Sturt Plateau Pipeline

Ecological Assessment

APA SPP Pty Ltd

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Prepared by:

SLR Consulting Australia

SLR Project No.: 680.030294.00001

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Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with APA SPP Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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Acronyms and Abbreviations

AECOM	Architecture, Engineering, Construction, Operations, and Management
AGPA	Australian Pipelines and Gas Association Ltd.
ALA	Atlas of Living Australia
AGP	Amadeus Gas Pipeline
AoO	Area of occupancy
APA	APA SPP Pty Ltd
BoM	Bureau of Meteorology
BVG	Broad Vegetation Group
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEPWS	Department of Environment, Parks and Water Security
DBH	Diameter at Breast Height
DoE	Department of the Environment
EMP	Environment Management Plan
EP Act	*Environment Protection Act 2019*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
INFRA	Infraspecific species under the TPWC Act
Int.	Introduced species under the TPWC Act
IUCN	International Union for the Conservation of Nature
LC	Least Concern under the TPWC Act
mbgl	Meters below ground level
MI	Migratory species under the EPBC Act
MNES	Matters of National Significance
(NL)	Not Listed under the TPWC Act
NVIS	National Vegetation Information System
NR Maps	Natural Resources Maps
NT	Northern Territory
NT EPA	Northern Territory Environment Protection Agency
PMST	Protected Matters Search Tool
SCLU Act	*Soil Conservation and Land Utilisation Act 1969*
ROW	Right of Way
SLR	SLR Consulting Australia Pty Ltd
SoBS	Sites of Botanical Significance
SoCS	Sites of Conservation Significance
SPP	Sturt Plateau Pipeline
SREBA	Strategic Regional Environmental and Baseline Assessment
Tamboran	Tamboran B2 Pty Ltd
TEC	Threatened Ecological Community
The Code	Code of Environmental Practice – Onshore Pipelines (AGPA, 2022)

Threatened species categories	EX	Extinct
	EW	Extinct in the wild
	CR	Critically Endangered
	EN	Endangered
	VU	Vulnerable
TPWC Act		*Territory Parks and Wildlife Conservation Act 1976*
TSSC		Threatened Species Scientific Committee
WM Act		*Weed Management Act 2001*
WoNS		Weed of National Significance

1.0 Introduction

1.1 Project background

SLR Consulting Australia Pty Ltd (SLR) was commissioned by APA SPP Pty Ltd (APA) to undertake baseline terrestrial ecology assessments for the construction of the Sturt Plateau Pipeline ('the SPP' or 'the Project'; Figure 1). APA is proposing to construct the SPP to transport appraisal gas from Tamboran B2 Pty Ltd's (Tamboran) Sturt Plateau Compression Facility development sites in the Beetaloo Sub-basin to the Amadeus Gas Pipeline (AGP). The AGP is a transmission pipeline that extends from the Amadeus Basin in the south of the Northern Territory (NT) to Darwin, in the north. It transports natural gas to Darwin, Alice Springs and regional centres, principally to fuel power generation.

The Project's combined construction footprint, comprises:

- The construction right of way (ROW) for the proposed pipeline.
- Construction footprints for the Shenandoah Facility and Sturt Plateau Facility.
- A temporary construction camp.
- Additional workspaces required to facilitate construction.
- A cathodic protection anode bed in the eastern end of the pipeline.

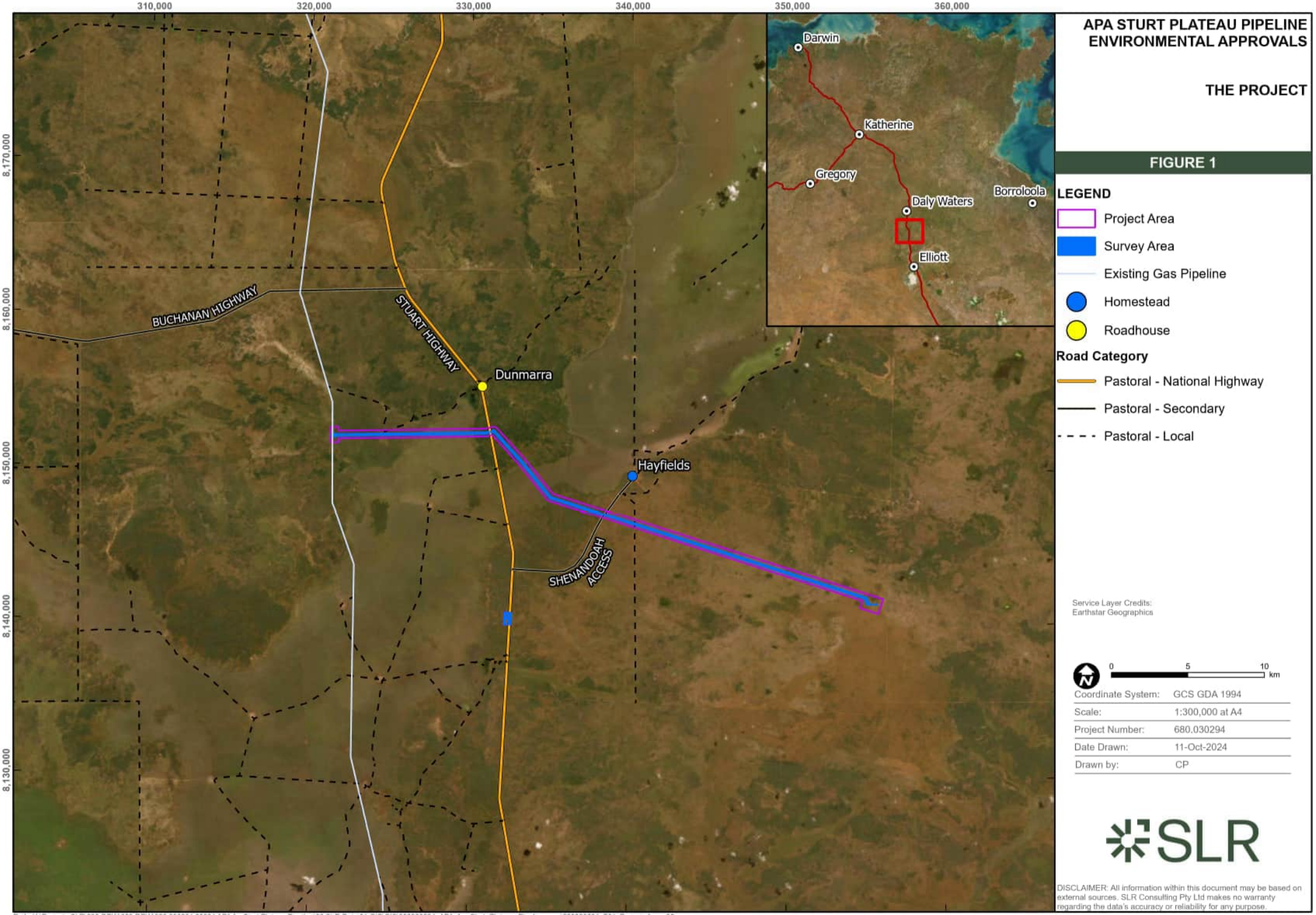
The Beetaloo Sub-basin, located 500 km south-east of Darwin in the NT, covers 28,000 km^2 and is estimated to contain 500 trillion cubic feet of gas (P50 gas-in-place resource as estimated by industry). It is in the early stages of its development, with several producers proposing to undertake additional development work to verify gas production quantities and ultimately sell the gas to commercial markets.

The preferred pipeline alignment (proposed pipeline) is approximately 37 km in length and passes through pastoral leasehold land. It crosses the Sturt Highway approximately 35 km south of Birdum and is proposed to be horizontally bored under the Stuart Highway. The pipeline would be buried for its entire length.

The Project commences on NT Portion 7026 (Shenandoah PPL) and extends west, across the Stuart Highway Road corridor and NT Portion 7513, to the AGP located on NT Portion 1077 (both Hayfield PPL). Details of land tenure for each respective lot are listed in Table 1.

Table 1 Land tenure details for the Project

Portion number	7026	7513	1077	Stuart Highway
Tenure Type	PPL	PPL	PPL	NTG road corridor
Station Name	Shenandoah	Hayfield	Hayfield	-
Title	CUFT 752	CUFT 823	CUFT 823	-
Street Number	14981 Stuart Highway, Birdum	-	1143 Buchanan Highway, Birdum	-
Survey ID	S2009/182A	CP005573	S811108	
Area (ha)	147,273	8040	176,702	-
Owner	A.P.N Pty Ltd	A.P.N Pty Ltd	A.P.N Pty Ltd	DIPL



APA STURT PLATEAU PIPELINE ENVIRONMENTAL APPROVALS

THE PROJECT

FIGURE 1

LEGEND

- Project Area
- Survey Area
- Existing Gas Pipeline
- Homestead
- Roadhouse

Road Category

- Pastoral - National Highway
- Pastoral - Secondary
- Pastoral - Local

Service Layer Credits:
Earthstar Geographics

0 5 10 km

Coordinate System:	GCS GDA 1994
Scale:	1:300,000 at A4
Project Number:	680.030294
Date Drawn:	11-Oct-2024
Drawn by:	CP

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1.2 Purpose and objectives

The purpose of this report is to outline the methods, results and outcomes of terrestrial ecological desk- and field-based assessments for the Project. This is achieved through the assessment of the following environmental matters:

- The terrestrial biodiversity values within the Project Area; including threatened and migratory species listed under the *Territory Parks and Wildlife Conservation Act 2006* (TPWC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Other Matters of National Environmental Significance (MNES) (as listed under the EPBC Act).
- Vegetation communities and watercourses mapped within the Project Area.
- The occurrence of significant sites (i.e. Sites of Conservation Significance (SoCS) and Sites of Botanical Significance (SoBS)), and native flora and fauna species.
- The identification of introduced flora and fauna species (weeds and pests) with potential relevance to the Project Area.

The Project Area of this report is defined by a 250 m buffer from the centre point of the proposed pipeline alignment (500 m linear width). This buffer has been provided to account for potential locations of 'additional work areas', as described in Section 1.3.2.2.

The Survey Area of this report is defined by a 75 m buffer from the centre point of the proposed pipeline alignment (150 m linear width). The Survey Area is equivalent to the area assessed during the May 2024 terrestrial ecology field assessment. Data collected within the Survey Area have been extrapolated from the limit of the 150 m ground-truthed corridor to the Project Area (500 m) corridor. Extrapolated data outside of the area ground-truthed during the field assessment should be interpreted with caution.

1.3 Description of proposed works

1.3.1 Construction methods

Construction of the Project is proposed to be undertaken in a progressive and sequential manner (i.e. clearing, trenching, and backfilling will be undertaken in incremental steps), therefore disturbance during construction will be staged. The typical pipeline construction sequence is (1) clear and grade, (2) pipe stringing, (3) pipe bending, (4) welding of pipe joints, (5) trench excavation, (6) lowering-in of the pipe, (7) backfilling, and (8) rehabilitation.

1.3.1.1 Clearing and grading

Clearing and grading of the ROW is undertaken to provide a safe and efficient area for construction activities. Clearing will be required to remove trees, shrubs and groundcover vegetation. Graders, bulldozers and excavators are generally used to clear and level the ROW. A ROW width of 30 m will generally be cleared and graded.

In areas of woody vegetation, trees and shrubs will be stockpiled as cleared. Rootstock of trees will generally be removed.

Cleared vegetation will be stockpiled on one or both sides of the ROW, as in Figure 2. Breaks will be left in stockpiled vegetation at fence lines, tracks and drainage lines and at locations to allow continued access for stock to water points.

Topsoil will be stripped to depths defined by soil surveys, typically over the full width of the ROW. In soil types with topsoil depth of 30 cm or greater, the stripping depth may be reduced to ensure stockpiles can be accommodated within the 30 m ROW width. Stripped topsoil will be stockpiled on one side of the ROW adjacent to vegetation stockpiles.

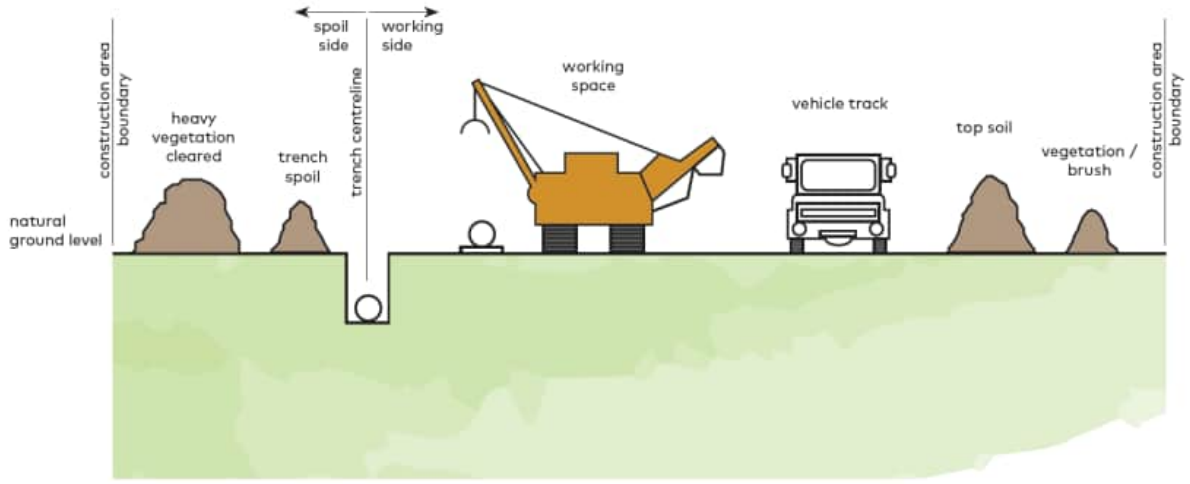


Figure 2 Typical layout for a pipeline construction corridor

1.3.1.2 Pipe stringing, bending and welding

Stringing involves distributing pipe lengths along the ROW in preparation for welding. Where required, pipe lengths will be bent using a hydraulic bending machine to match changes in either elevation or direction of the alignment. Following this, pipe lengths will be welded in to “pipe strings” of up to ~1,200 m in length, allowing for stock and landholder access breaks where required.

1.3.1.3 Trench excavation and horizontal boring

Specialised trenching machines and excavators will excavate to a minimum depth of 1200 mm to achieve the minimum depth of cover of 750 mm, and a minimum of 1650 mm to achieve the 1200 mm depth of cover for open cut crossings. Spoil generated during excavation would be stockpiled on the non-working side of the ROW, separately from vegetation and topsoil stockpiled earlier in the construction program (see Figure 2).

Breaks in the open trench will be included to facilitate stock and wildlife crossings and agricultural vehicle movements. Breaks will also be included at fences and drainage lines as required.

For areas where rock is present, trench excavation will be undertaken by rock saw machines or by excavators with rock hammer attachments. Blasting of rock will only occur in circumstances where a rock saw/rock hammer is found to be ineffective. This is considered unlikely to occur due to favourable geology across most of the alignment. Where blasting of rock is necessary, an operational procedure will be developed in accordance with Australian Standards detailing the blasting method.

Horizontal boring involves the excavation of a hole either side of the feature to be bored for installation of the pipeline beneath the surface feature which cannot be open cut, such as sealed roads. The additional disturbance footprint required for the horizontal bored crossings would generally be an area of 20 m x 70 m adjoining each side of the ROW.

Since traffic will need to continue to flow on the Stuart Highway this technique will be employed to ensure the pipeline crossing beneath the highway and adjacent table drains can be achieved at this location. This is the only location where a horizontal bored crossing will be needed for the Project.

1.3.1.4 Lowering and backfilling

Following trench excavation, the welded pipe strings will be lifted off skids and lowered into the trench using side-boom tractors. After lowering-in, the strings are welded together (a 'tie-in') in the trench.

During backfilling, care will be taken to ensure separation of topsoil and subsoil throughout this process. Subsoils will be compacted to reduce the settlement of the trench over the operational life of the pipeline.

Where required, trench blocks (also known as trench or sack breakers) will be installed prior to backfilling of the trench to control lateral water movement along the trench. Trench breakers are commonly installed in a number of environmental conditions, such as adjacent to watercourses and wetlands, on steep slopes or where drainage patterns change.

1.3.1.5 Reinstatement and rehabilitation of footprint

Rehabilitation of the construction footprint will be undertaken in accordance with the project CEMP and the latest Australian Pipelines and Gas Association Code of Environmental Practice (AGPA) (AGPA, 2022). It will be a progressive process with an aim to restore the land back to its prior productivity within a reasonable timeframe, subject to seasonal constraints.

Key activities would include:

- Removal of all temporary structures and buried infrastructure;
- Removal of all waste;
- Re-establishing topsoil cover;
- Returning all land and waterways to a stable condition;
- Ameliorating construction impacts to soil texture, structure and chemical composition, where required;
- Reinstating natural drainage patterns;
- Reinstating roadways and road reserves in accordance with the requirements of the relevant authority;
- Reinstating fencing and access tracks in accordance with the requirements of landowners;
- Spreading of mulch or timber, where appropriate;
- Application of seed and/or vegetation, where appropriate;
- Installing permanent erosion control measures (such as contour banks, filter strips) in erosion prone areas; and
- Ensuring the pre-construction environment is reinstated and disturbed habitats recreated where they do not affect pipeline operation and integrity (trees and shrubs are discouraged over and near the pipeline to maintain integrity of the pipe coatings) and to enable operational access.

1.3.2 Infrastructure components

Table 2 shows estimated disturbance requirements for the construction and operational phases of the Project, with estimated disturbance from each phase broken into infrastructure components. Further detail on infrastructure components for the Project are provided below.

Table 2 Estimated disturbance area for the Project

Infrastructure component	Disturbance area (ha)[1]	
	Construction	Operation
Pipeline ROW and surface facilities	110.8	111.9
Additional work areas	13.2	0
Temporary construction camp	21.5	0
Cathodic protection anode bed	0.3	0.3
Total	**145.8**	**112.2**

[1] At the time of writing, two construction ROWs were proposed and a final design has not been agreed upon. Due to this, exact disturbance areas are based on a tentative design and construction methodology with final numbers to be amended if required upon the completion of the final design.

1.3.2.1 Proposed pipeline and ROW

The proposed pipeline would be approximately 37 km in length and buried to a minimum of 750 mm, with a 30 m wide construction ROW. Table 3 further details the pipeline and ROW specifications. The pipeline will be buried for its entire length other than at surface facility locations. All surface facilities will be bounded by security fencing. At locations where the pipeline is potentially exposed to increase erosional forces, such as floodplains, additional protection will be provided by increased depth cover (i.e. 1,200 mm depth of cover at unsealed road crossings, drainage lines and floodplains). A visual representation of the ROW is shown in Figure 2.

Table 3 Pipeline an ROW specifications

Component	Description
Length	37 km
Material	High strength steel with fusion bonded epoxy external coating
Nominal diameter	300 mm
Nominal capacity	Max 50 TJ/day
Pipe wall thickness	6.4 mm
Pipe segment length	18 m (some 12 m)
Depth of cover	Minimum 750 mm
Easement / ROW	Nominally 30 m wide (approximately 37 km)
Design principles	In accordance with latest version of AS2885 Pipelines – Gas and liquid petroleum
Design life	40 years

A typical layout for the construction ROW is shown in Figure 2, consisting of the pipeline trench, working space, vehicle access track and stockpile areas either side of the alignment.

The construction corridor will follow the preferred alignment of the pipeline. The construction corridor includes an approximately 20 m wide working side and approximately 10 m wide spoil side as per Figure 2. Most construction activity will take place within this corridor. Construction activities will occur either from KP 0 to KP 37 (Option 1) or KP 37 to KP 0 (Option 2). Consequently, the working side of the ROW will be located to the north of the pipeline alignment if pipelaying commences at KP 0 or to the south of the pipeline alignment if pipelaying commences at KP 37. The direction of pipelaying will be dependent upon weather and site conditions at the commencement of construction. The potential impact of each option on vegetation communities is presented in Section 6.0.

1.3.2.2 Additional work areas

Construction laydown area adjacent to surface facilities

A construction laydown area of up to 1 ha will be required adjacent to the Shenandoah Facility and up to 1.3 ha will be required adjacent to the Sturt Plateau Facility for the storage of equipment and materials.

Cleared Vegetation Stockpiles

Cleared vegetation will be stockpiled within the ROW. Cleared vegetation stockpiles that cannot be accommodated within the ROW will be stockpiled within construction laydown areas adjacent to surface facilities, truck turnarounds and additional work areas associated with trenched/bored crossings.

Truck Turnarounds

Truck turnarounds are turning bays that are required along the ROW to allow trucks delivering pipe and other materials to be able to turn around and return to an appropriate exit point. Fifteen truck turnarounds are proposed to be located approximately every 2.5 km along the alignment. The truck turnaround locations may be subject to change based on pre-clearing surveys or based on site conditions at the time of construction. Truck turnarounds will be an additional 20 m width to the ROW for a length of about 50 m on one side of the ROW only.

Trenched/Bored Crossings

Unsealed roads and minor watercourses will typically be crossed using open cut trenching. The Stuart Highway will be crossed by horizontal boring.

Horizontal boring involves construction of a bell hole either side of the crossing with a horizontal bore hole for installation of the pipeline beneath sensitive surface features. The additional disturbance footprint required for horizontal boring crossings would generally be an area of approximately 20 m x 70 m adjoining each side of the ROW.

Water Bores, Water Storage and Hydrostatic Testing

A minimum of two new bores are proposed. These being located within the footprint of the temporary construction campsite. Hardstand and associated piping infrastructure will be required at water offtakes. Water storages are likely to be turkeys nests located at the construction camp and at KP 0. The estimated area required for each turkeys nest storage is 50 m X 50 m. The turkeys nest dams may be retained following construction.

Borrow pit for gravel material

A 50 m x 50 m borrow pit for gravel material is proposed within the footprint of the Sturt Plateau Facility temporary laydown area. Additional gravel material may be extracted from discrete areas within the site nominated for the camp area.

Cathodic protection anode bed

An impressed current cathodic protection system will be employed to protect the pipeline from corrosion and will require construction of a cathodic protection anode bed. The 300 m x 10 m, buried cathodic protection anode bed will be developed in the southern portion of the project area.

1.4 Regulatory framework

1.4.1 Commonwealth legislation

1.4.1.1 Environment Protection and Biodiversity Act 1999

The EPBC Act is administered by the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW). The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places, which are defined in the EPBC Act as MNES.

Database searches and field assessments should be conducted as part of any flora and fauna impact assessment. The results of these assessments can be used to determine the presence or likelihood of occurrence of MNES within the Project area. If any species or communities listed under the EPBC Act are present or likely to occur, an assessment of significance is required. If the proposed action may have a significant impact on a MNES, it must be referred to DCCEEW for assessment. If DCCEEW determines that the proposed action is likely to have significant impacts despite any suggested mitigation strategies, the Project will be considered as a controlled action and will require formal assessment and approval. If the proposed action is not likely to be significant, approval is not required if the action is taken in accordance with the referral. Consequently, the action can proceed, subject to any State, Territory, or local government requirements.

1.4.2 Territory legislation

1.4.2.1 Territory Parks and Wildlife Conservation Act 2006

The TPWC Act is administered by the NT Department of Environment, Parks and Water Security (DEPWS). The TPWC Act makes provisions for the establishment of Territory Parks and other Parks and Reserves and promotes the study, protection, conservation and sustainable utilisation of wildlife. The TPWC Act also covers the classification and management of wildlife, classification and control of feral animals, permits for taking wildlife, and designation and management of protected areas and private sanctuaries.

Wildlife management

The management of wildlife under the TPWC Act is to be carried out in a manner that promotes:

- The survival of wildlife in its natural habitat.
- The conservation of biological diversity within the NT.
- The management of identified areas of habitat, vegetation, ecosystem, or landscape to ensure the survival of populations of wildlife within those areas.

- The control or prohibition of:
  - The introduction or release of prohibited entrants into the NT.
  - Any other act, omission or thing that adversely affects, or will or is likely to adversely affect, the capacity of wildlife to sustain its natural processes.
- The sustainable use of wildlife and its habitat.

Feral animals are to be managed in a manner that reduces their population and the extent of their distribution within the NT and controls any detrimental effect they have on wildlife and the land.

Protected wildlife

Protected wildlife includes all wildlife that is:

- In a park, reserve, sanctuary, wilderness zone or area of essential habitat.
- A vertebrate that is indigenous to Australia.

The TPWC Act uses the International Union for the Conservation of Nature (IUCN) criteria to classify species. IUCN criteria classify wildlife into conservation categories as follows:

- Threatened categories:
  - Extinct (EX).
  - Extinct in the Wild (EW).
  - Critically Endangered (CE).
  - Endangered (EN).
  - Vulnerable (VU).

Threatened wildlife is automatically given protected wildlife status.

1.4.2.2 Environment Protection Act

The *Environment Protection Act 2019* (EP Act) is administered by DEPWS. The EP Act and subordinate regulation (EP Regulation, 2020) legislate the environmental impact assessment and approval process for the NT. The objectives of the act are to:

- Protect the environment of the NT.
- Promote ecologically sustainable development so that the wellbeing of the people the NT is maintained or improved without adverse impact on the environment.
- Recognise the role of environment impact assessment and environmental approval in prompting the protection and management of the environment.
- Provide for broad community involvement during the process of environmental impact assessment and approval.
- Recognise the role that Aboriginal people have as stewards of their country as conferred under their traditions and recognised in law, and the importance of participation by Aboriginal people and communities in environmental decision-making processes.

Additionally, the EP Act identifies activity- and location-based triggers, which may result in the referral of an action to the NT Environment Protection Agency (EPA) for assessment in accordance with the EP Regulation. An activity-based referral trigger includes actions that the Minister considers are likely to have a significant impact on the environment. A location-based referral trigger includes areas that the Minister considers are:

(a) of significance because of a feature of the natural or cultural environment; and

(b) likely to be subject to significant impact by actions.

The NT EPA has developed environmental factors and objectives to improve certainty, and increase transparency, within the environmental impact assessment process. 'Terrestrial ecosystems' is one of the 14 environmental factors (and falls under the Land theme) identified by NT EPA. The objective of the terrestrial ecosystem environmental factor is to 'protect terrestrial habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning' (NT EPA, 2022). This objective provides an indicator against which to assess whether the objects of the EP Act can be achieved and are used by the NT EPA to judge whether the environmental impact of a proposed action may be significant and ultimately whether a proposed action is likely to be acceptable (NT EPA, 2022).

1.4.2.3 Weeds Management Act

The *Weeds Management Act 2001* (WM Act) is administered by DEPWS and legislates the declared and potential weeds of the NT and their management. The purpose of the WM Act is to:

- Prevent the spread of weeds in, into and out of the NT and to ensure that the management of weeds is an integral component of land management in accordance with the Katherine Regional Weeds Strategy 2021-2026 (DEPWS, 2021a) or any other strategy adopted to control weeds in the NT.
- Ensure there is community consultation in the creation of weed management plans.
- Ensure that there is community responsibility in implementing weed management plans.

General duties for the owners and occupiers of land identified within the WM Act include, but are not limited to, the requirement for owners and occupiers to:

- Take all reasonable measures to prevent the land being infested with a declared weed.
- Take all reasonable measures to prevent a declared weed or potential weed on the land spreading to other land.
- Within 14 days after first becoming aware of a declared weed that has not previously been, or known to have been, present on the land, notify an officer of the presence of the declared weed.
- Comply with weed management plans relating to declared or potential weeds that are present on the land.
- Dispose of a potential weed on land which the potential weed is already present or at a designated weed disposal area.

1.4.2.4 Soil Conservation and Land Utilisation Act

The *Soil Conservation and Land Utilisation Act 1969* (SCLU Act) is administered by DEPWS and provides for the prevention of soil erosion and for the conservation and reclamation of soil.

1.4.2.5 Pastoral Land Act

Clearing of native vegetation on pastoral land is controlled by the *Pastoral Land Act 1992* (Pastoral Land Act). The Land Clearing Guidelines (DEPWS, 2024c) establish standards for native vegetation clearing and must be applied for 'development applications for the purpose of clearing of native vegetation' under the Pastoral Land Act.

2.0 Physical environment

2.1 Bioregional context

The Project Area wholly occurs within the Sturt Plateau bioregion (DEPWS, 2024a), which occupies an area of ~98,575 km^2 in central NT (Bastin, 2008). The bioregion comprises flat to gently undulating plains, with little local relief, and the vegetation is mainly eucalypt forests and woodlands dominated by bloodwoods over perennial grasses (Bastin, 2008). The northwesternmost portion of the Mitchell Grass Downs bioregion occurs ~6.5 km to the south of the western portion of the Project Area (DEPWS, 2024a). A review of spatial imagery suggests that sections of the Project Area intersect habitat units (i.e. seasonally inundated black soil plains) that are characteristic of the Mitchell Grass Downs bioregion (DEWPS, 2024a; Bastin ,2008).

2.2 Land Units and Soils

Land Units within the Project Area comprise:

- Elevated plains & pediments
- Sloping pediments
- Lower clay plains

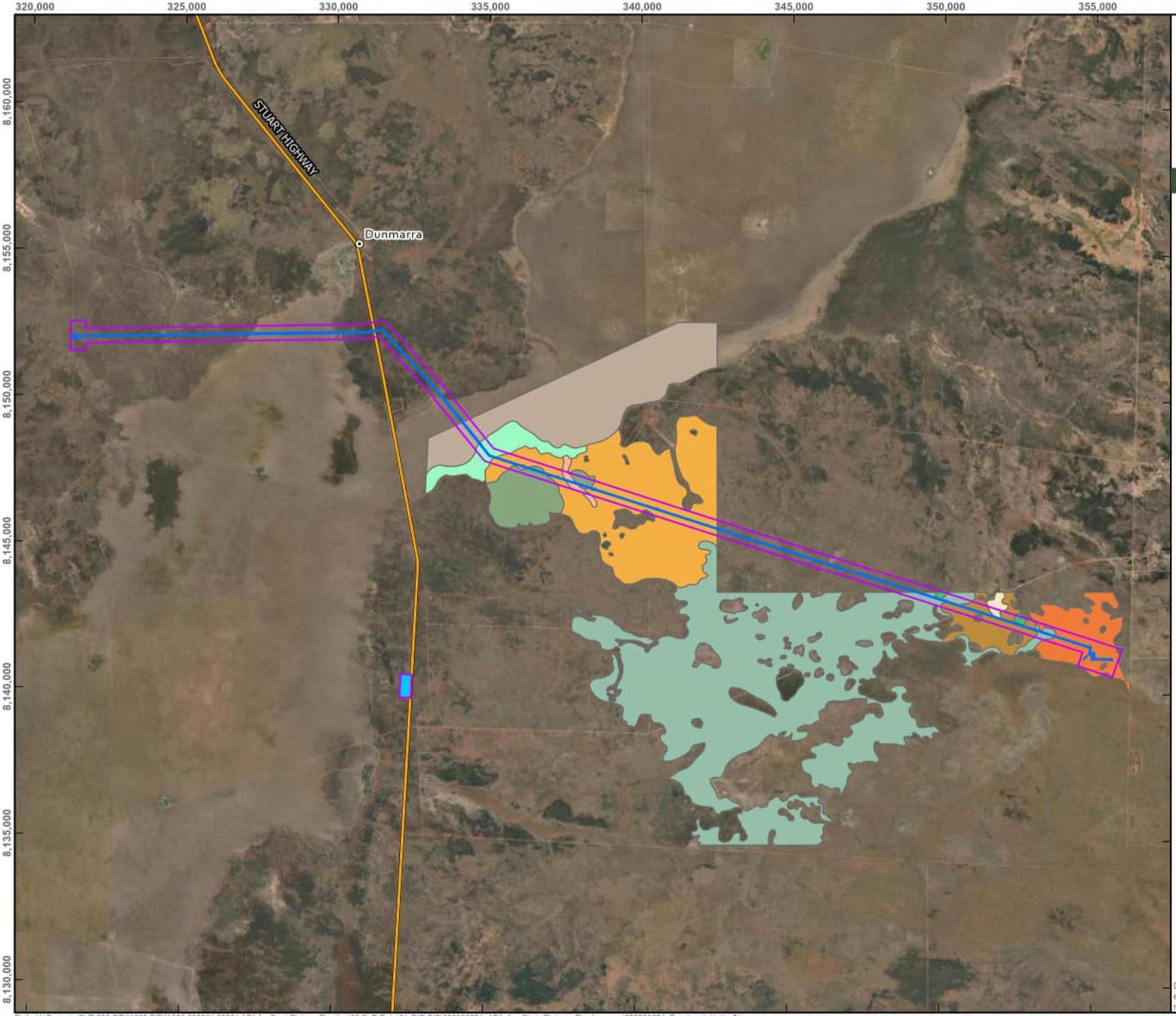
Table 4 shows the land units and land forms at the Project Area (Burley *et. al.* 2019). Figure 3 show the mapped land units.

Available data for soils is shown in Figure 4. The Project Area is dominated by kandosols and tenosols with vertosols within the floodplains. Pockets of hydrosols occur throughout the tenosols. At least one area of rudosols also occurs within the Project Area.

Table 4 Land units and landforms within the Project Area

Land Unit	Landform	Soil	Vegetation
Low Rises			
7a	Gently undulating dissected gravelly low rises and pediment slopes	Very shallow (<0.25 m) to moderately deep (<1 m), massive, brown earthy sands or red earths over ferricrete (Leptic Tenosols and Red/Brown Petroferric Kandosols)	*Corymbia dichromophloia* low open woodland
7b	Scoured gravelly gently undulating low rises and pediment slopes	Generally shallow (<0.5), massive, brown or red earths over indurated ferricrete (Red/Brown Petroferric Kandosols)	*Acacia shirleyi* low woodland
Plains			
8a3	Level sandy wash-slope plains and pediments	Massive, bleached, brown earthy sands or brown earths over ferricrete. Soil depth predominately moderately deep (0.5-1m), though quite variable. (Petroferric Tenosols/Kandosols)	*Corymbia dichromophloia* low open woodland

Land Unit	Landform	Soil	Vegetation
8a4	Broad, imperfectly drained, mostly endorheic plains	Deep (<1.5 m), massive, bleached, brown earthy sands or grey/yellow earths over ferricrete (Petroferric Kandosols)	*Melaleuca nervosa* low open woodland
8b2	Level colluvial plain margins and valley flats within narrow relict drainage features	Moderately deep (0.5-1.0 m), massive, red earths over ferricrete (Red Kandosols)	*Erythrophleum chlorostachys, Corymbia dichromophloia, Corymbia terminalis* low woodland
Inland Wetlands			
13a	Seasonally inundated level clay plains with gilgai microrelief	Very deep (>1.5 m), cracking, self-mulching, grey medium to heavy clay (Grey Vertosols)	*Eucalyptus microtheca* low open woodland



APA STURT PLATEAU PIPELINE ENVIRONMENTAL APPROVALS

LAND UNITS WITHIN THE PROJECT AREA

FIGURE 3

LEGEND

- Project Area
- Pipeline Construction ROW
- Temporary Construction Camp
- Town

Road Category

- Pastoral - National Highway

Land Unit - Dunmarra Survey

11a	8a2
13a	8a3
7a	8a4
7b	8b2
7c	8d

Service Layer Credits:
Earthstar Geographics

0 3 6 km

Coordinate System:	GCS GDA 1994
Scale:	1:175,000 at A4
Project Number:	680.030294
Date Drawn:	11-Oct-2024
Drawn by:	CP
Reviewed by:	NC

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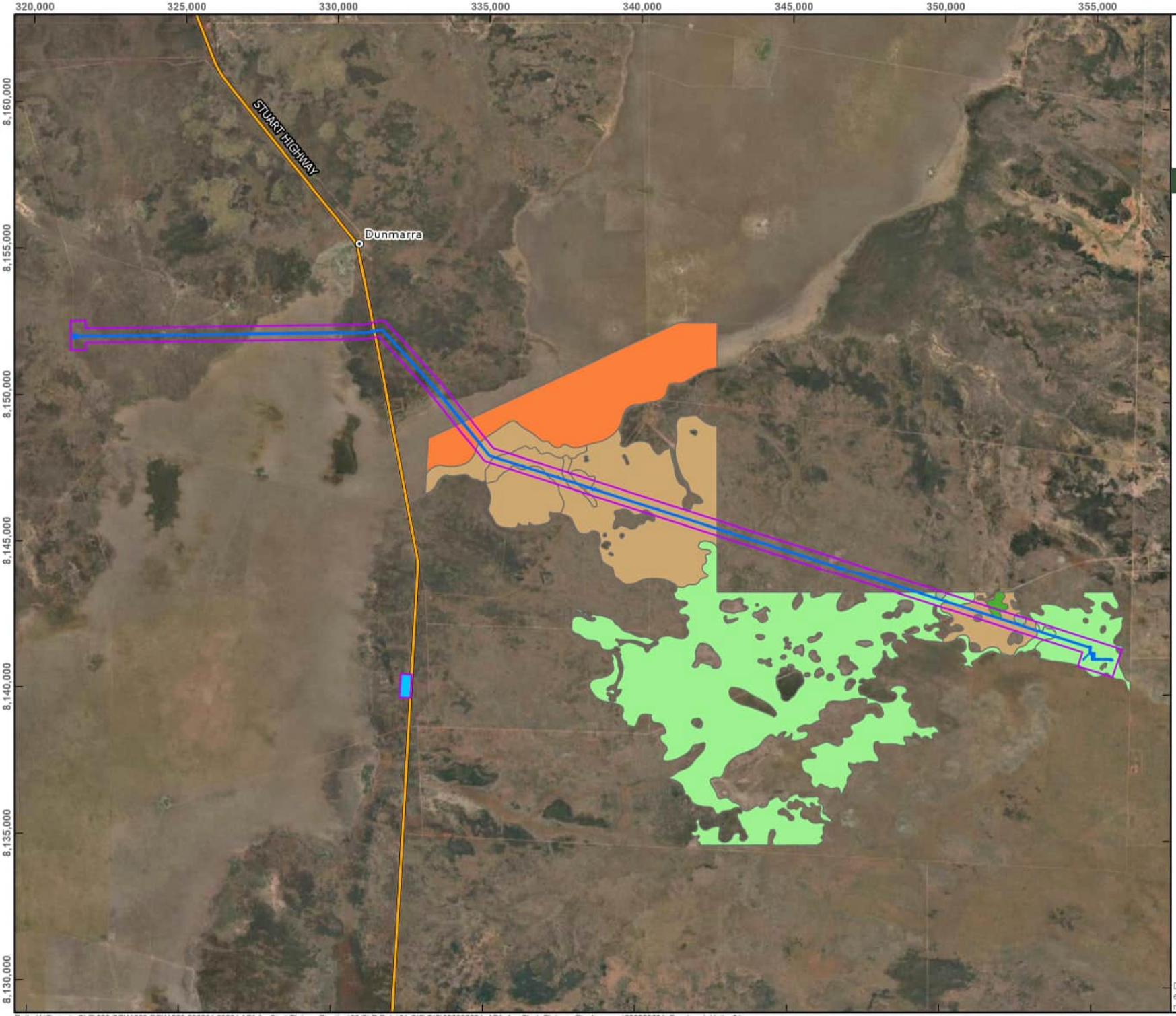
Path: H:\Projects-SLR\680-DRW\680-DRW\680.030294.00001 APA for Sturt Plateau Pipeline\06 SLR Data\01 GIS\GIS\680030294_APA_for_Sturt_Plateau_Pipeline.aprx\680030294_Fxx_Land_Units_01



APA STURT PLATEAU PIPELINE ENVIRONMENTAL APPROVALS

MAPPED SOILS WITHIN THE PROJECT AREA

FIGURE 4

LEGEND

- Project Area
- Pipeline Construction ROW
- Temporary Construction Camp
- Town

Road Category

- Pastoral - National Highway

Soil Type

- Hydrosol
- Kandosol
- Rudosol
- Tenosol
- Vertosol

Service Layer Credits: Earthstar Geographics

0 3 6 km

Coordinate System:	GCS GDA 1994
Scale:	1:175,000 at A4
Project Number:	680.030294
Date Drawn:	11-Oct-2024
Drawn by:	CP
Reviewed by:	NC

SLR

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Path: H:\Projects-SLR\680-DRW\680-DRW\680.030294.00001 APA for Sturt Plateau Pipeline\06 SLR Data\01 GIS\GIS\680030294_APA_for_Sturt_Plateau_Pipeline.aprx\680030294_Fxx_Land_Units_01

2.3 Climate

The climate of the Sturt Plateau is dry and monsoonal, with almost all rainfall occurring between November and March (Bastin, 2008). Mean annual rainfall in the local area to the Project Area is ~677 mm, with the highest annual rainfall recorded being ~1,182 mm (Bureau of Meteorology (BoM), 2024). Over the 2024 period preceding the May 2024 survey the local area experienced uncharacteristically high monthly rainfall, totalling ~1,141 mm (January, 467.8 mm; February, 288.0 mm; March, 353.8 mm; April, 31.8 mm; May, 0.0 mm) (BoM, 2024). This resulted in prolonged, broad-scale flooding of local, low-lying areas and components of the Project Area.

This information was obtained from the Daly Waters Airstrip weather station (station number 014626), located ~50 km from the western portion of the Project Area. Monthly rainfall data from this weather station are available over the 1939 – 2024 period.

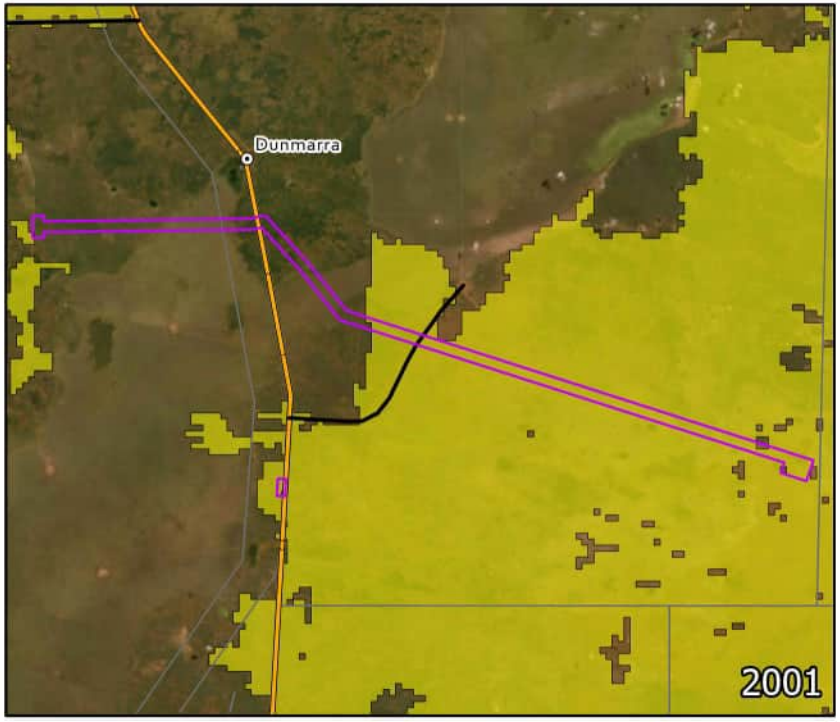
2.4 Surface water and drainage

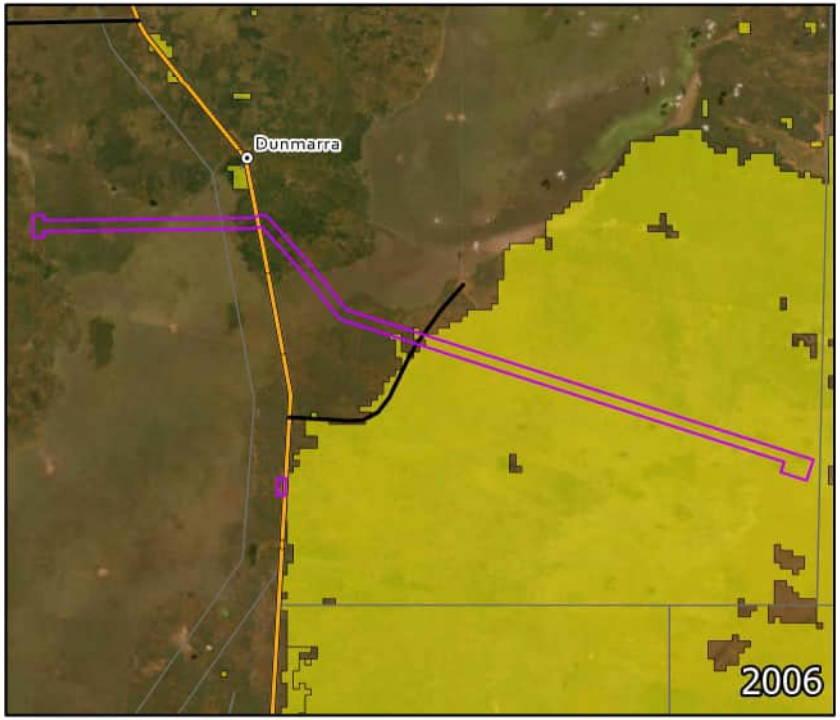
The Project Area is located within the northern portion of the Wiso River basin and a closed sub-catchment of ephemeral first and second order watercourses (DEPWS, 2024a). These watercourses coalesce into a broad seasonal floodplain, predominantly draining to the northeast of the Project Area (DEPWS, 2024a). These watercourses and their relationship to the Project Area are further described in Section 4.0.

2.5 Fire history

Regional fire scar data based on satellite imagery (Figure 5) indicates that fire activity is frequent in the region with widely varying extents of burnt areas yearly. In 2004, 84% of the Project Area was burnt, whilst more recently in 2023 only 7% was burnt. Significant fire scarring within proximity to the Project Area occurred in 2001, 2004, 2006 and 2012, as shown in Figure 5.

Over the past 25 years, fire has affected the Project Area in 16 of those years, with an average of 18% of the area burned annually. The highest recorded extent of fire was in 2004, when 84% of the area was impacted, while the lowest was 0%. Significant fire events in the past 20 years include 2001 (55%), 2004 (84%), 2006 (49%), 2012 (49%). The impact of fire frequency on ecological values is identified in Section 5.0.





APA STURT PLATEAU PIPELINE ENVIRONMENTAL APPROVALS

FIRE HISTORY WITHIN THE PROJECT AREA (NAFI)

FIGURE 5

LEGEND

- Project Area
- Fire Scar (NAFI)
- Town
- Cadastre

Road Category

- Pastoral - National Highway
- Pastoral - Secondary

Service Layer Credits:
Earthstar Geographics, Maxar

0 5 10 km

Coordinate System:	GCS GDA 1994
Scale:	1:350,000 at A4
Project Number:	680.030294
Date Drawn:	14-Oct-2024
Drawn by:	CP
Reviewed by:	MN

SLR

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Path: H:\Projects-SLR\680-DRW\680-DRW\680.030294.00001 APA for Sturt Plateau Pipeline\06 SLR Data\01 GIS\GIS\APA_Sturt_Plateau_FireHistory.aprx\680030294_Fxx_Fire_Scars_01

3.0 Flora and fauna assessment methodology

3.1 Overall assessment methodology

SLR employed a joint approach of desktop analysis and field surveys in this study. The study team implemented best practice recommendations from source such as:

- *NT Guidelines and Field Methodology for Vegetation Survey and Mapping* (Brocklehurst et al., 2007).
- *Guidelines for Assessment of Impacts on Terrestrial Biodiversity* (NT EPA, 2013).

The methodology encompassed two phases – scoping and field survey. The scoping phase encompassed:

- Project planning and definition of objectives.
- Assignment of qualified ecologists.
- Detailed desktop studies.
- Review of previous studies.
- Collation of existing records.
- Literature review of species and potential threats and impacts.

The field survey phase encompassed the following and were undertaken over 28 May to 2 June 2024:

- Systematic, targeted and incidental flora surveys.
- Vegetation community mapping and assessments.
- Systematic, targeted and incidental fauna surveys.

The survey work involved in this report was conducted under SLRs permit to interfere with wildlife for commercial purposes (permit number 74498), granted by the NT Parks and Wildlife Commission.

3.2 Desktop analysis

3.2.1 Database searches and online mapping resources

The DCCEEW Protected Matters Search Tool (PMST) Report (DCCEEW, 2024a; Appendix A) and the Natural Resource (NR) interactive mapping tool (NR Maps) (DEPWS, 2024a) were utilised to determine species, communities and areas of conservation significance with potential relevance to the Project Area. The search area for the DCCEEW (2024a) and DEPWS (2024a) desktop assessments contained all land within a 30 km buffer of a central coordinate (-16.848109, 133.478383) of the Project Area. The search area therefore incorporates the entirety of the Project Area and similar habitat in the surrounding landscape. The large search area also facilitates the inclusion of species records in a remote landscape where species records may be sparse or localised around developed areas.

The results of database searches and their relevance to the Project Area are discussed in Section 4.0 of this report. Flora and fauna species occurrence records prior to 1980 have been omitted from the interpretation of results. Where a species was returned from DEPWS (2024a) database searches with no date information but is listed as extinct within the NT on the NT Fauna Atlas (DEPWS, 2024b), this species was omitted from database search results and further any interpretation.

The following mapping resources and databases were reviewed as part of the desktop assessment:

- NR Maps (DEPWS, 2024a), including the following layer classes:
  - Watercourse and drainage feature mapping.
  - Fauna atlas.
  - Flora atlas.
  - Significant biodiversity areas.
  - Parks and reserves.
  - Vegetation.
  - Surface water drainage.
  - SREBA layers:
    - Bores
    - Water Table Depth Raster
    - Terrestrial Ecosystems
- Atlas of Living Australia (ALA) species occurrence maps (ALA, 2024).
- NT weeds database (provided by DEPWS, 2024).
- PMST interactive mapping tool (DCCEEW, 2024b).
- National Vegetation Information System (NVIS) Version 6.0 - Australia - Extant Vegetation (NT), (DCCEEW, 2020).

3.2.2 Likelihood of occurrence assessments

SLR has developed an approach for ranking threatened and migratory species and communities recorded from database searches in terms of their likelihood of occurring within the Project Area. The approach is based on the presence of local records, species' ranges and the habitat requirements for each species. Details of the criteria used to assess the likelihood of occurrence for threatened and migratory species are provided in Table 5.

The potential impacts to threatened and migratory species that may occur within the Project Area, an assessment of potential risks and impacts to these species, and management measures to preferentially avoid then mitigate potential impacts are discussed in Section 6.0.

Table 5 Key likelihood of occurrence assessment criteria

Likelihood of occurring	Key criteria	Definition
Present	Species recorded within the Survey Area during baseline assessments or records of this species identified to occur within the Project Area during the desktop assessment.	
High	Known records (<30 km) and/or within species known core range. AND Suitable habitat of high quality is present.	Historical records of the species occur within a 30 km radius of the Project Area, or the Project Area is within the species known range. Suitable habitat of high quality exists with the Project Area.

Likelihood of occurring	Key criteria	Definition
Moderate	Known records (<30 km) and/or within species non-core range. AND Marginally suitable habitat may be present, or habitat is degraded.	Historical records of the species occur within a 30 km radius of the Project Area and/or the Project Area is within the species known non-core range. Marginally suitable habitat may be present, or habitat is moderately degraded or fragmented.
Low	No records (<30 km) and/or outside of species range. OR Habitat present is likely unsuitable, absent, or highly degraded.	No historical records of this species occur within a 30 km radius of the Project Area and/or the Project Area is not within the known range for this species. OR The habitat within the Project Area is not suitable and/or is in extremely poor condition or is absent for the species.

3.2.3 Nomenclature and taxonomy

Apart from technical descriptions and tables, all flora and fauna species are referred to by their common names throughout this report, with their scientific names given in brackets after the first reference. Scientific names for flora species within this report will follow the 'NT Flora Species Checklist' (DEPWS, 2023). Scientific names for fauna species within this report will follow the 'NT Fauna Species Checklist' (DEPWS, 2024b). Where no common name is provided in reference texts, a search was conducted for other accepted common names and, if none were found, only the scientific name was used. An asterisk is used to denote species that are not native to Australia. The taxonomic sequence of birds within Appendix F. is structured in accordance with Gill *et al*. (2024).

3.2.4 Literature review

A review was undertaken of available literature for existing survey effort and ecological data with potential relevance to the Project Area.

3.3 Flora survey methodology

3.3.1 Overall methodology

Techniques described in Brocklehurst *et al*. (2007) were used to collect sufficient data during the field vegetation assessments to validate the vegetation communities identified during baseline assessments within the Survey Area. The key features recorded in the field relevant to this report are:

- Vegetation structure including height of each stratum and cover density.
- Key species within each stratum.
- Geology, landform and other land unit characterisation.

The purpose of flora surveys was to:

- Determine the extent of vegetation communities throughout the Project Area.
- Perform targeted searches for threatened flora species identified during database searches, via 'meander' searches.
- Compile a flora species inventory for the Survey Area.

3.3.2 Vegetation assessment sites

Site selection

Ground-truthing of vegetation communities within the Survey Area involved assessments of the floristic structure and composition of communities at various locations. Assessment sites were located where they would provide representative data for the vegetation community that was the subject of the assessment.

The location of the assessment sites and the survey techniques employed were selected to achieve the following:

- Accurately determine the extent of each vegetation community within the Survey Area.
- Provide data on the vegetation community condition.
- Target threatened flora species identified during database searches and their habitat within the Survey Area.
- Compile a flora species inventory for the Survey Area.

Survey techniques

18 vegetation assessments were conducted to validate the vegetation community mapping and to capture any variability in the structure and composition of vegetation communities. The vegetation survey techniques employed, and attributes recorded during the assessments are detailed in Table 6. In general, focus was given to the dominant species, crown cover and median height of the ecologically dominant layer, which is used to describe the structural form of each community based on the structural classification of vegetation communities described in Brocklehurst *et al*. (2007). Vegetation and/or land unit characteristic notes were also undertaken at an additional 24 locations during the field survey period. The location of assessment and vegetation and/or land unit characteristic note locations are shown in Section 5.0.

Various parts of the Survey Area were traversed using the random meander technique documented by Cropper (1993). This technique was applied to supplement other survey techniques and to:

- Locate and record any flora species not identified in vegetation assessment plots or rapid assessments.
- Target threatened flora species.
- Validate NVIS vegetation community mapping.
- Determine the presence and extent of pest flora species.

Table 6 Vegetation attributes measured at vegetation assessment sites

Survey area	Attributes measured
Survey plot (50x50 m)	Key species of each stratum. Median height of each stratum.

Survey area	Attributes measured
	Cover density of each stratum. Representative species list. Land zone and soil characteristics. Central coordinate.
Greater area encompassing the present vegetation association	Incidental species observed. Additional relevant notes.

3.3.3 Vegetation mapping

Mapping of vegetation communities was performed using a combination of vegetation traverses, aerial imagery, DEPWS (2024a) NVIS mapping and Strategic Regional Environmental and Baseline Assessment (SREBA) for the Beetaloo Sub-basin broad vegetation group (BVG) mapping (DEPWS, 2024a; Young *et al*., 2022). Using the information gained at each of the vegetation assessment sites, and observations made when traversing the Survey Area, the boundaries of vegetation communities were recorded using handheld GPS devices. Vegetation communities were mapped as distinct units where they were >1 ha in size (inclusive of areas outside of the Survey Area). Where vegetation communities were <1 ha in size they were considered to be non-mappable units.

3.4 Fauna survey methodology

3.4.1 Systematic survey sites

During the survey period systematic survey sites were established in different habitat units within the Survey Area, which were determined through an investigation of aerial imagery and DEPWS (2024a) vegetation mapping. Systematic survey sites were positioned to provide an appropriate spatial distribution within the Survey Area, while encompassing different habitat units and/or areas where project related disturbance was proposed. A description of habitat units, described as SREBA BVGs present at each systematic survey site is provided in Table 7. The location of each systematic survey site is shown in Section 5.0.

Table 7 Systematic fauna survey sites and corresponding habitat units

Site number	Habitat unit description	Representative photograph
Fauna site 1	*Melaleuca* low open woodland on floodplains and drainage depressions	
Fauna site 2	*Corymbia/Eucalyptus* open woodland on sandy loam	

Site number	Habitat unit description	Representative photograph
Fauna site 3	Lancewood forest	

3.4.2 Systematic survey techniques

The survey techniques employed at the systematic survey sites and at additional locations while traversing the Survey Area are detailed in Table 8.

Table 8 Fauna survey methods employed throughout the Survey Area

Survey method	Description
Elliott trapping	At each fauna trap site, type-A Elliott style traps were placed on the ground approximately 5 to 10m apart in a straight line for four nights at each site. Twenty traps were deployed at each site. All traps were baited with a mixture of rolled oats, peanut butter and honey.
Pitfall trapping	Drift fence lines[1] incorporating pitfall and funnel traps were established for four nights at each site. Four pitfalls (20L buckets) were installed along the drift fence at each site; one pitfall at the T-intersection, with the remaining three occurring along a central position along each 'arm' of the T-shaped array. The exception to this was 'Fauna site 3', where only three pitfalls could be installed due to a high proportion of sub-surface rock. Pitfalls were buried flush with the ground surface with the drift fence intersecting the centre of each bucket.
Funnel trapping	Six funnel traps were installed for four nights at each site. Funnel traps were 'paired', one on either side of the drift fence. One pair of funnel traps was placed along each of the three 'arms' of the T-shaped drift fence array.
Cage trapping	Four cage traps were placed at each traps site – one in each corner of the 100x100m trap site plot. Cage traps were installed for four nights and baited with a mixture of rolled oats, peanut butter, honey and a variety of different meats.
Camera trapping	Camera traps (motion-sensing infrared cameras) were installed at each trap site to target fauna that may be too cryptic to be detected by other trapping and survey techniques. One camera was deployed at each trap

Survey method	Description
	site for four nights and each camera was baited with a mixture of rolled oats, peanut butter, honey and a variety of different meats.
Active diurnal searches	Active diurnal searches were undertaken within the 100x100m trap site plot each day and concurrently with vegetation assessments throughout the Survey Area. This technique involved intensive investigation of ground-layer habitat features (such as under logs, rocks and leaf litter), low vegetation (under bark and tree stumps) for cryptic fauna, particularly reptiles. Searches were focussed during times of the day when reptile activity was likely to be at its peak. Visual observations of mammal tracks were also made to indicate presence of a species.
Diurnal bird surveys	Birds were surveyed within the 100x100m trap site each day and concurrently with vegetation assessments throughout the Survey Area. Survey effort was focussed on peak activity periods in the morning and around waterbodies, where present. Birds were identified from either direct observation (including observations of loose feathers) or by their calls.
Nocturnal surveys	High-powered spotlights were used to survey nocturnal mammals (flying, arboreal and terrestrial), birds (active nocturnal species and roosting diurnal species), reptiles and frogs within the 100x100m trap site plot at each fauna trap site. Additionally, where an area outside of these trap sites was identified as suitable for nocturnal threatened species, this area was also searched.
Microbat call detection	An Anabat SM4 bat call detector was deployed for one night at each fauna trap site to identify the presence of microbat species.
Incidental observations	In addition to the above-described survey methods, incidental observations of fauna species were continuously made over the field survey period. This included when driving along access roads (day and night) and while traversing the Survey Area on foot. Incidental observations of fauna species were attributed to habitat units' ground-truthed within the Survey Area to inform biodiversity values and habitat utilisation of fauna species within the Project Area.

1 Drift fence arrays were established in a T-shape (2 x intersecting 20 m lengths of drift fence). This method is recommended in Eyre *et al*. (2022) and differs from that recommended within DEPWS (2013), which details 4 x separate 10 m drift fences. However, the total drift fence length between the two methods is equal.

3.4.3 Systematic survey effort

The survey effort for each of the systematic fauna survey techniques described in Table 8 is outlined in Table 9. However, it should be noted that fauna species were continually observed throughout the survey period and incidental records were frequently obtained throughout the survey. Any notable, observations, tracks, scats or other signs of fauna were recorded with reference to the location and habitat type.

Table 9 Fauna survey effort for each systematic survey technique

Method	Systematic trap site survey effort	Total survey effort
Elliott trapping	20 traps x 4 nights x 3 sites	240 trap nights
Pitfall trapping	4 traps x 4 nights x 2 sites 3 traps x 4 nights x 1 site	44 trap nights
Funnel trapping	6 traps x 4 nights x 3 sites	72 trap nights
Cage trapping	4 traps x 4 nights x 3 sites	48 trap nights

Method	Systematic trap site survey effort	Total survey effort
Camera trapping	1 camera x 4 nights x 3 sites	12 camera trap nights
Active diurnal searches	1 person hour x 2 people x 4 days x 3 sites	24 person hours
Diurnal bird surveys	0.5 person hours x 2 people x 4 days x 3 sites	12 person hours
Nocturnal surveys	0.5 person hours x 4 people x 3 nights x 3 sites	18 person hours
Microbat call detection	1 detector nights x 3 sites	3 detector nights

3.4.4 Targeted survey techniques

Targeted survey techniques were used to increase the likelihood of detecting conservation significant species and/or their habitat. Specifically, targeted survey techniques were employed for the Gouldian Finch (*Erythrura gouldiae*), Painted Honeyeater (*Grantiella picta*), Greater Bilby (*Macrotis lagotis*) and Yellow-spotted Monitor (*Varanus panoptes*).

Gouldian Finch targeted survey techniques consisted of waterhole watches and intensive investigations of gregarious Finch and Woodswallow flocks, which are recommended survey methods for this species in CoA (2010).

Painted Honeyeater targeted survey techniques consisted of area searches and call playback during diurnal bird surveys and in areas where Mistletoe, particularly fruiting plants, were abundant. These are recommended survey methods for this species in Rowland (2012).

Daytime searches for signs of activity, including burrows, tracks and diggings were undertaken while traversing the Survey Area on foot for the Greater Bilby and Yellow-spotted Monitor, which is a recommended survey method for the Greater Bilby in CoA (2011a). There are currently no published targeted survey methods for the Yellow-spotted Monitor, however visual searches of microhabitat features (i.e. burrows) are a generalised survey method described in CoA (2011b). Should evidence of these species be identified then additional survey effort would be undertaken to further elucidate the presence and habitat values for these species.

3.4.5 Fauna habitat assessments

Fauna habitat assessments were undertaken at each of the 18 vegetation assessment sites. Fauna habitat assessment data collection at each of these 18 sites generally aligned with that outlined in Appendix 16 of Brocklehurst *et al*. (2007). Due to a high proportion of overlap in data collection requirements at vegetation assessment sites and Appendix 16 of Brocklehurst *et al*. (2007), additional information relating to fauna habitat values were noted on vegetation assessment proformas. To streamline the data collection process, focus was given to detailing fauna values that were present at vegetation assessment sites and in the general community that the assessment was undertaken in. Additional fauna habitat information noted at vegetation assessment sites included:

- Evidence and frequency of disturbance. This included factors such as clearing, infrastructure, and pest flora and fauna species;
- Site drainage and evidence of moisture retention of soils and microrelief (e.g., gilgais, wetland habitats, etc.);
- Evidence of grazing;
- Fire frequency and intensity;
- Presence of surface gravel, pebbles, cobbles and boulders;

- Evidence and type of erosion;
- Evidence of burrows or other large excavations (including those in termite mounds);
- Evidence of leaf litter and large, woody debris;
- Evidence of hollow bearing trees;
- Presence of mistletoe species; and

Any other features (artificial dams or other permanent/semi-permanent water sources, etc.) of relevance to fauna species, particularly threatened fauna.

4.0 Desktop analysis results

4.1 Vegetation communities

4.1.1 NVIS vegetation communities

12 NVIS vegetation communities were identified as occurring within 30 km of the Project Area during database searches (Table 10; DEPWS, 2024a; Figure 6). Six of these communities overlap with the Project Area; Veg. ID: 325, 331, 364, 394, 395, and 1041.

Table 10 NVIS mapped vegetation communities within 30 km of the Project Area

Veg ID	Level 3 description	Community description[1]	Environmental description
315	*Melaleuca* open forest	U+ ^*Melaleuca viridiflora*, *Melaleuca leucadendra*, *Melaleuca cajuputi*\^tree\7\c; M ^*M. leucadendra*, *Pandanus spiralis*, *Acacia auriculiformis*\^tree,palm\6\r; G ^*Pseudoraphis spinescens*, *Paspalum scrobiculatum*, *Oryza rufipogon* \forb,vine,^tussock grass\1\i	Open-forest, floodplain fringes.
325	*Melaleuca* low woodland	U+ ^*Melaleuca citrolens*, *Melaleuca minutifolia* +/- *Eucalyptus pruinosa*\^tree\6\i; M *Carissa lanceolata*, ^*M. citrolens*, *Melaleuca stenostachya*\^shrub\3\r; G ^*Eulalia aurea*, *Chrysopogon. fallax*, *Triodia microstachya* \forb,^tussock grass, hummock grass\1\i	Low woodland/open woodland, plains/relict drainage fringe.
331	*Corymbia* low woodland	U+ ^*Corymbia dichromophloia*, *Eucalyptus leucophloia* +/- *Corymbia ferruginea*\^tree\6\i; M ^*Terminalia canescens*, *Petalostigma pubescens*, *Erythrophleum chlorostachys*\^shrub\3\r; G ^*C. fallax*, *Triodia bitextura*, *Grewia retusifolia*\^tussock grass, hummock grass, shrub\1\	Gently undulating plains, shallow red to yellow, gravelly, sandy earths or stoney sands.
355	*Lysiphyllum* low open woodland	U+ ^*Lysiphyllum cunninghamii*, *Eucucalyptus pruinose* +/- *Eucalyptus terminalis*\^tree\6\r; M ^*Atalaya hemiglauca*, *Acacia lysiphloia* +/- *L. cunninghamii*\^shrub\3\r; G ^*E. aurea*, *C. fallax*, *Sorghum plumosum* \^tussock grass\1\c	Low lying flat to gently undulating plains, poor to moderately drained, medium to heavy clay soils

Veg ID	Level 3 description	Community description[1]	Environmental description
364	*Acacia* open forest	U+ ^*Acacia shirleyi* +/- *Macropteranthes kekwickii* +/- *C. dichromophloia*\^tree\7\c; M ^*Acacia shirleyi*, *Flueggea virosa*, *Acacia lysiphloia*\^shrub\4\i; G ^*C. fallax*, *Enneapogon oblongus*, *Aristida pruinosa*\^tussock grass\1\i	Rises with rocky skeletal soils extending onto shallow gravelly sands in drier areas.
383	*Melaleuca* woodland	U+ ^*M. viridiflora*, *M. leucadendra* +/- *Eucalyptus polycarpa var. polycarpa*\^tree\7\i; M ^*M. viridiflora*, *Sesbania cannabina*, *M. leucadendra*\^tree,shrub\6\r; G *Pseudoraphis spinescens*, ^*Fimbristylis spp*., *Eleocharis dulcis*\tussock grass,^sedge\1\i	Woodland/open-forest, billabongs
390	*Acacia* low open forest	U+ ^*A. shirleyi*\^tree\6\c; G ^*Eriachne ciliata*, *Schizachyrium fragile*, *C. fallax*\^tussock grass\1\i	Lateritic sandstone outcrops, plateaux, breakaways to north/rises and plains to south; gravelly lithosols, some shallow red, yellow and black earths; well drained
393	*Macropteranthes* low woodland	U+ ^*M. kekwickii*, *A. shirleyi*\^tree\6\i; G ^*Panicum mindanaense*, *Evolvulus alsinoides*\^tussock grass,forb\1\i	Lateritic sandstone outcrops, plateaux, breakaways to north/rises and plains to south; gravelly lithosols, some shallow red, yellow and black earths; well drained
394	*Macropteranthes* (mixed) low woodland	U+ ^*M. kekwickii*, *A. shirleyi*\^tree\6\i; G ^*C. fallax*, *Paspalidium rarum*, *Mnesithea formosa*\^tussock grass\2\i	Lateritic sandstone outcrops, plateaux, breakaways to north/rises and plains to south; gravelly lithosols, some shallow red, yellow and black earths; well drained.
395	*Acacia* low woodland	U+ ^*A. shirleyi*, *M. kekwickii*\^tree\6\i; G ^*Eragrostis cumingii*, *M. formosa*, *P. rarum*\^tussock grass\1\i	Lateritic sandstone outcrops, plateaux, breakaways to north/rises and plains to south; gravelly lithosols, some shallow red, yellow and black earths; well drained.
428	*Astrebla* low tussock grassland	M ^*Acacia victoriae*, *Acacia farnesiana* \^shrub\4\r; G+ ^*Astrebla pectinata*, *Iseilema vaginiflorum* +/- *Iseilema membranaceum*\^tussock grass\1\c	Plains, deep grey cracking clays over tertiary alluvium

Veg ID	Level 3 description	Community description[1]	Environmental description
1041	*Eucalyptus* low open woodland	U+ ^*Eucalyptus microtheca* +/- *Lophostemon grandiflorus* +/- *Ventilago viminalis*\^tree\6\r; M ^*Acacia holosericea*, *Atalaya hemiglauca* +/- *V. viminalis*\^shrub\3\r; G *E. aurea*, *C. fallax*, ^*Astrebla spp*.\^tussock grass\1\c	Low lying flat plains, fringing water courses and swamps. Light to heavy grey and brown clays, some loamy soil

1 Sub-formation description: dominant growth form, cover, height and dominant genus for each of the three traditional strata. (*i.e.* Upper (U+), Mid (M) and Ground (G)). Structural classification of vegetation community according to Brocklehurst *et al*., (2007).

4.1.2 Significant and sensitive vegetation communities

There are five significant and sensitive vegetation communities within the NT (DEPWS, 2024c):

- Mangrove forests,
- Monsoon rainforest,
- Riparian vegetation,
- Ssandsheet heath, and
- Old growth forest.

Of the vegetation communities that are DEPWS (2024a) mapped within the Project Area, ‘riparian vegetation’ is the only sensitive and significant vegetation community that has the potential to occur. This is due to the presence of DEPWS (2024a) mapped first and second order watercourses that intersect the Project Area (see Section 4.3.1).

DEPWS (2024c) describes riparian vegetation as being “native vegetation within and immediately surrounding a waterway”.

4.2 Threatened ecological communities

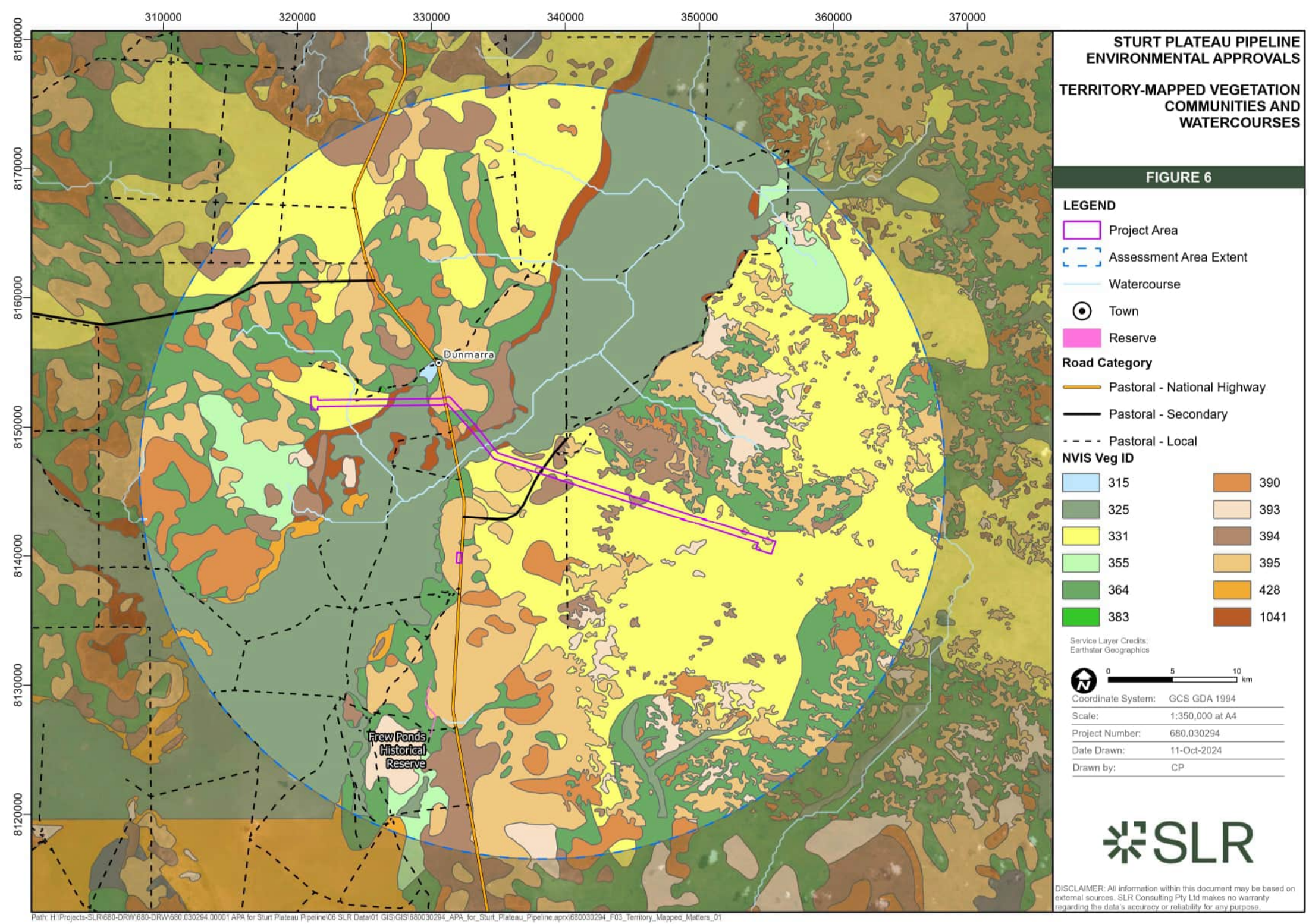
Threatened Ecological Communities (TECs) are a MNES. No TECs were identified as occurring within 30 km of the Project Area (DCCEEW, 2024a; Appendix A). The only TEC known to occur in the NT is the Arnhem Plateau Sandstone Shrubland Complex. This TEC is restricted to the Arnhem Plateau and surrounding outcrops, which occur ~260 km to the north of the Project Area. Therefore, there are no TECs occurring within, or near to, the Project Area.

4.3 Wetlands and watercourses

Project Area occurs in a localised sub-catchment of the Victoria River - Wiso basin (DEPWS, 2024a).

4.3.1 Watercourses

The Project Area intersects one first and one second order DEPWS (2024a) mapped minor watercourses (Figure 6).



STURT PLATEAU PIPELINE ENVIRONMENTAL APPROVALS

TERRITORY-MAPPED VEGETATION COMMUNITIES AND WATERCOURSES

FIGURE 6

LEGEND

- Project Area
- Assessment Area Extent
- Watercourse
- Town
- Reserve

Road Category

- Pastoral - National Highway
- Pastoral - Secondary
- Pastoral - Local

NVIS Veg ID

315	390
325	393
331	394
355	395
364	428
383	1041

Service Layer Credits: Earthstar Geographics

0 5 10 km

Coordinate System:	GCS GDA 1994
Scale:	1:350,000 at A4
Project Number:	680.030294
Date Drawn:	11-Oct-2024
Drawn by:	CP

SLR

DISCLAIMER: All information within this document may be based on external sources. SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

Path: H:\Projects-SLR\680-DRW\680-DRW\680.030294.00001 APA for Sturt Plateau Pipeline\06 SLR Data\01 GIS\GIS\680030294_APA_for_Sturt_Plateau_Pipeline.aprx\680030294_F03_Territory_Mapped_Matters_01

4.3.2 Wetlands

The Project Area does not overlap with any wetlands identified in the directory of important wetlands (DEPWS, 2024a). The nearest DEPWS (2024a) and DCCEEW (2024b) mapped important wetland is Lake Woods, which occurs ~100 km to the south of the Project Area. The Project Area does not occur within a catchment that flows to Lake Woods based on DEPWS (2024a) watercourse and catchment mapping.

The nearest RAMSAR wetland is associated with the Kakadu National Park and is located >300 km to the north of the Project Area (DCCEEW, 2024b).

4.3.3 Groundwater Dependent Ecosystems

Groundwater Dependent Ecosystems (GDE) are ecosystems which require access to groundwater in some capacity in order to survive in a particular landscape (BoM, 2022; Eamus & Froend, 2006; Murray et al., 2006). GDEs cover a small percentage of the Australian landscape and are an important biodiversity enhancement by providing unique ecosystem services in seasonally dry areas, providing economically important services such as water purification and improving biodiversity at local to regional scales (Murray et al., 2006). GDEs have been classified by Hatton & Evans (1998) and then further defined by Richardson et al. (2011) and (Doody et al., 2017) as:

- Wetland, lake, remnant terrestrial forest/shrubland and riparian ecosystems where groundwater discharge forms a component of the hydrological environment (Eamus et al., 2006; Murray et al., 2006; O'Grady et al., 2006a; O'Grady et al., 2006b).
- Springs where there is a surface expression of groundwater (i.e. artesian mound springs (Eamus *et al*., 2006).
- Cave and aquifer aquatic ecosystems which rely on groundwater including aquifer dwelling metazoans referred to as stygofauna (Humphreys, 2006).
- Estuarine and marine which rely on submarine discharge of water for nutrients (Paytan et al., 2006).

The presence of mesic environments and key groundwater dependent vegetation (GDV) can be used as an indicator for the delineation of (Biologic, 2021):

- GDEs – ecosystems which rely on permanent or intermittent access to groundwater to meet some or all their water requirements; or
- Inflow Dependent Ecosystems (IDEs) - ecosystems likely to access a water source in addition to rainfall (e.g., surface water, water stored in the unsaturated zone or small-scale groundwater sources), but which could also represent potential GDEs of lower but generally undetermined risk.

The GDE Atlas (BoM, 2022) is a management tool that enables the presence and the water needs of GDEs to be brought into the water planning and allocation process (BoM, 2022). It informs users where the groundwater requirements of ecosystems should be considered and enables this information to be viewed and used to identify the location and characteristics of potential GDEs (BoM, 2022).

The GDE Atlas indicated that no aquatic or subterranean GDEs are present within the Project Area. A section of the action crosses a potential terrestrial GDE; however, is classified as a 'low potential' GDE. A section of the action will cross a minor second order watercourse ephemeral stream; however, this area does not contain any likely associated GDEs.

Stygofauna are a form of GDE that inhabit the interstitial spaces of the cavities of alluvial, sedimentary and karstic aquifers. Data is available that can provide an indication of the

likelihood of stygofauna presence, with Hose, *et al.,* (2015) outlining the following factors affecting the distribution of stygofauna:

- **Formation type:** Stygofauna are predominantly found in aquifers with large (mm or greater) pore spaces, which a more common for alluvial, karstic and some fractured rock aquifers.
- **Depth below ground level:** The abundance and diversity of stygofauna typically decreases with depth below ground, with fauna are rarely found more than 100 m below ground level (Hose, *et al.,* 2015).
- **Proximity of exchange and recharge:** Stygofauna are more abundant in areas of surface water-groundwater exchange, compared to deeper areas or those further along the groundwater flow path remote from areas of exchange or recharge

A characterisation of the stygofauna and microbiological assemblages of the Beetaloo Sub-basin was conducted as part of the Gas Industry Social and Environment Research Alliance (Rees *et al.,* 2020). The study found two stygofauna specimens (*Parisia unguis* and *Bathynellaceae Bresvisomabathynella* sp.) and stygofauna eDNA from the Carpentaria Highway Roadside Bore (RN005942) located over 50 km north of the Project Area, while there were no reported findings of stygofauna in the Hayfield homestead bore and the Sturt Plains homestead bore. However, the study did identify eDNA which may indicate stygofauna presence. The results are consistent with Hose *et al* (2015), which indicates stygofauna are likely to be present at lower abundance at the observed groundwater depth within the Shenandoah South sites (~106 m below ground level).

These results are supported by the extensive field surveys of aquatic groundwater fauna undertaken in October 2021 and May 2022, as part of the SREBA aquatic ecosystem studies (Humphreys *et al.*, 2022). A total of 66 groundwater bores were sampled, with the sites selected to obtain spatial coverage across the study area and to stratify sampling by the hydrogeological formations present (Humphreys *et al.*, 2022). Results of the surveys returned a total of 280 stygofauna specimens across 28 taxa, with the highest diversity of stygofauna detected in the Tindall limestone aquifer (Humphreys *et al.*, 2022), which lies approximately 100 km northwest of the Project Area.

The results of the aquatic ecosystem studies (Humphreys *et al.*, 2022) further indicate that total taxa richness across 8 taxa groups occur in riverine sites in northern-draining catchments; specifically, 8 of the top 10 sites occur in the Roper catchment, with the maximum number of species (80) recorded within a seasonally flowing channel of the Little Roper River, which is over 200 km NW of the Project Area.

4.4 Sites of conservation and botanical significance

There are no Sites of Conservation Significance (SoCS) or Sites of Botanical Significance (SoBS) mapped within 30 km of the Project Area (DEPWS, 2024a). The nearest SoCS is located around Lake Wood Conservation Covenant, which is ~100 km to the south of the Project Area. The nearest SoBS is located ~180 km to the south of the Project Area and is associated with the Mitchell Grass Dows Bioregion.

4.5 Parks and reserves

The Frew Ponds Historical Reserve is the only park or reserve that occurs within 30 km of the Project Area (DEPWS, 2024a). This reserve is a memorial to the Frew Ponds Overland Telegraph Line and is located ~9.6 km to the south of the proposed camp and ~19 km southwest of the proposed alignment.

4.6 Flora species

4.6.1 Native and threatened flora species

Over 450 native flora species were returned from database searches as occurring within 30 km of a central coordinate within the Project Area (DEPWS, 2024a). None of these native flora species are threatened under either the TPWC or EPBC Acts (DEPWS, 2024a; DCCEEW, 2024a).

4.6.2 Introduced flora species

A total of 23 introduced flora species that are established within the NT were returned from database searches as occurring within 30 km of the Project Area (Table 11). The classification system of declared weeds within the NT is detailed below (both Class A and Class B weeds are also considered Class C):

- Class A – to be eradicated.
- Class B – growth and spread to be controlled.
- Class C – not to be introduced into the NT.

Of the introduced flora species returned from the desktop assessment, nine are declared weeds in the NT under the WM Act (see Table 11). Two of the introduced species returned from database searches are cited as Commonwealth listed Weeds of National Significance (WoNS; see Table 11).

The Project Area occurs within the Katherine regional weed management area within the NT (DEPWS, 2021a). Table 11 provides the regional status of introduced flora species returned from database searches. Introduced flora species (Table 11) returned from database searches fell within regional weed categories two, three and four within DEPWS (2021a). A description of DEPWS (2021a) weed categories is provided below:

- Category 1 – Priority weeds for eradication.
- Category 2 – Priority weeds for strategic control (including eradication of outliers).
- Category 3 – Weeds of concern.
- Category 4 – Hygiene and biosecurity weeds.
- Category 5 – ‘Alert’ Weeds.

A full description of, and management considerations for, regional weed categories can be found within the Katherine Regional Weeds Strategy 2021-2026 (DEPWS, 2021a).

4.7 Fauna species

4.7.1 Native, threatened and migratory fauna species

A total of 253 native fauna species have been recorded within 30 km of the Project Area (DEPWS, 2024a); 12 amphibian, 156 bird, 19 mammal and 66 reptile species. Of these species, 12 are threatened or migratory under the TPWC and/or EPBC Acts (Appendix B).

A total of 34 threatened or migratory fauna species were returned from database searches as occurring, or having the potential to occur, within 30 km of a central coordinate within the Project Area (DCCEEW, 2024a; DEPWS, 2024a). A likelihood of occurrence assessment was undertaken for each of these 34 species (Appendix B). 15 of these species were determined to have a moderate or high likelihood of occurring within the Project Area (Table 12), with the remaining 19 species determined to have a low likelihood of occurring.

4.7.2 Introduced fauna species

A total of three introduced fauna species were returned from database searches as occurring within 30 km of the Project Area: Cattle (*Bos taurus*), Cane Toad (*Rhinella marina*), and Feral Cat (*Felis catus*).

Table 11 Introduced flora species recorded within 30 km of the Project Area

Family	Scientific name	Common name	WoNS	WM Act class	DEPWS (2021a) category
Amaranthaceae	*Alternanthera pungens*	Khaki Weed	No	B	-
Amaranthaceae	*Amaranthus viridis*	Green Amaranth	No	-	-
Amaranthaceae	*Gomphrena celosioides*	*Gomphrena* Weed	No	-	-
Apocynaceae	*Calotropis procera*	Rubber Bush	No	B/-	3
Asteraceae	*Xanthium strumarium*	Noogoora Burr	No	B	4
Convolvulaceae	*Distimake dissectus*	White *Convolvulus* Creeper	No	-	-
Cyperaceae	*Cyperus rotundus*	Nut Grass	No	-	-
Euphorbiaceae	*Euphorbia hirta*	Asthma Plant	No	-	-
Euphorbiaceae	*Jatropha gossypiifolia*	Bellyache Bush	Yes	A/B	2
Fabaceae	*Parkinsonia aculeata*	*Parkinsonia*	Yes	B	3
Fabaceae	*Senna occidentalis*	Coffee *Senna*	No	B	4
Fabaceae	*Stylosanthes hamata*	Carribbean Stylo	No	-	-
Fabaceae	*Stylosanthes scabra*	Shrubby Stylo	No	-	-
Fabaceae	*Stylosanthes viscosa*	Stylo	No	-	-
Lamiaceae	*Hyptis capitata*	*Hyptis*	No	B	-
Lamiaceae	*Mesosphaerum suaveolens*	*Hyptis*	No	B	4
Meliaceae	*Azadirachta indica*	Neem	No	B	2
Passifloraceae	*Passiflora foetida*	Stinking Passion Flower	No	-	-
Poaceae	*Cenchrus ciliaris*	Buffel Grass	No	Unclassified	-
Poaceae	*Cynodon dactylon*	Couch Grass	No	-	-
Poaceae	*Digitaria bicornis*	Hairy Finger Grass	No	-	-

Family	Scientific name	Common name	WoNS	WM Act class	DEPWS (2021a) category
Poaceae	*Eragrostis amabilis*	Lovegrass	No	-	-
Poaceae	*Eragrostis pilosa*	Lovegrass	No	-	-

Table 12 Threatened and migratory fauna species likelihood of occurrence results summary

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Likelihood of occurrence
TPWC[2]	EPBC[2]						
BIRDS							
VU	EN	Estrilididae	*Erythrura gouldiae*	Gouldian Finch	PM	-	**Moderate**
VU	VU	Falconidae	*Falco hypoleucos*	Grey Falcon	PM / NRM	2	**Moderate**
LC	MI	Glareolidae	*Glareola maldivarum*	Oriental Pratincole	PM	-	**Moderate**
VU	VU	Meliphagidae	*Grantiella picta*	Painted Honeyeater	PM / NRM	1	**Moderate**
EN	EN	Rostratulidae	*Rostratula australis*	Australian Painted-snipe	PM / NRM	1	**Moderate**
LC	MI	Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	NRM	11	**Moderate**
REPTILES							
(NL)	CE	Scincidae	*Tiliqua scincoides intermedia*	Northern Blue-tongued Skink	PM	-	**High**
VU	-	Varandiae	*Varanus panoptes*	Yellow-spotted Monitor	NRM	3	**High**

1 Status: CE = Critically Endangered, EN = Endangered, LC = Least Concern, MI = Migratory, (NL) = Not Listed, NT = Near Threatened, VU = Vulnerable.

2 TPWC = *Territory Parks and Wildlife Conservation Act 1976*, EPBC = *Environment Protection and Biodiversity Conservation Act 1999*.

3 PM = Protected Matters Search Tool, NRM = NR Maps

4.8 Available literature

4.8.1 SREBA reports

A SREBA was undertaken for the Beetaloo Sub-basin, which included terrestrial vegetation and fauna surveys (Young *et al.*, 2022). Parts of the Project Area overlap with the Beetaloo Sub-basin, therefore outcomes of the SREBA are likely to be of relevance to the Project Area. Young *et al*. (2022) details outcomes of key ecological values and risks associated with the Beetaloo Sub-basin from the SREBA. These values and risks are summarised in Table 13.

The Project Area overlaps with a total of 13 SREBA mapped BVGs (Young *et al*., 2022; DEPWS, 2024a) (Table 14). Several of these BVGs are described to correspond with regionally significant moderate- and high-value vegetation types and habitat for significant faunal groups and species (Table 13 and Table 14).

SLR reviewed DEPWS (2024a) SREBA bore, water table depth raster and GDE layers to inform the likelihood for the Project Area to overlap with terrestrial GDEs. DEPWS (2024a) SREBA mapping indicates that the Project Area overlaps with a low to moderate confidence seasonal GDE (Table 14). A review of DEPWS (2024a) SREBA bore data and water table depth raster information indicates that groundwater within 30 km of the Project Area (see Section 3.2.1 for central coordinate of search area) sits between 71 and 120 m below ground level (mbgl) (n = 44 bores). In addition to these data, there is one outlier where the water level was recorded at 9 mbgl. However, this bore is located >20 km to the north east of SREBA mapped GDEs.

Table 13 High-level summary of SREBA biodiversity values and risks

Matter	Biodiversity values and risks	
High-value vegetation	Monsoon rainforest, riparian vegetation and wetlands.	
Moderate-value vegetation	Run-on woodland, floodplains and bullwaddy.	
Significant groups and species	Fauna	Waterbirds, Crested Shrike-tit, Gouldian Finch, Greater Bilby, Ghost Bat, Australian Painted-snipe, and Common Brushtail Possum.
	Flora	*Eleocharis retroflexa* and *Carex fascicularis.*
Risks to biodiversity	• Habitat degradation, fragmentation and loss. • Inappropriate fire regimes. • Reduction in surface water and/or groundwater availability. • Surface water and/or groundwater contamination. • Soil contamination, erosion and sedimentation. • Competition and predation. • Invasive plants. • Mortality of native species.	

Table 14 SREBA BVGs mapped across the Project Area

BVG #	BVG description	Significant vegetation type	Vegetation value	SREBA GDE?	GDE nature	GDE type	GDE confidence	BVG identified as habitat for significant groups or species?
1	*Corymbia/Eucalyptus* open woodland on sandy loam	-	Low	-	-	-	-	Crested Shrike-tit Gouldian Finch Greater Bilby
2	*Corymbia/Eucalyptus* woodland (run-on areas and heavier soils)	Run-on	Moderate	-	-	-	-	Crested Shrike-tit Gouldian Finch
5	Riparian woodland (ephemeral streams)	Riparian	High	Yes	Seasonal	Type 2 / Type 3	Low to Moderate	-
9	Lancewood forest	-	Low	-	-	-	-	-
10	Bullwaddy shrubland and woodland	-	Moderate	-	-	-	-	Greater Bilby
11	*Bauhinia* and *Corymbia* open woodland on sandy clay	-	Low	-	-	-	-	Gouldian Finch
12	*Eucalyptus chlorophylla* low open woodland	-	Low	-	-	-	-	Gouldian Finch
13	Silver box low open woodland	-	Low	-	-	-	-	Gouldian Finch
14	Coolabah low open woodland on clay	Floodplain	Moderate	-	-	-	-	-
15	Coolabah, *Lophostemon* and Gutta Percha swamps	Wetland/ floodplain	High / moderate	-	-	-	-	-
16	*Melaleuca* low open woodland on floodplains and drainage depressions	Floodplain/drainage depression	Moderate	-	-	-	-	Crested Shrike-tit Gouldian Finch
17	Tussock grassland	-	Low	-	-	-	-	-
21	*Acacia* shrubland and hummock grassland on sandplains	-	Low	-	-	-	-	Greater Bilby

4.8.2 Beetaloo Basin Shenandoah South E&A Program

Terrestrial ecological assessments were undertaken to support the development of the Beetaloo Basin Shenandoa South E&A Program (Shenandoah South Program). Publicly available information relating to these assessments are available in Environment Management Plan (EMP) for the Shenandoah South Program (Tamboran , 2024). Information within this EMP is relevant to seismic and exploration activities associated with the Shenandoah South Program.

The Project is interlinked with future components the Shenandoah South Program as it is intended to connect future infrastructure associated with the program with the Amadeus gas Pipeline. Because of this, potential impacts to terrestrial ecological values associated with development within the Project Area and the Shenandoah South Program are relevant for the assessment of cumulative impacts. Key outcomes and information within Tamboran (2024), chiefly those provided within Appendix K of the EMP were reviewed to support an assessment of cumulative impacts, which is detailed further in Section 6.5 of this report.

5.0 Field survey results

5.1 Environmental conditions

Daily temperature data over the field assessment period and during the week prior to the field assessment are provided in Table 15. Monthly rainfall totals over the annual period leading up to the 2024 field assessment compared to average monthly rainfall are shown in Figure 7. These data were obtained from the BoM Daly Waters Airstrip Weather Station (Station number: 014626) (BoM, 2024), which is located ~50km to the north of the Project Area and is the nearest BoM weather station with long-term weather data and nearby data over the field assessment period.

No rainfall was recorded from the BoM Daly Waters Airstrip Weather Station in May 2024 or over the field assessment period (BoM, 2024). However, minor (<3mm) overnight rainfall was experienced by field staff over the latter portion of the field assessment. This, in combination with above average monthly rainfall over January to April 2024 and cool night to warm day time temperatures, resulted in optimal conditions for the detection of a wide range of faunal groups. Additionally, above average monthly rainfall prior to the 2024 field assessment resulted in active growth and persistence of a high proportion of annual flora species and a 'good' overall vegetation condition within the Survey Area.

Table 15 Daily minimum and maximum temperatures during and leading up to the 2024 field assessment

Date		Temperature (^{0}C)[1]	
		Minimum	Maximum
Prior to field assessment	21/05/2024	14.4	27.4
	22/05/2024	14.4	28.6
	23/05/2024	15.7	30.6
	24/05/2024	14.9	32.3
	25/05/2024	16.2	32.7
	26/05/2024	15.6	32.7
	27/05/2024	15.8	31.8
Field assessment period	28/05/2024	13.6	32.1
	29/05/2024	15.6	32.9
	30/05/2024	22.2	33.1
	31/05/2024	20.9	28.9
	01/06/2024	19.9	26.5
	02/06/2024	16.4	27.9

1 Temperature data obtained from the BoM Daly Waters Airstrip weather station (Station number: 014626; BoM, 2024).

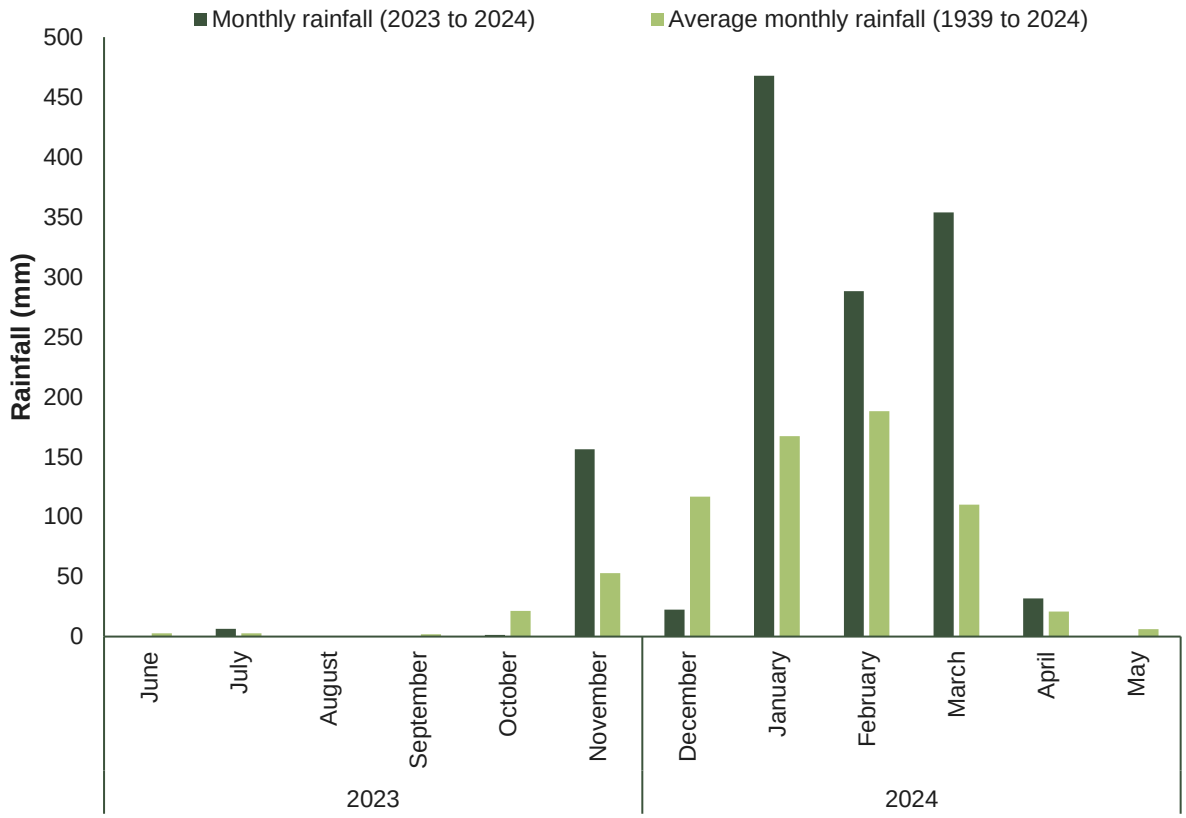


Figure 7 Monthly rainfall compared to average monthly rainfall (BoM, 2024; weather station number: 014626)

5.2 Flora survey results

5.2.1 Vegetation communities

The Survey Area was identified to intersect a total of seven distinct ground-truthed vegetation communities during the field assessment. Ground-truthed vegetation communities are shown in Figures 5 to 8 and the structural classification of each community according to Brocklehurst *et al*. (2007) is provided in Appendix C. A general description of each community, based on ground-truthed observations and data, is provided in Table 16. Ground-truthed vegetation communities did not strictly align with those detailed in Young *et al*. (2022). To support regional continuity in ecological assessments ground-truthed vegetation communities have been attributed to the most appropriate SREBA BVG (Table 16). Three ground-truthed vegetation communities align with SREBA moderate-value floodplain BVGs (Young *et al*., 2022). These ground-truthed communities are:

- *Melaleuca viridiflora* and *Acacia torulosa* low closed shrubland with *Triodia bitextura* hummock grassland;
- *Eucalyptus microtheca* open woodland on floodplains; and
- *E. microtheca* and *Lophostemon grandiflorus* open woodland on floodplain fringes.

No ground-truthed vegetation communities align with SREBA BVGs that equate to high-value vegetation, as described in Young *et al*. (2022). Additionally, no ground-truthed vegetation communities align with SREBA BVGs that equate to a GDE (Young *et al*., 2022).

Seasonal fire impacts were evident across all ground-truthed vegetation communities. Ground-truthed vegetation communities 1 and 2 (Table 16) were observed to be heavily influenced by fire. The dominance of flora species and relative structure of these communities varied considerably, with extensive areas of dense *Acacia* dieback and recruitment.

Table 16 Ground-truthed vegetation community descriptions

Veg. #	Corresponding SREBA BVG	Ground-truthed vegetation community description	Environmental description and soils
1	*Corymbia/Eucalyptus* woodland (run-on areas and heavier soils)	Mixed *Acacia* shrubland to variable grassland with variable emergent *Eucalyptus* and *Corymbia.*	Flats and run-on areas transitioning from yellow to grey clay loam.
2	*Melaleuca* low open woodland on floodplains and drainage depressions.	*Melaleuca viridiflora* and *Acacia torulosa* low closed shrubland with *Triodia bitextura* hummock grassland.	Drainage depressions on grey/brown clay, sandy loam.
3	Coolabah low open woodland on clay.	*Eucalyptus microtheca* open woodland on floodplains.	Floodplains on cracking, black clays.
4	*Corymbia*/*Eucalyptus* open woodland on sandy loam.	*Corymbia dichromophloia* open woodland with variable tussock/hummock grassland.	Flats and plains on red/brown clay, sandy loam.
5	Lancewood forest.	*Acacia shirleyi* open to closed woodland.	Minor rises on red/brown sandy clay loam.
6	Bullwaddy shrubland and woodland.	*Macropteranthes keckwickii* closed woodland.	Flats, run-on areas and minor rises on a red/grey/yellow sandy, clay loam.
7	Coolabah, *Lophostemon* and Gutta Percha swamps.	*E. microtheca* and *Lophostemon grandiflorus* open woodland on floodplain fringes.	Floodplain fringes on variable black, cracking clays to heavy, grey clay loam.

5.2.2 Flora species

A full inventory of flora species identified within the Survey Area during the field assessment is provided in Appendix D, along with the vegetation community that each species was recorded to occur within.

5.2.2.1 Native and threatened flora species

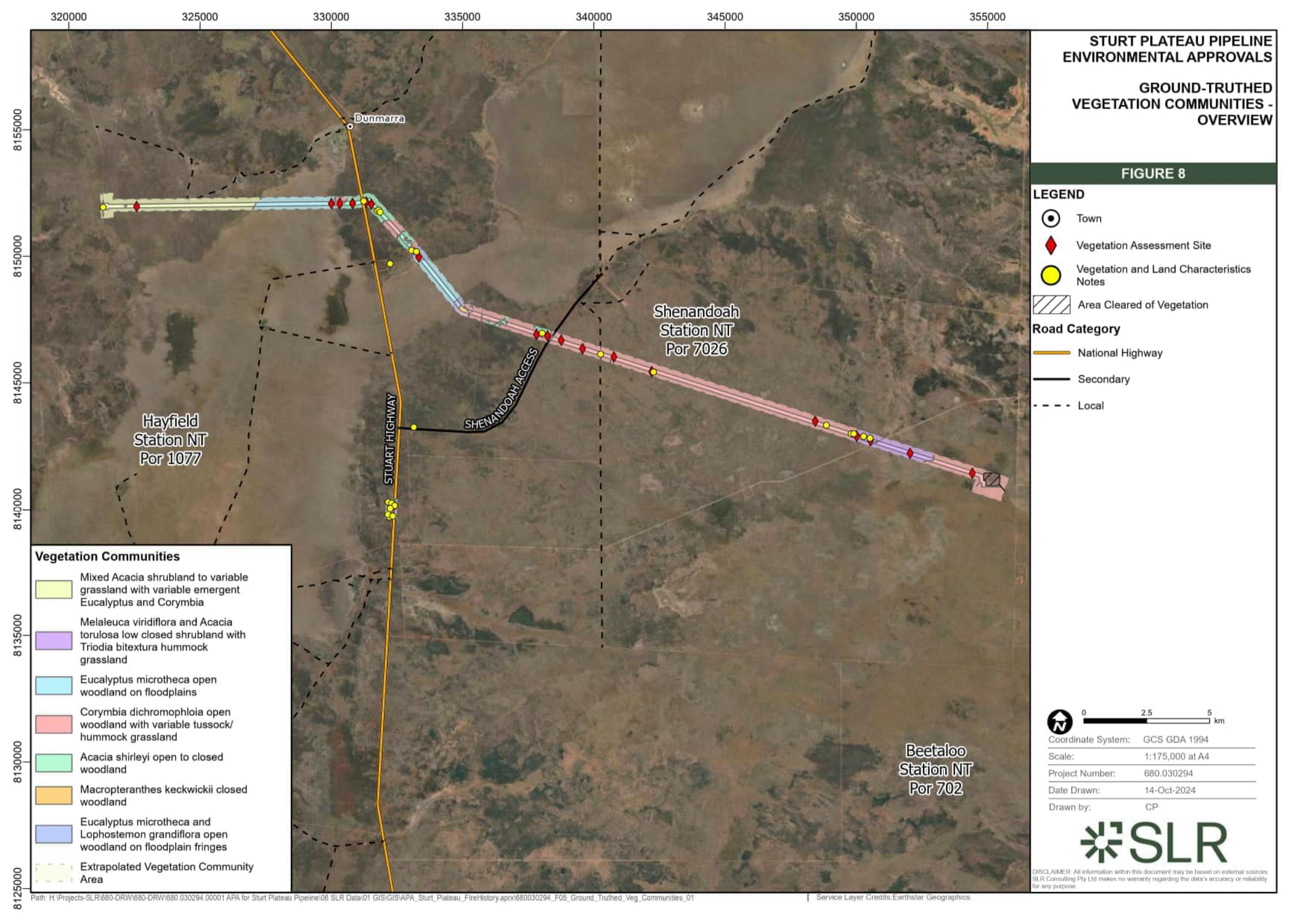
A total of 158 native flora species were identified within the Survey Area over the field assessment period. A full list of these species is provided in Appendix D along with their TPWC and EPBC Act status'. No threatened flora species, as listed under the TPWC or EPBC Acts, or regionally significant flora species, as listed in Young *et al*. (2022), were identified to occur within the Survey Area during the field assessment.

5.2.2.2 Introduced flora species

Several introduced flora species were identified during the field assessment. These species, along with their status as a WoNS, WM Act class, and DEPWS (2021a) category are shown in Table 17. Figure 12 shows the spatial distribution of introduced flora species identified during the field survey program. In general, the occurrence of introduced flora species was limited to previously disturbed areas such as access tracks and other previously cleared areas. However, it should be noted that Caribbean Stylo and Shrubby Stylo (*Stylosanthes hamata* and *Stylosanthes scabra*, respectively) formed a notable component of groundcover in *Acacia shirleyi* and *Corymbia dichromophloia* dominated vegetation communities to the west of the Stuart Highway.

Table 17 Introduced flora species identified within the Survey Area during the field assessment

Family	Scientific name	Common name	WoNS	WM Act class	DEPWS (2021a) category
Fabaceae	*Stylosanthes hamata*	Carribbean Stylo	No	-	-
Fabaceae	*Stylosanthes scabra*	Shrubby Stylo	No	-	-
Fabaceae	*Vachellia farnesiana*	Mimosa Bush	No	-	-
Lamiaceae	*Mesosphaerum suaveolens*	*Hyptis*	No	B	4
Malvaceae	*Sida cordifolia*	Flannel Weed	No	B	4
Passifloraceae	*Passiflora foetida*	Stinking Passion Flower	No	-	-
Poaceae	*Urochloa mosambicensis*	Sabi Grass	No	-	-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Dunmarra
Shenandoah Station NT Por 7026
Hayfield Station NT Por 1077
Beetaloo Station NT Por 702
STUART HIGHWAY
SHENANDOAH ACCESS
Vegetation Communities
Mixed Acacia shrubland to variable grassland with variable emergent Eucalyptus and Corymbia
Melaleuca viridiflora and Acacia torulosa low closed shrubland with Triodia bitextura hummock grassland
Eucalyptus microtheca open woodland on floodplains
Corymbia dichromophloia open woodland with variable tussock/ hummock grassland
Acacia shirleyi open to closed woodland
Macropteranthes keckwickii closed woodland
Eucalyptus microtheca and Lophostemon grandiflora open woodland on floodplain fringes
Extrapolated Vegetation Community Area
STURT PLATEAU PIPELINE
ENVIRONMENTAL APPROVALS
GROUND-TRUTHED
VEGETATION COMMUNITIES -
OVERVIEW
FIGURE 8
LEGEND
Town
Vegetation Assessment Site
Vegetation and Land Characteristics Notes
Area Cleared of Vegetation
Road Category
National Highway
Secondary
Local
0
2.5
5
km
Coordinate System: GCS GDA 1994
Scale: 1:175,000 at A4
Project Number: 680.030294
Date Drawn: 14-Oct-2024
Drawn by: CP
SLR
DISCLAIMER: All information within this document may be based on external sources. SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.
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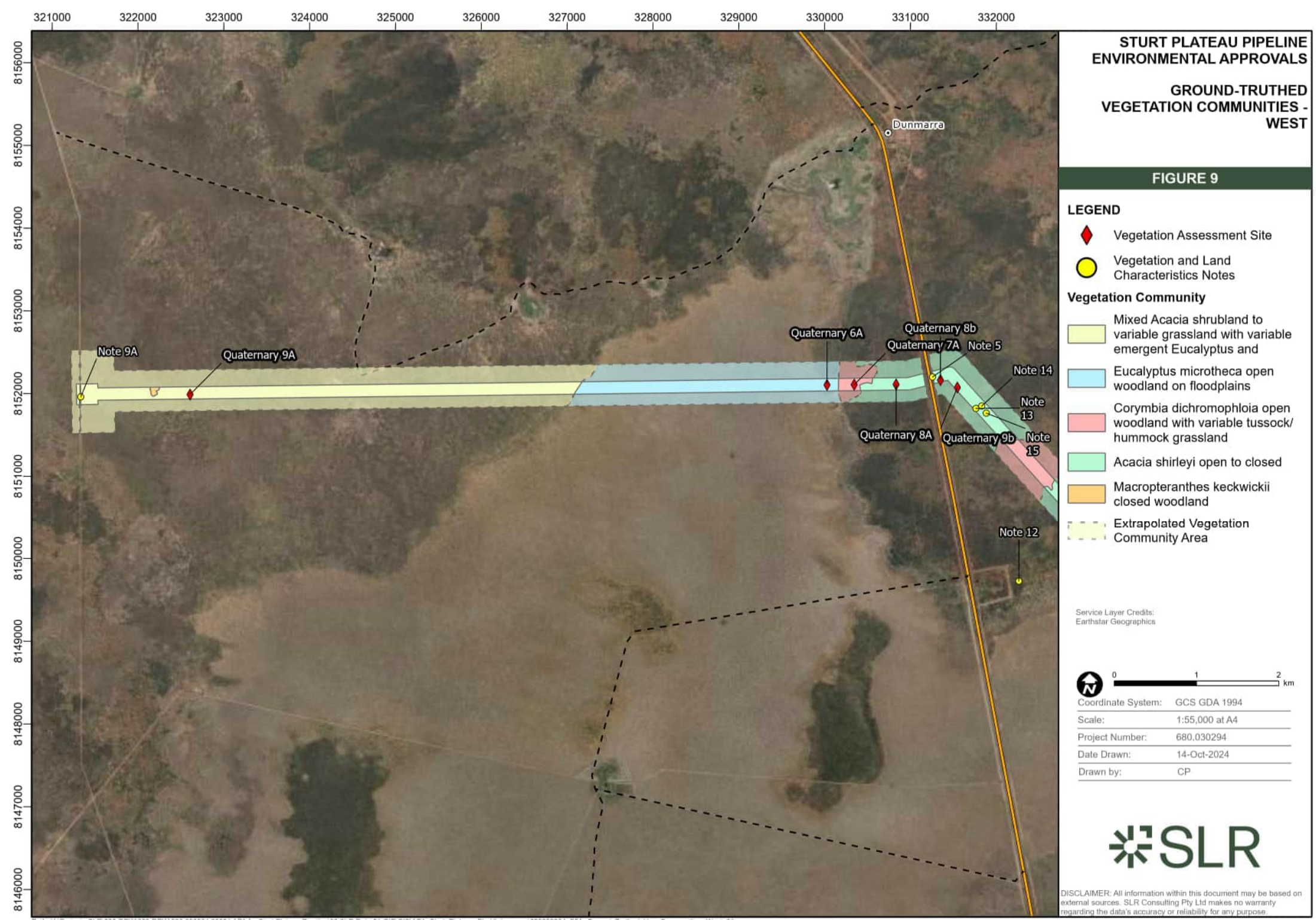
Service Layer Credits:Earthstar Geographics



STURT PLATEAU PIPELINE ENVIRONMENTAL APPROVALS

GROUND-TRUTHED VEGETATION COMMUNITIES - WEST

FIGURE 9

LEGEND

- Vegetation Assessment Site
- Vegetation and Land Characteristics Notes

Vegetation Community

- Mixed Acacia shrubland to variable grassland with variable emergent Eucalyptus and
- Eucalyptus microtheca open woodland on floodplains
- Corymbia dichromophloia open woodland with variable tussock/ hummock grassland
- Acacia shirleyi open to closed
- Macropteranthes keckwickii closed woodland
- Extrapolated Vegetation Community Area

Service Layer Credits: Earthstar Geographics

0 1 2 km

Coordinate System:	GCS GDA 1994
Scale:	1:55,000 at A4
Project Number:	680.030294
Date Drawn:	14-Oct-2024
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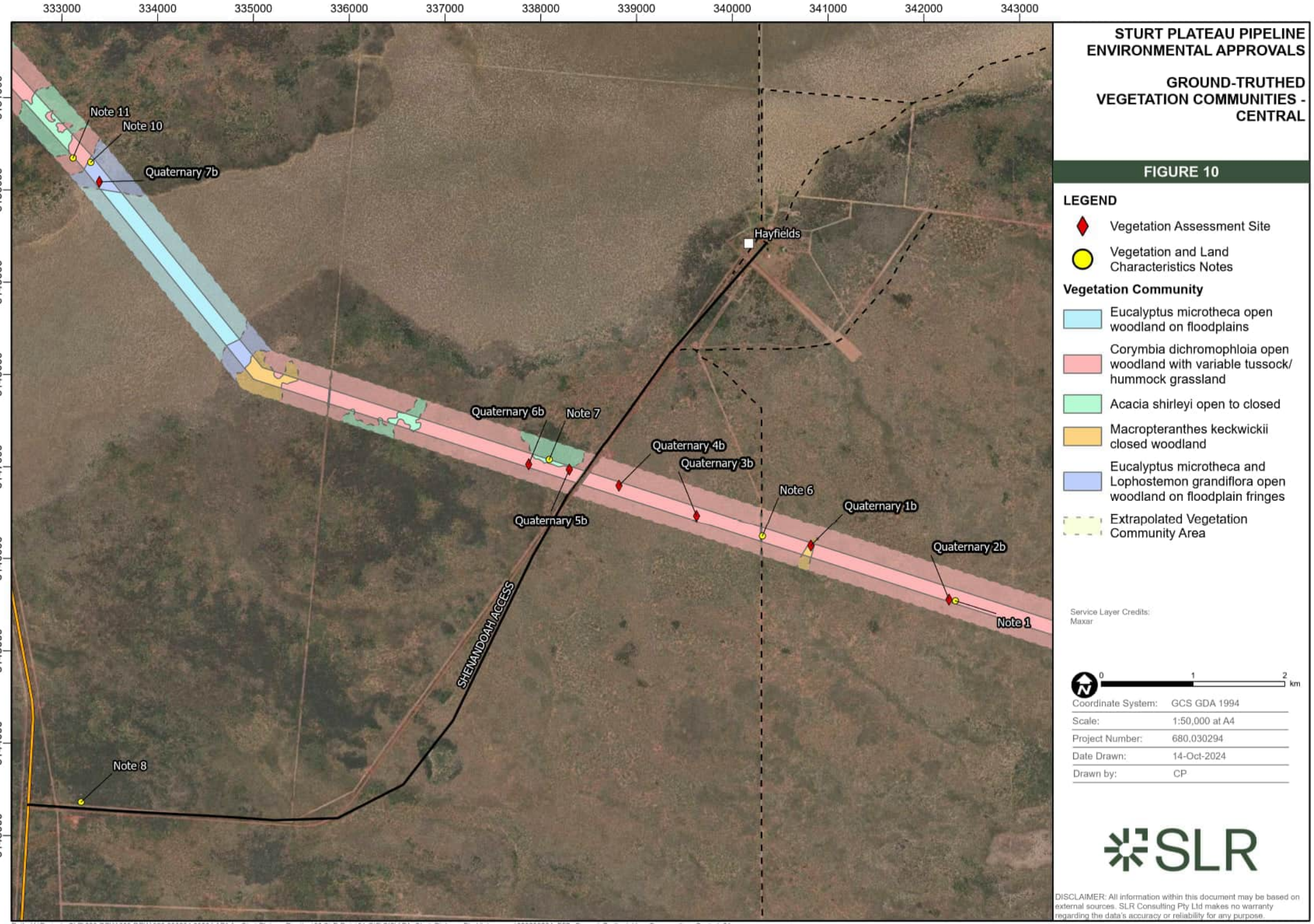

STURT PLATEAU PIPELINE ENVIRONMENTAL APPROVALS

GROUND-TRUTHED VEGETATION COMMUNITIES - CENTRAL

FIGURE 10

LEGEND

- Vegetation Assessment Site
- Vegetation and Land Characteristics Notes

Vegetation Community

- Eucalyptus microtheca open woodland on floodplains
- Corymbia dichromophloia open woodland with variable tussock/ hummock grassland
- Acacia shirleyi open to closed
- Macropteranthes keckwickii closed woodland
- Eucalyptus microtheca and Lophostemon grandiflora open woodland on floodplain fringes
- Extrapolated Vegetation Community Area

Service Layer Credits: Maxar

0 1 2 km

Coordinate System:	GCS GDA 1994
Scale:	1:50,000 at A4
Project Number:	680.030294
Date Drawn:	14-Oct-2024
Drawn by:	CP

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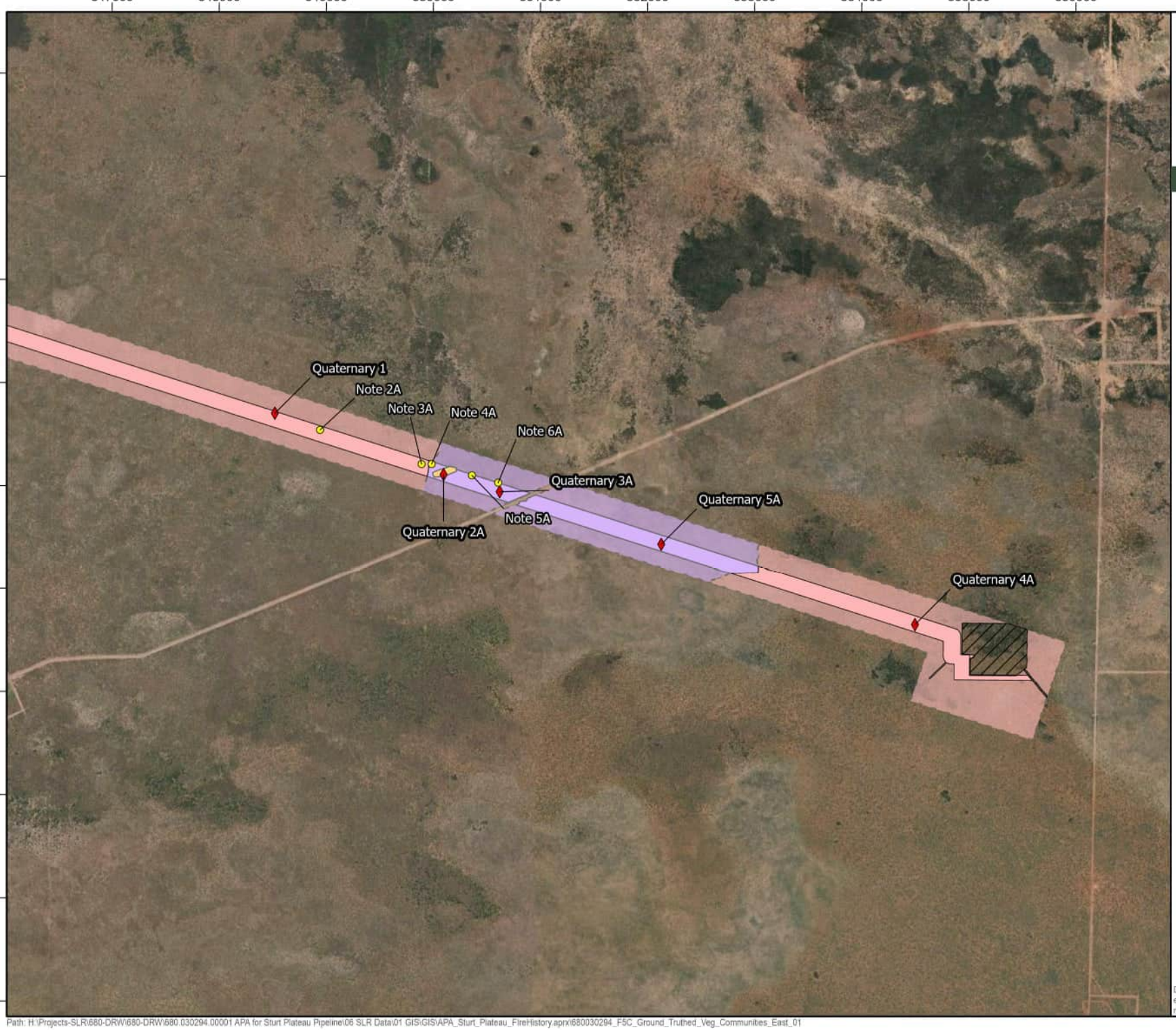

STURT PLATEAU PIPELINE ENVIRONMENTAL APPROVALS

GROUND-TRUTHED VEGETATION COMMUNITIES - EAST

FIGURE 11

LEGEND

- Vegetation Assessment Site
- Vegetation and Land Characteristics Notes
- Area Cleared of Vegetation

Vegetation Community

- Melaleuca viridiflora and Acacia torulosa low closed shrubland with Triodia bitextura hummock
- Corymbia dichromophloia open woodland with variable tussock/ hummock grassland
- Macropteranthes keckwickii closed woodland
- Extrapolated Vegetation Community Area

Service Layer Credits: Earthstar Geographics

0 1 2 km

Coordinate System:	GCS GDA 1994
Scale:	1:50,000 at A4
Project Number:	680.030294
Date Drawn:	14-Oct-2024
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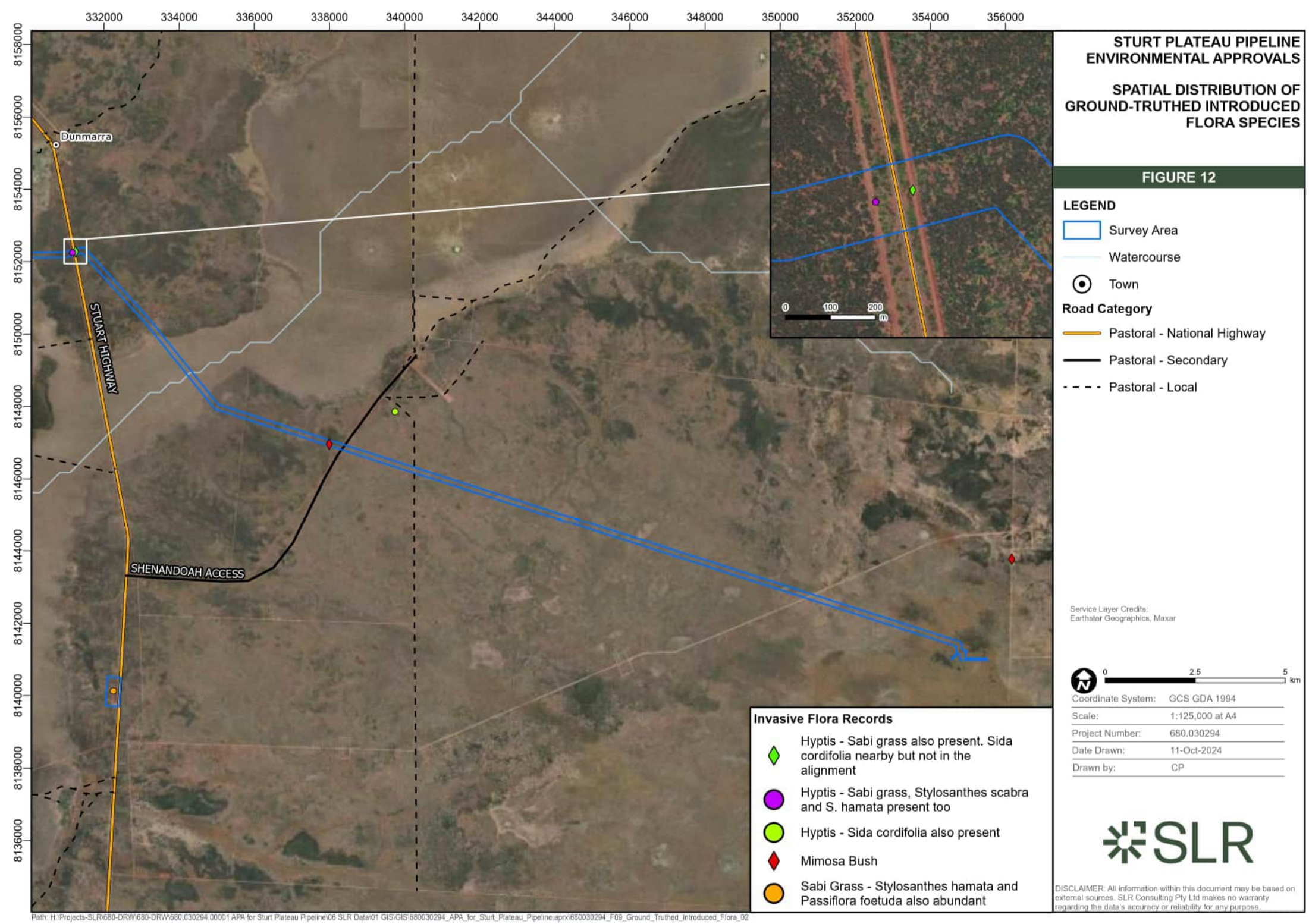

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Scale:	1:125,000 at A4
Project Number:	680.030294
Date Drawn:	11-Oct-2024
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5.3 Fauna survey results

5.3.1 Fauna species

5.3.1.1 Native, threatened and migratory fauna species

A total of 119 native fauna species were ground-truthed over the field assessment period; four amphibian, 92 bird, nine mammal and 14 reptile species. A full list of these species is provided in Appendix E along with their TPWC and EPBC Act status'. This included at least four and up to five Microchiroptera species; two species could not be differentiated via call detection methods. The microbat call interpretation report is provided in Appendix F.

Threatened and migratory fauna species, as listed under the TPWC and EPBC Acts, incidentally observed by SLR during the field assessment are as follows:

- Gouldian Finch (*Chloebia gouldiae*). Vulnerable under the TPWC Act and endangered under the EPBC Act.
- Glossy Ibis (*Plegadis falcinellus*). Migratory under the EPBC Act.

Up to 10 Gouldian Finch individuals were observed drinking from an artificial, roadside water source located along the Buchanan Highway (Figure 13) when accessing the western portion of the Survey Area. The surrounding vegetation community was characterised by *Acacia shirleyi* open to closed forest on minor rises, which was surrounded by *Corymbia dichromophloia* open woodland with variable tussock/ hummock grassland. A variety of other finch species were observed to be drinking from the same water source and in higher abundance to the Gouldian Finch. These other finch species are Zebra Finch (*Taeniopygia guttata*), Double-barred Finch (*Stizoptera bichenovii*), Long-tailed Finch (*Poephila acuticauda*) and Pictorella Mannikin (*Heteromunia pectoralis*). No Gouldian Finch individuals were observed within the Survey Area during the 2024 field assessment.

Three Glossy Ibis individuals were flushed from a roadside drain along the Stuart Highway (Figure 13) when accessing the central portion of the Survey Area. The surrounding vegetation community was characterised by *Eucalyptus microtheca* open woodland on floodplains. Surface water was abundant in this area due to accumulation from roadside drains and above average rainfall prior to the 2024 field assessment. No Glossy Ibis individuals were observed within the Survey Area during the 2024 field assessment.

During the 2024 field assessment AECOM representatives were undertaking ecological assessments in areas that overlapped, and were adjacent to, the Project Area. AECOM flushed two Grey Falcon (*Falco hypoleucos*) individuals to the east of the Project Area during these assessments (Figure 13). This species is listed as vulnerable under both the TPWC and EPBC Acts. AECOM provided SLR information regarding this observation, which is detailed below:

> *"Two Grey Falcons were sighted flying overhead and circling around in the sky. One bird made a brief two-note squawking call. The birds were easily identified by the grey plumage and yellow cere (beak) and legs. The timing of the sighting was 29/5/2024 at approximately 2:50pm. The habitat was treeless plains with sparse Melaleuca shrubs. The birds flew away from us in a westerly direction."*

Four TPWC Act near threatened species were identified within the Survey Area during the 2024 field assessment; the Emu (*Dromaius novaehollandiae*), Australia Bustard (*Ardeotis australis*), Bush Stone-curlew (*Burhinus grallarius*), and Pictorella Manikin (*Heteromunia pectoralis*).

5.3.1.2 Introduced fauna species

Two introduced fauna species were observed within the Survey Area during 2024 field assessment; Cattle (*Bos taurus*) and Feral Cat (*Felis catus*). The surrounding land use is primarily Cattle grazing and evidence of Cattle occupation was evident throughout all parts of the Survey Area accessed during the 2024 survey. Cattle impacts were greatest around artificial watering points and fence lines and diminished with distance from these areas. Feral Cats were captured at Fauna Trap Site 1 (Figure 13) via passive infrared camera trap survey methods. Additionally, this species was incidentally observed during night-spotting activities at the Tamboran Camp while enroute to the Survey Area.

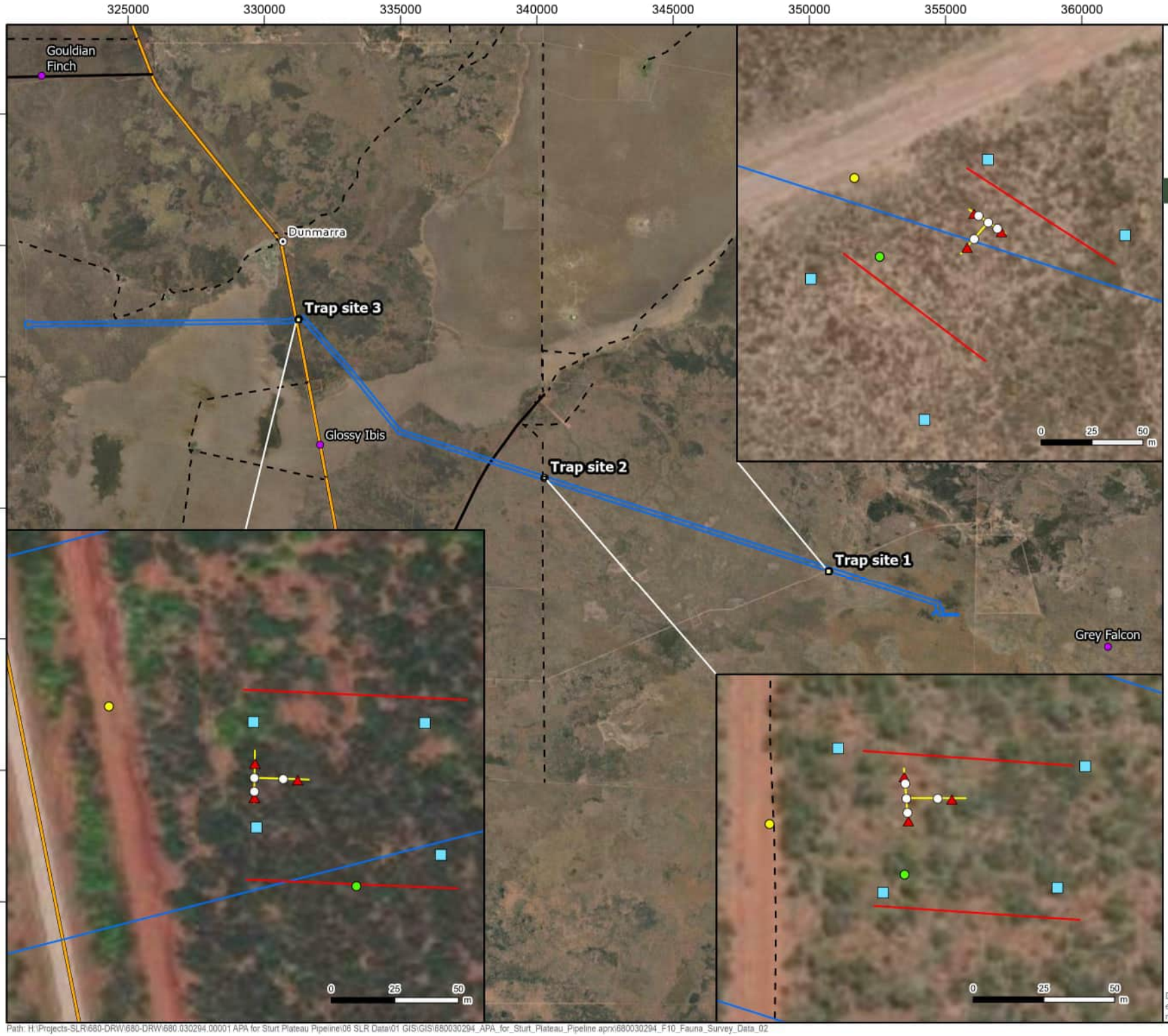
5.3.2 Fauna habitat values and disturbance

A variety of fauna habitat values were ground-truthed within the Survey Area and values were often sympatric with particular ground-truthed vegetation communities.

Fire impacts were evident across all ground-truthed vegetation communities but were most prevalent at ground-truthed vegetation communities 1 and 2. The fire history within these communities resulted in dense, shrubby *Acacia* regrowth and low proportions of leaf litter and woody debris. Trees were also sparse to absent within these communities. All ground-truthed vegetation communities showed impacts from existing clearing within the vicinity of roads and access tracks, which reduced fauna habitat values in these areas. Additionally, Cattle impacts were more prevalent in these areas, particularly along fence lines and near artificial watering points outside of the Project Area.

No perennial water sources were observed within the Survey Area, resulting in an absence of perennial drinking opportunities for fauna species. Ground-truthed vegetation community 3 contained a high proportion of standing water due to prior heavy, flooding rainfall within the local area. This resulted in ephemeral values for large waterbirds and predatory birds, along with those to other taxa groups. Ground-truthed vegetation community 2 acts as a minor drainage depression within the surrounding landscape. Minimal surface water was present within this community at the time of the field assessment. However, the presence of the Desert Spadefoot Toad (*Notoden nichollsi*) and annual flora species that rely on high and prolonged soil-moisture indicates that soils within these areas retain water for extended periods.

Woody debris was most prevalent within ground-truthed vegetation communities 4, 5, and 6, along with leaf litter and surface gravel and pebbles. Surface cobbles were very scarce and were rarely encountered in community 5. Soils were often comprised of varying degrees of clay, loam and sand. Sandy clay soils were evident in ground-truthed vegetation community 4, which may provide burrowing opportunities for a variety of fauna species. No burrows of threatened fauna species were observed. This community also contained the highest proportion of tree hollows, which varied in aperture and relative abundance, due to the size and age of Small-fruited Bloodwood. Although not measured during the field assessment, there are likely to be individuals of the Small-fruited Bloodwood within ground-truthed vegetation community 4 that exceed a diameter at breast height (DBH) of 40 cm.



STURT PLATEAU PIPELINE ENVIRONMENTAL APPROVALS

FAUNA SURVEY DATA

FIGURE 13

LEGEND

- Survey Area
- Threatened and Migratory Fauna Observations
- Town
- Bat Detector
- Cage Trap
- Camera Trap
- Funnel
- Pit Fall
- Drift Fence
- Elliott Trap

Road Category

- Pastoral - National Highway
- Pastoral - Secondary
- Pastoral - Local

Service Layer Credits:
Earthstar Geographics, Maxar

0 2.5 5 km

Coordinate System:	GCS GDA 1994
Scale:	1:195,000 at A4
Project Number:	680.030294
Date Drawn:	11-Oct-2024
Drawn by:	CP

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6.0 Impact assessment and management

The Project has the potential to impact biodiversity values in a variety of ways during the development phases of the Project. These are summarised below in Table 18 along with recommended management strategies. The estimated impact area to each ground-truthed vegetation community by development of the Project is provided in Table 19.

APGA (2022) outlines common impacts risk to environmental and other values associated with the construction, operational, and rehabilitation phases of onshore pipelines. This document also outlines comprehensive management strategies to reduce the risk of impacts to these environmental and other values. Environmental and other values described in this document are:

- Native vegetation;
- Fauna;
- Biosecurity (e.g., pests, weeds, disease);
- Natural and Historical Heritage;
- Indigenous Heritage;
- Soil (e.g., erosion, acid sulfate);
- Water (e.g., hydrology, watercourses);
- Waste (e.g., hazardous, non-hazardous);
- Emissions (e.g., dust, noise, vibration, gas);
- Third parties (e.g., nuisance); and
- Chemicals and contamination.

It is recommended that standard impact management practices are implemented during the construction, operation, and rehabilitation phases of the Project to minimise impacts to environmental and other values described in APGA (2022). Management recommendations provided in Table 18 are generally based on those provided, or otherwise described, in APGA (2022).

Outcomes of desktop and field assessments identified several matters of Territory and National environmental significance that warrant further impact assessment and potential management. These are:

- Sensitive and significant vegetation communities (riparian vegetation);
- Parks and Reserves;
- Introduced flora and fauna species; and
- Threatened and migratory fauna species.

Impact assessment and management recommendations for these matters of Territory and National environmental significance are provided below.

6.1 Sensitive and significant vegetation communities

Significant and sensitive vegetation in the NT is identified in the NT Land Clearing Guidelines (DEPWS, 2024c), these guidelines provide a framework for assessing potential impacts on significant and sensitive vegetation.

Sensitive vegetation is a term, applied to ecosystems easily impacted by neighbouring or adjacent land uses or management. Significant vegetation also includes spatially restricted habitat types that are important to a relatively large number of wildlife species, including rainforest, monsoon vine forest or vine thicket; sandsheet heath; riparian vegetation; mangroves; and vegetation containing large trees with hollows suitable for fauna. Most of these significant vegetation types are also sensitive (DEPWS, 2024c).

6.1.1 Riparian vegetation

The Project Area intersects one first and one second order DEPWS (2024a) mapped minor watercourse. Native vegetation within and immediately surrounding these DEPWS (2024a) mapped watercourses equates to 'riparian vegetation' as defined in DEPWS (2024c). Table 20 provides the recommended widths for riparian buffers described within DEPWS (2024c).

Riparian vegetation plays a critical role in the maintenance of instream ecological processes as well as providing physical stability to the waterway, ameliorating water quality and providing critical habitat or resources for a range of plant and animal species often not available elsewhere within a landscape. Clearing of riparian vegetation and drainage depressions has the potential to not only result in the direct removal of sensitive/significant vegetation and impact on the values associated with this habitat, but also to negatively impact receiving environments immediately adjacent and downstream of developmental impacts (DEPWS, 2024c).

The value of riparian vegetation within the Project Area is considered to be low on the basis that:

- The key indicator species is *Eucalyptus microtheca*, which is typified as a facultative phreatophyte and not highly dependent of groundwater sources for survival;
- A review of DEPWS (2024a) spatial imagery does not indicate a distinct bed or bank area for the mapped watercourses and surrounding vegetation is not distinctly different in the vicinity of these mapped watercourses.
- There was no known presence or likelihood of occurrence of threatened or otherwise significant plants or animals within the riparian vegetation communities;
- There was no known occurrence of high density phreatophytic vegetation;
- The local and regional impact to the riparian communities is likely to be low; and
- DEPWS (2024a) mapped watercourses are described as non-perennial.

In regard to the assessment of impacts based on the proposed Disturbance Footprint, the following outcomes can be confidently determined:

- Low value riparian vegetation that is not distinctly different to that within the broad, surrounding area;
- Project Area is located at the start of catchment therefore minimal influence to the overall community;
- Short term impact where the timing of the disturbance will be during the dry season when it is highly unlikely that these communities will be inundated from seasonal rainfall;
- The Disturbance Footprint will be rehabilitated with native flora; and
- The Disturbance Footprint is linear with minimal proposed disturbance to native vegetation and interruptions to surface water flow paths.

Overall, the Project has a low likelihood of impacting riparian vegetation. However, it is recommended that the clearing of riparian vegetation is avoided and DEPWS (2024c) recommended buffers are applied where possible. Should clearing of riparian vegetation be unavoidable, it is recommended that APGA (2022) impact management strategies to water (e.g., hydrology and watercourses) and soil (erosion) are adopted to minimise the risk of impacts. These include applying appropriate sediment and erosion control on slopes, regular monitoring of the area, reduction of the extent and duration of soil disturbance, control of water movement through the area and stabilisation of areas immediately after works. Additionally, it is recommended that native groundcover vegetation and non-woody shrubs be reinstated via natural top-soil seedbank after any clearing occurs. This will aid in managing the risk of impacts to riparian vegetation, watercourses, and water quality via erosion.

6.1.2 Groundwater Dependent Ecosystems

No ground-truthed vegetation communities within the Study area equate to SREBA BVGs described as GDEs. However, the Project Area intersects a SREBA 'low potential' terrestrial GDE, which coincides with DEPWS (2024a) mapped watercourses. DEPWS (2024c) states that "*Generally, where groundwater is within 20 m of the land surface some species of native plant may access and use groundwater*". A review of DEPWS (2024a) SREBA mapped GDEs, bores, and water table depth raster information indicates that the water table below the Project Area is >70 mbgl. Therefore, it is unlikely that vegetation within the Project Area equates to a terrestrial GDE as depth to groundwater is beyond the rooting depth of native species(Canadell *et al*., 1996; Schenk & Jackson, 2002). This is supported by SLR ground-truthed data within the vicinity of the SREBA mapped GDE. The key indicator species in this general area was *Eucalyptus microtheca*, which is typified as a facultative phreatophyte and not highly dependent of groundwater sources for survival. Overall, it is unlikely that development of the Project Area will impact upon a terrestrial GDE.

Clearing applications where the proposed Disturbance Footprint will be used for activities that require water within close proximity to a GDE must consider the impact of water use (NTPS, 2020). Taking or diverting water from natural waterways or groundwater should not have a significant impact on the health of GDEs including the 'halo of hydrological influence' surrounding GDEs (NTPS, 2020).

The Project intends to use groundwater for dust suppression, compaction, hydrostatic testing and potable water services for the campsite during the construction phase of the Project. The water sources will be obtained from existing and new groundwater extraction licence entitlements. It is expected that any GDEs in close proximity to the action will not be impacted as water use will be short-term during the construction phase and minimal infrequent water use is expected during the operational phase.

Further, based on the outcomes of the stygofauna studies discussed in section 4.3.3, the depth of the groundwater, likely low abundance of stygofauna and short duration and volume of water extraction for construction, impacts to stygofauna from water extraction are considered highly unlikely. Any impacts are likely to be extremely localised, in the vicinity of metres.

Changes in groundwater quality may also result in impacts to stygofauna. Impacts to aquifers may be mitigated through, for example, the use of low toxicity drilling fluid systems during the construction of new bores. Based upon the above information, the presence of significant assemblages of stygofauna in the area is considered limited and impacts considered unlikely.

6.2 Parks and reserves

The Frew Ponds Historical Reserve is the only park or reserve that occurs within 30 km of the Project Area (DEPWS, 2024a). This reserve is a memorial to the Frew Ponds Overland Telegraph Line and is located ~18 km to the south of the Project Area. Localised development of the Project Area will not result in an impact to this or any other parks or reserves. No further management is required or recommended.

6.3 Introduced flora and fauna species

Very few introduced flora and fauna species were identified within the Survey Area during the field assessment. Of these, most are commensurate with those occurring within the surrounding region and land use (i.e. Cattle grazing).

Introduced flora species generally occurred in low abundance and were generally isolated to sections of existing access tracks and prior disturbance. No WoNS were identified within the Survey Area and only two WM Act declared weed species (Class B) were identified; Hyptis and Flannel Weed. These two species are also listed under DEPWS (2021a) as Category 4 weeds. All remaining introduced flora species are not afforded a relevant class under the WM Act or category under DEPWS (2021a).

Feral Cats were observed within the Survey Area and at the ‘Tamboran Camp’. The presence of this species at the Tamboran Camp highlights the importance of introducing management strategies for this species around the Temporary Construction Camp.

Biosecurity management strategies provided in APGA (2022) are recommended to be applied at all stages of the Project. This will result in the Project having a low risk of instigating the establishment and proliferation of introduced flora and fauna species. To assist with this, it is recommended that native groundcover and non-woody shrubs are allowed to grow over any cleared area. This will reduce the likelihood of introduced species establishing and will also reduce the net loss of biodiversity values within the Project Area due to vegetation clearing during the construction phase of the Project.

6.4 Threatened and migratory fauna species

No threatened or migratory fauna species were observed within the Survey Area during the 2024 field assessment. Three species were incidentally observed within the broader region over the field survey period; Gouldian Finch, Grey Falcon, and Glossy Ibis. The following species were determined to have a moderate or high likelihood of occurring within the Project Area based on outcomes or desk- and field-based assessments:

- Gouldian Finch;
- Grey Falcon;
- Painted Honeyeater;
- Australian Painted-snipe;
- Northern Blue-tongued Skink;
- Yellow-spotted Monitor;
- Oriental Pratincole; and
- Glossy Ibis.

Potential impacts to these species were assessed against the MNES Significant impact guidelines (DoE, 2013). These assessments are provided in Table 21. The outcomes of these assessments are that none of these species will be significantly impacted by

development of the Project. Recommendations and strategies to manage the risk of impacts to biodiversity values within the Project Area are provided in Table 18.

Table 18 Impact pathways during development of the Project and management recommendations

Impact pathway	Further description and management recommendations
Direct removal of native vegetation and fauna habitat	During the construction phase of the Project vegetation communities will be required to be cleared and maintained for the development of infrastructure components. Routine maintenance of woody regrowth above the pipeline and 3 m buffer area to incorporate vehicle movement will be maintained during the operation phase. No further clearing of native vegetation is likely to be required during the operational phase of the Project. It is recommended that native groundcover vegetation and non-woody shrubs be re-established via natural top-soil seedbank after any clearing occurs. This will aid in managing the risk of impacts to native vegetation communities, watercourses, and water quality via erosion, and fauna habitat values within the Disturbance Footprint. This is of particular note as this will reduce the net loss of potential habitat for threatened and migratory fauna species within the Disturbance Footprint. The reinstation of native groundcover species will also aid in reducing the potential for introduced flora to establish within cleared areas. It is recommended that vegetation clearing is undertaken during the dry season when surface water is absent and soil moisture is low. This will aid minimising impacts to biodiversity values and will also facilitate streamlined workflow.
Mortality of fauna species and impacts to threatened species breeding places.	During construction, the Project may result in the mortality of native fauna species through vegetation clearing or trench entrapment. The Code (AGPA, 2022) provides recommendations and strategies for mitigating potential impacts to native fauna species that are at risk of impacts during the construction phase of the Project. These include, but are not limited to, the provision of spotter catchers, daily fauna checks of trenches, fauna shelters, earth plugs or access ramps at prescribed distances of open trench. The implementation strategies such as these during the construction phase of the Project will minimise the potential for individuals of this species to be directly impacted by the Project. Pre-clearance surveys for threatened species breeding places are recommended to be undertaken by spotter catchers prior to the commencement of sequential clearing. The objectives of these surveys should be to identify breeding places and adaptively manage impacts to these places should they be encountered. An example of adaptive management is to introduce clearing

Impact pathway	Further description and management recommendations
	exclusion zones during the construction phase of the Project. This is recommended as species may commence utilisation of the Disturbance Footprint after the completion of the baseline flora and fauna assessment. Examples of species to consider during these pre-clearance surveys are the Grey Falcon (nests) and Yellow-spotted monitor (burrows).
Introduction of pest flora and fauna species	See Section 6.3 of this report.

Table 19 Estimated area of impact to each ground-truthed vegetation community by development of the Project

Veg. #	Ground-truthed description	Estimated impact area (ha)[1]	
		Option 1	Option 2
1	Mixed *Acacia* shrubland to variable grassland with variable emergent *Eucalyptus* and *Corymbia.*	18.95[2]	18.90
2	*Melaleuca viridiflora* and *Acacia torulosa* low closed shrubland with *Triodia bitextura* hummock grassland.	9.22[2]	9.21
3	*Eucalyptus microtheca* open woodland on floodplains.	20.42	20.51[2]
4	*Corymbia dichromophloia* open woodland with variable tussock/hummock grassland.	64.84[2]	64.76
5	*Acacia shirleyi* open to closed woodland.	16.61	16.79[2]
6	*Macropteranthes keckwickii* closed woodland.	2.33[2]	2.22
7	*E. microtheca* and *Lophostemon grandiflorus* open woodland on floodplain fringes.	2.06[2]	2.01
Total		**134.43**	**134.41**

1. Exact impact areas to ground-truthed vegetation communities are subject to change based on changes to Project design once finalised.
2. Indicates 'worst case' impact areas for development options, which have been used to inform impact area calculations for threatened species habitat. The sum of these values is 136.58 ha.

Table 20 Recommended widths of riparian buffers within the Land Clearing Guidelines (DEPWS, 2024c)

Riparian class	Stream order	Minimum buffer width (m)	Measured from
Drainage depression	N/A	25	The outer edge of the drainage depression, which is the extent of the associated poorly drained soils and associated vegetation

Riparian class	Stream order	Minimum buffer width (m)	Measured from
Intermittent streams	First		The outer edge of the riparian vegetation or levee (whichever is the greater). If braided channels are present, the edge of the outer most stream channel.
	Second	50	As above.
Creeks	Third and fourth	100	
Rivers	Fifth or higher	250	

Table 21 Significant impact assessment for threatened and migratory fauna species with a moderate to high likelihood of occurrence within the Project

Status[1]		Scientific name	Common name	Species ecology, threats, and habitat values within the Project	Significant impact criteria	Outcomes[3]
TPWC Act[2]	EPBC Act[2]					
Threatened species						
VU	EN	*Erythrura gouldiae*	Gouldian Finch	**Species ecology and threats:** The Gouldian Finch is found from the Cape York Peninsula of northern Australia through north-west Queensland and to the Northern Territory and Kimberley Region of Western Australia. The nesting period for this species is typically between April and July, however this may be extended in some years. This species nests in tree hollows, preferring small patches of open woodland, usually on ridges dominated by cavity bearing trees such as *Eucalyptus brefifolia* in the west and *Eucalyptus tintinnans* in the east. The understorey of these communities is dominated by grasses such as *Sarga spp*., *Schizachyrium spp*., and *Triodia spp*. and nesting usually occurs within 2-4 km of perennial waterholes or springs (TSSC, 2016a). The largest known breeding population of this species occurs north of Katherine (O'Malley, 2006). Non-breeding birds disperse widely, following grass and seed resources, with evidence of banded juveniles moving 200 km in a few weeks. Additionally, vagrants have been recorded on the edge of the Simpson Desert ~1,000 km south of the normal distribution (TSSC, 2016a; Garnett & Baker, 2021). This species feeds almost exclusively on grass seed and depend on a relatively small number of grass species, which seed at different times throughout the year. In the wet season, this species relies on a small number of perennial grass species, including *Alloteropsis semialata* and *Chrysopogon fallax*, consuming the seeds directly off plants as they ripen. In the dry season, they depend on the large volume of annual grass seed that is produced towards the end of the previous wet season that lies dormant on the ground (TSSC, 2016a). Other grass species that this species has been documented to forage on include *Triodia spp*. (including *Triodia bitextura*), *Heteroppogon triticeus*, *Sehima nervosum*, *Xerochloa laniflora* and *Themeda triandra*. Threats to this species described in O'Malley (2006), Garnet & Baker (2021), and TSSC (2016a) are: • Inappropriate fire regimes. • Impacts from overgrazing and Feral Pigs (*Sus scrofa*). • Historically, Air Sac Mite (*Stemostoma tracheacolum*) was investigated for its role in causing population declines. Although the mite was often identified in sick birds, its role in causing poor condition remains unclear. • Loss and competition for hollows during breeding. Critical components of suitable core habitat for this species appear to the be presence of favoured annual and perennial grasses (especially *Sorghum*), a nearby source of surface water and, in the breeding season, unburnt hollow-bearing *Eucalyptus* (DCCEEW, 2024c). **Habitat values within the Project Area:** This species was not observed within the Survey Area during the 2024 field assessment. However, ≤10 individuals of this species were	Lead to a long-term decrease in the size of a population.	This species is estimated to occur as one, but may occur as two, populations within Australia. Western birds are panmictic, however Einasleigh Uplands/Cape York Peninsula birds may be isolated. Aside from this, the population of this species is not severely fragmented and is not subject to extreme fluctuations in its extent of occurrence and area of occupancy (AoO). The number of mature individuals can fluctuate at a site level, but there is no evidence of fluctuations of an order of magnitude at a populations level (Garnett & Baker, 2021). The population of this species within the local area is part of a broader panmictic population and individuals have demonstrated ability to travel across large distances in search of resources. Therefore, development of the Project will not lead to a long-term decrease in the size of a population of this species.
					Reduce the AoO of the species.	The population of this species is not severely fragmented and is not subject to extreme fluctuations in its extent of occurrence and AoO (Garnett & Baker, 2021). Therefore, development of the Project will not reduce the AoO of the species.
					Fragment an existing population into two or more populations.	The population of this species within the local area is part of a broader panmictic population and individuals have demonstrated ability to travel across large distances in search of resources (Garnett & Baker, 2021). Therefore, development of the Project will not fragment an existing population into two or more populations.
					Adversely affect habitat critical to the survival of the species.	Potential foraging habitat for this species was ground-truthed within the Project area. The estimated area of potential foraging habitat for this species that may be impacted by development of the Project is ~112.14 ha. This estimated extent of disturbance is ~0.05% of that represented within the broader region based on ground-truthed observations and DEPWS (2024a) mapping within the desktop assessment area. Whilst there is a net loss of potential foraging habitat within the Project area, contiguous vegetation within the surrounding landscape with similar values will remain unimpacted by the Project. Therefore, the effect of impacts to habitat critical to the survival of the species are not likely to be adverse.
					Disrupt the breeding cycle of a population.	The spatial distribution of tree species (*E. brevifolia* and *E. tintinnans*) that this species is documented to use during breeding does not overlap with the Project Area (ALA, 2024). This is consistent with known existing and large breeding populations of this species (O'Malley, 2006) and other breeding areas described in TSSC (2016a). As the Project area does not occur within known breeding locations for this species and no evidence of breeding was observed during the 2024 field assessment development of the Project will not disrupt the breeding cycle of a population of this species.
					Modify, destroy, remove, isolate or decrease the availability or quality of	Potential foraging habitat for this species was ground-truthed within the Project area. The estimated area of potential foraging habitat for

Status[1]		Scientific name	Common name	Species ecology, threats, and habitat values within the Project	Significant impact criteria	Outcomes[3]
TPWC Act[2]	EPBC Act[2]					
				opportunistically observed on one occasion drinking from an artificial water source. This water source is located ~9.5km to the north of the westernmost portion of the proposed alignment, along the Buchanan Highway (~4km west of the Stuart Highway intersection). The surrounding vegetation community was characterised by *Acacia shirleyi* open to closed forest on minor rises, which was surrounded by *Corymbia dichromophloia* open woodland with variable tussock/ hummock grassland. Grass species ground-truthed during the 2024 field assessment that this species is known or likely to forage on are *Chrysopogon fallax*, *Sorghum timorense*, *Schizachyrium fragile*, *Triodia bitextura*, *Sehima nervosa*, and *Themeda triandra*. These grasses were found across ground-truthed vegetation communities 1, 2, 4, 5 and 6. Based on this, it is estimated that there may be ~112.14 ha of foraging habitat for this species within the Disturbance Footprint. The spatial distribution of tree species (*E. brevifolia* and *E. tintinnans*) that this species is documented to use during breeding does not overlap with the Project Area (ALA, 2024). This is consistent with known existing and large breeding populations of this species (O'Malley, 2006) and other breeding areas described in TSSC (2016a). As the Project Area does not occur within known breeding locations for this species, and no evidence of breeding was observed during the 2024 field assessment, the Project Area is unlikely to contain breeding habitat for this species. Outside of seasonally ephemeral floodplains and drainage depressions, surface water was limited within the Survey Area. There are no perennial water sources that may be utilised by this species within the Project Area that will be affected by development of the Project.	habitat to the extent that the species is likely to decline.	this species that may be impacted by development of the Project is ~112.14 ha. This estimated extent of disturbance is ~0.05% of that represented within the broader region based on ground-truthed observations and DEPWS (2024a) mapping within the desktop assessment area. Whilst there is a net loss of potential foraging habitat within the Disturbance Footprint, contiguous vegetation within the surrounding landscape with similar values will remain unimpacted by the Project. Therefore, development of the Project will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline.
					Result in invasive species that are harmful to the species becoming established in the species habitat.	Impacts from overgrazing and Feral Pigs are the key threats to this species from invasive fauna. Invasive flora, such as introduced grass species, may also competitively exclude preferred food sources for this species. Feral Pigs were not returned from database searches as being relevant to the Project Area (ALA, 2024). However, this species occurs widely across northern Australia and may access portions of the Project Area. Development of the Project is not likely to increase the likelihood of Feral Pigs utilising the Project Area based on their wide-ranging occurrence. The existing land-use of the Project Area is for Cattle grazing. Therefore, impacts from grazing are likely to be pre-existing and development of the Project will not result in the establishment of this species. The implementation of biosecurity management strategies, as described in the Code (AGPA, 2022), will result in the Project having a low risk of resulting in invasive species that are harmful to this species becoming established in the species habitat.
					Introduce disease that may cause the species to decline.	Although not a disease, the Air Sac Mite may have contributed to previous population declines of this species. The threat posed by this species is assumed to be constant across different areas (O'Malley, 2006). Therefore, development of the Project will not introduce disease that may cause this species to decline.
					Interfere with the recovery of the species.	As Development of the Project will not result in a significant impact to the above criteria, the Project will not interfere with the recovery plan (O'Malley, 2006), or the recovery of, this species.
				Outcome:	This species has not been observed to occur within the Project Area. Development of the Project may impact up to ~112.14 ha of habitat for this species. This is ~0.05% of that available in the surrounding region, the balance of which will remain unimpacted by the Project. Despite a net loss of habitat, development of the Project will not result in a significant impact to this species.	
VU	VU	*Falco hypoleucos*	Grey Falcon	**Species ecology and threats:** This species is sparsely distributed across a large area of Australia, however, is considered rare or nomadic across much of its range. Throughout its distribution, this species has been recorded to prefer lightly timbered country, especially stony plains and lightly timbered *Acacia* scrublands (Morcombe, 2003). However, it has also been recorded to occur around inland wooded watercourses (Garnett *et al*., 2011). The presence of this species in an area and modelled habitat	Lead to a long-term decrease in the size of an important population of the species.	This species consists of a single, panmictic population across Australia that is not severely fragmented or subject to extreme fluctuation in the extent of occurrence, AoO, locations or mature individuals (Garnett & Baker, 2021). Additionally, the Project Area occurs within the central portion of this species' broad distribution (Menkhorst *et al*., 2017, Garnett & Baker, 2021). Based on these factors, the Project Area does not contain an important population of this species. Therefore, development of the Project will not lead to a long-term decrease in the size of an important population of this species.

Status[1]		Scientific name	Common name	Species ecology, threats, and habitat values within the Project	Significant impact criteria	Outcomes[3]
TPWC Act[2]	EPBC Act[2]					
				suitability are both highly variable between seasons and years (Garnett & Baker, 2021). Breeding occurs from June to November and eggs are laid in the old nests of other birds, particularly those of other raptors or corvids. The nests chosen are usually in the tallest trees along watercourses, particularly River Red Gum (*Eucalyptus camaldulensis*) and *Eucalyptus coolabah*. However, this species is also known to nest in telecommunication towers. This species consists of a single, panmictic population across Australia that is not severely fragmented or subject to extreme fluctuation in the extent of occurrence, AoO, locations or mature individuals (Garnett & Baker, 2021). No important populations of this species are described. There is no defined habitat that is critical to the survival of this wide-ranging panmictic species. Key considerations for habitat that may equate to habitat critical to the survival of this species are areas that are necessary for activities such as foraging, breeding, roosting or dispersal. Threats to this species are described in TSSC (2020) are: • Egg collection and falconry (both low risk); • Birdwatchers, photographers, collision with traffic, collision with fences and powerlines (all moderate risk); • Small population size and nest shortage (both high risk); and • Predation by cats, increased temperatures in arid and semi-arid Australia, and grazing by exotic herbivores (all very high risk). **Habitat values within the Project Area:** This species was not observed within the Survey Area during the 2024 field assessment and no distinct breeding or roosting locations were identified. Two individuals of this species were observed by AECOM ~5.5km to the east of the Project Area in June 2024. Due to the wide range of habitats that this species occupies and the presence of nearby records, all ground-truthed vegetation communities within the Project Area are likely to constitute habitat for this species. As no active breeding places were observed, habitat for this species within the Survey Area is likely to be primarily for foraging.	Reduce the AoO of an important population.	This species consists of a single, panmictic population across Australia that is not severely fragmented or subject to extreme fluctuation in the extent of occurrence, AoO, locations or mature individuals (Garnett & Baker, 2021). Additionally, the Project Area occurs within the central portion of this species' broad distribution (Menkhorst *et al*., 2017, Garnett & Baker, 2021). Based on these factors, the Project Area does not contain an important population of this species. Therefore, development of the Project will not lead to a reduction in the AoO of an important population.
					Fragment an existing important population into two or more populations.	This species consists of a single, panmictic population across Australia that is not severely fragmented or subject to extreme fluctuation in the extent of occurrence, AoO, locations or mature individuals (Garnett & Baker, 2021). Additionally, the Project Area occurs within the central portion of this species' broad distribution (Menkhorst *et al*., 2017, Garnett & Baker, 2021). Based on these factors, the Project Area does not contain an important population of this species. Therefore, development of the Project will not lead to the fragmentation of an existing important population into two or more populations.
					Adversely affect habitat critical to the survival of the species.	No active or distinct roosting or breeding places for this species were identified within the Survey Area during the 2024 field assessment. Additionally, habitats within the Project Area are not necessary for the dispersal of this species. Ground-truthed vegetation communities contain potential foraging habitat for this species. Therefore, it is estimated that ~134.70 ha of potential foraging habitat for this species may be impacted by development of the Project. This estimated extent of disturbance is ~0.05% of that represented within the broader region based on ground-truthed observations and DEPWS (2024a) mapping within the desktop assessment area. Whilst there is a net loss of potential foraging habitat for this species within the Disturbance Footprint, contiguous vegetation within the surrounding landscape with similar values will remain unimpacted by the Project. Therefore, the effect of impacts to habitat critical to the survival of the species are not likely to be adverse.
					Disrupt the breeding cycle of an important population.	This species consists of a single, panmictic population across Australia that is not severely fragmented or subject to extreme fluctuation in the extent of occurrence, AoO, locations or mature individuals (Garnett & Baker, 2021). Additionally, the Project Area occurs within the central portion of this species' broad distribution (Menkhorst *et al*., 2017, Garnett & Baker, 2021). Based on these factors, the Project Area does not contain an important population of this species. Therefore, development of the Project will not lead to the disruption in the breeding cycle of an important population.
					Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No active or distinct roosting or breeding places for this species were identified within the Survey Area during the 2024 field assessment. Additionally, habitats within the Project Area are not necessary for the dispersal of this species. Ground-truthed vegetation communities contain potential foraging habitat for this species. Therefore, it is estimated that ~134.70 ha of potential foraging habitat for this species may be impacted by

Status[1]		Scientific name	Common name	Species ecology, threats, and habitat values within the Project	Significant impact criteria	Outcomes[3]
TPWC Act[2]	EPBC Act[2]					
						development of the Project. This estimated extent of disturbance is ~0.05% of that represented within the broader region based on ground-truthed observations and DEPWS (2024a) mapping within the desktop assessment area. Whilst there is a net loss of potential foraging habitat for this species within the Disturbance Footprint, contiguous vegetation within the surrounding landscape with similar values will remain unimpacted by the Project. Therefore, development of the Project will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline.
					Result in invasive species that are harmful to the species becoming established in the species habitat.	Predation by Feral Cats are described as a threat to this species. Feral Cats were detected within the Survey Area during the 2024 field assessment. Based on this, this species is likely to be pre-established within the surrounding region. The implementation of biosecurity management strategies, as described in the Code (AGPA, 2022), will result in the Project having a low risk of resulting in invasive species that are harmful to this species becoming established in the species habitat.
					Introduce disease that may cause the species to decline.	Disease is not a known threat to this species. Therefore, the Project will not introduce disease that will case this species to decline.
					Interfere substantially with the recovery of the species.	As Development of the Project will not result in a significant impact to the above criteria, the Project will not interfere with the recovery plan objectives (TSSC, 2020), or the recovery of, this species.
				Outcome:	The Project Area does not occur in a location that supports an important population of this species. Development of the Project may impact up to ~134.70 ha of potential habitat for this species. This is ~0.05% of that available in the surrounding region, the balance of which will remain unimpacted by the Project. Despite a net loss of potential foraging habitat, development of the Project will not result in a significant impact to this species.	
VU	VU	*Grantiella picta*	Painted Honeyeater	**Species ecology and threats:** This species is seasonally migratory within Australia. This species breeds on the inland slopes of the Great Dividing Range south-east of an almost straight line from Chinchilla in Queensland to the Grampians in Victoria. After the Spring to Summer breeding season, there are very few records of this species in the southeastern portion of its Australian distribution. During the non-breeding season, most records of this species occur in northwestern Queensland south of the Gulf of Carpentaria and in the northeastern Northen Territory, south of the Roper River. The northward migration starts in March and most birds return to the breeding range from September to November (Garnett & Baker, 2021). This species often occurs singly or in pairs, and less often in small flocks. Preferred habitat for this species includes areas where mistletoe is abundant, the fruit of which its diet primarily consists of. Such habitats may include eucalypt forests/woodlands, riparian woodlands of Black Box and River Red Gum, Box-ironbark-yellow gum woodlands, *Acacia* dominated woodlands, Paperbarks, Casuarinas, *Callitris*, and trees on farmland or gardens. Preferred woodlands are those in wider blocks of remnant vegetation with a high proportion of mature trees as these often host more mistletoe. However, this species has also been	Lead to a long-term decrease in the size of an important population of the species.	This species occurs as a single population within Australia (Garnett & Baker, 2021). There are no important populations of this species described within DAWE (2021). Therefore, development of the Project will not lead to a long-term decrease in the size of an important population of the species.
					Reduce the AoO of an important population.	This species occurs as a single population within Australia (Garnett & Baker, 2021). There are no important populations of this species described within DAWE (2021). Therefore, development of the Project will not reduce the AoO of an important population.
					Fragment an existing important population into two or more populations.	This species occurs as a single population within Australia (Garnett & Baker, 2021). There are no important populations of this species described within DAWE (2021). Therefore, development of the Project will not fragment an existing important population into two or more populations.
					Adversely affect habitat critical to the survival of the species.	The Project Area contains potential foraging habitat for this species, which is defined as habitat critical to the survival of this species in DAWE (2021). The estimated extent of disturbance to potential foraging habitat for this species is ~83.96 ha. This estimated extent of disturbance is ~0.04% of that represented within the broader region based on ground-truthed observations and DEPWS (2024a) mapping within the desktop assessment area.

Status[1]		Scientific name	Common name	Species ecology, threats, and habitat values within the Project	Significant impact criteria	Outcomes[3]
TPWC Act[2]	EPBC Act[2]					
				observed in narrow roadside strips if ample mistletoe fruit is available (DoE, 2015). Habitat critical to the survival of this species is described in DAWE (2021) as: • Breeding habitat: Known or likely breeding habitat in Boree/Weeping Myall, Brigalow woodlands, box-gum woodlands and box-ironbark forests on the inland slopes of the Great Dividing Range in New South Wales, Victoria and southern Queensland. • Foraging habitat: All preferred foraging species within known and likely foraging habitat particularly mistletoes of the genus *Amyema* growing on forest and woodland eucalypts and Acacias. • Habitat for the long-term maintenance of the species: All key Biodiversity Areas with Painted Honeyeater as a Trigger species. Suitable habitat in future climate niches as information becomes available. Threats to this species is described in DAWE (2021) are: • Habitat loss (very high risk); • Habitat degradation (very high risk); • Competition (moderate risk); • Climate variability and change (very high risk). This species exists as single population within Australia (Garnett & Baker (2021). No important populations of this species are described in DAWE (2021). No key Biodiversity areas for this species are described for the Northern Territory in DAWE (2021). **Habitat values within the Project Area:** This species was not observed within the Survey Area during the 2024 field assessment. *Amyema maidenii* was observed to be fruiting during the field assessment and the field assessment was undertaken over a period when this species may occur during the non-breeding season. The Project Area occurs within the non-breeding range for this species, therefore values for this species are limited to those for foraging. *A. maidenii* was observed to occur on *Corymbia dichromophloia*, *Acacia shirleyi*, and *Terminalia canescens* across ground-truthed vegetation communities 4, 5, and 6. It should be noted that *A. maidenii* was observed to grow extensively on these host species in the broader region during the 2024 field assessment.		Whilst there is a net loss of potential foraging habitat within the Disturbance Footprint, contiguous vegetation within the surrounding landscape with similar values will remain unimpacted by the Project. Therefore, the effect of impacts to habitat critical to the survival of the species are not likely to be adverse.
					Disrupt the breeding cycle of an important population.	This species occurs as a single population within Australia (Garnett & Baker, 2021). There are no important populations of this species described within DAWE (2021). Therefore, development of the Project will not disrupt the breeding cycle of an important population. Furthermore, the Project Area occurs outside of the breeding distribution for this species.
					Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The Project Area contains potential foraging habitat for this species. The estimated extent of disturbance to potential foraging habitat for this species is ~83.96 ha. This estimated extent of disturbance is ~0.04% of that represented within the broader region based on ground-truthed observations and NVIS mapping within the desktop assessment area. Whilst there is a net loss of potential foraging habitat within the Disturbance Footprint, contiguous vegetation within the surrounding landscape with similar or equal values will remain unimpacted. Therefore, development of the Project will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline.
					Result in invasive species that are harmful to the species becoming established in the species habitat.	Invasive species are not described as a threat to this species. The implementation of biosecurity management strategies, as described in the Code (AGPA, 2022), will result in the Project having a low risk of resulting in invasive species that are harmful to this species becoming established in the species habitat.
					Introduce disease that may cause the species to decline.	Disease is not a known threat to this species. Therefore, the Project will not introduce disease that will case this species to decline.
					Interfere substantially with the recovery of the species.	As Development of the Project will not result in a significant impact to the above criteria, the Project will not interfere with the recovery plan objectives (DAWE, 2021), or the recovery of, this species.
				Outcome:	The Project Area does not occur in a location that supports an important population of this species. Development of the Project may impact up to ~83.96 ha of habitat for this species. This is ~0.04% of that available in the surrounding region, the balance of which will remain unimpacted by the Project. Despite a net loss of potential foraging habitat, development of the Project will not result in a significant impact to this species.	
EN	EN	*Rostratula australis*	Australian Painted-snipe	**Species ecology and threats:** This species has been recorded at wetland sites throughout much of Australia but is most common in the eastern states. This species is a distinct but can be hard to detect due to its cryptic and crepuscular behaviour. This species typically occurs in shallow freshwater wetlands and other permanently or temporarily inundated areas, particularly	Lead to a long-term decrease in the size of a population.	This highly mobile species occurs as a single population across Australia (Garnett & Baker, 2021; DCCEEW, 2022). No individuals of this species have been recorded within the Project Area and surrounding records are centralised around seasonal wetlands. Distinct wetland values and associated BVGs are not present within the Project. Therefore, development of the Project will not lead to a long-term decrease in the size of a population.

Status[1]		Scientific name	Common name	Species ecology, threats, and habitat values within the Project	Significant impact criteria	Outcomes[3]
TPWC Act[2]	EPBC Act[2]					
				where rank tussocks of grasses, sedges, rushes or reeds are present (DCCEEW, 2024c; Morcombe, 2003). This species breeds in shallow, temporary or infrequently filed freshwater or brackish wetlands following flooding, preferring wetlands with complex shorelines and a patchwork of shallow water, small islands, exposed wet mulch, and low dense cover (less than knee height). This species forages on seeds and invertebrates, including insects, worms, molluscs and crustaceans from the water's edge (Garnett & Baker, 2021). There is some evidence of partial migration from southeastern wetlands to coastal central and northern Queensland in autumn and winter. All sightings south of Queensland since 2015 have been between October and April, but some birds appear to stay in northern Australia all year round (Garnett & Baker, 2021). There is one local record of this species within 30 km of the Project, which is located ~2.7 km (from 1991) to the north of the Project (DEPWS, 2024a; ALA, 2024). There are several other nearby records of this species to the south of the Project around Lake Woods (ALA, 2024). Furthermore, Marcelina, the first Australian Painted-snipe to be tracked, has been recorded utilising an area of seasonal wetland area ~20km to the northeast of the Project in June 2024 (Pers. comms. Matt Herring from 'Tracking Australian Painted-snipe', June 2024). Threats to this species is described in DCCEEW (2022) are: • Changes to water regimes (very high risk); • Structural changes to wetlands (very high risk); • Drainage of wetlands (very high risk); • Fragmentation of waterways (moderate risk); • Deterioration of water quality (moderate risk); • Invasive plants (very high risk); • Climate variability and change (high risk); • Livestock overgrazing (moderate risk); • Invasive animals (moderate risk); • Human disturbance (moderate risk); • Fire (moderate risk); and • Low genetic diversity (high risk). Habitat critical to the survival of this species is described in DCCEEW (2022) as: • Any natural wetland habitat where the species is known or likely to occur (especially with suitable breeding habitat); and • Any location that may be periodically occupied by this species when wetland conditions are favourable. **Habitat values within the Project Area:** This species was not observed within the Survey Area during the 2024 field assessment. No distinct freshwater wetlands or other permanently inundated areas were ground-truthed within the Survey Area. Potential	Reduce the AoO of the species.	This highly mobile species occurs as a single population across Australia (Garnett & Baker, 2021; DCCEEW, 2022). No individuals of this species have been recorded within the Project Area and surrounding records are located around distinct, seasonal wetlands (ALA, 2024). Distinct wetland values and associated BVGs are not present within the Project Area. Therefore, development of the Project will not reduce the area of occupancy of the species
					Fragment an existing population into two or more populations.	This highly mobile species occurs as a single population across Australia (Garnett & Baker, 2021; DCCEEW, 2022). Localised clearing of vegetation does not present a barrier to dispersal for this highly mobile species. Therefore, development of the Project will not fragment an existing population into two or more populations.
					Adversely affect habitat critical to the survival of the species.	This species has not been recorded within the Project Area. The Project Area may contain intermittent and opportunistic foraging habitat for this species. The estimated extent of disturbance to potential foraging habitat for this species is ~22.57 ha. This estimated extent of disturbance is ~0.65% of that represented within the broader region based on ground-truthed observations and DEPWS (2024a) mapping within the desktop assessment area. Whilst there is a net loss of potential foraging habitat within the Disturbance Footprint, contiguous vegetation within the surrounding landscape with similar values will remain unimpacted by the Project. Therefore, the effect of impacts to habitat critical to the survival of the species are not likely to be adverse.
					Disrupt the breeding cycle of a population.	The Project Area does not contain suitable breeding (wetland) habitat for this species. Therefore, development of the Project will not disrupt the breeding cycle of the species.
					Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	This species has not been recorded within the Project Area. The Project Area may contain intermittent and opportunistic foraging habitat for this species. The estimated extent of disturbance to potential foraging habitat for this species is ~22.57 ha. This estimated extent of disturbance is ~0.65% of that represented within the broader region based on ground-truthed observations and DEPWS (2024a) mapping within the desktop assessment area. Whilst there is a net loss of potential foraging habitat within the Disturbance Footprint, contiguous vegetation within the surrounding landscape with similar values will remain unimpacted by the Project. Therefore, development of the Project will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline.
					Result in invasive species that are harmful to the species becoming established in the species habitat.	Invasive plants and animals are described as threats to this species. Introduced flora species were infrequently encountered during the 2024 field assessment. The implementation of biosecurity management strategies, as described in the Code, will result in the Project having a low risk of resulting in invasive species that are harmful to this species becoming established in the species habitat.
					Introduce disease that may cause the species to decline.	Disease is not a known threat to this species. Therefore, development of the Project will not introduce disease that will case this species to decline.

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TPWC Act[2]	EPBC Act[2]					
				habitat for this species within the Project Area is limited to temporarily inundated open woodland (ground-truthed vegetation communities 3 and 7), which is only inundated via extreme seasonal rainfall. The estimated extent of disturbance to potential habitat for this species is ~22.57 ha. Habitat values for this species within the Project Area are likely to be limited to those for opportunistic foraging, as distinct wetland, and preferred, values are absent. This is supported by ground-truthed vegetation communities not corresponding to SREBA wetland BVGs.	Interfere with the recovery of the species.	As Development of the Project will not result in a significant impact to the above criteria, the Project will not interfere with the recovery plan objectives (DCCEEW, 2022), or the recovery of, this species.
				Outcome:	This species has not been observed to occur within the Project Area. Development of the Project may impact up to ~22.57 ha of habitat for this species. This is ~0.65% of that available in the surrounding region, the balance of which will remain unimpacted by the Project. Despite a net loss of habitat, development of the Project will not result in a significant impact to this species.	
(NL)	CE	*Tiliqua scincoides intermedia*	Northern Blue-tongued Skink	**Species ecology and threats:** This species occurs across northern Australia from Eighty Mile Beach in Western Australia, across the southern Kimberly and Top End of the Northern Territory, to approximately the Gregory Downs/Cloncurry area in western Queensland. (DCCEEW, 2023b). This species occurs in a wide variety of ecosystems but is not identified to occur in mangroves. This species has been recorded from dissected sandstone plateaus and gorges, limestone ranges, granite, basalt and dolerite hills, glacial shale undulations, sand plains, sandy waterways, swamps, cracking clay floodplains and coastal flats. Vegetation associations include riparian forest, vine scrub, monsoon rainforest, *Pandanus*-lined gorges, *Melaleuca* forest, eucalypt woodland and savanna, sparse and dense shrubland, and spinifex and tussock grassland. Most, but not all, detections have occurred near seasonal or permanent water. (DCCEEW, 2023b). This species shelters under shrubs and thick grasses, in leaf litter, within burrows, and under built structures and discarded household items. DCCEEW (2023b) provides a wide-ranging description of habitat that is critical to the survival of this species. It was found that, on average, individuals of this species spend 95% of their time in small, fragmented patches of relatively dense vegetation that provide cool shade and damp conditions within an otherwise inhospitable landscape. These areas are considered to be habitat critical to the survival of this species. One DCCEEW (2023b) example of habitat critical to the survival of this species is dense thickets within floodplains, grasslands, shrublands, savannas and woodlands. Threats to this species identified in DCCEEW (2023b) are: • Mining, water drawdown, inundation, illegal collection, traditional hunting (all moderate risk); • Frequent sever fire, post-fire predation by Feral Cats, impacts from Cattle, Asian Water Buffalo and Feral Pigs (all high risk); and • Impacts from the Cane Toad (very high risk). DCCEEW (2023c) recovery actions for this species are centralised around managing impacts to this species from the Cane Toad.	Lead to a long-term decrease in the size of a population.	No individuals of this species have been recorded within the Project Area. Impacts from the introduced Cane Toad is the key factor influencing population decline in this species and the catalyst for this species threatened status (DCCEEW, 2023b). Cane Toads are pre-established in the surrounding region based on outcomes of the desktop assessment. Based on existing impacts being the leading factor contributing to general population decline in this species, development of the Project is will not contribute to long-term decreases in the size of a local population.
					Reduce the AoO of the species.	No individuals of this species have been recorded within the Project Area. The estimated AoO of this species is 704 km^2 (DCCEEW, 2023b) and the Project Area occurs within an extensive area of DCCEEW (2024c) modelled core distribution (habitat) for this species. Clearing for linear infrastructure (30 m wide) will not reduce the AoO of this species, particularly because the Project Area occurs within a broad area of DCCEEW (2024c) modelled core distribution for this species.
					Fragment an existing population into two or more populations.	Individuals of this species have home ranges of 2 to 12 ha (DCCEEW, 2023b). Clearing for linear infrastructure (30 m wide) will not represent a barrier that will fragment the existing mainland population of this species into two or more populations.
					Adversely affect habitat critical to the survival of the species.	Ground-truthed vegetation communities may contain habitat that is critical to the survival of this species. Therefore, it is estimated that ~134.70 ha of potential foraging habitat for this species may be impacted by development of the Project. This estimated extent of disturbance is ~0.05% of that represented within the broader region based on ground-truthed observations and DEPWS (2024a) mapping within the desktop assessment area. Whilst there is a net loss of potential habitat for this species within the Disturbance Footprint, contiguous vegetation within the surrounding landscape with similar values will remain unimpacted by the Project. Therefore, the effect of impacts to habitat critical to the survival of the species are not likely to be adverse.
					Disrupt the breeding cycle of a population.	This species is viviparous, giving birth at the start of the wet season (December to January) after mating in the dry season (August to September) (DCCEEW, 2023b). No distinct breeding cycle requirements are described in DCCEEW (2023b) for this species.

Status[1]		Scientific name	Common name	Species ecology, threats, and habitat values within the Project	Significant impact criteria	Outcomes[3]
TPWC Act[2]	EPBC Act[2]					
				Habitat values within the Project Area: This species was not observed within the Survey Area during the 2024 field assessment. However, based on the wide variety of habitats that this species is known to occupy, the Project Area likely supports suitable habitat for this species across all ground-truthed vegetation communities. These habitats may also be considered habitat critical to the survival of this species based on examples provided within DCCEEW (2023b).		Therefore, development of the Project will not disrupt the breeding cycle of this species.
					Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Ground-truthed vegetation communities may contain habitat for this species. Therefore, it is estimated that ~134.70 ha of potential habitat for this species may be impacted by development of the Project. This estimated extent of disturbance is ~0.05% of that represented within the broader region based on ground-truthed observations and DEPWS (2024a) mapping within the desktop assessment area. Whilst there is a net loss of potential habitat for this species within the Disturbance Footprint, contiguous vegetation within the surrounding landscape with similar values will remain unimpacted by the Project. Therefore, development of the Project will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline.
					Result in invasive species that are harmful to the species becoming established in the species habitat.	Cane Toads are the key introduced species identified in DCCEEW (2023b) that pose a threat to this species. It is also identified that Feral Cat predation of this species due to post-fire exposure and Cattle impacts is a high-risk threat to this species. Feral Cats and Cattle were ground-truthed within the Survey Area during the 2024 field assessment, therefore these species are pre-established in the local area. No Cane Toads were observed during the 2024 field assessment. However, this species was returned from database searches as occurring within the desktop assessment area. Therefore, it is likely that Cane Toads are pre-established in the surrounding region. The implementation of biosecurity management strategies, as described in the Code, will result in the Project having a low risk of resulting in invasive species that are harmful to this species becoming established in the species habitat. As invasive species that are harmful to this species are already pre-established in the surrounding region development of the Project has a low risk of contributing to the establishment of these species.
					Introduce disease that may cause the species to decline.	Disease is not a known threat to this species. Therefore, the Project will not introduce disease that will case this species to decline.
					Interfere with the recovery of the species.	As development of the Project will not result in a significant impact to the above criteria, the Project will not interfere with the recovery (DCCEEW, 2023b) of this species.
				Outcome:	This species has not been observed to occur within the Project Area. Development of the Project may impact up to ~134.70 ha of habitat for this species. This is ~0.05% of that available in the surrounding region, the balance of which will remain unimpacted by the Project. Despite a net loss of habitat, development of the Project will not result in a significant impact to this species.	
VU	-	*Varanus panoptes*	Yellow-spotted Monitor	**Species ecology and threats:** This species has a broad geographic range across the far north of Australia, from the Kimberly's to Cape York Peninsula, and southwards through most of Queensland. In the Northern Territory, it has been recorded across most of the Top End and the Gulf Region (south to Katherine, Judbarra/Gregory National Park and the Gulf hinterland). This terrestrial species occupies a wide variety of habitats, including coastal beaches, floodplains, grasslands and woodlands. In these	Lead to a long-term decrease in the size of an important population of the species.	This species has not been observed within the Project Area and there are no important populations of this species within the Project Area. Therefore, development of the Project will not lead to a long-term decrease in the size of an important population of this species.
					Reduce the area of occupancy of an important population.	This species has not been observed within the Project Area and there are no important populations of this species within the Project Area. Therefore, development of the Project will not reduce the area of occupancy of an important population.

Status[1]		Scientific name	Common name	Species ecology, threats, and habitat values within the Project	Significant impact criteria	Outcomes[3]
TPWC Act[2]	EPBC Act[2]					
				areas, it predominantly feeds on small terrestrial vertebrates and insects (DEPWS, 2024b). This species nests in a deep (1.0 to 3.6 m) burrow, which is the deepest known of any vertebrate. Nesting occurs during the late-wet season and early dry season (February to June). Nests often occur in warrens (groups of up to 30 burrows close to one another). Nesting generally occurs along rivers and creeks in sandy areas with an open canopy and scattered shrubs and grasses (Doody *et al*., 2015). The advance of the Cane Toad across the Northern Territory presents the key threat to this species. This species is highly susceptible to Cane Toad toxin and monitors can easily ingest Cane Toads large enough to result in death (DEPWS, 2024b). No important populations of this species are defined. This species has a broad distribution across northern and eastern Australia, with a disjunct, but wide-ranging distribution in central-western Western Australia (Wilson & Swan, 2023).\ **Habitat values within the Project Area:** This species was not observed within the Survey Area during the 2024 field assessment. However, based on the wide variety of habitats that this species is known to occupy, the Project Area likely supports suitable habitat for this species across all ground-truthed vegetation communities. These habitats have the potential to be used by this species for foraging. Breeding habitat is excluded herein because no evidence of breeding (i.e. burrows) was observed for this species during the 2024 field assessment. A review of Wilson & Swan (2023) and ALA (2024) shows that the Project Area does not occur near the limit of this species' range; the Project Area occurs within the broad distribution of this species. The Project Area does not occur near the limit of the species' range, therefore the Project Area is not likely to contain key source populations of this species or populations that are necessary for maintaining genetic diversity. Overall, the Project Area is not likely to comprise an important population of this species.	Fragment an existing important population into two or more populations.	This species has not been observed within the Project Area and there are no important populations of this species within the Project Area. Therefore, development of the Project will not fragment an existing important population into two or more populations.
					Adversely affect habitat critical to the survival of the species.	Ground-truthed vegetation communities may contain foraging habitat that is critical to the survival of this species. Therefore, it is estimated that ~134.70 ha of potential foraging habitat for this species may be impacted by development of the Project. The estimated extent of potential disturbance is ~0.05% of that represented within the broader region based on ground-truthed observations and DEPWS (2024a) mapping within the desktop assessment area. Whilst there is a net loss of potential foraging habitat for this species within the Disturbance Footprint, contiguous vegetation within the surrounding landscape with similar values will remain unimpacted by the Project. Therefore, the effect of impacts to habitat critical to the survival of the species are not likely to be adverse.
					Disrupt the breeding cycle of an important population.	This species has not been observed within the Project Area and there are no important populations of this species within the Project Area. Therefore, development of the Project will not disrupt the breeding cycle of an important population of this species. Furthermore, no evidence of burrows (or warrens) for this species were ground-truthed within the Survey Area.
					Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Ground-truthed vegetation communities may contain foraging habitat that is critical to the survival of this species. Therefore, it is estimated that ~134.70 ha of potential foraging habitat for this species may be impacted by development of the Project. The estimated extent of potential disturbance is ~0.05% of that represented within the broader region based on ground-truthed observations and DEPWS (2024a) mapping within the desktop assessment area. Whilst there is a net loss of potential foraging habitat for this species within the Disturbance Footprint, contiguous vegetation within the surrounding landscape with similar values will remain unimpacted by the Project. Therefore, development of the Project will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
					Result in invasive species that are harmful to the species becoming established in the species habitat.	Cane Toads are the key introduced species identified in DEPWS (2024b) that pose a threat to this species. No Cane Toads were observed during the 2024 field assessment. However, Cane Toads were returned from database searches as occurring within the desktop assessment area. Therefore, it is likely that Cane Toads are pre-established in the surrounding region. The implementation of biosecurity management strategies, as described in the Code, will result in the Project having a low risk of resulting in invasive species that are harmful to this species becoming established in the species habitat. As invasive species that are harmful to this species are already pre-established in the surrounding region development of the Project has a low risk of contributing to the establishment of these species.
					Introduce disease that may cause the species to decline.	Disease is not a known threat to this species. Therefore, the Project will not introduce disease that will case this species to decline.

Status[1]		Scientific name	Common name	Species ecology, threats, and habitat values within the Project	Significant impact criteria	Outcomes[3]
TPWC Act[2]	EPBC Act[2]					
					Interfere substantially with the recovery of the species.	As development of the Project will not result in a significant impact to the above criteria, the Project will not interfere with the recovery of this species.
				Outcome:	The Project Area does not occur in a location that supports an important population of this species. Development of the Project may impact up to ~134.70 ha of potential habitat for this species. This is ~0.05% of that available in the surrounding region, the balance of which will remain unimpacted by the Project. Despite a net loss of habitat, development of the Project will not result in a significant impact to this species.	
Migratory species						
LC	MI	*Glareola maldivarum*	Oriental Pratincole	**Species ecology and threats:** Within Australia this species is widespread in northern areas, especially along the coasts of the Pilbara Region and the Kimberley Division in Western Australia, the Top End of the Northern Territory, and parts of the Gulf of Carpentaria. It is also widespread but scattered inland. Inland habitats include open plains, floodplains or short grasslands. They often occur near terrestrial wetlands (DCCEEW, 2024c). This species does not breed in Australia and generally roosts in bare areas such as claypans or areas with low vegetation, such as saltmarsh or airfields. This species forages aerially at heights varying from just above the ground up to 300 m. During the non-breeding season, this species feeds on a variety of insects, including dragonflies, cicadas, beetles, moths, ants, termites, locusts, grasshoppers, flies, bees and wasps (DCCEEW, 2024c). The population of this species is estimated to range from ~2.5-2.8 million individuals and in Australia there are no immediate threats to its survival (DCCEEW, 2024c). **Habitat values within the Project Area:** This species was not observed within the Project Area during the 2024 field assessment and only one individual has been recorded within 30 km of the Project after 1980 (ALA, 2024). This one individual represents <0.00004% of the estimated population (lower range) of this species. Therefore, the Project Area and broader desktop assessment area does not support an ecologically significant proportion of the population of this species. The Project Area does not support breeding habitat for this species. Additionally, ground-truthed vegetation communities are not suitably open to support roosting habitat for this species. Foraging habitat for this species is limited to the airspace above the Project Area and linear vegetation clearing will not diminish the abundance of prey for this species. This species is widely distributed across Australia during the non-breeding season and there are no immediate threats to this species in Australia that result in population declines of this species. Furthermore, the Project Area does not occur at the limit of the non-breeding range of this species (ALA, 2024). Overall, the Project Area does not support important habitat for this species.	Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for the species.	The Project Area does not support important habitat for this species. Therefore, development of the Project will not substantially modify, destroy or isolate an area of important habitat for this species.
					Result in invasive species that are harmful to the species being established in an area of important habitat for the species.	Invasive species within Australia are not described as a threat to this species. Additionally, the Project Area does not support important habitat for this species. Therefore, development of the Project will not result in invasive species that are harmful to this species being established in an area of important habitat.
					Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population.	The Project Area does not support an ecologically significant proportion of the population of this species. Therefore, development of the Project will not seriously disrupt the lifecycle of an ecologically significant proportion of the population.
				Outcome:	This species has not been recorded to occur within the Project Area. Additionally, the Project Area does not support important habitat for this species or an ecologically significant proportion of the population of this species. Therefore, development of the Project will not significantly impact this species.	

Status[1]		Scientific name	Common name	Species ecology, threats, and habitat values within the Project	Significant impact criteria	Outcomes[3]
TPWC Act[2]	EPBC Act[2]					
LC	MI	*Plegadis falcinellus*	Glossy Ibis	**Species ecology and threats:** This species preferred habitat for foraging and breeding are freshwater marshes at the edges of lakes and rivers, lagoons, floodplains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. This species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons, however, these are not preferred habitats for this species. (DCCEEW, 2024c). Within Australia, this species disperses in response to good rainfall, expanding its range in Autumn. However, the core breeding (Spring and Summer) areas used at within the Murray-Darling Basin region of New South Wales and Victoria, the Macquarie Marshes in New South Wales, and in southern Queensland. This species feeds in very shallow water, foraging mostly for aquatic invertebrates. However, this species will also eat fish, frogs and tadpoles, dryland invertebrates, lizards, small snakes and nestling birds. Seeds of aquatic plants may also be eaten, including commercial rice, which is recorded as a major diet item in parts of northern Australia. This species roost in trees or shrubs usually near, but sometimes far, from waterbodies (DCCEEW, 2024c). Wetland destruction or degradation is the major threat this species, particularly within the breeding range. Other identified threats include clearing, grazing, burning, increased salinity, groundwater extraction, hunting, pesticides, and invasion by exotic plants and fish resulting in habitat modification (DCCEEW, 2024c). The population of this species within Australia is estimated to be ~12% (~144,000 individuals) of the worldwide population, which ranges from ~1.2-3.2 million individuals (DCCEEW, 2024c). **Habitat values within the Project:** This species was not observed within the Project Area during the 2024 field assessment. However, three individuals were incidentally observed on one occasion to be foraging in seasonally inundated open *Eucalyptus microtheca* woodland ~5km to the south of the Disturbance Footprint. A further 11 records of this species were returned from database searches as occurring within 30 km of the Project Area. Cumulatively, these observations (14 individuals) represent <0.01% of the estimation Australian population of this species and ~0.001% of the worldwide population of this species. Therefore, the Project Area and broader desktop assessment area does not support an ecologically significant proportion of the population of this species. This species may utilise floodplain vegetation within the Project Area for foraging and roosting when these areas are inundated after heavy seasonal rainfall that results in flooding. This vegetation type occurs extensively outside of the Project Area. Minor clearing of vegetation within potential foraging habitat for this species will not diminish foraging opportunities for this species as this species is known not forage in open areas where surface water is present. This species roosts opportunistically, therefore development of the Project will not remove roosting habitat that is necessary for this species. The Project Area does not overlap with known breeding habitat for this species. Based on this, the Project does not support habitat of critical importance to this species. Populations of this species within Australia	Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for the species.	The Project Area does not support important habitat for this species. Therefore, development of the Project will not substantially modify, destroy or isolate an area of important habitat for this species.
					Result in invasive species that are harmful to the species being established in an area of important habitat for the species.	Habitat invasion and modification by exotic plants and fish are identified as a threat to this species. The implementation of biosecurity management strategies, as described in the Code, will result in the Project having a low risk of resulting in invasive species that are harmful to this species becoming established in the species habitat.
					Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population.	The Project Area does not support an ecologically significant proportion of the population of this species. Therefore, development of the Project will not seriously disrupt the lifecycle of an ecologically significant proportion of the population.

Status[1]		Scientific name	Common name	Species ecology, threats, and habitat values within the Project	Significant impact criteria	Outcomes[3]
TPWC Act[2]	EPBC Act[2]					
				are not known to be declining and the Project Area does not occur on the limit of the species range (ALA, 2024; Menkhorst *et al*., 2017). Overall, the Project Area does not support an important population of this species.		
				Outcome:	This species has not been recorded to occur within the Project Area. Additionally, the Project Area does not support important habitat for this species or an ecologically significant proportion of the population of this species. Therefore, development of the Project will not significantly impact this species.	

1 Status: CE = Critically Endangered, EN = Endangered, LC = Least Concern, MI = Migratory, NE = Not Evaluated, (NL) = Not Listed, VU = Vulnerable.

3 TPWC = *Territory Parks and Wildlife Conservation Act 1976*, EPBC = *Environment Protection and Biodiversity Conservation Act 1999*.

3 Impact area (ha) estimates are based off the 'worst case' impacts to relevant ground-truthed vegetation communities between development options. Per cent impact to habitats within the surrounding region are based off impacts to ground-truthed vegetation communities and the proportion DEPWS (2024a) NVIS communities that align with these communities within the desktop assessment area.

6.5 Cumulative impact assessment

The Beetaloo Basin Shenandoah South E&A Program (Shenandoah South Program) was identified to be relevant for consideration in the assessment of cumulative impacts associated with the Project. This is because the Project is intended to interconnect future components the Shenandoah South Program with the existing Amadeus gas pipeline.

Publicly available terrestrial ecological information relating to the Shenandoah South Program is available in the Environment Management Plan (EMP) for this program (Tamboran, 2024). Formal significant impact assessments following the methodology provided herein are not provided in Tamboran (2024). Therefore, direct comparison between outcomes to assist in the assessment of cumulative impacts can not be undertaken. *In lieu* of this, SLR reviewed the extent of vegetation communities documented to be impacted as part of the Shenandoah South Program. This is due to their connectedness with threatened fauna habitat values and subsequent detailed impact assessments provided in this report. However, only the total area (ha) of each vegetation community ground-truthed within Shenandoah South Program Lease Pad Areas are provided in Tamboran (2024) and not the area of proposed impact to each of these ground-truthed vegetation communities. Therefore, quantitative cumulative impact assessments can not be undertaken based on publicly available information for the Shenandoah South Program. Cumulative impact assessments are thus limited to qualitative assessments based on the available information.

Potential disturbance to vegetation communities associated with the Shenandoah South Program is generally characterised by the construction of (see Figure 23 in Appendix K of Tamboran, 2024):

- Exploration drill pads;
- Seismic lines;
- Gravel pits; and
- Well pad access tracks.

Vegetation clearing for infrastructure will not contribute notable additional impacts with consideration to those assessed in this report. Particularly in consideration to the extensive areas of contiguous vegetation in the surrounding region that will remain unimpacted by the Project and the Shenandoah South Program. Overall, development of the Project will not result in significant cumulative impacts based on publicly available information at the time of writing.

7.0 Conclusions and recommendations

The baseline flora and fauna assessment for the Project Area identified a variety of biodiversity values as occurring within the Project Area through desk- and field-based assessments. Based on the outcomes of these assessments, several of these matters were relevant for impact assessment due to their occurrence within, or proximity to, the Project Area. These matters are:

- Sensitive and significant vegetation communities (riparian vegetation);
- Introduced flora and fauna species; and
- Threatened and migratory fauna species.

Significant impact assessments of threatened and migratory fauna species revealed that development of the Project is not at risk of significantly impacting these species. Additionally, the Project is not at risk of impacting local Parks and Reserves. Clearing of native vegetation has the potential to impact upon riparian vegetation values. However, the implementation of APGA (2022) standard practices to manage impacts to native vegetation, water, and soil will likely result in impacts being of low risk within otherwise sparse vegetation communities. To support this, it is recommended that clearing activities are undertaken during the dry season when soil moisture is low. Furthermore, post clearing for temporary and below-ground infrastructure, it is recommended that native groundcover and non-woody shrub species are re-established across cleared areas via existing seedbank within reinstated topsoil. This will reduce the extent and likelihood of long-term impacts to biodiversity and environmental values within the Disturbance Footprint and minimise the potential for establishment of introduced flora species. The implementation of APGA (2022) biosecurity management strategies will also aid in minimising any impacts from introduced species.

The Code (AGPA, 2022) provides recommendations and strategies for mitigating potential impacts to native fauna species that are at risk of impacts during the construction phase of the Project. These include, but are not limited to, the provision of spotter catchers, daily fauna checks of trenches, fauna shelters, earth plugs or access ramps at prescribed distances of open trench. The implementation strategies such as these during the construction phase of the Project will minimise the potential for individuals of this species to be directly impacted by the Project.

Pre-clearance surveys for threatened species breeding places are recommended to be undertaken by spotter catchers prior to the commencement of sequential clearing. The objectives of these surveys should be to identify breeding places and adaptively manage impacts to these places should they be encountered. An example of adaptive management is to introduce clearing exclusion zones during the construction phase of the Project. This is recommended as species may commence utilisation of the Project Area after the completion of the baseline flora and fauna assessment.

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Appendix A EPBC Act Protected Matters Report

Sturt Plateau Pipeline

Ecological Assessment

APA SPP Pty Ltd

SLR Project No.: 680.030294.00001

6 December 2024

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 09-May-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	19
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	18
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	1
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	1

Details

Matters of National Environmental Significance

Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
Erythrura gouldiae Gouldian Finch [413]	Endangered	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Falcunculus frontatus whitei Crested Shrike-tit (northern), Northern Shrike-tit [26013]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Tyto novaehollandiae kimberli](#) Masked Owl (northern) [26048]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			
[Macroderma gigas](#) Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In feature area
[Macrotis lagotis](#) Greater Bilby [282]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Saccolaimus saccolaimus nudicluniatus](#) Bare-rumped Sheath-tailed Bat, Bare-rumped Sheathtail Bat [66889]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Trichosurus vulpecula arnhemensis](#) Northern Brushtail Possum [83091]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
[Acanthophis hawkei](#) Plains Death Adder [83821]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Elseya lavarackorum](#) Gulf Snapping Turtle [67197]	Endangered	Species or species habitat may occur within area	In buffer area only
[Tiliqua scincoides intermedia](#) Northern Blue-tongued Skink [89838]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Varanus mertensi](#) Mertens' Water Monitor, Mertens's Water Monitor [1568]	Endangered	Species or species habitat may occur within area	In feature area
[Varanus mitchelli](#) Mitchell's Water Monitor [1569]	Critically Endangered	Species or species habitat may occur within area	In feature area
SHARK			
[Pristis pristis](#) Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Marine Species			
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Terrestrial Species			
Cecropis daurica Red-rumped Swallow [80610]		Species or species habitat may occur within area	In feature area
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Charadrius veredus			
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area	In feature area
Glareola maldivarum			
Oriental Pratincole [840]		Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anseranas semipalmata			
Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Cecropis daurica as Hirundo daurica](#) Red-rumped Swallow [80610]		Species or species habitat may occur within area overfly marine area	In feature area
[Chalcites osculans as Chrysococcyx osculans](#) Black-eared Cuckoo [83425]		Species or species habitat may occur within area overfly marine area	In feature area
[Charadrius veredus](#) Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area	In feature area
[Glareola maldivarum](#) Oriental Pratincole [840]		Species or species habitat may occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat may occur within area	In feature area
[Hirundo rustica](#) Barn Swallow [662]		Species or species habitat may occur within area overfly marine area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Reptile			
Crocodylus johnstoni			
Freshwater Crocodile, Johnston's Crocodile, Johnstone's Crocodile [1773]		Species or species habitat may occur within area	In buffer area only

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In buffer area only

Geological and Bioregional Assessments			[Resource Information]
Name	State	Website	Buffer Status
Beetaloo GBA region	NT	GBA website	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix B Potential occurrence of threatened and migratory species

Sturt Plateau Pipeline

Ecological Assessment

APA SPP Pty Ltd

SLR Project No.: 680.030294.00001

6 December 2024

Table B1 Likelihood of occurrence for threatened and migratory fauna species returned from database searches (post-1980 records; 30 km search radius)

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Ecology	Likelihood of occurrence
TPWC[2]	EPBC[2]							
BIRDS								
VU	EN	Accipitridae	*Erythrotriorchis radiatus*	Red Goshawk	PM	-	This species prefers open forests and woodland with a mosaic of vegetation types, particularly near riverine systems and permanent water where there is an abundance of prey species (DCCEEW, 2024c, and reference therein). Resident pairs prefer intact, extensive woodlands and forests with a mosaic of open vegetation types that contain permanent water. The home range in northern Australia has been reported up to 200 km^2, with indications it may be even larger (Aumann & Baker-Gabb, 1991). Satellite tracking studies have shown this species is capable of travelling distances of over 1,500 km and soaring of heights of >1km (DCCEEW, 2023). The breeding range of this species occurs across the Kimberly, east to Cape York Peninsula, and on the Tiwi islands, but this species may also breed at very low densities in the Wet Tropics and Einasleigh Uplands of Queensland (DCCEEW, 2023). Birds recorded in central Australia, far outside the breeding range, likely include dispersive juveniles and seasonal migrants from further north (DCCEEW, 2024c; DCCEEW, 2023)	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest post-1980 record of this species is located ~190 km to the northwest of the Project Area, with most other nearby records commencing ~200 km to the north of the Project Area around Mataranka (ALA, 2024). The Project Area occurs within the DCCEEW (2024c) modelled non-core distribution for this species. The Project Area does not support preferred habitat for this species due to an absence of permanent water and associated riparian vegetation. The Project Area may support dispersive and opportunistic habitat for this species, particularly when high seasonal rainfall result in ephemeral inundation of open floodplains. Due to an absence of preferred habitat (permanent water) and local records, and the Project Area occurring outside of the DCCEEW (2024c) modelled core distribution for this species, this species is considered to have a low likelihood of occurring within the Project Area.
LC	MI	Apodidae	*Apus pacificus*	Fork-tailed Swift	PM	-	This species is a non-breeding visitor to all states and territories of Australia. This species is almost exclusively aerial, flying from <1 m above the ground to at least 300 m or higher. Within Australia, this species occurs over a wide area across a variety of disturbed and un-disturbed habitats. This species often occurs over inland plains, but also sometimes above foothills or near cliffs and beaches in coastal areas. This species arrives in Australia around September to October and has generally departed Australia by May (DCCEEW, 2024c).	**Low** – There are no DEPWS local records of this species within 30 km of the Project Area (DEPWS, 2024a), however there are several post-1980 records of this species on the ALA (2024) along the Sturt Highway. The nearest of these (collected in 2020) occurs ~9 km south of the proposed alignment and adjacent to the proposed camp (ALA, 2024). As this species is predominantly aerial it is unlikely to utilise terrestrial habitats within the Project Area. Therefore, this species has a low likelihood of occurring within the Project Area.
LC	MI	Charadriidae	*Charadrius veredus*	Oriental Plover	PM / NRM	1	This species arrives in northern Australia between Exmouth and Derby in Western Australia and some records along the coast of the Top End and Gulf of Carpentaria (DCCEEW, 2024c). Inland records of this species predominantly occur on black soil plains of northern Western Australia, Northern Territory and north-western Queensland. Inland habitats can also include freshwater systems as well as flat, open, semi-arid or arid grasslands. They have also been recorded in recently burned areas (DCCEEW, 2024c). This species is a regular summer migrant that has been recorded across all mainland states but is most regularly recorded across coastal areas and the northern inland (Pizzey & Knight, 2012).	**Low** – There is one local record of this species within 30 km of the Project Area (DEPWS, 2024a). This record is associated with a section of an open plain (~24 km) to the northeast of the Project Area that is subject to longer periods of water retention (ALA, 2024). The Project Area occurs within the DCCEEW (2024c) non-core modelled distribution for this species. Sections of the Project Area overlap with open *Eucalyptus microtheca* woodland on black soil that is subject to seasonally ephemeral inundation/water logging. These areas are unlikely to contain suitable habitat for this species due to the high density of groundcover and a lack of suitably open areas for this species to forage within. This species has a low likelihood of occurring within the Project Area based on an absence of suitable ground-truthed habitat.

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Ecology	Likelihood of occurrence
TPWC[2]	EPBC[2]							
LC	MI	Cuculidae	*Cuculus optatus*	Oriental Cuckoo	PM	-	This species migrates to Australia from Asia and can be found from September to March. This species occupies a wide range of dense to open woodland and forest habitats, especially on the edges of riparian forest and occasionally gardens. (Menkhorst *et al*., 2017).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local records of this species are located ~200 km to the north and east of the Project Area (ALA, 2024). The Project Area occurs within the margin of the southernmost extent of the DCCEEW (2024c) non-core modelled distribution for this species. Based on an absence of nearby records and the Project Area occurring on the margin of the non-core modelled distribution for this species, this species has a low likelihood of occurring within the Project Area.
VU	EN	Estrilididae	*Erythrura gouldiae*	Gouldian Finch	PM	-	The Gouldian Finch is found from the Cape York Peninsula of northern Australia through north-west Queensland and to the Northern Territory and Kimberley Region of Western Australia. Breeding habitat includes areas characterised by rocky hills with hollow-bearing smooth-barked gums. Feeding habitat includes areas dominated by spear grasses or native sorghum, cockatoo grass, golden beard grass, or spinifex-dominated communities (TSSC, 2016a).	**Moderate** – There are no DEPWS (2024a) records of this species within 30 km of the Project Area. Most records of this species commence ~50 km north of the Project Area around Daly Waters, with records increasing in density further north of this point (ALA, 2024). Records directly south of this point within the NT (inclusive of the Project Area) are scarce, suggesting infrequent dispersal into areas south of Daly Waters (ALA, 2024). During the field assessment ≤10 individuals of this species were opportunistically observed on one occasion drinking from an artificial water source. This water source is located ~9.5 km to the north of the westernmost portion of the proposed alignment, along the Buchanan Highway (~4 km west of the Stuart Highway intersection). No individuals of this species were observed within the Project Area. The Project Area overlaps with the DCCEEW (2024c) modelled core distribution for this species. The Project Area may support foraging habitat for this species during optimal years where precluding environmental conditions support population expansions and subsequent southerly dispersal. However, there are no microhabitat features unique to the Project Area that would result in this species targeting habitats within the Project Area that are not more abundant or of higher quality in the broader region. In consideration of this and nearby observations of this species made during field assessment, this species is determined to have a moderate likelihood of occurring within the Project Area.
VU	VU	Falconidae	*Falco hypoleucos*	Grey Falcon	PM / NRM	2	This species is sparsely distributed across a large area of Australia, however, is considered rare or nomadic across much of its range. Throughout its distribution, this species has been recorded to prefer lightly timbered country, especially stony plains and lightly timbered *Acacia* scrublands (Morcombe, 2003). However, it has also been recorded to occur around inland wooded watercourses (Garnett *et al*., 2011). The presence of this species in an area and modelled habitat suitability are both highly variable between seasons and years (Garnett & Baker, 2021).	**Moderate** – There are two DEPWS (2024a) local records of this species within 30 km of the Project Area. However, there are several nearby post-1980 records of this species on ALA (2024). The nearest of these being within ~20 km to the north and south of the Project Area, however these records have a spatial resolution of 10 km (ALA, 2024). Two individuals of this species were observed on one occasion by AECOM on the 29 May 2024 at a location ~5.6 km to the east of the easternmost portion of the proposed alignment. These individuals were observed

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Ecology	Likelihood of occurrence
TPWC[2]	EPBC[2]							
								flying overhead and circling above treeless plains with sparse *Melaleuca* shrubs. The Project Area contains habitat that is broadly suitable for this species but this habitat is ubiquitous with that of the surrounding area and region. Therefore, there are no unique values for this species within the Project Area that are not widely represented within local or broader area. The Project Area occurs within a section of DCCEEW (2024c) modelled non-core distribution for this species, but modelled core distribution occurs just to the south and west of the Project Area. Based on the presence of local records, modelled habitat suitability being highly variable between seasons and years, and an absence of unique values for this species within the Project aera, this species is considered to have a moderate likelihood of occurring within the Project Area.
NT	VU	Falcunculidae	*Falcunculus frontatus whitei*	Crested Shrike-tit (northern)	PM	-	The northern sub-species of the Crested Shrike-tit is endemic to north-western Australia, occurring in the Kimberly region of Western Australia and in the north of the Northern Territory. This sub-species has been recorded in eight different woodland types in northern Australia, which are mainly dominated by Darwin Woolybutt (*Eucalyptus miniata*), Darwin Stringybark (*Eucalyptus tetrodonta*) or Smooth-stemmed Bloodwood (*Eucalyptus bleeseri*). Within these habitats, this sub-species is thought to forage for invertebrates, mostly in foliage branches, and the trunk and bark of trees. The scarcity of records of this sub-species suggests that populations are at very low density and may consist of small groups of two to five individuals. Populations may be widely spaced, possibly up to 20 km apart, and occupying large home ranges (20 ha) that individuals remain resident within throughout the year (TSSC, 2016b and references therein).	**Low** – There are no DEPWS (2024a) local records of this species within 30 km of the Project Area. The nearest records of this species are ~50 km to the north of the Project Area (ALA, 2024). The Project Area occurs to the south of the southern extent of the DCCEEW (2024c) modelled core distribution for this sub-species. Due to an absence of local records and the Project Area occurring outside of the DCCEEW (2024c) modelled distribution for this species, this species is considered to have a low likelihood of occurring within the Project Area.
LC	MI	Glareolidae	*Glareola maldivarum*	Oriental Pratincole	PM	-	Within Australia this species is widespread in northern areas, especially along the coasts of the Pilbara Region and the Kimberley Division in Western Australia, the Top End of the Northern Territory, and parts of the Gulf of Carpentaria. It is also widespread but scattered inland. Inland habitats include open plains, floodplains or short grasslands. They often occur near terrestrial wetlands (DCCEEW, 2024c).	**Moderate** – There are no DEPWS (2024a) local records of this species within 30 km of the Project Area. However, there is one nearby post-1980 records of this species on ALA (2024) from the Dunmarra Roadhouse, which is ~3 km to the north of the Proposed alignment along the Stuart Highway. The Project Area occurs within the DCCEEW (2024c) non-core modelled distribution for this species. Sections of the Project Area overlap with seasonally waterlogged open woodlands or other open grassy habitats that may support habitat for this species. This is supported by the broader spatial distribution of northern inland records of this species (ALA, 2024). The Project Area has the potential to support habitat for this species, however the Project Area does not support any unique habitat values that are not widely abundant in the broader region. Based on this and the

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Ecology	Likelihood of occurrence
TPWC[2]	EPBC[2]							
								Project Area occurring in the non-core modelled distribution for this species, this species is considered to have a moderate likelihood of occurring within the Project Area.
NE	MI	Hirundinidae	*Cecropis daurica*	Red-rumped Swallow	PM	-	This species can be found in the northern parts of Australia. This bird is found in mountains, hilly country, river gorges, valleys and sea cliffs. This species is insectivorous and forages on the wing (Menkhorst *et al*., 2017).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local record of this species is located ~280 km to the north of the Project Area (ALA, 2024). The Project Area occurs within the southern extent of the DCCEEW (2024c) modelled non-core distribution for this species. Due to an absence of nearby records and the Project Area occurring towards the southern extent of the modelled distribution for this species, this species is considered to have a low likelihood of occurring within the Project Area.
NE	MI	Hirundinidae	*Hirundo rustica*	Barn Swallow	PM	-	This species is typically found patchily along the north coast of the mainland and is typically found in open country in coastal lowlands utilising a wide variety of habitats (DES, 2023 and references therein)	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local record of this species is located ~280 km to the north of the Project Area (ALA, 2024). Inland records of this species are sparse and infrequent, with most records occurring in coastal areas (ALA, 2024). Therefore, the Project Area is likely to support unsuitable, absent, or highly degraded habitat for this species. The Project Area occurs within the DCCEEW (2024c) modelled non-core distribution for this species. Due to an absence of local records and habitat values for this species within the Project Area likely being low, this species is considered to have a low likelihood of occurring within the Project Area.
LC	MI	Laridae	*Hydroprogne caspia*	Caspian Tern	NRM	1	This species mostly occurs in sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) and those with sandy or muddy margins are preferred. They also occur on near-coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes, waterholes, reservoirs, rivers and creeks. They also utilise artificial wetlands, including reservoirs, sewage ponds and saltworks. This species predominantly forages in open wetlands, including lakes and rivers (DCCEEW, 2024c).	**Low** – There is one DEPWS (2024a) local record of this species and three additional nearby post-1980 records of this species (ALA, 2024), which are located ~3 km to the north and ~4.5 km to the south of the Project Area. These records are located around seasonally inundated or waterlogged in low-lying *Eucalyptus microtheca* open woodland. Sections of the Project Area overlap with open *Eucalyptus microtheca* woodland on black soil that is subject to seasonally ephemeral inundation/water logging. These areas are unlikely to contain suitable habitat for this species due to the high density of groundcover and a lack of suitably open areas for this species to forage within. This species has a low likelihood of occurring within the Project Area based on an absence of suitable ground-truthed habitat.
VU	VU	Meliphagidae	*Grantiella picta*	Painted Honeyeater	PM / NRM	1	This species is seasonally migratory within Australia. This species breeds on the inland slopes of the Great Dividing Range south-east of an almost straight line from Chinchilla in Queensland to the Grampians in Victoria. After the Spring to Summer breeding season, there are very few records of this species in the southeastern portion of its Australian distribution.	**Moderate** – There is one DEPWS (2024a) local record within 30 km of the Project Area, and an additional two ALA (2024) local records of this species within close proximity of the Project Area; one adjacent to the Dunmarra Roadhouse~3 km to the north of the proposed alignment and one ~2 km to the south of the proposed camp (ALA, 2024). Most other records of

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Ecology	Likelihood of occurrence
TPWC[2]	EPBC[2]							
							During the non-breeding season, most records of this species occur in northwestern Queensland south of the Gulf of Carpentaria and in the northeastern Northen Territory, south of the Roper River. The northward migration starts in March and most birds return to the breeding range from September to November (Garnett & Baker, 2021 and references therein). This species often occurs singly or in pairs, and less often in small flocks. Preferred habitat for this species includes areas where mistletoe is abundant, the fruit of which its diet primarily consists of. Such habitats may include eucalypt forests/woodlands, riparian woodlands of Black Box and River Red Gum, Box-ironbark-yellow gum woodlands, Acacia dominated woodlands, Paperbarks, Casuarinas, Callitris, and trees on farmland or gardens. Preferred woodlands are those in wider blocks of remnant vegetation with a high proportion of mature trees as these often host more mistletoe. However, this species has also been observed in narrow roadside strips if ample mistletoe fruit is available (DoE, 2015 and references therein).	this species in the inland areas of the NT are sparse and scattered (ALA, 2024). The proposed alignment occurs within the DCCEEW (2024c) modelled non-core distribution for this species, however, the proposed camp occurs within a small area of DCCEEW (2024c) modelled core distribution for this species. Due to the presence of local records and the Project Area occurring within modelled non-core and core habitat for this species, this species is considered to have a moderate likelihood of occurring within the Project Area. It should be noted that this moderate likelihood outcome is relevant to foraging habitat for this species only.
NE	MI	Motacillidae	*Motacilla cinerea*	Grey Wagtail	PM	-	An uncommon migrant in Australia, this species is rarely recorded in the Northern Territory or Queensland. It prefers montane forests and forested areas associated with watercourses (Menkhorst *et al*., 2017).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local record of this species is located ~250 km to the northeast of the Project Area (ALA, 2024). Inland records of this species are infrequent, sparse, and scattered (ALA, 2024). The Project Area occurs in the DCCEEW (2024c) modelled non-core distribution for this species. Due to an absence of local records and a paucity of inland records in Australia the Project Area is unlikely to support suitable habitat for this species. Based on this, this species is considered to have a low likelihood of occurring within the Project Area.
NE	MI	Motacillidae	*Motacilla tschutschensis*[4]	Eastern Yellow Wagtail	PM	-	This species is a rare but regular migrant to coastal areas within Australia. It typically inhabits open habitats, often near water and occasionally on drier inland plains and edges of mangroves (Morcombe, 2003). The highest densities of records of this species within Australia are located along the east coast (ALA, 2024).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local records of this species are located ~280 km to the north and east of the Project Area (ALA, 2024). All other records of this species in Australia occur in coastal locations (ALA, 2024). Project Area occurs in the DCCEEW (2024c) modelled non-core distribution for this species. Due to an absence of local records and a paucity of inland records in Australia the Project Area is unlikely to support suitable habitat for this species. Based on this, this species is considered to have a low likelihood of occurring within the Project Area.
EN	EN	Rostratulidae	*Rostratula australis*	Australian Painted-snipe	PM / NRM	1	This species has been recorded at wetland sites throughout much of Australia but is most common in the eastern states. The Australian Painted-snipe is a distinct species but can be hard to detect due to its cryptic and crepuscular behaviour. This species typically occurs in shallow freshwater wetlands and other permanently or temporarily inundated areas,	**Moderate** – There is one local record of this species within 30 km of the Project Area, which is located ~2.7 km (from 1991) to the north of the Project Area (DEPWS, 2024a; ALA, 2024). There are several other nearby records of this species to the south of the Project Area around Lake Woods (ALA, 2024). Furthermore, Marcelina, the first Australian Painted-

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Ecology	Likelihood of occurrence
TPWC[2]	EPBC[2]							
							particularly where rank tussocks of grasses, sedges, rushes or reeds are present (DCCEEW, 2024c; Morcombe, 2003). There is some evidence of partial migration from southeastern wetlands to coastal central and northern Queensland in autumn and winter. All sightings south of Queensland since 2015 have been between October and April, but some birds appear to stay in northern Australia all year round (Garnett & Baker, 2021).	snipe to be tracked, has been recorded utilising an area of seasonally wetland area ~20 km to the northeast of the Project Area in June 2024 (Pers. comms. Matt Herring from 'Tracking Australian Painted-snipe', June 2024). The Project Area occurs within the DCCEEW (2024c) modelled non-core distribution for this species. When ephemerally inundated, the Project Area may support values for this species. However, these values are highly ephemeral and are not unique compared to those within the surrounding area that this species has been recorded to utilise. Based on this, this species is considered to have a moderate likelihood of occurring within the Project Area.
LC	MI	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	PM / NRM	2	This species has a widespread but patchy distribution along all coastlines and in inland parts of Australia. Within this broad distribution this species can be found in coastal and inland wetlands with varying levels of salinity (DCCEEW, 2024c and references therein). However, this species is most commonly found in muddy or rocky shores of estuaries, deltas of streams, banks upstream, lakes, pools, billabongs, reservoirs, and dams (DCCEEW, 2024c and references therein).	**Low** – There are two DEPWS (2024a) local records of this species within 30 km of the Project Area, plus several others on ALA (2024). The nearest of these records are located ~3 km to the north and ~5 km to the south of the proposed alignment (ALA, 2024). The Project Area occurs just to the south of DCCEEW (2024c) modelled core distribution for this species. Sections of the Project Area overlap with open *Eucalyptus microtheca* woodland on black soil that is subject to seasonally ephemeral inundation/water logging. These areas are unlikely to contain suitable habitat for this species due to the high density of groundcover and a lack of suitably open areas for this species to forage within. This species has a low likelihood of occurring within the Project Area based on an absence of suitable ground-truthed habitat.
LC	VU, MI	Scolopacidae	*Calidris acuminata*	Sharp-tailed Sandpiper	PM / NRM	17	This species occurs around the entire coast of Australia outside its breeding season, where it is found in a broad range of permanent or ephemeral water bodies, primarily brackish (DCCEEW, 2024c and references therein). It prefers muddy edges of shallow fresh or brackish wetlands, and uses flooded paddocks, sedge lands and other ephemeral wetlands.	**Low** – There are 17 DEPWS (2024a) local records of this species within 30 km of the Project Area. The nearest of these records are located ~3 km to the north and ~5 km to the south of the proposed alignment (ALA, 2024). The Project Area occurs within the DCCEEW (2024c) modelled non-core distribution for this species. Sections of the Project Area overlap with open *E. microtheca* woodland on black soil that is subject to seasonally ephemeral inundation/water logging. These areas are unlikely to contain suitable habitat for this species due to the high density of groundcover and a lack of suitably open areas for this species to forage within. This species has a low likelihood of occurring within the Project Area based on an absence of suitable ground-truthed habitat.
CE	CE, MI	Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	PM	-	This species occurs around the coasts of Australia and is quite widespread inland, however inland areas extending from eastern Australia into central inland Australia do not represent a core occurrence area for this species within Australia (Menkhorst *et al*., 2017).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest records of this species are located ~100 km to the south of the Project Area around Lake Woods (ALA, 2024). Inland records of this species within

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Ecology	Likelihood of occurrence
TPWC[2]	EPBC[2]							
							This species mainly occurs on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets, lagoons and also around non-tidal swamps, lakes, and lagoons near the coast, foraging on mudflats and nearby shallow water (DCCEEW, 2024c; Higgins & Davies, 1996).	Australia are sparse, scattered and overall infrequent, with most records occurring coastally (ALA, 2024). The Project Area occurs within the DCCEEW (2024c) modelled non-core distribution for this species. Due to an absence of local records and suitable, preferred, coastal habitats being absent, this species is considered to have a low likelihood of occurring within the Project Area.
NE	MI	Scolopacidae	*Calidris melanotos*	Pectoral Sandpiper	PM	-	Most records of this species are around the coasts of Australia or within south-eastern Australia (ALA, 2024). Inland records of this species are sparse and scattered, with most occurring around the Alice Springs area (ALA, 2024). This species prefers shallow wetlands (fresh and marine) and tends not to utilise small or ephemeral water bodies (Menkhorst *et al*., 2017; DCCEEW, 2024c).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local record of this species is located ~100 km to the south of the Project Area around Lake Woods (ALA, 2024). The Project Area occurs within the DCCEEW (2024c) modelled non-core distribution for this species. Due to an absence of local records and suitable permanent wetland habitats for this species within the Project Area this species is considered to have a low likelihood of occurring within the Project Area.
LC	MI	Scolopacidae	*Tringa glareola*	Wood Sandpiper	NRM	2	This species uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent aquatic plants or grass, and dominated by taller fringing vegetation, such has dense stands of rushes or reeds, shrubs or dead or live trees, especially *Melaleuca* and River Red Gums (*Eucalyptus camaldulensis*) and often with fallen timber. They also frequent inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops. They are also found at some small wetlands only when they area drying. They are rarely found using brackish wetlands, or dry stunted saltmarsh. Typically, they do not use coastal flats, but are occasionally recorded in stony wetlands. This species uses artificial wetlands, including open sewage ponds, reservoirs, large farm dams, and bore drains (DCCEEW, 2024c).	**Low** – There are two DEPWS (2024a) local records of this species within 30 km of the Project Area, plus several others on ALA (2024). The nearest of these records are located ~3 km to the north and ~5 km to the south of the proposed alignment (ALA, 2024). The Project Area does not occur within the DCCEEW (2024c) modelled distribution for this species. Sections of the Project Area overlap with open *E. microtheca* woodland on black soil that is subject to seasonally ephemeral inundation/water logging. These areas are unlikely to contain suitable habitat for this species due to the high density of groundcover and a lack of suitably open areas for this species to forage within. This species has a low likelihood of occurring within the Project Area based on an absence of suitable ground-truthed habitat.
LC	EN, MI	Scolopacidae	*Tringa nebularia*	Common Greenshank	NRM	3	This species is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often around tidal pools, rock-flats and rock platforms. This species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges	**Low** – There are three DEPWS (2024a) local records of this species within 30 km of the Project Area, plus several others on ALA (2024). The nearest of these records are located ~3 km to the north and ~5km to the south of the proposed alignment (ALA, 2024). The Project Area does not occur within the DCCEEW (2024c) modelled distribution for this species. Sections of the Project Area overlap with open *E. microtheca* woodland on black soil that is subject to seasonally ephemeral inundation/water logging. These areas are unlikely to contain suitable habitat for this species due to the high density of groundcover and a lack of suitably open areas for this species to forage within.

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Ecology	Likelihood of occurrence
TPWC[2]	EPBC[2]							
							and saltmarsh, mangroves, thickets of rushes, and dead or live trees (DCCEEW, 2024c).	This species has a low likelihood of occurring within the Project Area based on an absence of suitable ground-truthed habitat.
LC	MI	Scolopacidae	*Tringa stagnatilis*	Marsh Sandpiper	NRM	5	This species occupies permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. It is less often recorded at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In north Australia, they prefer intertidal mudflats, although surveys in Kakadu National Park recorded more birds around shallow freshwater lakes than in areas influenced by tide. At the Top End, they often use ephemeral pools on inundated freshwater and tidal floodplains (DCCEEW, 2024c).	**Low** – There are five DEPWS (2024a) local records of this species within 30 km of the Project Area, plus several others on ALA (2024). The nearest of these records are located ~3 km to the north of the proposed alignment (ALA, 2024). The Project Area does not occur within the DCCEEW (2024c) modelled distribution for this species. Sections of the Project Area overlap with open *E. microtheca* woodland on black soil that is subject to seasonally ephemeral inundation/water logging. These areas are unlikely to contain suitable habitat for this species due to the high density of groundcover and a lack of suitably open areas for this species to forage within. This species has a low likelihood of occurring within the Project Area based on an absence of suitable ground-truthed habitat.
LC	MI	Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	NRM	11	This species preferred habitat for foraging and breeding are freshwater marshes at the edges of lakes and rivers, lagoons, floodplains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. This species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons, however, these are not preferred habitats for this species (DCCEEW, 2024c).	**Moderate** – There are 11 DEPWS (2024a) local records of this species within 30 km of the Project Area, plus several others on ALA (2024). The nearest of these records are located ~3 km to the north and ~5 km to the south of the proposed alignment (ALA, 2024). Additionally, three individuals of this species were incidentally observed on one occasion to be foraging in seasonally inundated open *E. microtheca* woodland ~5 km to the south of the proposed alignment. The Project Area occurs within the Menkhorst *et al*. (2017) modelled core distribution for this species. When inundated, the Project Area may support some values for this species, however these values are highly ephemeral and are not unique compared to those within the surrounding area. Based on this, this species is considered to have a moderate likelihood of occurring within the Project Area.
VU	VU	Tytonidae	*Tyto novaehollandiae kimberli*	Masked Owl (northern mainland)	PM	-	The distribution of the Masked Owl (northern) is poorly known. This sub-species has been recorded in riparian forests, Melaleuca swamps, open forest and on the edges of mangroves, as well as along the margins of sugar cane fields (DCCEEW, 2024c).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local record of this species is located ≥250 km to the north, east and west of the Project Area (ALA, 2024). The Project Area occurs within the DCCEEW (2024c) modelled non-core distribution for this species. Based on this and an absence of local records, this species is considered to have a low likelihood of occurring within the Project Area.
MAMMALS								
NT	VU	Emballonuridae	*Saccolaimus saccolaimus nudicluniatus*	Bare-rumped Sheath-tailed Bat	PM	-	This species has been detected at 11 locations in mostly coastal and adjacent areas of the Northern Territory and 21 locations along the tropical east coast of Queensland, from Iron Range to Jerona. Most	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local record of this species is located ~480 km to the north of the Project Area (ALA, 2024). The

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Ecology	Likelihood of occurrence
TPWC[2]	EPBC[2]							
							recently, the species was also detected at 40 locations throughout the Kimberly region of Western Australia. Habitat for this species is variable and includes northern tropical savanna woodlands and forests, coastal sand dunes, mangroves, paperbark woodlands, riparian forests and lowland rainforests, as well as sandstone and limestone ranges and gorges (Baker & Gynther, 2023). This species prefers to roost in groups, ranging from 10 to 100 individuals, in large trees with deep, hollow pipes, where the hollow is at least 18cm in diameter and the entrance to the hollow is at least 6m above the ground (Baker & Gynther, 2023).	Project Area overlaps with a very small and isolated area of DCCEEW (2024c) modelled non-core distribution for this species on the southernmost extent of modelled occurrence within central NT. The Project Area occurs outside of the Baker & Gynther (2023) modelled distribution for this species. Based on this and an absence of local records this species is considered to have a low likelihood of occurring within the Project Area.
NT	VU	Megadermatidae	*Macroderma gigas*	Ghost Bat	PM	-	The distribution of this species is discontinuous across Australia with two ranges in Queensland: coastal and near-coastal eastern Queensland, from Cape York to near Rockhampton, and western Queensland (DCCEEW, 2024c; Hourigan, 2011). It has been recorded hunting in rainforest, deciduous vine thicket, open woodland, spinifex, black soil and grassland habitats. Ghost Bats roost in caves, boulder piles, shallow escarpments and mines, and have very specific roosting requirements with respect to temperature and humidity (Van Dyck *et al*., 2013). Contemporary genetic studies show that the entire species is dependent upon relatively few regional breeding sites. Although this species may disperse widely, females rarely move from their natal roost and individuals have been recorded travelling 12 km from a daytime roost to forage (Baker & Gynther, 2023).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local record of this species is located ~200 km to the north of the Project Area (ALA, 2024). The Project Area marginally overlaps with DCCEEW (2024c) modelled non-core distribution for this species. Due to an absence of local records and the Project Area not supporting necessary roosting habitat for this species, this species is considered to have a low likelihood of occurring within the Project Area.
NT	VU	Phalangeridae	*Trichosurus vulpecula arnhemensis*	Common Brushtail Possum (north-western)	PM	-	This subspecies (referred to herein as this species) of the Common Brushtail Possum occurs discontinuously from the Gulf of Carpentaria hinterland near Borroloola, Northern Territory, westward to the Kimberly, Western Australia. Most of the current population appears to be in the Northern Territory (TSSC, 2021). This species mainly occurs in tall eucalypt open forests with large hollow-bearing trees, particularly where the understorey includes some shrubs that bear fleshy fruits. However, it also occurs in some mangrove communities (especially where these contain hollow-bearing trees), some rainforests, and some semi-urban areas (notably around Darwin) (TSSC, 2021).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local record of this species is located ~200 km to the north of the Project Area (ALA, 2024). The Project Area overlaps with DCCEEW (2024c) modelled core distribution for this species. However, does not overlap with the Baker & Gynther (2023) modelled distribution for this species. Furthermore, occurrences of this species, which may not represent occurrences of this sub-species, in the central parts of the NT are very sparse and scattered. Based on this and an absence of local records, this species is considered to have a low likelihood of occurring within the Project Area.
VU	VU	Thylacomyidae	*Macrotis lagotis*	Greater Bilby	PM	-	This species' original distribution encompassed arid and semi-arid regions of Australia which has now been reduced to areas in western Northern Territory and into northern parts of Western Australia, as well as a small area near the Diamantina River in and around Astrebla Downs National Park in western Queensland (Menkhorst & Knight, 2011). Its habitat mostly consists of sandy deserts, hummock grasslands and Acacia shrublands (Menkhorst & Knight, 2011). However,	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). There is one record from 1930, which is ~3 km to the north of the Project Area and a variety of 2011 records of this species ~65 km to the southwest of the Project Area (ALA, 2024). The Project Area overlaps with DCCEEW (2024c) modelled non-core distribution for this species and just outside of the Baker & Gynther (2023) modelled extant distribution for this species. Overall,

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Ecology	Likelihood of occurrence
TPWC[2]	EPBC[2]							
							broad-scale surveys of this species in the NT in the 1990's indicated that laterite and drainage line land systems were occupied more frequently than sand plain and dune systems (DENR, 2006).	the Project Area occurs on the northern fringe of historical occurrence records of this species as well as the historical distribution for this species. Furthermore, no evidence of this species was observed during the baseline assessment. Based on this, this species is considered to have a low likelihood of occurring within the Project Area.
REPTILES								
LC	EN	Chelidae	*Elseya lavarackorum*	Gulf Snapping Turtle	PM	-	This species is restricted to rivers that drain into the Gulf of Carpentaria, which includes the Calvert to Nicholson River systems in the Northern Territory and associated sub-systems; Roper, Limmen Bight, Robinson and Nicholson Rivers (DEWHA, 2008; DCCEEW, 2024c). Within these river systems and their associated overflow lagoons and oxbow lakes this species is found in deeper permanent pools, most often with muddy, sandy or rocky bottoms. This species also occurs in the middle reaches of rivers, upstream of saline regions and downstream of escarpments, including plunge pools. Steep rocky gorges and river reaches with intact riverbanks seem to be preferred habitat for this species (DCCEEW, 2024c).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local record of this species is located >245 km to the northeast of the Project Area (ALA, 2024). The Project Area does not occur within the DCCEEW (2024c) modelled distribution for this species and there are no notable watercourses that would support preferred habitat for this species within the Project Area. Based on this, this species is considered to have a low likelihood of occurring within the Project Area.
VU	VU	Elapidae	*Acanthophis hawkei*	Plains Death Adder	PM	-	The exact distribution of this species is unclear. Suitable habitat for this species consists of flat, treeless, cracking-soil riverine floodplains. Based on the presence of suitable habitat, the potential geographic range of this species extends from Western Queensland, across the north of the Northern Territory to north-east Western Australia. Fragmented populations of this species are known to occur in the Mitchell Grass Downs of western Queensland, the Barkly Tableland on the Northern Territory/Queensland border and east of Darwin in the Northern Territory (DSEWPC, 2012).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). Most records of this species are located >350 km to the north of the Project Area, however there is one pre-1980 record ~90 km to the south of the Project Area (ALA, 2024). The Project Area occurs outside of the DCCEEW (2024c) modelled distribution for this species. The Project Area also occurs outside of the Wilson & Swan (2023) modelled distribution for this species. Based on this and an absence of local records, this species is considered to have a low likelihood of occurring within the Project Area.
(NL)	CE	Scincidae	*Tiliqua scincoides intermedia*	Northern Blue-tongued Skink	PM	-	This species occurs across northern Australia from Eighty Mile Beach in Western Australia, across the southern Kimberly and Top End of the Northern Territory, to approximately the Gregory Downs/Cloncurry area in western Queensland (DCCEEW, 2023b). This species occurs in a wide variety of ecosystems but is not identified to occur in mangroves. This species has been recorded from dissected sandstone plateaus and gorges, limestone ranges, granite, basalt and dolerite hills, glacial shale undulations, sand plains, sandy waterway, swamps, cracking clay floodplains and coastal flats. Vegetation associations include riparian forest, vine scrub, monsoon rainforest, *Pandanus*-lined gorges, *Melaleuca* forest, eucalypt woodland and savanna, sparse and dense shrubland, and spinifex and tussock grassland. Most, but not all, detections	**High** – There are no DEPWS (2024a) local records of this species within 30 km of the Project Area. However, a review of ALA (2024) revealed records, one being contemporary (from 2020), of this species from the Dunmarra Roadhouse, ~3 km to the north of the Project Area. The Project Area overlaps with the DCCEEW (2024c) modelled core distribution for this species. Due to the wide variety of habitats that this species is known to occupy, the Project Area likely supports suitable habitat for this species. Based on this, this species is considered to have a high likelihood of occurring within the Project Area.

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Ecology	Likelihood of occurrence
TPWC[2]	EPBC[2]							
							have occurred near seasonal or permanent water (DCCEEW, 2023b). This species shelters under shrubs and thick grasses, in leaf litter, within burrows, and under built structures and discarded household items. They tend to avoid areas with bare ground (DCCEEW, 2023b).	
VU	EN	Varandiae	*Varanus mertensi*	Merten's Water Monitor	PM	-	This species is highly aquatic and seldom ventures more than 5 to10 m from the edge of the water, except when transiting among core aquatic activity areas. Habitats that this species is recorded from are perennial and semi-permanent pools in upper catchment areas, including springs, seeps, swamps, creeks and gorges. The margins of permanent streams, rivers and lakes in lower catchment areas. Floodplain billabongs, lagoons, swamps and soaks. Perennial waterholes in woodlands, and man-made irrigation channels and the margins of dams (DCCEEW, 2023c).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local record of this species is located ~125 km to the east and north of the Project Area (ALA, 2024). The Project Area occurs within the DCCEEW (2024c) modelled non-core distribution for this species. The Project Area does not support suitable watercourse habitats for this species. Due to an absence of local records and habitats within the Project Area likely being unsuitable for long-term occupation of this species, this species is considered to have a low likelihood of occurring within the Project Area.
VU	CE	Varandiae	*Varanus mitchelli*	Mitchell's Water Monitor	PM	-	This species occurs across the wet-dry tropics of northern Australia from Yampi Sound Training Area in the far west Kimberly of Western Australia across the Kimberly and Top End of the Northern Territory, to approximately Boodjamulla National Park in Queensland (DCCEEW, 2023d). This species inhabits freshwater and saline wetlands that range from seasonal gorges in upper catchments to large rivers and coastal floodplains. It is recorded from rivers, creeks, riffle zones, gorges, springs, lagoons, swamps, mangroves, and foreshores. This species has a strong association with *Pandanus* and other areas of woody vegetation that are directly adjacent to waterbodies, e.g., rainforest, *Melaleuca*, and mangroves. It is often encountered basking or resting on *Pandanus* and other woody vegetation near the water, partially submerged logs, mangroves, riverbanks, rocks, and manmade structures such as rocky sea walls and slabs of concrete (DCCEEW, 2023d). Darwin is home to one of the few recorded remnant subpopulations of this species (DCCEEW, 2023e). In the Darwin area, this species is known to inhabit and rely upon saline foreshore and riparian areas adjacent to the city. Occurrences of this species in the Darwin area are likely to be under-reported as it is not often considered that this species may occur in saline riparian habitats and surveys are often undertaken in the cool, dry months, when this species is inactive and almost impossible to detect (DCCEEW, 2023d).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest local record of this species is located ~160 km to the northeast of the Project Area (ALA, 2024). A small section of the Project Area overlaps with the DCCEEW (2024c) modelled non-core distribution for this species. The remainder of the Project Area does not overlap with DCCEEW (2024c) modelled core or non-core habitat. The Project Area does not support suitable watercourse or wetland habitats for this species. Due to an absence of local records and habitats within the Project Area likely being unsuitable for the occupation of this species, this species is considered to have a low likelihood of occurring within the Project Area.
VU	-	Varandiae	*Varanus panoptes*	Yellow-spotted Monitor	NRM	10	This species has a broad geographic range across the far north of Australia, from the Kimberly's to Cape York Peninsula, and southwards through most of Queensland. In the Northern Territory, it has been recorded across most of the Top End and the Gulf	**High** – There are ten DEPWS (2024a) local records this species within 30 km of the Project Area, which are all located within 10 km of the proposed alignment or proposed camp (DEPWS, 2024a; ALA, 2024). Based on the presence of local records and suitable

Status[1]		Family name	Scientific name	Common name	Source[3]	Local records	Ecology	Likelihood of occurrence
TPWC[2]	EPBC[2]							
							Region (south to Katherine, Judbarra/Gregory National Park and the Gulf hinterland). This terrestrial species occupies a wide variety of habitats, including coastal beaches, floodplains, grasslands and woodlands. In these areas, it predominantly feeds on small terrestrial vertebrates and insects (DEPWS, 2021).	habitat (floodplains, grasslands and woodlands) for this species occurring within the Project Area, this species is considered to have a high likelihood of occurring.
SHARKS AND RAYS								
VU	VU, MI	Pristidae	*Pristis pristis*	Large-tooth Sawfish	PM	-	This is a marine/estuarine species that typically spends its first three to four years in freshwater growing to about half its adult size (4 m+). Juveniles and sub-adults of this species predominantly occur in rivers and estuaries, while large mature individuals tend to occur more often in coastal and offshore waters up to 25 m deep. In northern Australia, this species is generally confined to freshwater drainages and the upper reaches of estuaries, occasionally being found as far as 400 km from the sea. This species tends to move up reivers during flood periods and small individuals (1.5 m) have been caught in remote ponds where they have been isolated for several years between floods. Preferred habitat for this species is mud bottoms of river embayments and estuaries, but also occurs in upstream environments. This species is not found near riparian vegetation and is typically found in turbid channels of large rivers over soft mud bottoms more than 1 m deep with a preference for deeper sections of rivers adjacent to a sand or silt shallow, such as a sandbar or shallow backwater (DCCEEW, 2024c and references therein).	**Low** – There are no local records of this species within 30 km of the Project Area (DEPWS, 2024a). The nearest record of this species is located ~220 km to the east of the Project Area (ALA, 2024). The Project Area overlaps with the outer margin of the DCCEEW (2024c) modelled non-core distribution for this species. The Project Area does not support suitable watercourse habitats for this species. Due to an absence of local records and habitats within the Project Area likely being unsuitable for the occupation of this species, this species is considered to have a low likelihood of occurring within the Project Area.

1. Status: CE = Critically Endangered, EN = Endangered, LC = Least Concern, MI = Migratory, NE = Not Evaluated, (NL) = Not Listed, NT = Near Threatened, VU = Vulnerable.
2. TPWC = *Territory Parks and Wildlife Conservation Act 1976*, EPBC = *Environment Protection and Biodiversity Conservation Act 1999*.
3. PM = Protected Matters Search Tool, NRM = NR Maps
4. Synonymous with *Motacilla flava*.

Appendix C Ground-truthed vegetation communities

Sturt Plateau Pipeline

Ecological Assessment

APA SPP Pty Ltd

SLR Project No.: 680.030294.00001

6 December 2024

Table C1 Floristic composition and structure of ground-truthed vegetation communities

Veg #	Land unit	Ground-truthed floristic composition and structure[1]	Representative photograph
1	Flats and run-on areas transitioning from yellow to grey clay loam.	U ^*Eucalyptus microtheca*, ^*Eucalyptus spp*., ^*Corymbia spp*.\^tree\7\r; M+^*Acacia lysiphloia*, *Acacia holosericea*, *Melaleuca viridiflora*, *E. microtheca*\^shrub\4\c,i; G ^*Aristida inaequiglumis*, ^*Eriachne armitii*, ^*Sehima nervosa*, *Sporobolus sp*., *Ludwigia perennis*\^tussock and hummock grasses,forbs\2\c.	

Veg #	Land unit	Ground-truthed floristic composition and structure[1]	Representative photograph
2	Drainage depressions on grey/brown clay, sandy loam.	U ^*M. viridiflora*, ^*Acacia torulosa*, *Macropteranthes keckwickii*\^tree,shrub\6\r; M+^*M. viridiflora*, ^*A. torulosa*, *Acacia difficilis*\^shrub\5\d; G ^*Triodia bitextura*, *Cyperus spp*.\^tussock and hummock grasses,sedges,forbs\1\d.	
3	Floodplains on cracking, black clays.	U+^*E. microtheca*\^tree\6\c; M ^*E. microtheca*\^shrub\5\r; G ^*Dichanthium sericeum*\^tussock grasses,sedges,forbs\2\d.	

Veg #	Land unit	Ground-truthed floristic composition and structure[1]	Representative photograph
4	Flats and plains on red/brown clay, sandy loam.	U+^*Corymbia dichromophloia*, *Eucalyptus pruinosa*, *Erythrophleum chlorostachys*, *Terminalia canescens*\^tree\7\c; M ^*T. canescens*, ^*Acacia ssp.*, *Calytrix exstipulata*, *Dodonaea hispidula*, *Alphitonia excelsa*\^shrub\5\i; G ^*T. bitextura*, ^*Aristida inaequiglumis*\^tussock and hummock grasses,forbs\1\c.	
5	Minor rises on red/brown sandy clay loam.	U+^*Acacia shirleyi, Macropteranthes keckwickii, Gyrocarpus americanus* \^tree\7\c; M ^*M. keckwickii*, *Santalum lanceolatum*\^shrub\5\r; G ^*Aristida sp*., ^*Enneapogon sp*., ^*Sporobolus sp*., *Panicum sp*., *Stylosanthes spp.*\^tussock grasses,forbs\1\c.	

Veg #	Land unit	Ground-truthed floristic composition and structure[1]	Representative photograph
6	Flats, run-on areas and minor rises on a red/grey/yellow sandy, clay loam.	U+^*M. keckwickii*, *A. shirleyi*, *Bauhinia cunninghamii*, *Terminalia volucris*, *Grevillea striata*\^tree\7\c; M ^*M. keckwickii*, *A. shirleyi*, *T. volucris*, *S. lanceolatum*, *Carissa lanceolata*\^shrub\5\i; G ^*Panicum sp*.\^tussock grasses,forbs\1\c.	
7	Floodplain fringes on variable black, cracking clays to heavy, grey clay loam.	U+^*E. microtheca*, *Lophostemon grandiflous*, *Acacia difficilis*, *Hakea arborescens*\^tree\6\i; M ^*S. lanceolatum*, *E. microtheca*, *Acacia spp*.\^shrub,tree\4\c; G ^*A. inaequiglumis, Eragrostis cumingii, L. perennis, Cyperus spp*.\^tussock grasses,forbs.sedges\1\c.	

stic composition and structure description is based on the NVIS information hierarchy (Brocklehurst *et al*., 2007).

Appendix D Ground-truthed flora species list

Sturt Plateau Pipeline

Ecological Assessment

APA SPP Pty Ltd

SLR Project No.: 680.030294.00001

6 December 2024

Table D1 Ground-truthed flora species

Status[1]		Family name	Scientific name	Common name	Ground-truthed vegetation community						
TPWC[2]	EPBC[2]				1[3]	2[4]	3[5]	4[6]	5[7]	6[8]	7[9]
LC	-	Acanthaceae	*Rostellularia adscendens*	Pinktongues				X			
LC	-	Amaranthaceae	*Achyranthes aspera*	Chaff-flower	X						
LC	-	Amaranthaceae	*Alternanthera denticulata*	Lesser Joyweed		X	X				
LC	-	Amaranthaceae	*Dysphania kalpari*	Rat-tail Goosefoot					X		
LC	-	Amaranthaceae	*Gomphrena canescens*	Batchellors Buttons					X		
LC	-	Amaranthaceae	*Gomphrena sp.*	*Gomphrena*		X					
LC	-	Amaranthaceae	*Ptilotus fusiformis*	Skeleton Plant				X			
LC	-	Amaranthaceae	*Ptilotus sp.*	*Ptilotus*					X		
LC	-	Apocynaceae	*Carissa lanceolata*	Currant Bush		X		X			
LC	-	Apocynaceae	*Cynanchum viminale*	Caustic Vine						X	
LC	-	Asparagaceae	*Thysanotus chinensis*	*Thysanotus*		X					
LC	-	Asteraceae	*Pterocaulon serrulatum*	Fruit-salad Bush		X		X			
LC	-	Asteraceae	*Pterocaulon sphacelatum*	Apple Bush		X		X			
LC	-	Astreaceae	*Bidens bipinnata*	Cobblers Pegs				X	X		
LC	-	Bignoniaceae	*Dolichandrone heterophylla*	Lemonwood		X					
LC	-	Bixaceae	*Cochlospermum gregorii*	Kapok Bush				X			
LC	-	Boraginaceae	*Ehretia saligna*	Coonta				X			
LC	-	Boraginaceae	*Heliotropium spp.*	*Heliotropium*		X					
LC	-	Byblidaceae	*Byblis liniflora*	Flypaper Trap		X					
LC	-	Campanulaceae	*Lobelia sp.*	*Lobelia*		X					
LC	-	Capparaceae	*Capparis lasiantha*	Split-arse-jack					X		
LC	-	Caryophyllaceae	*Polycarpaea sp.*	*Polycarpaea*				X	X		
LC	-	Celastraceae	*Denhamia cunninghamii*	Narrow-leaf *Maytenus*				X			
LC	-	Celastraceae	*Stackhousia intermedia*	Wiry *Stackhousia*		X					
LC	-	Cleomaceae	*Cleome viscosa*	Tickweed				X			
LC	-	Combretaceae	*Macropteranthes kekwickii*	Bullwaddy		X	X	X	X	X	
LC	-	Combretaceae	*Terminalia canescens*	Winged Nut Tree		X		X	X		
LC	-	Combretaceae	*Terminalia volucris*	Rosewood		X		X	X	X	
LC	-	Commelinaceae	*Cartonema parviflorum*	*Cartonema*		X					
LC	-	Commelinaceae	*Murdannia graminea*	Blue *Murdannia*		X					
INFRA	-	Convolvulaceae	*Evolvulus alsinoides*	Blue Periwinkle				X	X		
LC	-	Convolvulaceae	*Ipomoea sp.*	*Ipomoea*		X	X	X	X		
LC	-	Convolvulaceae	*Jacquemontia browniana*	Snake Stem				X			
LC	-	Convolvulaceae	*Jacquemontia sp.*	*Jacquemontia*				X			

Status[1]		Family name	Scientific name	Common name	Ground-truthed vegetation community						
TPWC[2]	EPBC[2]				1[3]	2[4]	3[5]	4[6]	5[7]	6[8]	7[9]
LC	-	Convolvulaceae	*Operculina aequisepala*	Onion Vine			X				
LC	-	Convolvulaceae	*Xenostegia tridentata*	*Xenostegia*				X			
-	-	Cucurbitaceae	*Citrullus lanatus*	Water Melon				X			
LC	-	Cucurbitaceae	*Cucumis argenteus*	-				X			
LC	-	Cucurbitaceae	*Cucumis melo*	Bush Cucumber				X			
LC	-	Cyperaceae	*Cyperus spp.*	Cyperus		X	X				X
LC	-	Droseraceae	*Drosera burmanni*	Tropical Sundew		X					
LC	-	Droseraceae	*Drosera derbyensis*	Sundew		X					
DD	-	Droseraceae	*Drosera finlaysoniana*	Sundew		X					
LC	-	Ebenaceae	*Diospyros humilis*	Ebony						X	
LC	-	Euphorbiaceae	*Mallotus nesophilus*	Mallotus						X	
LC	-	Fabaceae	*Abrus precatorius*	Crab's Eye Vine						X	
INFRA	-	Fabaceae	*Acacia colei*	Kalkardi	X			X			
LC	-	Fabaceae	*Acacia difficilis*	River Wattle		X		X			
LC	-	Fabaceae	*Acacia galioides*	Wattle		X					
LC	-	Fabaceae	*Acacia holosericea*	Silver Wattle	X					X	
LC	-	Fabaceae	*Acacia lysiphloia*	Turpentine Bush	X			X			
LC	-	Fabaceae	*Acacia shirleyi*	Lancewood					X	X	
LC	-	Fabaceae	*Acacia torulosa*	Torulosa Wattle		X		X			
LC	-	Fabaceae	*Acacia wickhamii*	Wickham's Wattle				X			
LC	-	Fabaceae	*Bauhinia cunninghamii*	Bean Tree	X					X	
LC	-	Fabaceae	*Crotalaria aridicola subsp. densifolia*	Chillagoe Horse Poison				X			
LC	-	Fabaceae	*Crotalaria medicaginea*	Clover-leaf Rattlepod	X		X				
LC	-	Fabaceae	*Dichrostachys spicata*	Single Thorn Prickly Bush					X		
LC	-	Fabaceae	*Erythrophleum chlorostachys*	Cooktown Ironwood				X	X		
LC	-	Fabaceae	*Indigofera linifolia*	Native Indigo				X			
LC	-	Fabaceae	*Indigofera linnaei*	Birdsville Indigo				X			
LC	-	Fabaceae	*Indigofera sp.*	*Indigofera*				X	X		
LC	-	Fabaceae	*Neptunia sp.*	*Neptunia*	X	X					
LC	-	Fabaceae	*Petalostylis cassioides*	Butterfly Bush				X			
Int.	-	Fabaceae	*Stylosanthes hamata*	Carribbean Stylo				X	X		
Int.	-	Fabaceae	*Stylosanthes scabra*	Shrubby Stylo				X	X		
LC	-	Fabaceae	*Tephrosia spp.*	*Tephrosia*				X	X		
LC	-	Fabaceae	*Uraria lagopodioides*	*Uraria*				X			
Int.	-	Fabaceae	*Vachellia farnesiana*	Mimosa Bush				X		X	

Status[1]		Family name	Scientific name	Common name	Ground-truthed vegetation community						
TPWC[2]	EPBC[2]				1[3]	2[4]	3[5]	4[6]	5[7]	6[8]	7[9]
LC	-	Fabaceae	*Vigna lanceolata*	Pencil Yam	X	X					
LC	-	Fabaceae	*Zornia sp.*	*Zornia*						X	
LC	-	Goodeniaceae	*Goodenia sp.*	*Goodenia*	X	X		X			
LC	-	Hemerocallidaceae	*Dianella sp.*	*Dianella*				X			
LC	-	Hernadiaceae	*Gyrocarpus americanus*	Helicopter Tree				X	X		
LC	-	Lamiaceae	*Clerodendrum floribundum*	Smooth *Clerodendrum*				X			
Int.	-	Lamiaceae	*Mesosphaerum suaveolens*	*Hyptis*				X	X		
LC	-	Lauraceae	*Cassytha filiformis*	Dodder Laurel		X					
LC	-	Lecythidaceae	*Planchonia careya*	Cocky Apple				X			
LC	-	Loganiaceae	*Mitrasacme spp.*	*Mitrasacme*	X	X		X			
LC	-	Loganiaceae	*Strychnos lucida*	Strychnine Tree						X	
LC	-	Loranthaceae	*Amyema maidenii*	Pale-leaf Mistletoe				X	X	X	
LC	-	Malvaceae	*Abutilon sp.*	*Abutilon*					X	X	
LC	-	Malvaceae	*Brachychiton megaphyllus*	Red Flowering Kurrajong		X		X			
LC	-	Malvaceae	*Corchorus sidoides*	Flannel Weed					X	X	
LC	-	Malvaceae	*Gossypium australe*	Native Cotton				X			
LC	-	Malvaceae	*Grewia savannicola*	Dog's Balls				X			
LC	-	Malvaceae	*Hibiscus geranioides*	*Hibiscus*				X			
LC	-	Malvaceae	*Hibiscus meraukensis*	Ballerina *Hibiscus*				X			
INFRA	-	Malvaceae	*Hibiscus sturtii*	Sturt's *Hibuscus*				X			
LC	-	Malvaceae	*Melhania oblongifolia*	Velvet *Hibiscus*				X	X	X	
Int.	-	Malvaceae	*Sida cordifolia*	Flannel Weed				X	X		
LC	-	Malvaceae	*Waltheria indica*	*Waltheria*	X	X		X			
LC	-	Marsileaceae	*Marsilea sp.*	Nardoo		X	X				
LC	-	Menispermaceae	*Tinospora smilacina*	Snake Vine				X			
LC	-	Menyanthaceae	*Nymphoides sp.*	*Nymphoides*			X				
LC	-	Myrtaceae	*Calytrix exstipulata*	Turkey Bush				X	X		
LC	-	Myrtaceae	*Corymbia confertiflora*	Broad-leaf Carbeen				X			
LC	-	Myrtaceae	*Corymbia dichromophloia*	Small-fruited Bloodwood				X	X		
LC	-	Myrtaceae	*Corymbia sp.*	Corymbia	X			X	X		
LC	-	Myrtaceae	*Eucalyptus camaldulensis*	Red River Gum				X			
LC	-	Myrtaceae	*Eucalyptus leucophloia*	Snappy Gum				X			
LC	-	Myrtaceae	*Eucalyptus microtheca*	Coolabah	X	X	X				X
LC	-	Myrtaceae	*Eucalyptus pruinosa*	SilverBox	X	X		X			
LC	-	Myrtaceae	*Lophostemon grandiflorus*	Northern Swamp Box							X

Status[1]		Family name	Scientific name	Common name	Ground-truthed vegetation community						
TPWC[2]	EPBC[2]				1[3]	2[4]	3[5]	4[6]	5[7]	6[8]	7[9]
LC	-	Myrtaceae	*Melaleuca nervosa*	Yellow-barked Paperbark		X					
LC	-	Myrtaceae	*Melaleuca viridiflora*	Broad-leaved Paperbark	X	X					
LC	-	Nyctaginaceae	*Boerhavia sp.*	Tar Vine	X	X					
LC	-	Oleaceae	*Jasminum molle*	*Jasminum*						X	
LC	-	Onagraceae	*Ludwigia perennis*	Upright Primrose	X	X	X				X
Int.	-	Passifloraceae	*Passiflora foetida*	Stinking Passion Flower				X	X		
LC	-	Phyllanthaceae	*Breynia cernua*	*Breynia*				X	X	X	
LC	-	Phyllanthaceae	*Flueggea virosa*	White Currant				X	X		
LC	-	Phyllanthaceae	*Phyllanthus sp.*	*Phyllanthus*		X		X			
LC	-	Picrdoendraceae	*Petalostigma banksii*	Smooth-leaved Quinine				X			
LC	-	Picrdoendraceae	*Petalostigma pubescens*	Quinine Bush		X		X			
LC	-	Poaceae	*Aristida calycina*	Dark Wiregrass					X	X	
LC	-	Poaceae	*Aristida contorta*	Bunched Kerosene Grass		X		X	X		
LC	-	Poaceae	*Aristida holathera*	Erect Kerosene Grass		X		X	X		
LC	-	Poaceae	*Aristida inaequiglumis*	Unequal Three-awn		X		X			
LC	-	Poaceae	*Aristida sp.*	*Aristida*	X						
LC	-	Poaceae	*Bothriochloa ewartiana*	Desert Bluegrass	X	X					
LC	-	Poaceae	*Chrysopogon fallax*	Golden Beard Grass	X			X			
LC	-	Poaceae	*Cymbopogon bombycinus*	Silky Oilgrass	X						
LC	-	Poaceae	*Dichanthium sericeum*	Silky Bluegrass	X		X				
LC	-	Poaceae	*Digitaria brownii*	Cotton Panic Grass					X		
LC	-	Poaceae	*Ectrosia scabrida*	Hares-foot Grass		X					
LC	-	Poaceae	*Elytrophorus spicatus*	Spikegrass	X	X					
LC	-	Poaceae	*Enneapogon lindleyanus*	*Enneapogon*					X		
LC	-	Poaceae	*Enneapogon sp.*	*Enneapogon*			X				
LC	-	Poaceae	*Eragrostis cumingii*	Fairy Grass		X					
LC	-	Poaceae	*Eragrostis spp.*	Lovegrass	X	X					
LC	-	Poaceae	*Eriachne armittii*	Longawn Wanderrie Grass	X	X					
LC	-	Poaceae	*Eriachne ciliata*	Slender Wanderrie				X	X		
LC	-	Poaceae	*Eriachne obtusa*	Northern Wanderrie	X	X					
LC	-	Poaceae	*Eulalia aurea*	Silky Browntop	X						
LC	-	Poaceae	*Heteropogon contortus*	Black Speargrass	X						
LC	-	Poaceae	*Iseilema sp.*	Flinders Grass	X						
LC	-	Poaceae	*Panicum decompositum*	Native Millet	X			X	X	X	
LC	-	Poaceae	*Panicum effusum*	Hairy Panic	X			X	X	X	

Status[1]		Family name	Scientific name	Common name	Ground-truthed vegetation community						
TPWC[2]	EPBC[2]				1[3]	2[4]	3[5]	4[6]	5[7]	6[8]	7[9]
LC	-	Poaceae	*Schizachyrium fragile*	Firegrass		X		X			
LC	-	Poaceae	*Sehima nervosum*	White Grass	X			X			
LC	-	Poaceae	*Setaria surgens*	Brown Pigeon Grass		X					
LC	-	Poaceae	*Sorghum timorense*	Downs *Sorghum*	X			X			
LC	-	Poaceae	*Sporobolus australasicus*	Australian Dropseed	X	X	X	X	X	X	
LC	-	Poaceae	*Themeda triandra*	Kangaroo Grass	X						
LC	-	Poaceae	*Triodia bitextura*	Curly Spinifex		X		X	X	X	
Int.	-	Poaceae	*Urochloa mosambicensis*	Sabi Grass				X	X		
LC	-	Proteaceae	*Grevillea mimosoides*	*Grevillea*				X			
LC	-	Proteaceae	*Grevillea parallela*	Silver *Grevillea*				X			
LC	-	Proteaceae	*Grevillea striata*	Beefwood				X		X	
LC	-	Proteaceae	*Hakea arborescens*	Yellow *Hakea*				X			
LC	-	Proteaceae	*Hakea lorea*	Long-leaf Corkwood					X		
LC	-	Rhamnaceae	*Alphitonia excelsa*	Soap Tree		X		X	X	X	
LC	-	Rhamnaceae	*Ventilago viminalis*	Supplejack				X			
LC	-	Rubiaceae	*Gardenia ewarti*	Native *Gardenia*		X		X			
LC	-	Santalacae	*Santalum lanceolatum*	Sandalwood				X	X	X	
LC	-	Sapindaceae	*Atalaya hemiglauca*	Whitewood						X	
LC	-	Sapindaceae	*Dodonaea hispidula*	Distichostemon				X			
LC	-	Sapindaceae	*Dodonaea physocarpa*	Baloon Hopbush				X			
LC	-	Stylidiaceae	*Stylidium sp.*	*Stylidium*		X					
LC	-	Thymelaeaceae	*Pimelea sanguinea*	Thecanthes	X	X		X	X		
LC	-	Violaceae	*Hybanthus aurantiacus*	Orange Spade Flower				X			
LC	-	Violaceae	*Hybanthus enneaspermus*	Blue Spade Flower				X			
LC	-	Vitaceae	*Cayratia trifolia*	*Cayratia*			X	X			
LC	-	Xyridaceae	*Xyris complanata*	Yellow Iris		X					

1. Status: CE = Critically Endangered, DD = Data Deficient, EN = Endangered, (Int) = Introduced in the Northern Territory, LC = Least Concern, NE = Not Evaluated, NT = Near Threatened, VU = Vulnerable.
2. TPWC = *Territory Parks and Wildlife Conservation Act 1976*, EPBC = *Environment Protection and Biodiversity Conservation Act 1999*.
3. Mixed *Acacia* shrubland to variable grassland with variable emergent *Eucalyptus* and *Corymbia*.
4. *Melaleuca viridiflora* and *Acacia torulosa* low closed shrubland with *Triodia bitextura* hummock grassland on sandy loam drainage depressions
5. *Eucalyptus microtheca* open woodland.
6. *Corymbia dirchromophloia* open woodland.
7. *Acacia shirleyi* open to closed woodland.
8. *Macropteranthes kekwickii* closed to open tall shrubland.
9. *Eucalyptus microtheca* and *Lophostemon grandiflorus* open woodland on floodplain fringes.

Appendix E Ground-truthed fauna species list

Sturt Plateau Pipeline

Ecological Assessment

APA SPP Pty Ltd

SLR Project No.: 680.030294.00001

6 December 2024

Table E1 Ground-truthed fauna species

Status[1]		Family name	Scientific name	Common name	Ground-truthed vegetation community						
TPWC[2]	EPBC[2]				1[3]	2[4]	3[5]	4[6]	5[7]	6[8]	7[9]
AMPHIBIANS											
LC	-	Myobatrachidae	*Notoden nichollsi*	Desert Spadefoot Toad		X					
LC	-	Hylidae	*Litoria caerulea*	Green Tree Frog			X	X	X		
LC	-	Hylidae	*Litoria inermis*	Peters' Frog		X					
LC	-	Hylidae	*Litoria rubella*	Red Tree Frog				X			
BIRDS											
NT	-	Casuariidae	*Dromaius novaehollandiae*	Emu		X					
LC	-	Anseranatidae	*Anseranas semipalmata*	Magpie Goose			X				
LC	-	Anatidae	*Dendrocygna eytoni*	Plumed Whistling-Duck			X				
LC	-	Anatidae	*Anas superciliosa*	Pacific Black Duck		X	X				
LC	-	Anatidae	*Anas gracilis*	Grey Teal			X				
LC	-	Anatidae	*Aythya australis*	Hardhead			X				
LC	-	Phasianidae	*Synoicus ypsilophorus*	Brown Quail	X						
LC	-	Columbidae	*Phaps chalcoptera*	Common Bronzewing	X	X		X	X	X	
LC	-	Columbidae	*Ocyphaps lophotes*	Crested Pigeon	X	X		X	X	X	
LC	-	Columbidae	*Geopelia cuneata*	Diamond Dove		X					
LC	-	Columbidae	*Geopelia placida*	Peaceful Dove		X		X			
LC	-	Columbidae	*Geopelia humeralis*	Bar-shouldered Dove		X		X			
NT	-	Otididae	*Ardeotis australis*	Australian Bustard	X						
LC	-	Centropodidae	*Centropus phasianinus*	Pheasant Coucal		X		X			
LC	-	Podargidae	*Podargus strigoides*	Tawny Frogmouth				X	X		
LC	-	Caprimulgidae	*Eurostopodus argus*	Spotted Nightjar				X			
LC	-	Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar		X		X			
NT	-	Burhinidae	*Burhinus grallarius*	Bush Stone-curlew		X		X			
LC	-	Charadriidae	*Vanellus miles*	Masked Lapwing				X			
LC	-	Turnicidae	*Turnix sp.*	Button-quail	X						
LC	-	Glareolidae	*Stiltia isabella*	Australian Pratincole			X				
LC	-	Ciconiidae	*Ephippiorhynchus asiaticus*	Black-necked Stork			X				
LC	-	Anhingidae	*Anhinga novaehollandiae*	Australasian Darter			X				
LC	-	Ardeidae	*Ardea pacifica*	White-necked Heron			X				
LC	-	Ardeidae	*Ardea alba*	Great Egret			X				
LC	-	Ardeidae	*Ardea intermedia*	Intermediate Egret			X				
LC	-	Ardeidae	*Egretta novaehollandiae*	White-faced Heron			X				
LC	-	Ardeidae	*Egretta picata*	Pied Heron			X				

Status[1]		Family name	Scientific name	Common name	Ground-truthed vegetation community						
TPWC[2]	EPBC[2]				1[3]	2[4]	3[5]	4[6]	5[7]	6[8]	7[9]
LC	-	Ardeidae	*Nycticorax caledonicus*	Nankeen Night-Heron			X				
LC	MI	Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis			X				
LC	-	Threskiornithidae	*Threskiornis molucca*	Australian White Ibis			X				
LC	-	Threskiornithidae	*Threskiornis spinicollis*	Straw-necked Ibis			X	X			
LC	-	Threskiornithidae	*Platalea regia*	Royal Spoonbill			X				
LC	-	Accipitridae	*Elanus axillaris*	Black-shouldered Kite			X	X			
LC	-	Accipitridae	*Hieraaetus morphnoides*	Little Eagle			X				
LC	-	Accipitridae	*Aquila audax*	Wedge-tailed Eagle	X	X		X			
LC	-	Accipitridae	*Circus approximans*	Swamp Harrier			X				
LC	-	Accipitridae	*Circus assimilis*	Spotted Harrier			X	X			
LC	-	Accipitridae	*Accipiter fasciatus*	Brown Goshawk		X		X	X		
LC	-	Accipitridae	*Milvus migrans*	Black Kite	X	X	X	X			
LC	-	Accipitridae	*Haliastur sphenurus*	Whistling Kite		X	X	X			
LC	-	Strigidae	*Ninox boobook*	Australian Boobook				X			
LC	-	Alcedinidae	*Todiramphus pyrrhopygius*	Red-backed Kingfisher					X	X	
LC	-	Meropidae	*Merops ornatus*	Rainbow Bee-eater		X					
LC	-	Falconidae	*Falco cenchroides*	Nankeen Kestrel	X	X	X	X			
LC	-	Falconidae	*Falco longipennis*	Australian Hobby					X		
LC	-	Falconidae	*Falco berigora*	Brown Falcon		X		X			
LC	-	Cacatuidae	*Calyptorhynchus banksii banksii*	Red-tailed Black-cockatoo		X		X	X	X	
LC	-	Cacatuidae	*Eolophus roseicapilla*	Galah	X	X	X	X			
LC	-	Psittacidae	*Aprosmictus erythropterus*	Red-winged Parrot		X	X	X	X		
LC	-	Psittacidae	*Psitteuteles versicolor*	Varied Lorikeet			X				
LC	-	Ptilonorhynchidae	*Chlamydera nuchalis*	Great Bowerbird		X					
LC	-	Maluridae	*Malurus lamberti*	Variegated Fairy-wren				X		X	
LC	-	Maluridae	*Malurus melanocephalus*	Red-backed Fairy-wren	X			X		X	
LC	-	Meliphagidae	*Acanthagenys rufogularis*	Spiny-cheeked Honeyeater					X	X	
LC	-	Meliphagidae	*Gavicalis virescens*	Singing Honeyeater					X	X	
LC	-	Meliphagidae	*Ptilotula keartlandi*	Grey-headed Honeyeater	X						
LC	-	Meliphagidae	*Conopophila rufogularis*	Rufous-throated Honeyeater	X						
LC	-	Meliphagidae	*Lichmera indistincta*	Brown Honeyeater	X	X	X	X	X	X	X
LC	-	Meliphagidae	*Melithreptus albogularis*	White-throated Honeyeater				X	X	X	
LC	-	Meliphagidae	*Melithreptus gularis*	Black-chinned Honeyeater				X			
LC	-	Meliphagidae	*Philemon citreogularis*	Little Friarbird		X		X	X	X	
LC	-	Pardalotidae	*Pardalotus striatus*	Striated Pardalote		X		X			

Status[1]		Family name	Scientific name	Common name	Ground-truthed vegetation community						
TPWC[2]	EPBC[2]				1[3]	2[4]	3[5]	4[6]	5[7]	6[8]	7[9]
LC	-	Acanthizidae	*Smicrornis brevirostris*	Weebill				X			
LC	-	Acanthizidae	*Gerygone olivacea*	White-throated Gerygone				X			
LC	-	Pomatostomidae	*Pomatostomus temporalis*	Grey-crowned Babbler		X		X		X	
LC	-	Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	X	X		X	X	X	
LC	-	Campephagidae	*Lalage tricolor*	White-winged Triller				X	X	X	
LC	-	Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella				X	X	X	
LC	-	Pachycephalidae	*Oreoica gutturalis*	Crested Bellbird		X		X		X	
LC	-	Pachycephalidae	*Colluricincla harmonica*	Grey Shrike-thrush				X			
LC	-	Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler	X	X	X	X	X	X	X
LC	-	Artamidae	*Artamus cinereus*	Black-faced Woodswallow		X		X	X	X	
LC	-	Artamidae	*Artamus minor*	Little Woodswallow					X		
LC	-	Artamidae	*Cracticus nigrogularis*	Pied Butcherbird				X	X	X	
LC	-	Artamidae	*Gymnorhina tibicen*	Australian Magpie		X		X		X	
LC	-	Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail	X	X	X	X	X	X	X
LC	-	Monarchidae	*Grallina cyanoleuca*	Magpie-lark	X	X	X	X	X	X	X
LC	-	Monarchidae	*Myiagra nana*	Paperbark Flycatcher						X	
LC	-	Corcoracidae	*Struthidea cinerea*	Apostlebird		X		X	X	X	
LC	-	Corvidae	*Corvus orru*	Torresian Crow	X	X	X	X	X	X	X
LC	-	Petroicidae	*Microeca fascinans*	Jacky Winter	X					X	
LC	-	Petroicidae	*Melanodryas cucullata*	Hooded Robin		X			X		
LC	-	Cisticolidae	*Cisticola exilis*	Golden-headed Cisticola	X		X				
LC	-	Locustellidae	*Cincloramphus mathewsi*	Rufous Songlark	X				X	X	
LC	-	Nectariniidae	*Dicaeum hirundinaceum*	Mistletoebird		X		X			
LC	-	Estrildidae	*Taeniopygia guttata*	Zebra Finch	X			X		X	
LC	-	Estrildidae	*Stizoptera bichenovii*	Double-barred Finch	X			X		X	
LC	-	Estrildidae	*Poephila acuticauda*	Long-tailed Finch	X			X		X	
VU	EN	Estrildidae	*Chloebia gouldiae*	Gouldian Finch					X		
NT	-	Estrildidae	*Heteromunia pectoralis*	Pictorella Mannikin	X				X		
LC	-	Motacillidae	*Anthus novaeseelandiae*	Australasian Pipit	X						
MAMMALS											
Int.	-	Bovidae	*Bos taurus*	Cattle	X	X	X	X	X	X	X
LC	-	Canidae	*Canis familiaris dingo*	Dingo		X					
LC	-	Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheath-tailed Bat		X		X	X		
Int.	-	Felidae	*Felis catus*	Feral Cat		X		X			
LC	-	Macropodidae	*Notamacropus agilis*	Agile Wallaby		X		X			

Status[1]		Family name	Scientific name	Common name	Ground-truthed vegetation community						
TPWC[2]	EPBC[2]				1[3]	2[4]	3[5]	4[6]	5[7]	6[8]	7[9]
LC	-	Macropodidae	*Osphranter rufus*	Red Kangaroo				X			
NT	-	Macropodidae	*Onychogalea unguifera*	Northern Nailtail Wallaby				X			
LC	-	Miniopteridae	*Miniopterus orianae*	Large Bent-winged Bat		X		X	X		
LC	-	Molossidae	*Chaerephon jobensis*	Greater Northern Free-tailed Bat		X		X	X		
LC	-	Muridae	*Pseudomys delicatus*	Delicate Mouse				X			
LC / LC	- / -	Vespertilionidae	*Scotorepens greyii / Chalinolobus nigrogriseus*	Little Broad-nosed Bat / Hoary Wattled Bat		X		X	X		
REPTILES											
LC	-	Agamidae	*Chlamydosaurus kingii*	Frilled Lizard				X			
LC	-	Agamidae	*Ctenophorus isolepis*	Central Military Dragon		X					
LC	-	Agamidae	*Diporiphora magna*	Yellow-sided Two-lined Dragon				X			
LC	-	Boidae	*Antaresia childreni*	Children's Python				X			
LC	-	Boidae	*Aspidites melanocephalus*	Black-headed Python				X			
LC	-	Boidae	*Liasis olivaceus*	Olive Python				X			
LC	-	Diplodactylidae	*Strophurus ciliaris*	Northern Spiny-tailed Gecko					X		
(NL)	-	Gekkonidae	*Gehyra gemina*	Plain Tree Dtella				X	X		
LC	-	Gekkonidae	*Heteronotia binoei*	Bynoe's Gecko				X	X		
LC	-	Scincidae	*Carlia munda*	Shaded-litter Rainbow Skink				X	X		
LC	-	Scincidae	*Ctenotus helenae*	Clay-soil *Ctenotus*		X					
LC	-	Scincidae	*Ctenotus pulchellus*	Red-sided *Ctenotus*				X			
LC	-	Scincidae	*Ctenotus robustus*	Eastern Striped *Ctenotus*				X			
LC	-	Scincidae	*Menetia greyii*	Common Dwarf Skink					X		

1. Status: CE = Critically Endangered, DD = Data Deficient, EN = Endangered, (Int) = Introduced in the Northern Territory, LC = Least Concern, MI = Migratory, NE = Not Evaluated, NT = Near Threatened, VU = Vulnerable.
2. TPWC = *Territory Parks and Wildlife Conservation Act 1976*, EPBC = *Environment Protection and Biodiversity Conservation Act 1999*.
3. Mixed *Acacia* shrubland to variable grassland with variable emergent *Eucalyptus* and *Corymbia*.
4. *Melaleuca viridiflora* and *Acacia torulosa* low closed shrubland with *Triodia bitextura* hummock grassland on sandy loam drainage depressions
5. *Eucalyptus microtheca* open woodland.
6. *Corymbia dirchromophloia* open woodland.
7. *Acacia shirleyi* open to closed woodland.
8. *Macropteranthes kekwickii* closed to open tall shrubland.
9. *Eucalyptus microtheca* and *Lophostemon grandiflorus* open woodland on floodplain fringes.

Appendix F Microbat call identification report

Sturt Plateau Pipeline

Ecological Assessment

APA SPP Pty Ltd

SLR Project No.: 680.030294.00001

6 December 2024

Night Time Ecology

Bioacoustic Analysis

Sturt Pipeline

SLR Consulting

August 2, 2024

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LIMITATIONS AND CONSIDERATIONS

To gain a comprehensive understanding of the ecosystems and species present in an area, surveys are best undertaken over several years and across different seasons. The results presented in this report are based on surveys conducted over four nights and provides only a “snap-shot” of information about the species present on the site.

Extraneous noise caused by insects and farm machinery can have detrimental impacts on the ability of bat call sequence detection. This noise can have consequences on the detection of sequences as well as the formal identification of species.

Glossary and acronyms

PCA	Principal component analysis

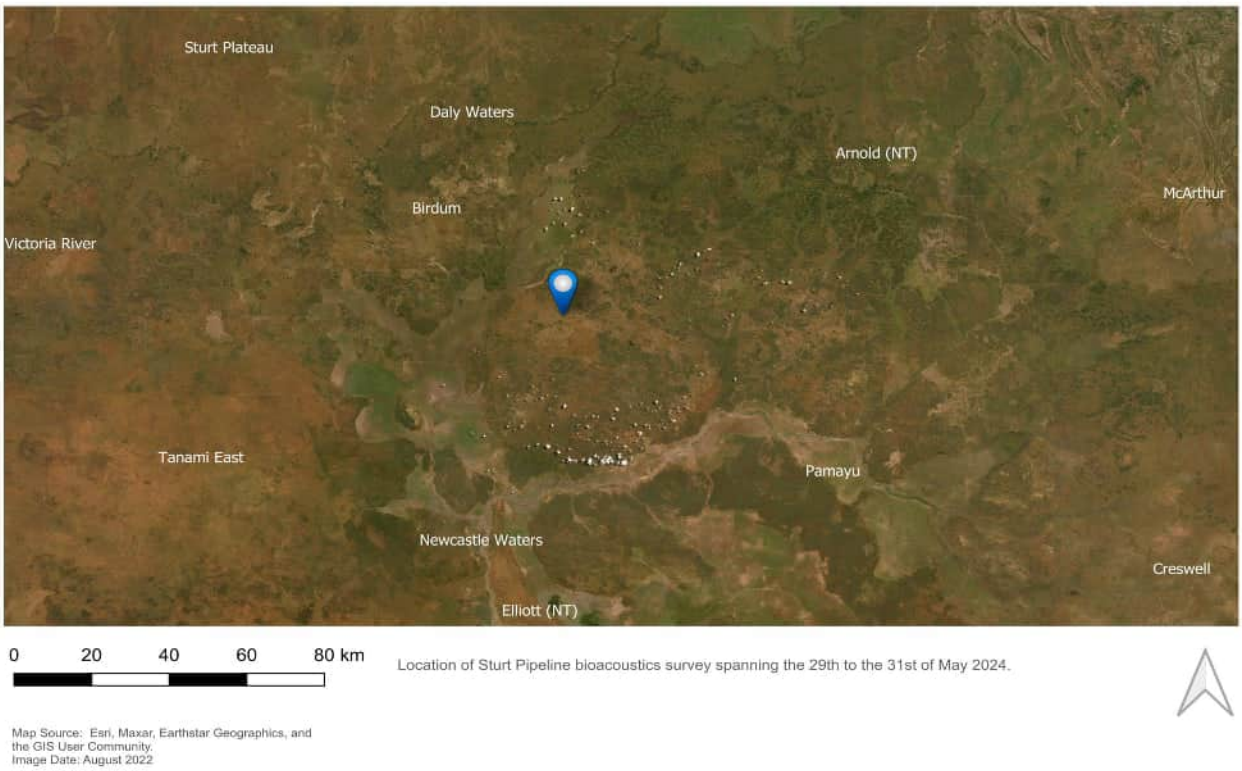
Table of Contents

List of Figures

1.0 Introduction

Night Time Ecology was commissioned by SLR Consulting Pty Ltd to undertake bioacoustic analysis of ultrasonic microchiropteran recordings collected over three nights for the Sturt Pipeline Project (the Project). The data was collected on a Songmeter and supplied as full-spectrum waveform files.

Figure 1 Aerial Image of Sturt Pipeline Bat Survey Area



2.0 Acoustic Analysis Methodology

The full-spectrum files were automatically processed by Night Time Ecology's PteronSpectra Ultrasonic software. This produced a spreadsheet with standard call metrics for identification as well as producing the most likely species based on those metrics, derived from existing keys (e.g., Milne 2002, Penny *et al*. 2004, Reinhold *et al*. 2001). The species selected were filtered based on geographic relevance via the Australasian Bat Society's BatMap (Australasian Bat Society 2021).

In accordance with recommendations contained within the *Bat Calls of NSW* key (Pennay *et al*. 2004), call sequences containing less than three consecutive pulses were excluded from analysis due to insufficient information to allow for accurate identification. Manual confirmation of species identification was achieved by comparing call spectrograms and derived metrics of labelled files with those of regionally relevant reference calls and/or with

published call descriptions (e.g., Milne 2002, Reinhold *et al*. 2001). The likelihood of species' occurrence in the Project Area was confirmed by referring to relevant distributional information (e.g., Australasian Bat Society 2021; Churchill 2008; van Dyck *et al*. 2013).

From the resultant data, two statistical analyses were undertaken to provide support of the findings. Initially, a principal component analysis (PCA) was performed to visualise the metrics of each recording in two dimensions. Secondly, hierarchical clustering was performed on the average metric data to produce a dendrogram. After combining the clustering and the PCA plot, visual inspection of all three plots highlighted possible clustering and outliers different to those labelled during the automated stage.

2.1 Reporting standard

The format and content of this report follows Australasian Bat Society standards for the interpretation and reporting of bat call data (Reardon, 2003), available on-line at http://www.ausbats.org.au/.

Species nomenclature follows Armstrong *et al.* (2021).

3.0 Results

Over the span of the three nights, only 277 files (8%) of the 3,470 recordings contained valid calls meeting or exceeding the minimum requirements for identification laid out by Pennay *et al*. (2004). Representative calls for all species recorded can be found in **Appendix 1**.

Table 1 Valid and Invalid Recordings per Night

Night	Valid	Invalid	Total
29th	50	153	203
30th	170	700	870
31st	57	2,340	2,397
Total	277 (8%)	3,193	3,470

Table 2 *Per Night Species List from Supplied Data*

Species	Confidence[1]	Night 1	Night 2	Night 3	Total
C. jobensis	++	3	4	5	12
S. flaviventris	+++	27	40	13	80
M. schreibersii orianae	++	4	3	7	14
Inconclusive					
S. flaviventris/C. jobensis		6	61	24	91
S. greyii/C. nigrogriseus		9	66	3	78

Notes. [1] +++ = *Confident, ++ = Probable, + = Possible, based on similarity to the keys metrics and shapes.*

Figure 2 Principal Component Analysis Plot Coloured by Pteron Identification

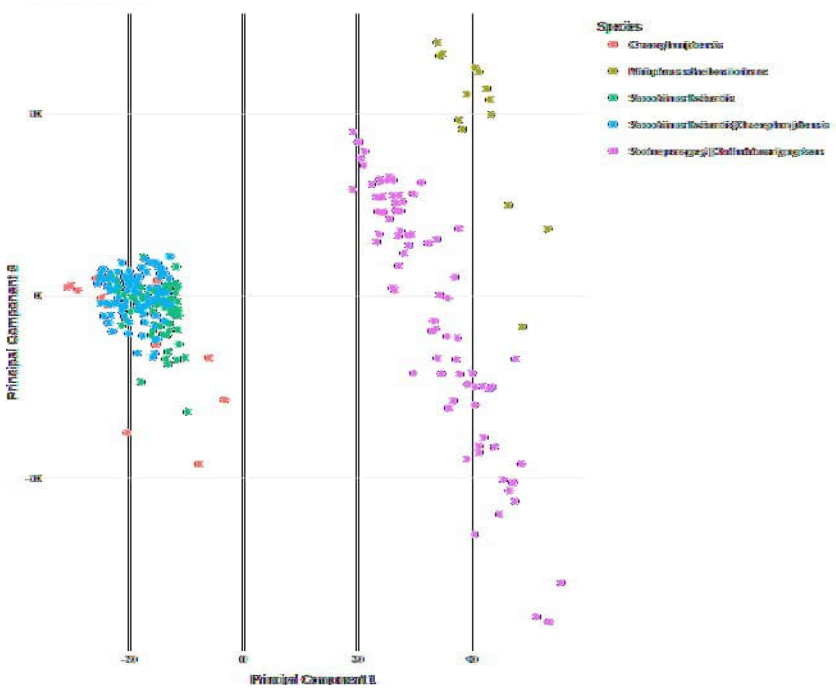
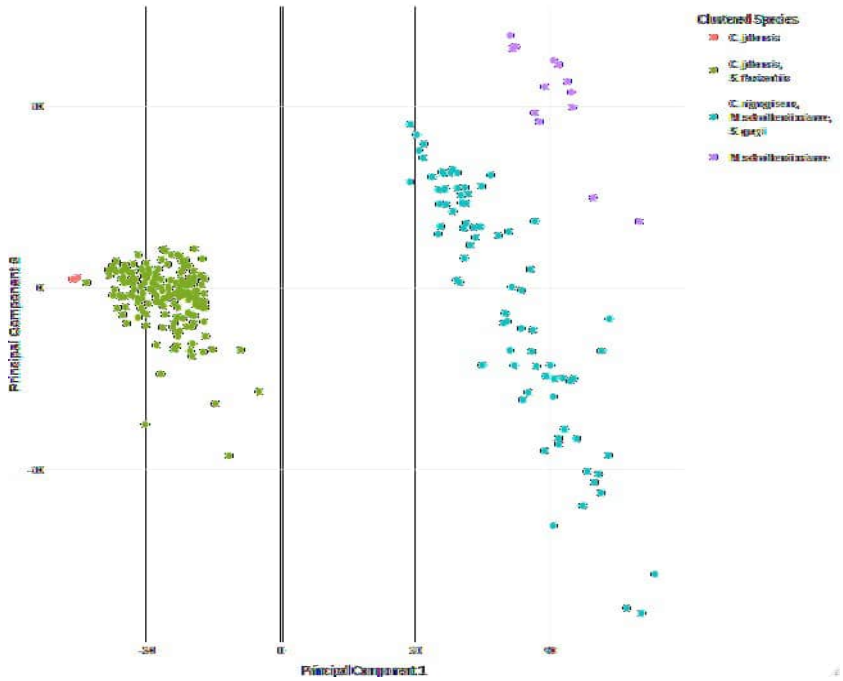


Figure 3 Principal Component Analysis Plot Coloured by Hierarchical Clustering



4.0 Discussion

The PCA plots shown in **Figure 2** and **Figure 3** highlight the challenge of differentiating species with similar call qualities from bioacoustic surveys, illustrated by the overlapping clustering of *C. jobensis* and *S. flaviventris*. However, as a confirmatory tool, the resultant clustering patterns of the hierarchical cluster analysis (**Figure 3**) suggests a statisical alignment with the species identification from the available data (**Figure 2**). Visual confirmation of known calls against the representative examples from the analyis, verified the findings of this report.

5.0 Conclusion

Call sequences of *Chaerephon jobensis, Miniopterus schreibersii orianae, Saccolaimus flaviventris* as well as *Scotorepens greyii/Chalinolobus nigrogriseus* were recorded over the three nights in the Sturt Pipeline Project Area. The presence of *Chalinolobus nigrogriseus* or *Scotorepens greyii* cannot be differentially supported as several recordings contained non-differentiating features characteristic of both these species.

No species identified in this analysis are listed under either the Commonwealth *Environment Protection and Biodiversity Conservation Act (1999)* or the *Territory Parks and Wildlife Conservation Act (1976)*.

6.0 References

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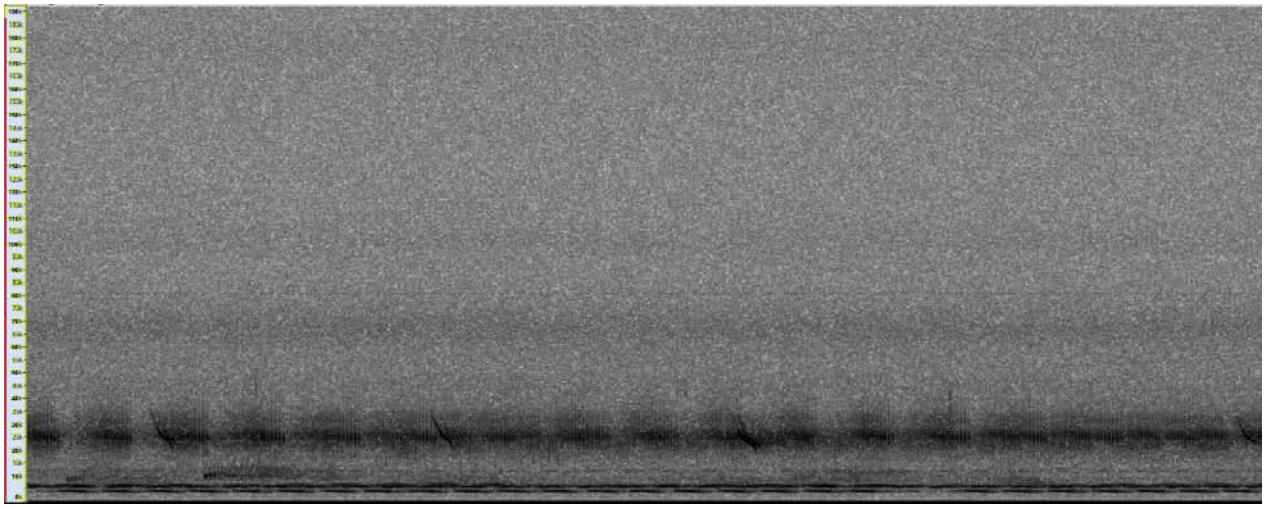
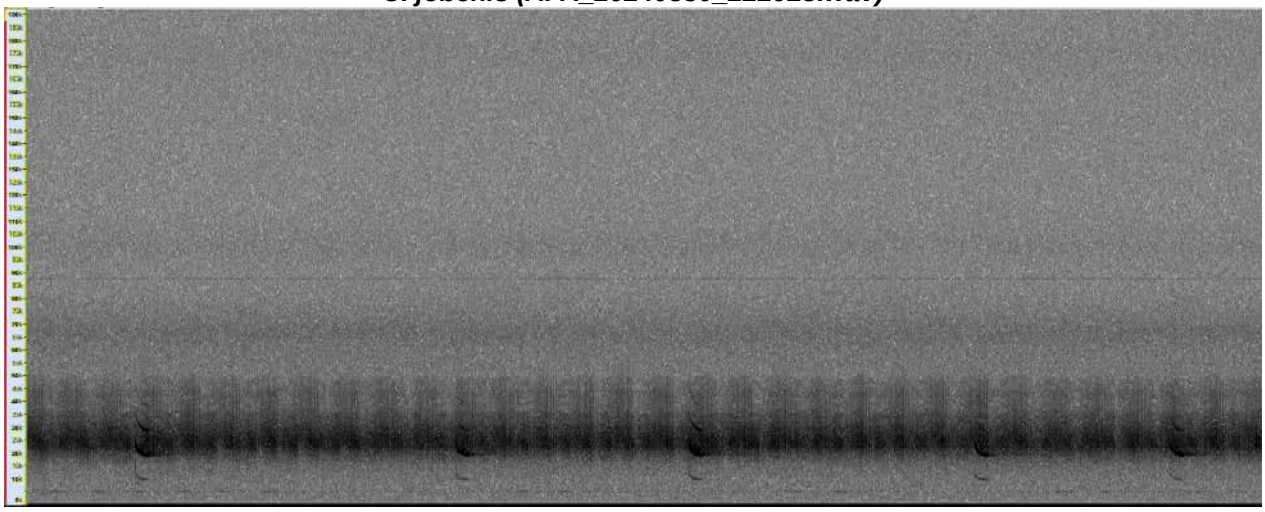
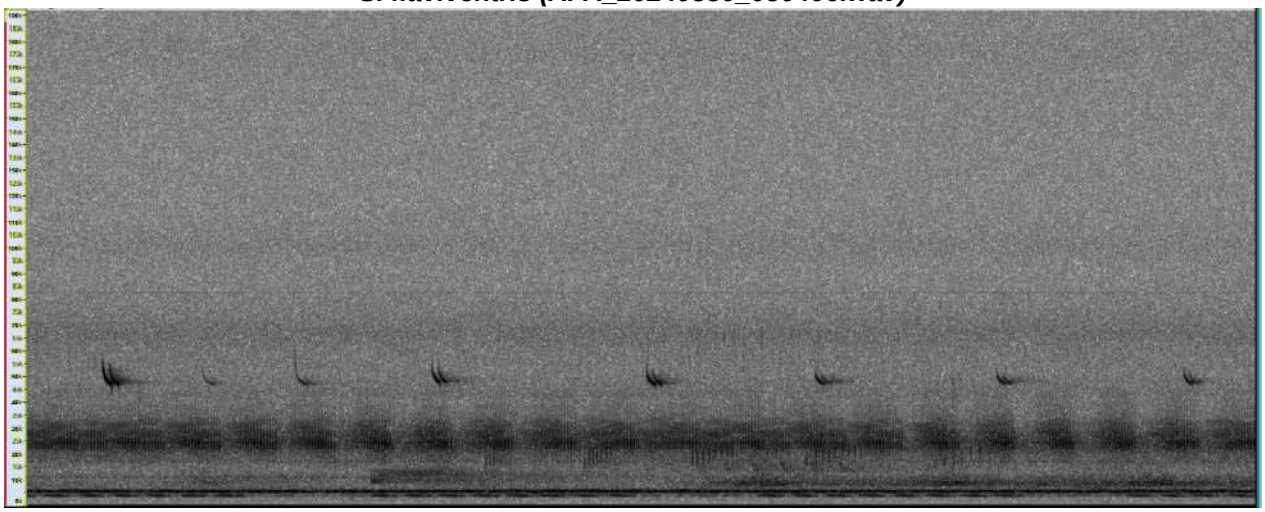
Appendix 1



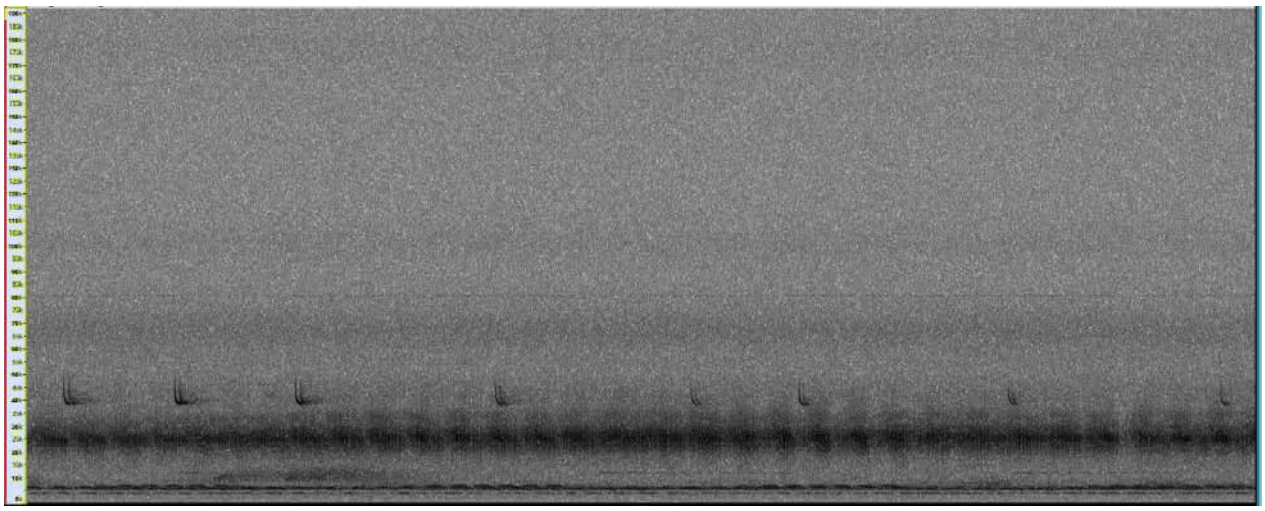
C. jobenis (APA_20240530_222928.wav)



S. flaviventris (APA_20240530_050406.wav)



M. schreibersii orianae (APA_20240530_211949.wav)



C. nigrogriseus/S. greyii (APA_20240531_004412.wav)

Revision history

Revision No.	Revision date	Details	Prepared by	Reviewed and Approved by
V1	Draft	Draft for Client Review	Isaac Floyd	Isaac Floyd
Final	02 August 2024	Report finalised	Isaac Floyd	Isaac Floyd

Distribution list

Copy #	Date	Type	Issued to	Name
V1	19 July 2024	Electronic	SLR Consulting	Ellen Clark
Final	02 August 2024	Electronic	SLR Consulting	Matthew McIntosh

Citation: Night Time Ecology, 2024, *Bioacoustic Analysis of Sturt Pipeline Data*, Report to SLR Consulting.

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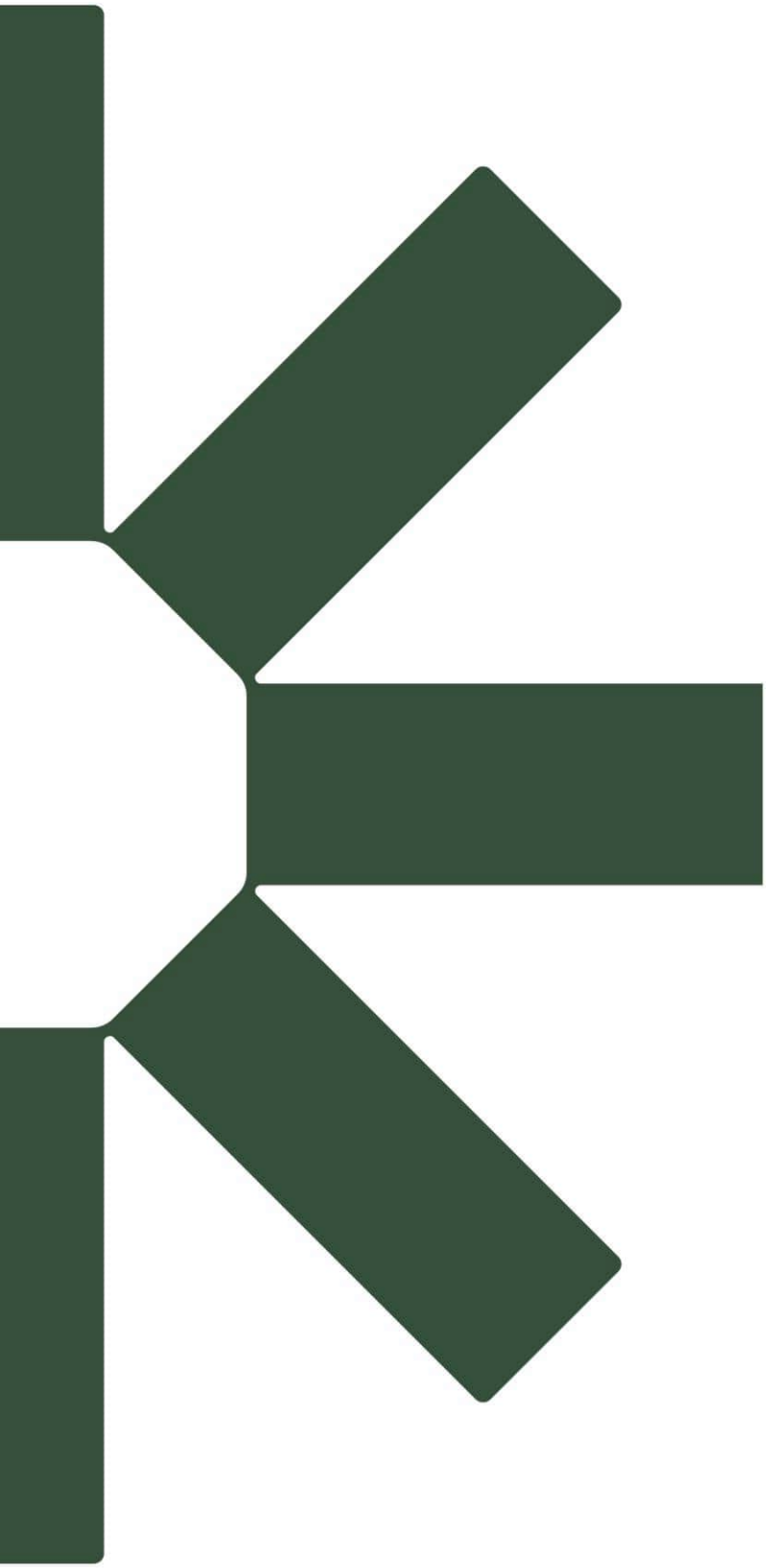

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