perenjori Location Records (DBCA 2024 WA Herbarium Records)

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
1	8193339			Small area of remnant vegetation on private property, located c. 5 km W of Morawa-Three Springs Road, Billeranga Hills, c. 18 km SW of Morawa	GPS	2/07/2007		unknown	Native Vegetation	
2	8585083			Woodland, 6.1 km SW from Timber Reserve, 15.7 km NE of Koolanooka, 23.2 km E of Morawa	GPS	12/07/2008		unknown	Native Vegetation	
3	3464652			Woodland, 13.6 km E of Perenjori	AUTO	22/08/1957		unknown	Native Vegetation	
4	3464644			13.2 km N of Perenjori	AUTO	25/08/1965		unknown	Salt Lake	Same as record ID 14.
5	5274524			12.8 km NE of Perenjori, 17 km E of Bowgada	MAN	26/06/1997		unknown	Rural	
6	6475582			18 km N of Perenjori	GPS	12/10/2000		unknown	Native Vegetation	

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
7	5982146	c. 20 mature plants		5.4 km SW of Camel Soak, 6.3 km SE of Damperwah Station on Vermin Proof Fence, c. 34 km E of Perenjori,	MAN	26/06/1997		20	Rural	
8	6219063			3.2 km SE from Timber Reserve, 5.8 km S of Mullewa Lake, 1 km N of Koolanooka Springs Road, 5.9 km E from its western end	MAN	23/10/1986		unknown	Native Vegetation	Same as Record ID 8.
9	6218679			2.2 miles E of the western end of Koolanooka Springs Road, then 250 m from the road	MAN	23/10/1986		unknown	Native Vegetation	Same as Record ID 9.
10	6171796			10.3 km E of Prenjori on road to Paynes Find	MAN	15/09/1978		unknown	Road	
11	6753051			3.3 km E of Fallon Road on Koolanooka - Mungada Road	GPS	10/09/2003		unknown	Native Vegetation	
12	6588433			4.3 km W of Mongers Lake, 3.9 km N of Wanarra Road, on Rabbit Proof Fence Road, E of Perenjori	GPS	13/10/2003		unknown	Native Vegetation	
13	7399448			The property Orchid Ridge 30 km ES E of Perenjori of S side of	GPS	19/08/2005		unknown	Road	

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
				Wanarra road; the breakaway ridge is on the right hand side of the track to the homestead						
14	7454074			13.2 km N of Perenjori	TOPO	/08/1957		unknown	Salt Lake	Same as Record ID 4
15	7682123	abundant, confined to this strip along the ridgeline.		Perenjori Hills, ca 10 km NE of Perenjori townsite. ca 1 km SE from Bestry Road and Solomon Road intersection	GPS	1/11/2006		unknown	Native Vegetation	
16	4210867	common		SE corner of Nature Reserve 40161, NE of Perenjori	GPS	20/06/1995	Bowgarder Nature Reserve	unknown	Reserve	
17	7357028	sparse (10-30%)		2.8 km S from Koolanooka Springs Road, Koolanooka Hills	GPS	9/10/2005		unknown	Native Vegetation	
18	3464636			15.3 km N of Buntine Nature Reserve	TOPO	8/08/1960		unknown	Rural	
19		2090		Dingle Dell Homestead, 7.8 km SE of Dingle Dell Homestead, 2.3. km NE of intersection of Lochada Rd and Sharpe Rd, 11.7 km SW of Bogada	GPS	28/09/2018		2090	Native Vegetation	

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
20		165		Dingle Dell Homestead, 7.8 km SE of Dingle Dell Homestead, 2.3. km NE of intersection of Lochada Rd and Sharpe Rd, 11.7 km SW of Bogada	GPS	28/09/2018		165	Native Vegetation	

Appendix D

Regional *Enekbatus longistylus* Records

Table 8-4: Regional *Enekbatus longistylus* Location Records (DBCA 2024 WA Herbarium Records)

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
1	6588409	ca 20 plants of Enekbatus present.		6.6 km E of Solomon Road, on Perenjori - Rothsay Road	GPS	13/10/2003		20	Road	
2	6055567			SE corner of Morawa, next to cemetery	MAN	2/10/1962		unknown	Road	
3	6055583			Perenjori	MAN	/11/1953		unknown	Road	
4	6055524			Rabbit Proof Fence, 23 miles E of Perenjori	TOPO	/09/1934		unknown	Salt Lake	Same point as ID 9
5	6055532			29 km S of Morawa	MAN	2/10/1962		unknown	Rural	
6	6055575			Side of Sullivan Rd/Drummond Rd, 700 m N of Tardun	MAN	27/09/1973		unknown	Road	

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
7	6764495			Solomon Road, at intersection of Perenjori - Rothsay Road	GPS	10/09/2003		unknown	Rural	Same as Record ID 8, same population as IDs 12 & 13
8	6764509			Solomon Road, at intersection of Perenjori - Rothsay Road	GPS	10/09/2003		unknown	Rural	Same as ID 7
9	6055540			Rabbit Proof Fence, 23 miles E of Perenjori	TOPO	/09/1934		unknown	Salt Lake	Same point as ID 4
10	7036248	6-20 plants		Corner Hill Road and Perenjori - Mullewa Road, Perenjori	GPS	28/09/2003		6-20 plants	Rural	
11	8745587	2-5 plants		C. 20 km N Morawa near Gutha Wheat Bin	GPS	20/08/2014		2-5 plants	Railway	
12	6764487			Solomon Road, at intersection of Perenjori - Rothsay Road	GPS	10/09/2003		unknown	Rural	Same population as ID 7, 8, 13.

Record_ID	Sheet	Frequency	Notes	Locality	Geo_ Method	Date	DBCA_Land	Population size estimate	Land Use /Tenure	Notes
13	6588395			Solomon Road, at intersection of Perenjori - Rothsay Road	GPS	13/10/2003		unknown	Rural	Same population as ID 7, 8, 14.
14	6055559			15 km NE of Koolanooka Nature Reserve	MAN	19/09/1931		unknown	Native Vegetation	Duplicate of ID 15
15	6055559			15 km NE of Koolanooka Nature Reserve	MAN	19/09/1931		unknown	Native Vegetation	Duplicate of ID 14
16	9421149	uncommon		35 km E of Kirkalocka mine, Eastern boundary of Kirkalocka Station (Cooladar Hill)	GPS	13/08/2004	Gagarlagu Nature Reserve	unknown	Reserve	