Native Vegetation Clearance

Mount Lofty Golf Estate

Data Report

Clearance under the *Native Vegetation Regulations 2017*

9 May 2023

Prepared by Dr. M Louter and A. Carpenter (NVC Accredited Consultants) – EBS Ecology

Native Vegetation Clearance Mount Lofty Golf Estate Data Report

9 May 2023

Version 5 – Final (Updated)

Prepared by EBS Ecology for Mount Lofty Estate Pty Ltd

Document Control					
Revision No.	**Date issued**	**Authors**	**Reviewed by**	**Date Reviewed**	**Revision type**
1	14/10/2022	Dr. M Louter (NVC Accredited Consultant)	Emma Tremain NVC Accredited Consultant)	14/10/2022	Draft V1
2	30/11/2022	Dr. M Louter (NVC Accredited Consultant)	-	-	Draft V2
3	13/12/2022	Dr. M Louter (NVC Accredited Consultant)	-	-	Final
4	04/04/2023	A. Carpenter (NVC Accredited Consultant)	-	-	Final (Updated)
5	09/05/2023	Dr. M Louter (NVC Accredited Consultant)	-	-	Final (Updated)

Distribution of Copies			
Revision No.	**Date issued**	**Media**	**Issued to**
1	14/10/2022	Electronic	Tiana Della Putta, Trice – Project & Development Managers Sonia Mercorella, Trice – Project & Development Managers
2	30/11/2022	Electronic	Tiana Della Putta, Trice – Project & Development Managers Sonia Mercorella, Trice – Project & Development Managers
3	13/12/2022	Electronic	Tiana Della Putta, Trice – Project & Development Managers Sonia Mercorella, Trice – Project & Development Managers
4	04/04/2023	Electronic	Tiana Della Putta, Trice – Project & Development Managers Sonia Mercorella, Trice – Project & Development Managers
5	09/05/2023	Electronic	Tiana Della Putta, Trice – Project & Development Managers Sonia Mercorella, Trice – Project & Development Managers

EBS Ecology Project Number: GX220701

CITATION: EBS Ecology (2023) Native Vegetation Clearance Mount Lofty Golf Estate Data Report. Report to Mount Lofty Estate Pty Ltd. EBS Ecology, Adelaide.

Cover photograph: VA A1a – *Eucalyptus viminalis ssp. viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon*.

EBS Ecology
112 Hayward Avenue
Torrensville, South Australia 5031
t: 08 7127 5607
http://www.ebsecology.com.au
email: info@ebsecology.com.au

Glossary and abbreviations

ALA	Atlas of Living Australia
BAM	Bushland Assessment Method
BDBSA	Biological Databases of South Australia
Clearance	The killing, destruction, removal or damage of vegetation including pruning.
DA	Development Application
DAWE	Department of Agriculture, Water and the Environment (Commonwealth) (now DCCEEW)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth) (previously DAWE)
DEH	Department for Environment and Heritage
DEW	Department for Environment and Water
EBS Ecology	Environmental and Biodiversity Services Pty Ltd, trading as EBS Ecology
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ha	hectare(s)
IBRA	Interim Bio-regionalisation of Australia
km(s)	kilometre(s)
LSA Act	*Landscape South Australia Act 2019*
m(s)	metre(s)
MGCP	Mount George Conservation Park
Mount Lofty Estate	Mount Lofty Golf Estate Pty Ltd
MNES	Matters of National Environmental Significance, as defined under the EPBC Act
mm(s)	Millimetre(s)
Native vegetation	A plant or plants of a species indigenous to South Australia (including dead trees >600mm diameter, and planted vegetation protected under the Native Vegetation Act such as SEB's or Heritage Agreements)
NPW Act	*National Parks and Wildlife Act 1972*
NV Act	*Native Vegetation Act 1991*
NV Regs	*Native Vegetation Regulations 2017*
NVC	Native Vegetation Council
PDI Act	*Planning, Development and Infrastructure Act 2016*
PMST	Protected Matters Search Tool
the Project	The proposed redevelopment of the Stirling Golf Course at the Stirling Golf Club consisting of a redeveloped golf course, hotel, hotel pods and associated infrastructure.

the Project Area	Proposed development at the Stirling Golf Club, 35 Golflinks Road, Stirling South Australia 5152
SA	South Australia / South Australian
Search Area	5 km buffer of the Project Area considered in the desktop assessment database searches.
SEB	Significant Environmental Benefit
ssp.	Subspecies
sp.	Species (singular)
SSCC	SA Seed Conservation Centre
STAM	Scattered Tree Assessment Method
TEC	Threatened Ecological Communities
Trice	Trice – Project & Development Managers
TSSC	Threatened Species Scientific Committee
UBS	Unit Biodiversity Score
VA(s)	Vegetation Association(s)
var.	variety
%	Percent

Table of contents

List of Tables

List of Figures

Attachments

Attachment 1 – Preliminary Design Plans of the Project

Attachment 2 – Bushland Assessment Method Scoresheet (A1a)

Attachment 3 – Bushland Assessment Method Scoresheet (A1b)

Attachment 4 – Bushland Assessment Method Scoresheet (A1c)

Attachment 5 – Bushland Assessment Method Scoresheet (A2)

Attachment 6 – Bushland Assessment Method Scoresheet (A3)

Attachment 7 – Scattered Tree Assessment Method Scoresheet

Attachment 8 – Scattered Tree Photo File

Attachment 9 – Design Iterations

Attachment 10 – NVC Correspondence 35m Buffer

1. Application information

Table 1. Application details.

Applicant:	Mount Lofty Estate Pty Ltd		
Key contact:	David Bills, Trice – URPS E: dbills@urps.com.au M: 0404 056 648		
Landowner:	*If the applicant is not the landowner, written permission must be provided*		
Site Address:	Stirling Golf Club, 35 Golflinks Road, Stirling South Australia 5152		
Local Government Area:	Adelaide Hills Council	**Hundred:**	Onkaparinga
Title ID:	CT/5891/805	**Parcel ID**	D59212 A53

Table 2. Summary of the proposed clearance.

Purpose of clearance:	Clearance required for the construction of a new hotel, hotel pods and associated infrastructure.
Native Vegetation Regulation:	Regulation 12, Schedule 1; clause 27, *Impact assessed development*
Description of the vegetation under application:	VA A1a – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey; VA A1b – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey; VA A1c – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over exotic understorey; VA A2 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over *Pultenaea daphnoides*; and VA A3 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* +- *Acacia Melanoxylon* over exotics. A total of 151 scattered trees, including 16 *Acacia melanoxylon* (Blackwood), 52 *Eucalyptus obliqua* (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna Gum), 76 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and six *Exocarpos cupressiformis* (Native Cherry) from poor to excellent in health.
Total proposed clearance – area (ha) and/or number of trees:	A total of 1.716 ha of native vegetation is proposed for clearance, including: 0.261 ha of VA A1a – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey. 1.307 ha of VA A1b – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey; 0.048 ha of VA A1c – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over exotic understorey;

	0.013 ha of VA A2 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over *Pultenaea daphnoides*. 0.087 ha of VA A3 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* +- *Acacia Melanoxylon* over exotics A total of 106 scattered trees are proposed for removal within the Project Area, which includes 10 *Acacia melanoxylon* (Blackwood), 44 *Eucalyptus obliqua* (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna Gum), 48 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and three *Exocarpos cupressiformis* (Native Cherry) from poor to excellent in health.
Level of clearance:	Level 4
Overlay (Planning and Design Code):	Native Vegetation Overlay and State Significant Native Vegetation Overlay
Map of proposed clearance area:	
Mitigation Hierarchy:	**Avoidance** The area in which the 18 pods are proposed to be constructed will impact on several scattered trees and an extensive amount of vegetation association A1b.

	scattered trees are planned for retention in this area and will be avoided. These trees will still be accounted for as a result of applicable CFS Buffers (see Section 5). The proposed new vehicle access in the southern part of the Project Area utilises an existing partially cleared, albeit unofficial walking entrance and avoids better quality vegetation adjacent to this area. The proposed area for the carpark adjacent to the Scent Factory redevelopment also avoids direct impacts to vegetation associations A1b and A3 (see Figure 4) See Section 4.1.5 for photos of the areas proposed for the new vehicle access and car park. **Minimization** The proposed footprint of the main hotel building was selected based on the existing site footprint, minimising additional impact to surrounding vegetation despite the proposed footprint being larger. Efforts to minimise the extent, duration and intensity of impacts on the clearance of native vegetation around the pods has been considered at multiple stages of the planning process. A total of 13 iterations (as of 30/08/2022) have been documented which include a reduction in the number of pods, and relocation of where these pods are proposed to be located. Initial designs included plans for up to 50 pods to be constructed in the northern extent of the Project Area requiring clearance of a substantial amount of native vegetation. Further detail on these iterations is provided in Attachment 9. Where applicable, reasonable and feasible measures to prevent pollution of waterways and drainage lines in the area downstream of the proposed works during and post construction will be implemented. Installation of exclusion fencing and signage to delineate the limits of clearing and vegetation to be retained will be installed in order to minimise disturbance in the Project Area. Furthermore, clearing of vegetation, including the clearing of native vegetation and fauna habitat, will be minimised to the greatest extent practicable through the selection of plant (machinery) that will avoid impact on retained trees. **Rehabilitation or restoration** The rehabilitation or restoration of some areas that are impacted by the clearance of native vegetation will be achieved through revegetation, with a preference for species local to the Adelaide Hills. Some areas will not be able to be rehabilitated due to CFS constraints and the need to maintain specific bushfire attack level ratings.
SEB Offset proposal	Payment of **$615,436.80** which includes a **$32,084.39** administration fee into the NV fund.

2. Purpose of clearance

2.1. Description

Trice – Project & Development Managers (Trice) on behalf of Mount Lofty Estate Pty Ltd (Mount Lofty Estate) have engaged EBS Ecology (EBS) to undertake a native vegetation clearance assessment for the clearance associated with the proposed redevelopment of the Stirling Golf Course at the Stirling Golf Club, consisting of a redeveloped golf course, hotel, hotel pods and associated infrastructure (The Project), located in Stirling, South Australia (SA).

Objectives

The objectives of the native vegetation assessment were to:

- Undertake a desktop assessment of the likelihood of occurrence and status of threatened flora and fauna protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and State *National Parks and Wildlife Act 1972* (NPW Act);
- Assess native vegetation within the Project Area for clearance using the Native Vegetation Council (NVC) endorsed Bushland Assessment Method (BAM) and Scattered Tree Assessment Method (STAM); and
- Calculate the Significant Environmental Benefit (SEB) offset requirements based on the impact footprint.

2.2. Background

Current and surrounding land use

The Project Area is located at the Stirling Golf Club at 35 Golflinks Road, Stirling, which is located approximately 2.5 kilometres (km) northwest of Bridgewater and 15 km south east of Adelaide (Figure 1). The area is adjacent to Mount George Conservation Park (MGCP). Cox Creek runs through the Project Area from the adjacent MGCP. There are also three artificially constructed lakes or dams to the north of the Stirling Golf Club clubhouse and in the northern section of the Project Area (see Figure 1 pg. 11).

Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation (including exotic vegetation associated with the golf course) within the Project Area. Five vegetation associations (VAs) were recorded within the Project Area. The understorey in these associations was heavily degraded and introduced flora species such as *Fumaria capreolata* (White-flower Fumitory), *Iris* sp. (Iris) and *Rubus fruticosus aggregate* (Blackberry) were dominant in areas.

A total of 151 native scattered trees were also recorded within the Project Area. All trees were of a mature age and ranged from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species.

Administrative boundaries

This Project is located within the Adelaide Hills Council Local Government Area and the Hills and Fleurieu Landscape Management Region (DEW 2022a).

Bioregions

The Interim Biogeographical Regionalisation of Australia (IBRA) identifies geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. The Project Area occurs in the Mount Lofty Ranges subregion of the Flinders Lofty Block Bioregion. At a local scale, the IBRA subregions are further categorised by Environmental Associations and the Project Area falls within the Uraidla Environmental Association.

Approximately 15% (46,342 ha) of the Mount Lofty Ranges IBRA Subregion and approximately 26% (3,674 ha) of the Uraidla IBRA Environmental Association is mapped as remnant vegetation. Of this, 27% (12,706 ha) and 20% (749 ha) is formerly conserved and protected, respectively (DCCEEW 2022a).

2.3. General location map

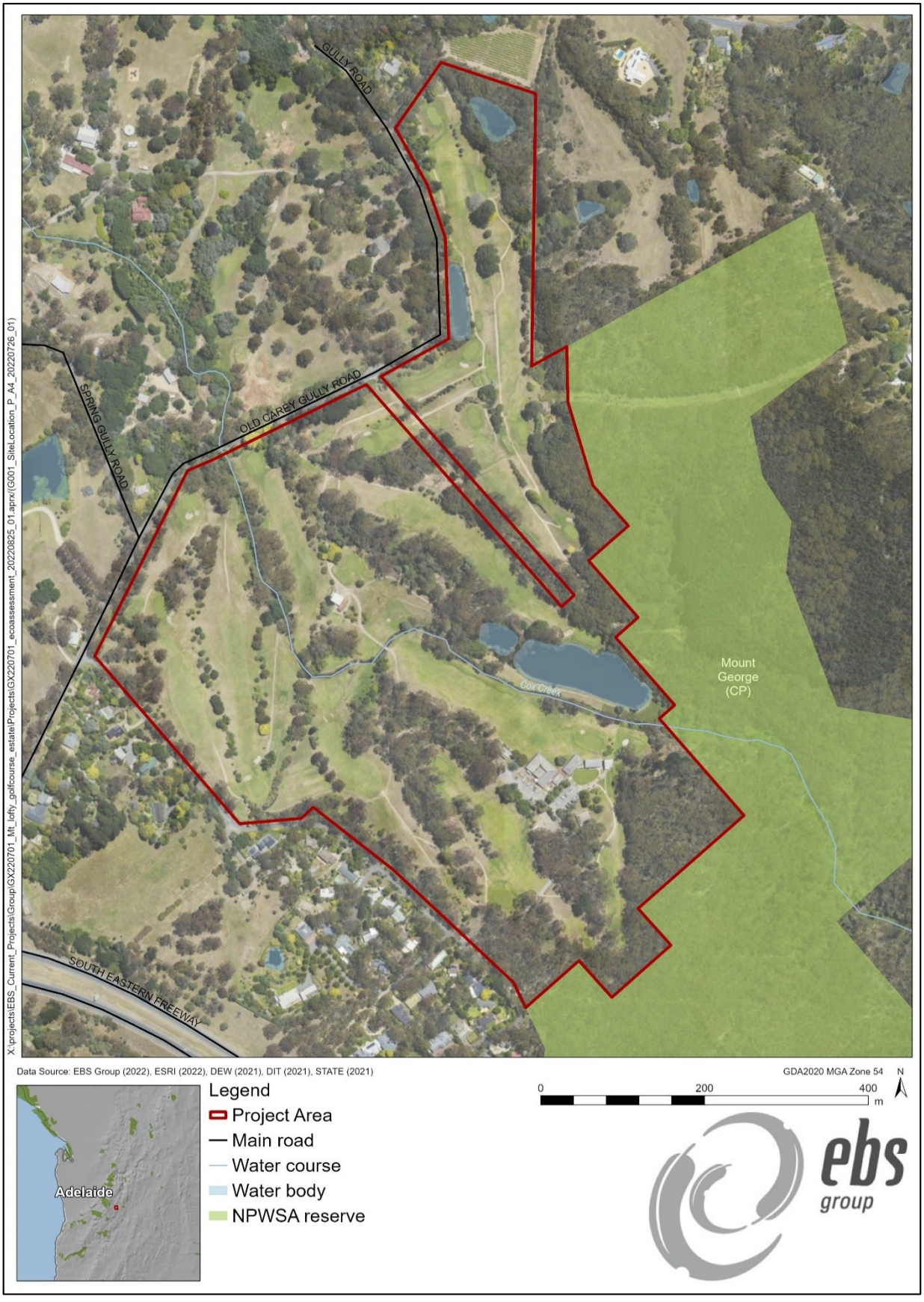

Figure 1. The Project Area at the Stirling Golf Club.

2.4. Details of the proposal

A clearance report is required for the proposed redevelopment of the Stirling Golf Course at the Stirling Golf Club.

The proposed Mount Lofty Golf Estate's new development is summarised as follows:

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites.
  - 15 x two bedroom serviced apartments.
  - 15 x three bedroom serviced apartments.
  - 2 penthouse serviced apartments.
  - Back of house, plant storage and maintenance areas.
  - A 537m^2 function room.
  - A 212m^2 restaurant with 89 m^2 external terrace.
  - 186m^2 sports bar.
  - A 189m^2 gallery and cafe.
  - A 94m^2 wellness centre with 125m^2 gym and spa/massage treatment rooms.
- Private retreats – 'Pods'
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
  - Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
  - Extension to the Perfumery to include a covered outdoor dining area.
  - Orchard and perfumery garden plantings to reimagine the former use of the building as a "Scent Factory".
  - Note: the perfumery building will temporarily house the golf club whilst construction is occurring.
- Golf Course Facilities Building - 2-5 level building comprising:
  - Retention of 18-hole golf course with improvements.
  - Refurbished function facilities, cart storage and 138m^2 clubhouse in new building.
  - New 97m^2 pro-shop, administration areas, gym and change rooms.
- Car Parking, Access and Waste Management
  - A total of 200 car parking spaces in two car parking areas.
  - Emergency vehicle access via western entry from Golflinks Road.
  - Main access point via Golflinks Road.
  - Designated service bay for waste collection and service vehicles.
  - Porte cochere and valet area for guests and buses.

  - A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.
  - Designated waste storage areas.
- Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m^2 together with a right of way 'A', comprising the hotel building and pods.
  - Allotment 533, with an approximate area of 5,056m^2 together with a right of way 'B', comprising the golf club and facilities building.
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

The proponents additionally intend to rebrand the development as the Mount Lofty Golf Estate which was the original name of the course when it opened in 1925. The aim of the development will be to improve access to tourists and capitalise on the growing tourism market.

The development has been declared a major project by the Minister for Planning and Local Government (the South Australian Government Gazette 2020, p. 5848) and will be assessed by a state-run process. At the time of preparing this report, the development design has not been finalised and layout will be guided by the reports of numerous specialists. Preliminary design drawings of the Project Area (as provided to EBS on 07/03/2023) are provided in Attachment 1.

2.5. Approvals <u>required</u> *or* <u>obtained</u>

- *Environment Protection and Biodiversity Conservation Act 1999* – Not required.
- *Native Vegetation Act 1991* – this data report.
- *National Parks and Wildlife Act 1972* – EBS has the required flora collection permit (K25613-22).
- *Landscape South Australia Act 2019* – A Water Affecting Activity Permit is not required for this Project; A permit to transport declared weeds on a public road may be required for this Project.
- *Planning, Development and Infrastructure Act 2016* – Approval is required for this Project.
- *Aboriginal Heritage Act 1988* – Approval will be required if any sites, objects or remains are uncovered during the works.

2.6. Native Vegetation Regulation

The Project is in accordance with Division 5 of the *Native Vegetation Regulations 2017*, which allows for the clearance of native vegetation in relation to specific activities as set out in Schedule 1, Parts 4, 5 or 6 of the Regulations. The Project is considered to be permitted under the following regulation:

Regulation 12(27) — Impact assessed development

(1) Clearance of vegetation that is incidental to a proposed development to which section 115 of the *Planning, Development and Infrastructure Act 2016* applies, provided that—

(a) an environmental impact statement and an Assessment Report relating to the development have been prepared under the *Planning, Development and Infrastructure Act 2016*; and

(b) the Minister responsible for the administration of the *Planning, Development and Infrastructure Act 2016* referred the environmental impact statement to the Council for comment and report and—

(i) the Council provided comments that were included (wholly or substantially) in the relevant Assessment Report; or

(ii) the Council failed to provide comments within 30 business days after receiving the Minister's invitation for comment and report; and

(c) the Minister has granted a development authorisation for the proposed development under section 115 of the *Planning, Development and Infrastructure Act 2016*.

2.7. Development Application information

The Project falls within the Recreation – Rec Zone and both the Native Vegetation and State Significant Native Vegetation Overlays apply.

3. Method

3.1. Desktop assessment

A desktop assessment was undertaken to determine the potential for any threatened fauna species, and Threatened Ecological Communities (TECs) (both Commonwealth and State listed) to occur within the Project Area. This was achieved by undertaking database searches using a 5 km buffer of the Project Area (Search Area).

3.1.1. PMST report

A Protected Matters Search Tool (PMST) report was generated on 30/03/2023 to identify nationally threatened flora and fauna, migratory fauna and TECs under the EPBC Act relevant to the Project Area (DCCEEW 2023). Only species and TECs identified in the PMST report that are likely or known to occur within the Search Area were assessed for their likelihood of occurrence within the Project Area. Marine species were removed from this list as the vegetation under assessment is terrestrial.

3.1.2. BDBSA data extract

A Biological Databases of South Australia (BDBSA) search was obtained from the Department for Environment and Water (DEW) to identify flora and fauna species that have been recorded within 5 km of the Project Area (data extracted 16/08/2022; DEW 2022b, Recordset number: DEWNRBDBSA220816-1). The BDBSA is comprised of an integrated collection of species records from the South Australian Museum, conservation organisations, private consultancies, Birds SA, Birdlife Australia and the Australasian Wader Study Group, which meet DEW's standards for data quality, integrity and maintenance. Only species with records since 1995 and a spatial reliability of less than 1 km were assessed for their likelihood of occurrence.

3.1.3. Likelihood of occurrence

The criteria for the likelihood of occurrence of threatened species within the Project Area are described in Table 3.

Table 3. Criteria for the likelihood of occurrence of threatened species within the Project Area.

Likelihood	Criteria
Highly Likely/Known	Recorded in the last 10 years, the species does not have highly specific niche requirements, the habitat is present and falls within the known range of the species distribution or; The species was recorded as part of field surveys.
Likely	Recorded within the previous 20 years, the area falls within the known distribution of the species and the area provides habitat or feeding resources for the species.
Possible	Recorded within the previous 20 years, the area falls inside the known distribution of the species, but the area provide limited habitat or feeding resources for the species. Recorded within 20 -40 years, survey effort is considered adequate, habitat and feeding resources present, and species of similar habitat needs have been recorded in the area.
Unlikely	Recorded within the previous 20 years, but the area provide no habitat or feeding resources for the species, including perching, roosting or nesting opportunities, corridor for movement or shelter. Recorded within 20 -40 years; however, suitable habitat does not occur, and species of similar habitat requirements have not been recorded in the area. No records despite adequate survey effort.

3.2. Field assessment

The initial field assessment was undertaken by NVC Accredited Consultant J. Skewes and N. Piscioneri on 26 August 2022. An additional field assessment was undertaken on 30 September 2022. Both field assessments were undertaken on foot and were in accordance with the Bushland Assessment Method (BAM) (NVC 2020a) and Scattered Tree Assessment Method (STAM) (NVC, 2020b). Each tree was identified to species, photographed, measured at 1 m for diameter, height, dieback and the number and size of hollows were recorded. Species lists of both native and exotic understorey species were compiled.

3.2.1. Bushland Assessment Method

The BAM is derived from the Nature Conservation Society of South Australia's Bushland Condition Monitoring methodology (Croft *et al.* 2008). The BAM used to assess areas of native vegetation requiring clearance and calculate the SEB requirements.

Details of site selection/stratification and assessment protocols, and the biodiversity value components assessed and the factors that influence these components are outlined in the *Bushland Assessment Manual* (NVC 2020a).

The Conservation Significance Scores were calculated from direct observations of flora and direct and historical observations of fauna species of conservation significance. All fauna identified as known to occur in the PMST, and fauna with BDBSA records since 1995 and with a spatial reliability of less than 1 km, within 5 km of the Project Area, were included in the BAM scoresheets. Species determined as unlikely to occur within the Project Area will be removed by the Native Vegetation Branch if the finding is supported. Marine and/or wetland species were omitted from the scoresheets given the Project Area is terrestrial.

3.2.2. Scattered Tree Assessment Method

The STAM is derived from the *Scattered Tree Clearance Assessment in South Australia: Streamlining, Guidelines for Assessment and Rural Industry Extension* report (Cutten and Hodder 2002). The STAM is suitable for assessing scattered trees in the following instances:

- Individual scattered trees (i.e. canopy does not overlap). The spatial distribution of trees may vary from approaching what would be considered their original distribution (pre-European) through to single isolated trees in the middle of a paddock; or
- Dead trees (when a dead tree is considered native vegetation); or
- Clumps of trees (contiguous overlapping canopies) if the clump is small (approximately <0.1 ha); and
- For both scattered trees and clumps:
    - The ground layer comprises wholly or largely of introduced species;
    - Some scattered colonising native species may be present, but represent <5% of the ground cover; and
    - The area around the trees consists of introduced pasture or crops.

Details of the scattered tree Point Scoring System are outlined in the *Scattered Tree Assessment Manual* (NVC 2020b).

The numbers of uncommon and threatened scattered tree using fauna species entered into the Scattered Tree Scoresheet were calculated by cross-referring the BDBSA data extract (see Section 3.1.2) and the lists of scattered tree using fauna in the *Scattered Tree Assessment Manual* (NVC 2020b). The resource use of each species identified was considered when determining each tree's suitability for threatened fauna species (e.g. species that only use hollows in scattered trees were only assigned to scattered trees containing hollows).

3.2.3. Field survey

Fauna surveys were conducted in conjunction with the flora assessments along the site. All native and exotic fauna species opportunistically encountered (directly observed, or tracks, scats, burrows, nests and other signs of presence) during the native vegetation assessment were recorded. Potential fauna refuge sites, such as hollows, were noted as an indication of availability of suitable habitat. Particular attention was paid to identifying habitat for threatened species. For each opportunistic fauna observation, the species, number of individuals, GPS location, detection methodology (sight, sound or sign) and habitat were recorded.

3.3. Limitations

3.3.1. Desktop assessment

The desktop assessment was based on existing datasets and references from a range of sources. EBS has not attempted to verify the accuracy of any such information. The findings and conclusions expressed by EBS are based solely upon information in existence at the time of the assessment.

Flora and fauna records were sourced from the PMST and BDBSA. The BDBSA only includes verified flora and fauna records submitted to DEW or partner organisations. It is recognised that knowledge is poorly captured, and it is possible that significant species occur that are not reflected by database records. Although much of the BDBSA data has been through a variety of validation processes, the lists may contain errors and should be used with caution. DEW give no warranty that the data is accurate or fit for any particular purpose of the user or any person to whom the user discloses the information.

The EPBC Act protected matters report and BDBSA flora and fauna records were limited to a 5 km buffer around the Project Area. Fauna species, in particular birds can traverse distances in excess of 20 km. It is also acknowledged that the presence of species may not be adequately represented by database records. Hence the EPBC and BDBSA results may not highlight all potential threatened flora and fauna species that may occur in the area, within a 5 km radius. A precautionary approach has therefore been adopted, with reference to existing EPBC and BDBSA records and native vegetation cover. The combination of database records and background research have provided a solid baseline foundation for determining the flora and fauna that are likely to, or are known to, occur within the Project Area.

3.3.2. Flora

The ecological assessment was conducted just before spring. Threatened orchid species and numerous forbs, herbs and grasses are only just beginning to flower at this time of year, and therefore it is possible that species were present that were undetectable at the time of the field survey.

4. Assessment outcomes

4.1. Vegetation assessment

4.1.1. General description of the vegetation, the site and matters of significance

Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation (including exotic vegetation associated with the golf course) within the Project Area. The understorey in areas of native vegetation not directly associated with the golf course were heavily degraded and introduced flora species such as *Fumaria capreolata* (White-flower Fumitory), *Iris* sp. (Iris) and *Rubus fruticosus aggregate* (Blackberry) were dominant in these areas. MGCP is directly adjacent (to the east and southeast) of the Project Area (see Figure 1, pg. 14) and supports a large assemblage of both nationally and State listed flora and fauna (DEH 2006). Five VAs were recorded within the Project Area:

- VA A1a – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey;
- VA A1b – Eucalyptus viminalis ssp. viminalis and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey;
- VA A1c – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over exotic understorey;
- VA A2 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over *Pultenaea daphnoides*; and
- VA A3 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* +- *Acacia Melanoxylon* over exotics.

A map of the VAs within the Project Area is provided in Figure 2 (on page 23). Any fairways and greens associated with the golf course are classified as exotic vegetation but are not mapped.

A total of 151 scattered trees, including 16 *Acacia melanoxylon* (Blackwood), 52 *Eucalyptus obliqua* (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna Gum), 76 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and six *Exocarpos cupressiformis* (Native Cherry) were recorded within the Project Area.

A map of all scattered trees recorded in the Project Area is provided in Figure 3 (on page 24). All trees were categorised based on their Unit Biodiversity Score (UBS). A tree with a UBS of less than 4 was categorised as low in quality and should be retained as much as possible but may be removed. A tree with a UBS between 4 and 7 was categorised as moderate in quality and should be retained where possible and a tree with a UBS of greater than 7 was categorised as high in quality and should be avoided. All trees were of a mature age and ranged from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species.

No flora species listed under the EPBC Act were recorded within the Project Area.

One flora species listed under the NPW Act as Rare was recorded in the Project Area:

- *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum).

This species was present in large numbers throughout the Project Area in remnant patches of native vegetation and as scattered trees.

A total of 89 flora species, including 41 introduced species were recorded within the Project Area. Timing of the survey likely influenced this result, with spring annual forbs and grasses only just beginning to flower or appear. Flora species recorded during the survey are provided in Appendix 1.

No fauna species listed under the EPBC Act were recorded within the Project Area.

Two fauna species listed under the NPW Act were recorded in the Project Area:

- Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare; and
- Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable.

The scat of the Common Brushtail Possum was observed in VA A1a directly adjacent to the main building of the Golf Club.

Four Yellow-tailed Black Cockatoo were observed flying over the Project Area and later perched in native vegetation within VA A1a.

A total of 26 fauna species were recorded within the Project Area, 23 were birds and three were mammals. Two of these species are introduced fauna. Fauna species observed during the survey are provided in Appendix 2.

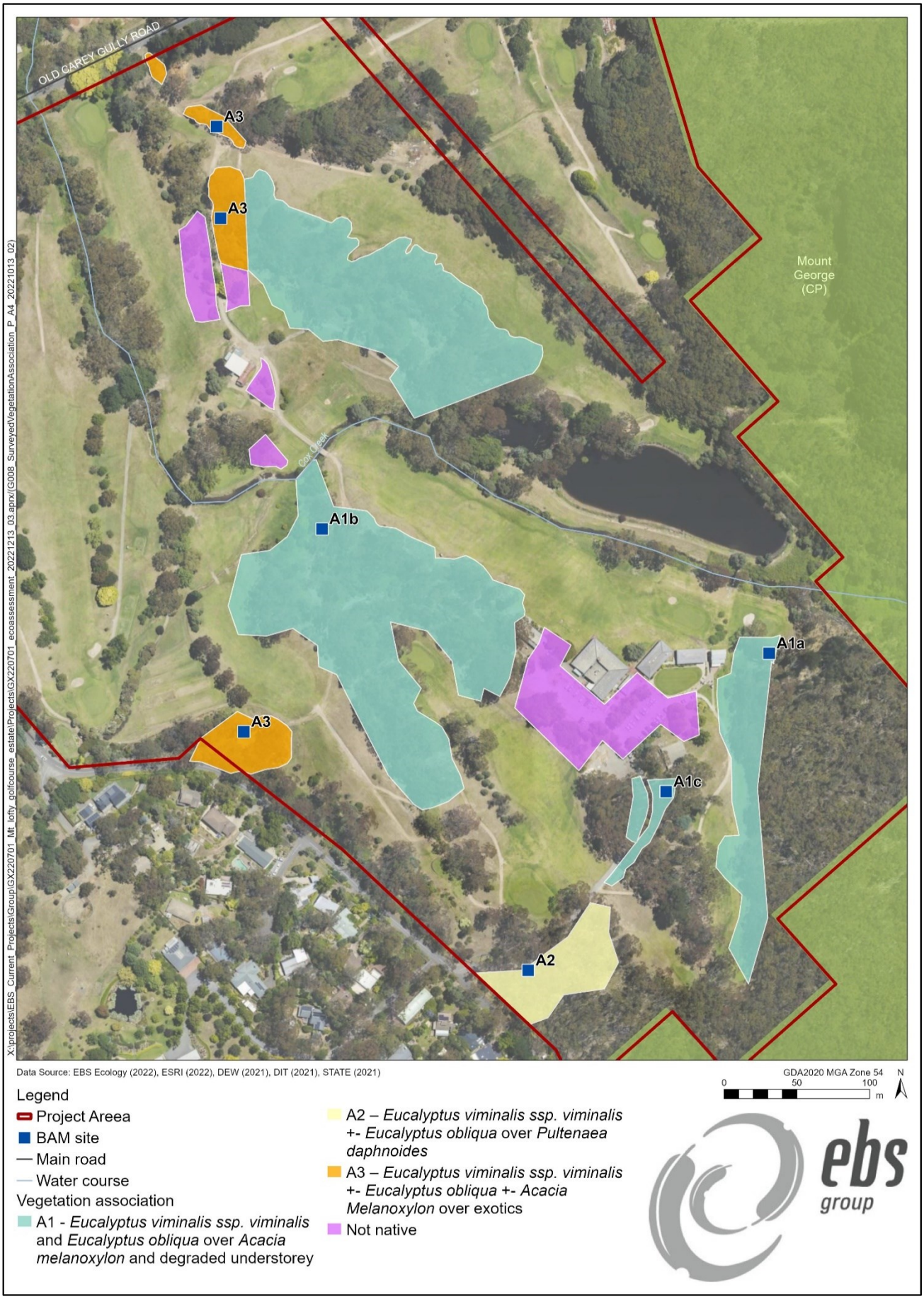

Figure 2. VAs and non-native vegetation recorded within the Project Area. Any fairways and greens associated with the golf course are classified as exotic vegetation but are not mapped.

Figure 3. Scattered trees recorded within the Project Area, categorised according to Unit Biodiversity Score (UBS).

4.1.2. Details of the vegetation associations proposed to be impacted

All five VAs within the Project Area are proposed to be impacted:

- VA A1a – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey (Table 4);
- VA A1b – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey (Table 5);
- VA A1c – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over exotic understorey (Table 6);
- VA A2 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over *Pultenaea daphnoides* (Table 7); and
- VA A3 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* +- *Acacia Melanoxylon* over exotics (Table 8).

The five impacted VAs in the Project Area are detailed in Table 4 to Table 8.

Table 4. Summary of VA A1a.

Vegetation Association	A1a – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon*
 Photo direction and location: south (easting: 294303, northing: 6125455)	
General description	Woodland dominated by an overstorey of *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and *Eucalyptus obliqua* (Messmate Stringybark). Mid storey species include *Acacia melanoxylon* (Blackwood) and *Leptospermum continentale* (prickly Tea-tree). The ground cover was dominated by *Acrotriche serrulata* (Cushion Ground-berry) and *Lepidosperma semiteres* (Wire Rapier-sedge). Vegetation was in very good condition with some weed incursions particularly on the edge of the VA closest to the golf course fairway. Weed species that were dominant include *Iris* sp. (Iris), *Rubus fruticosus aggregate* (Blackberry) and *Cytisus scoparius* (English Broom).
Threatened species or community	No EPBC Act flora species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat. The following flora species listed under the NPW Act were determined as likely to occur in the Project Area: • *Acacia gunnii* (Ploughshare Wattle) – State Rare; • *Deyeuxia densa* (Heath Bent-grass) – State Rare; • *Deyeuxia minor* (Small Bent-grass) – State Vulnerable; • *Dianella longifolia* var. *grandis* (Pale Flax-lily) – State Rare; • *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) – State Rare and observed within the Project Area; • *Gastrodia sesamoides* (Potato Orchid) – State Rare;

	• *Rytidosperma tenuius* (Short-awn Wallaby-grass) – State Rare. An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat (see Appendix 4). A total of 15 threatened fauna species listed under the EPBC Act and/or NPW Act were assessed as highly likely / known or likely to occur within the Project Area based on survey effort, suitable habitat and recent records: • Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare; • Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare; • Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered; • Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area; • Elegant Parrot (*Neophema elegans elegans*) – State Rare; • Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and • Jacky Winter (*Microeca fascinans fascinans*) – State Rare; • Little Eagle (*Hieraaetus morphnoides*) – State Vulnerable; • Peregrine Falcon (*Falco peregrinus macropus*) – State Rare; • Scarlet Robin (*Petroica boodang boodang*) – State Rare; • Southern Brown Bandicoot (*Isoodon obesulus obesulus*) – nationally Endangered and State Vulnerable. • Square-tailed Kite (*Lophoictinia isura*) – State Endangered; • White-winged Chough (*Corcorax melanorhamphos*) – State Rare; • Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and • Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area. An additional 17 fauna species listed under the EPBC Act and/or NPW Act were assessed as possible to occur within the Project Area based on survey effort, suitable habitat and recent records (see Appendix 6 and Appendix 7).

Landscape context score	1.17	**Vegetation Condition Score**	14.10	**Conservation significance score**	1.10
Unit biodiversity Score	18.15	**Area (ha)**	0.261	**Total biodiversity Score**	4.74

Table 5. Summary of VA A1b.

Vegetation Association	A1b – *Eucalyptus viminalis* ssp. *viminalis* and *Eucalyptus obliqua* over *Acacia melanoxylon* and degraded understorey.
 Photo direction and location: west (easting: 293995, northing: 6125540)	
General description	Woodland dominated by an overstorey of *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and *Eucalyptus obliqua* (Messmate Stringybark). Mid storey species include *Acacia melanoxylon* (Blackwood) and *Pultenaea daphnoides* (Large-leaf Bush Pea). The ground cover was dominated *Pteridium esculentum* ssp. *esculentum* (Bracken Fern) and introduced flora species. Vegetation was in poor to moderate condition with substantial weed incursions. Weed species that were dominant include *Iris* sp. (Iris) *Fumaria capreolata* (White-flower fumitory) and *Rubus fruticosus aggregate* (Blackberry) amongst others.
Threatened species or community	No EPBC Act flora species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat. The following flora species listed under the NPW Act were determined as likely to occur in the Project Area: • *Acacia gunnii* (Ploughshare Wattle) – State Rare; • *Deyeuxia densa* (Heath Bent-grass) – State Rare; • *Deyeuxia minor* (Small Bent-grass) – State Vulnerable; • *Dianella longifolia* var. *grandis* (Pale Flax-lily) – State Rare; • *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) – State Rare and observed within the Project Area; • *Gastrodia sesamoides* (Potato Orchid) – State Rare;

	• *Rytidosperma tenuius* (Short-awn Wallaby-grass) – State Rare. An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat (see Appendix 4). A total of 15 threatened fauna species listed under the EPBC Act and/or NPW Act were assessed as highly likely / known or likely to occur within the Project Area based on survey effort, suitable habitat and recent records: • Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare; • Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare; • Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered; • Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area; • Elegant Parrot (*Neophema elegans elegans*) – State Rare; • Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and • Jacky Winter (*Microeca fascinans fascinans*) – State Rare; • Little Eagle (*Hieraaetus morphnoides*) – State Vulnerable; • Peregrine Falcon (*Falco peregrinus macropus*) – State Rare; • Scarlet Robin (*Petroica boodang boodang*) – State Rare; • Southern Brown Bandicoot (*Isoodon obesulus obesulus*) – nationally Endangered and State Vulnerable. • Square-tailed Kite (*Lophoictinia isura*) – State Endangered; • White-winged Chough (*Corcorax melanorhamphos*) – State Rare; • Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and • Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area. An additional 17 fauna species listed under the EPBC Act and/or NPW Act were assessed as possible to occur within the Project Area based on survey effort, suitable habitat and recent records (see Appendix 6 and Appendix 7).

Landscape context score	1.15	**Vegetation Condition Score**	13.92	**Conservation significance score**	1.10
Unit biodiversity Score	17.61	**Area (ha)**	1.307	**Total biodiversity Score**	23.01

Table 6. Summary of VA A1c.

Vegetation Association	A1c – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over exotic understorey
 Photo direction and location: south (easting: 294232, northing: 6125361)	
General description	Woodland dominated by an overstorey of *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and *Eucalyptus obliqua* (Messmate Stringybark). Mid storey species include *Acacia melanoxylon* (Blackwood) and *Pultenaea daphnoides* (Large-leaf Bush Pea). Vegetation was in poor condition with several weed incursions particularly on the edge of the VA closest to the main driveway. Weed species that were dominant include *Vinca major* (Blue Periwinkle), *Allium triquetrum* (Three-cornered Garlic) and *Ulex europaeus* (Gorse) amongst others.
Threatened species or community	No EPBC Act flora species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat. The following flora species listed under the NPW Act were determined as likely to occur in the Project Area: • *Acacia gunnii* (Ploughshare Wattle) – State Rare; • *Deyeuxia densa* (Heath Bent-grass) – State Rare; • *Deyeuxia minor* (Small Bent-grass) – State Vulnerable; • *Dianella longifolia* var. *grandis* (Pale Flax-lily) – State Rare; • *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) – State Rare and observed within the Project Area; • *Gastrodia sesamoides* (Potato Orchid) – State Rare;

	• *Rytidosperma tenuius* (Short-awn Wallaby-grass) – State Rare. An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat (see Appendix 4). A total of 15 threatened fauna species listed under the EPBC Act and/or NPW Act were assessed as highly likely / known or likely to occur within the Project Area based on survey effort, suitable habitat and recent records: • Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare; • Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare; • Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered; • Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area; • Elegant Parrot (*Neophema elegans elegans*) – State Rare; • Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and • Jacky Winter (*Microeca fascinans fascinans*) – State Rare; • Little Eagle (*Hieraaetus morphnoides*) – State Vulnerable; • Peregrine Falcon (*Falco peregrinus macropus*) – State Rare; • Scarlet Robin (*Petroica boodang boodang*) – State Rare; • Southern Brown Bandicoot (*Isoodon obesulus obesulus*) – nationally Endangered and State Vulnerable. • Square-tailed Kite (*Lophoictinia isura*) – State Endangered; • White-winged Chough (*Corcorax melanorhamphos*) – State Rare; • Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and • Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area. An additional 17 fauna species listed under the EPBC Act and/or NPW Act were assessed as possible to occur within the Project Area based on survey effort, suitable habitat and recent records (see Appendix 6 and Appendix 7).

Landscape context score	1.18	**Vegetation Condition Score**	11.39	**Conservation significance score**	1.10
Unit biodiversity Score	14.79	**Area (ha)**	0.048	**Total biodiversity Score**	0.71

Table 7. Summary of VA A2.

Vegetation Association	A2 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* over *Pultenaea daphnoides*
 Photo direction and location: southwest (easting: 294138, northing: 6125237)	
General description	Woodland dominated by an overstorey of *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and *Eucalyptus obliqua* (Messmate Stringybark). Mid storey species include *Acacia melanoxylon* (Blackwood) and *Pultenaea daphnoides* (Large-leaf Bush Pea). The ground cover was dominated by *Ixodia achillaeoides* ssp. *alata* (Hills Daisy) and *Lepidosperma semiteres* (Wire Rapier-sedge). Vegetation was in very good condition with some weed incursions particularly on the edge of the VA closest to the main driveway. Weed species that were present include *Allium triquetrum* (Three-cornered Garlic), *Pittosporum undulatum* (Sweet Pittosporum) and *Cytisus scoparius* (English Broom).
Threatened species or community	No EPBC Act flora species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat. The following flora species listed under the NPW Act were determined as likely to occur in the Project Area: • *Acacia gunnii* (Ploughshare Wattle) – State Rare; • *Deyeuxia densa* (Heath Bent-grass) – State Rare; • *Deyeuxia minor* (Small Bent-grass) – State Vulnerable; • *Dianella longifolia* var. *grandis* (Pale Flax-lily) – State Rare; • *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) – State Rare and observed within the Project Area; • *Gastrodia sesamoides* (Potato Orchid) – State Rare; • *Rytidosperma tenuius* (Short-awn Wallaby-grass) – State Rare.

	An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat (see Appendix 4). A total of 15 threatened fauna species listed under the EPBC Act and/or NPW Act were assessed as highly likely / known or likely to occur within the Project Area based on survey effort, suitable habitat and recent records: • Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare; • Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare; • Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered; • Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area; • Elegant Parrot (*Neophema elegans elegans*) – State Rare; • Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and • Jacky Winter (*Microeca fascinans fascinans*) – State Rare; • Little Eagle (*Hieraaetus morphnoides*) – State Vulnerable; • Peregrine Falcon (*Falco peregrinus macropus*) – State Rare; • Scarlet Robin (*Petroica boodang boodang*) – State Rare; • Southern Brown Bandicoot (*Isoodon obesulus obesulus*) – nationally Endangered and State Vulnerable. • Square-tailed Kite (*Lophoictinia isura*) – State Endangered; • White-winged Chough (*Corcorax melanorhamphos*) – State Rare; • Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and • Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area. An additional 17 fauna species listed under the EPBC Act and/or NPW Act were assessed as possible to occur within the Project Area based on survey effort, suitable habitat and recent records (see Appendix 6 and Appendix 7).

Landscape context score	1.18	**Vegetation Condition Score**	25.73	**Conservation significance score**	1.10
Unit biodiversity Score	33.39	**Area (ha)**	0.013	**Total biodiversity Score**	0.44

Table 8. Summary of VA A3.

Vegetation Association	A3 – *Eucalyptus viminalis* ssp. *viminalis* +- *Eucalyptus obliqua* +- *Acacia Melanoxylon over exotics.*
 Photo direction and location: southwest (easting: 293942, northing: 6125402)	
General description	Woodland dominated by an overstorey of *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and *Eucalyptus obliqua* (Messmate Stringybark). Mid storey species include *Acacia melanoxylon* (Blackwood) and *Pteridium esculentum* ssp. *esculentum* (Bracken Fern). Vegetation was in very poor condition with multiple introduced species recorded. Weed species that were dominant include but are not limited to *Allium triquetrum* (Three-cornered Garlic), *Ulex europaeus* (Gorse), *Rubus fruticosus aggregate* (Blackberry) and *Watsonia* sp. (Watsonia).
Threatened species or community	No EPBC Act flora species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat. The following flora species listed under the NPW Act were determined as likely to occur in the Project Area: • *Acacia gunnii* (Ploughshare Wattle) – State Rare; • *Deyeuxia densa* (Heath Bent-grass) – State Rare; • *Deyeuxia minor* (Small Bent-grass) – State Vulnerable; • *Dianella longifolia* var. *grandis* (Pale Flax-lily) – State Rare; • *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) – State Rare and observed within the Project Area; • *Gastrodia sesamoides* (Potato Orchid) – State Rare; • *Rytidosperma tenuius* (Short-awn Wallaby-grass) – State Rare.

	An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat (see Appendix 4). A total of 15 threatened fauna species listed under the EPBC Act and/or NPW Act were assessed as highly likely / known or likely to occur within the Project Area based on survey effort, suitable habitat and recent records: • Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare; • Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare; • Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered; • Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area; • Elegant Parrot (*Neophema elegans elegans*) – State Rare; • Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and • Jacky Winter (*Microeca fascinans fascinans*) – State Rare; • Little Eagle (*Hieraaetus morphnoides*) – State Vulnerable; • Peregrine Falcon (*Falco peregrinus macropus*) – State Rare; • Scarlet Robin (*Petroica boodang boodang*) – State Rare; • Southern Brown Bandicoot (*Isoodon obesulus obesulus*) – nationally Endangered and State Vulnerable. • Square-tailed Kite (*Lophoictinia isura*) – State Endangered; • White-winged Chough (*Corcorax melanorhamphos*) – State Rare; • Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and • Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area. An additional 17 fauna species listed under the EPBC Act and/or NPW Act were assessed as possible to occur within the Project Area based on survey effort, suitable habitat and recent records (see Appendix 6 and Appendix 7).

Landscape context score	1.18	**Vegetation Condition Score**	1.38	**Conservation significance score**	1.10
Unit biodiversity Score	1.79	**Area (ha)**	0.087	**Total biodiversity Score**	0.16

Bushland Assessment Method Scoresheets for all VAs are provided in Attachment 2 to Attachment 6.

4.1.3. Details of the scattered trees proposed to be impacted

A total of 106 scattered trees are proposed for removal within the Project Area, which includes 10 *Acacia melanoxylon* (Blackwood), 44 *Eucalyptus obliqua* (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna Gum), 48 State Rare *Eucalyptus viminalis ssp. viminalis* (Manna Gum) and three *Exocarpos cupressiformis* (Native Cherry) from poor to excellent in health. (Table 9).

Further detail on scattered trees is provided in the Scattered Tree Assessment scoresheet (Attachment 7).

Scattered tree using fauna species in the Project Area are provided in Appendix 3.

Photographs of scattered trees are provided in the Scattered Tree Photo File (Attachment 8).

Table 9. Details of the 106 scattered trees proposed to be impacted.

Tree or Cluster ID	Tree species	# Trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Fauna Habitat Score
6	*Eucalyptus viminalis* ssp. *viminalis*	2	20.0	0	50.5	0	3.67	1.8
7	*Eucalyptus obliqua*	1	12.5	0	37	10	1.23	1.8
8	*Acacia melanoxylon*	1	9.0	1 medium	44	10	2.54	1.8
9	*Eucalyptus viminalis* ssp. *viminalis*	1	23.0	1 small	148	10	8.58	1.8
10	*Eucalyptus obliqua*	1	16.0	1 small	89	15	4.35	1.8
11	*Eucalyptus obliqua*	1	8.0	0	24	20	0.42	1.8
12	*Eucalyptus viminalis* ssp. *viminalis*	1	17.0	0	60	40	2.13	1.8
13	*Eucalyptus viminalis* ssp. *viminalis*	1	25.0	1 small 1 medium	111	15	8.71	1.8
14	*Eucalyptus viminalis* ssp. *viminalis*	1	24.0	0	93	25	5.95	1.8
15	*Eucalyptus obliqua*	1	11.0	1 small	96	40	2.42	1.8
16	*Eucalyptus viminalis* ssp. *viminalis*	1	18.0	0	71	5	3.91	1.8
17	*Eucalyptus viminalis* ssp. *viminalis*	1	16.0	0	45	5	2.27	1.8
18	*Eucalyptus viminalis* ssp. *viminalis*	1	16.0	0	62.5	15	2.50	1.8
19	*Eucalyptus viminalis* ssp. *viminalis*	1	17.0	2 small 2 medium	112	5	7.03	1.8
20	*Eucalyptus obliqua*	1	14.0	0	49	80	0.59	1.8
21	*Eucalyptus obliqua*	1	14.0	0	110	75	2.02	1.8

Tree or Cluster ID	Tree species	# Trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Fauna Habitat Score
22	*Eucalyptus obliqua*	1	12.0	0	53	80	0.54	1.8
23	*Eucalyptus obliqua*	1	13.0	0	54	15	1.99	1.8
24	*Eucalyptus viminalis* ssp. *viminalis*	1	26.0	1 small 3 medium 1 large	160	3	11.25	1.8
26	*Eucalyptus viminalis* ssp. *viminalis*	1	11.0	0	97	85	1.13	1.8
27	*Eucalyptus viminalis* ssp. *viminalis*	1	10.0	0	70	10	2.12	1.8
28	*Eucalyptus viminalis* ssp. *viminalis*	1	23.0	1 medium	164	10	9.08	1.8
29	*Eucalyptus viminalis* ssp. *viminalis*	1	20.0	1 small	99	20	6.09	1.8
30	*Eucalyptus viminalis* ssp. *viminalis*	1	20.0	1 small	120.5	10	7.01	1.8
31	*Eucalyptus viminalis* ssp. *viminalis*	1	13.0	1 large	70	75	2.03	1.8
32	*Eucalyptus viminalis* ssp. *viminalis*	1	16.0	0	86	25	3.51	1.8
33	*Eucalyptus viminalis* ssp. *viminalis*	1	17.0	1 medium	91	20	4.39	1.8
34	*Eucalyptus viminalis* ssp. *viminalis*	1	24.0	1 small	98	20	7.01	1.8
35	*Eucalyptus viminalis* ssp. *viminalis*	1	14.0	1 large	75	20	4.05	1.8
36	*Eucalyptus viminalis* ssp. *viminalis*	1	18.0	0	112	15	4.53	1.8
37	*Eucalyptus viminalis* ssp. *viminalis*	1	18.0	2 small	106	20	4.84	1.8
41	*Eucalyptus viminalis* ssp. *viminalis*	1	21.0	0	96	3	6.14	1.8
42	*Eucalyptus viminalis* ssp. *viminalis*	1	18.0	0	76.5	3	4.15	1.8
43	*Eucalyptus obliqua*	1	16.0	0	72	5	3.66	1.8
44	*Eucalyptus viminalis* ssp. *viminalis*	1	12.0	0	45	5	1.42	1.8
45	*Eucalyptus viminalis* ssp. *viminalis*	1	14.0	0	58	0	2.43	1.8
46	*Eucalyptus obliqua*	1	17.0	0	53	10	2.50	1.8

Tree or Cluster ID	Tree species	# Trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Fauna Habitat Score
47	*Eucalyptus viminalis* ssp. *viminalis*	1	17.0	0	89	3	4.27	1.8
48	*Eucalyptus obliqua*	1	16.0	0	55	5	2.51	1.8
49	*Eucalyptus obliqua*	1	15.0	0	60	5	2.51	1.8
50	*Eucalyptus obliqua*	1	20.0	4 small	101	10	6.66	1.8
51	*Acacia melanoxylon*	1	13.0	0	44	3	4.07	1.8
52	*Eucalyptus obliqua*	1	16.0	1 small	90.5	10	4.51	1.8
53	*Eucalyptus viminalis* ssp. *viminalis*	1	23.0	1 small 1 medium	140	3	9.60	1.8
54	*Eucalyptus viminalis* ssp. *viminalis*	1	19.0	0	95	5	4.67	1.8
55	*Eucalyptus obliqua*	1	16.0	0	62	10	2.59	1.8
56	*Eucalyptus obliqua*	1	18.0	0	87	3	4.47	1.8
57	*Eucalyptus obliqua*	1	12.0	0	76	15	2.35	1.8
58	*Eucalyptus viminalis* ssp. *viminalis*	1	25.0	0	116	3	7.63	1.8
59	*Eucalyptus obliqua*	1	17.0	0	69	10	3.61	1.8
60	*Eucalyptus viminalis* ssp. *viminalis*	1	20.0	1 small 1 medium	90	10	7.00	1.8
61	*Eucalyptus viminalis* ssp. *viminalis*	1	17.0	1 small	70	3	4.29	1.8
62	*Eucalyptus viminalis* ssp. *viminalis*	1	13.0	0	69	65	1.19	1.8
63	*Eucalyptus obliqua*	1	12.0	0	57	90	0.52	1.8
64	*Eucalyptus obliqua*	1	21.0	0	48	75	1.36	1.8
65	*Eucalyptus viminalis* ssp. *viminalis*	1	24.0	0	57	35	3.64	1.8
66	*Eucalyptus viminalis* ssp. *viminalis*	1	17.0	2 small	56	10	3.64	1.8
67	*Eucalyptus obliqua*	1	20.0	0	53	15	3.48	1.8
68	*Eucalyptus viminalis* ssp. *viminalis*	1	15.0	0	60	10	2.42	1.8
69	*Eucalyptus obliqua*	1	15.0	0	51	40	1.33	1.8
70	*Eucalyptus obliqua*	1	16.0	0	60	3	3.34	1.8
71	*Exocarpos cupressiformis*	1	6.0	0	9	0	1.11	1.8

Tree or Cluster ID	Tree species	# Trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Fauna Habitat Score
72	*Exocarpos cupressiformis*	1	6.5	0	19	0	2.00	1.8
73	*Exocarpos cupressiformis*	1	8.0	0	11	0	1.93	1.8
74	*Eucalyptus obliqua*	1	18.0	1 small	74	10	4.48	1.8
75	*Eucalyptus obliqua*	1	18.0	0	69	30	3.31	1.8
76	*Eucalyptus obliqua*	1	18.5	0	64	5	3.83	1.8
77	*Eucalyptus obliqua*	1	16.0	0	49	60	1.18	1.8
78	*Eucalyptus obliqua*	1	16.5	1 small	71	5	4.23	1.8
79	*Acacia melanoxylon*	1	9.0	0	20	20	0.96	1.8
80	*Acacia melanoxylon*	6	5.0	0	6	0	0.33	1.8
81	*Eucalyptus obliqua*	1	17.0	0	66	5	3.64	1.8
82	*Eucalyptus obliqua*	1	18.0	0	113	40	3.95	1.8
83	*Eucalyptus obliqua*	1	19.0	2 small	105	10	6.49	1.8
84	*Eucalyptus obliqua*	1	19.0	1 small	97	20	5.93	1.8
85	*Eucalyptus obliqua*	1	19.5	1 small	117	20	6.55	1.8
86	*Eucalyptus obliqua*	1	17.0	1 small	52.5	10	3.57	1.8
87	*Eucalyptus viminalis* ssp. *viminalis*	1	20.0	1 small	94	10	6.33	1.8
88	*Eucalyptus viminalis* ssp. *viminalis*	1	19.0	0	50	15	2.53	1.8
89	*Eucalyptus obliqua*	1	19.5	0	67	20	3.73	1.8
96	*Eucalyptus viminalis* ssp. *viminalis*	1	20.5	2 small 1 medium	115	20	7.39	1.8
100	*Eucalyptus viminalis* ssp. *viminalis*	1	13.5	0	29.5	10	1.11	1.8
104	*Eucalyptus viminalis* ssp. *viminalis*	1	18	1 small	73	10	4.38	1.8
105	*Eucalyptus viminalis* ssp. *viminalis*	1	20	2 small 1 medium	144	15	8.30	1.8
120	*Eucalyptus obliqua*	1	17.0	1 small	84.5	15	4.45	1.8
121	*Eucalyptus obliqua*	1	16.0	1 small	81	5	4.47	1.8
122	*Eucalyptus viminalis* ssp. *viminalis*	1	22.0	2 small	166	5	9.08	1.8
123	*Eucalyptus viminalis* ssp. *viminalis*	1	23.0	3 small	143	15	8.21	1.8

Tree or Cluster ID	Tree species	# Trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Fauna Habitat Score
124	*Acacia melanoxylon*	1	7.0	0	5	0	0.42	1.8
125	*Eucalyptus obliqua*	1	16.0	3 small 1 medium 1 large	123	5	7.12	1.8
126	*Eucalyptus obliqua*	1	18.0	2 small	83.5	20	4.49	1.8
127	*Eucalyptus obliqua*	1	18.5	1 small	82	10	4.84	1.8
131	*Eucalyptus obliqua*	1	16.0	0	74	70	1.41	1.8
132	*Eucalyptus obliqua*	1	17.0	2 medium 1 large	76	40	4.10	1.8
133	*Eucalyptus viminalis* ssp. *viminalis*	1	19.5	2 small 2 medium	95	10	7.01	1.8
134	*Eucalyptus obliqua*	1	18.5	0	106	15	4.59	1.8
135	*Eucalyptus viminalis* ssp. *viminalis*	1	20.0	2 small 3 medium	103	5	7.55	1.8
139	*Eucalyptus obliqua*	1	19.0	3 small	100	5	6.56	1.8
144	*Eucalyptus viminalis* ssp. *cygnetensis*	1	17.0	5 small	110	25	7.31	1.8
145	*Eucalyptus viminalis* ssp. *viminalis*	1	19.5	0	78	5	4.40	1.8

4.1.4. Site map showing areas of proposed impact

A map of the impacted vegetation associations in the Project Area is provided in Figure 4. Any fairways and greens associated with the golf course are classified as exotic vegetation but are not mapped.

A map of the impacted scattered trees in the Project Area is provided in Figure 5. All trees were categorised based on their Unit Biodiversity Score (UBS). For more information on this categorisation see Section 4.1.1.

Any clearance figures presented in Section 5 are calculated by considering a 20 m buffer due to CFS constraints with the exception of a 35m clearance buffer from the eastern most building face.

Figure 4. Vegetation associations impacted within the Project Area.

Figure 5. Scattered trees impacted within the Project Area categorised according to UBS.

4.1.5. Photo log

General photos of the Project Area are provided in Figure 6 to Figure 9.

Figure 6. Non-native vegetation surrounding the Scent factory redevelopment.

Figure 7. Location of the proposed car park to the north of the Scent factory.

Figure 8. The proposed new vehicle access in the southern part of the Project Area that is currently an unofficial walking entrance.

Figure 9. Remnant scattered trees adjacent the main access road in the southeast of the Project Area.

4.2. Threatened species assessment

4.2.1. Matters of National Environmental Significance

The EPBC Act PMST report identified 37 threatened species and 13 migratory species protected under the EPBC Act, which may be relevant to the Project Area. Table 10 summarises the results of the PMST report and the relevant MNES are discussed further below.

The assessment of likelihood of national and state listed threatened flora and fauna (identified by the PMST) to occur in the Project Area is summarised in Table 11 to Table 13.

Note that some of these matters are not impacted by, or relevant to, the Project (e.g., Fish and listed marine species which are afforded specific protection within Commonwealth marine areas), and these matters are therefore not discussed further.

Table 10. Summary of the EPBC Act Protected Matters Search Tool results (5 km buffer).

Matters of National Environment Significance under EPBC Act 1999	Identified within the search area
World Heritage Properties	None
National Heritage Properties	None
Wetlands of International Importance	None
Great Barrier Reef Marine Park	None
Commonwealth Marine Areas	None
Listed Threatened Ecological Communities	None
Listed Threatened Species	37 (18 flora and 19 fauna)
Listed Migratory Species	13

4.2.2. Listed Threatened Ecological Communities (TEC)

No TECs will be impacted by the proposed project as there are no TECs located within 5 kilometres of the Project Area.

4.2.3. Threatened flora

The PMST (DCCEEW 2023) identified 11 flora species listed as threatened under the EPBC Act as known or likely to occur within 5 km of the Project Area (Table 11). None of the species were assessed as potentially occurring within the Project Area based on recent records and suitable habitat. A BDBSA search identified 73 additional State listed flora species, that have records within 5 km of the Project Area, with <1 km reliability (Table 11) (DEW 2022b). A total of seven of the species were assessed as known / highly likely or likely to occur within the Project Area based on survey effort, recent records and suitable habitat:

- *Acacia gunnii* (Ploughshare Wattle) – State Rare;
- *Deyeuxia densa* (Heath Bent-grass) – State Rare;
- *Deyeuxia minor* (Small Bent-grass) – State Vulnerable;
- *Dianella longifolia* var. *grandis* (Pale Flax-lily) – State Rare;

- *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) – State Rare and observed within the Project Area;
- *Gastrodia sesamoides* (Potato Orchid) – State Rare;
- *Rytidosperma tenuius* (Short-awn Wallaby-grass) – State Rare.

An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat.

BDBSA flora records located within 5 km of the Project Area are provided in Appendix 4.

A detailed likelihood assessment of threatened flora species information including distribution and preferred habitat information for the Project Area is provided in Appendix 5.

Table 11. Threatened flora identified by the PMST and/or BDBSA search in the Project Area (green shading = known / highly likely or likely to occur, orange shading = possible to occur) (DCCEEW 2023; DEW 2022b).

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
Acacia gunnii	Ploughshare Wattle		R	2	2022	**Likely**
Acacia iteaphylla	Flinders Ranges Wattle		R	2	2022	**Possible**
Acacia stricta	Hop Wattle		R	2	2005	**Unlikely**
Amphibromus archeri	Pointed Swamp Wallaby-grass		R	2	2018	**Possible**
Austrostipa tenuifolia			R	2	2018	**Possible**
Baloskion tetraphyllum ssp. *tetraphyllum*	Tassel Cord-rush		V	2	2012	**Unlikely**
Bauera rubioides	Wiry Bauera		R	2	2011	**Unlikely**
Blechnum nudum	Fishbone Water-fern		R	2	2022	**Unlikely**
Blechnum wattsii	Hard Water-fern		R	2	2010	**Unlikely**
Boronia nana var. *hyssopifolia*	Dwarf Boronia		R	2	2022	**Possible**
Boronia parviflora	Swamp Boronia		R	2	2018	**Unlikely**
Caladenia argocalla	White-beauty Spider-orchid	EN	E	1	Likely	**Unlikely**
Caladenia behrii	Pink-lipped Spider-orchid	EN	E	1	Likely	**Unlikely**
Caladenia gladiolata	Bayonet Spider-orchid	EN	E	1	Likely	**Unlikely**
Caladenia leptochila ssp. *leptochila*	Narrow-lip Spider-orchid		R	2	2020	**Possible**
Caladenia necrophylla	Late Spider-orchid		R	2	2008	**Unlikely**
Caladenia pusilla	Pigmy Caladenia		R	2	2013	**Possible**
Caladenia rigida	Stiff White Spider-orchid	EN	E	1	Likely	**Unlikely**

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
Caleana major	Large Duck-orchid		V	2	2000	**Unlikely**
Callistemon brachyandrus	Prickly Bottlebrush		R	2	2019	**Unlikely**
Cardamine paucijuga	Annual Bitter-cress		R	2	2011	**Possible**
Coronidium gunnianum	Pale Everlasting		E	2	2006	**Possible**
Deyeuxia densa	Heath Bent-grass		R	2	2021	**Likely**
Deyeuxia minor	Small Bent-grass		V	2	2020	**Likely**
Dianella longifolia var. *grandis*	Pale Flax-lily		R	2	2019	**Likely**
Dicksonia antarctica	Soft Tree-fern		E	2	2020	**Unlikely**
Dipodium pardalinum	Leopard Hyacinth-orchid		V	2	2012	**Possible**
Diuris behrii	Behr's Cowslip Orchid		V	2	2015	**Possible**
Diuris chryseopsis	Cowslip Orchid		E	2	1998	**Unlikely**
Drosera binata	Forked Sundew		R	2	2017	**Possible**
Drosera stricticaulis	Erect Sundew		V	2	1998	**Unlikely**
Eryngium ovinum	Blue Devil		V	2	2013	**Possible**
Eryngium vesiculosum	Prostrate Blue Devil		R	2	2010	**Possible**
Eucalyptus dalrympleana ssp. *dalrympleana*	Candlebark Gum		R	2	2022	**Possible**
Eucalyptus fasciculosa	Pink Gum		R	2	2021	**Possible**
Eucalyptus viminalis ssp. *viminalis*	Manna Gum		R	2	2022	**Known/Highly Likely**
Euphrasia collina ssp. *osbornii*	Osborn's Eyebright	EN	E	1	Known	**Unlikely**
Gastrodia sesamoides	Potato Orchid		R	2	2021	**Likely**
Gleichenia microphylla	Coral Fern		R	2	2022	**Unlikely**
Glycine latrobeana	Clover Glycine	VU	V	1	Likely	**Unlikely**
Gonocarpus micranthus ssp. *micranthus*	Creeping Raspwort		R	2	2018	**Possible**
Goodenia brunnea			R	2	2018	**Unlikely**
Grevillea aquifolium	Prickly Grevillea		R	2	1997	**Unlikely**
Hypolepis rugosula	Ruddy Ground-fern		R	2	2022	**Unlikely**
Juncus amabilis			V	2	2009	**Unlikely**

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
Lagenophora sublyrata	Slender Bottle-daisy		V	2	2019	**Possible**
Leionema hillebrandii	Mount Lofty Phebalium		R	2	2022	**Possible**
Logania saxatilis	Rock Logania		R	2	1996	**Unlikely**
Luzula flaccida	Pale Wood-rush		V	2	2020	**Possible**
Lycopodiella lateralis	Slender Clubmoss		R	2	2017	**Unlikely**
Lycopodium deuterodensum	Bushy Clubmoss		E	2	2009	**Unlikely**
Machaerina gunnii	Slender Twig-rush		R	2	2018	**Unlikely**
Melaleuca armillaris ssp. *akineta*	Needle-leaf Honey-myrtle		R	2	2008	**Unlikely**
Mentha diemenica	Slender Mint		R	2	2011	**Possible**
Nymphoides crenata	Wavy Marshwort		R	2	1995	**Unlikely**
Poa umbricola	Shade Tussock-grass		R	2	2018	**Unlikely**
Prasophyllum pallidum	Pale Leek-orchid	VU	R	1	Likely	**Unlikely**
Prasophyllum pruinosum	Plum Leek-orchid	EN	E	1	Known	**Unlikely**
Pterostylis cucullata	Leafy Greenhood	VU	E	1	Likely	**Unlikely**
Pterostylis setifera	Bristly Greenhood		E	2	2018	**Unlikely**
Pultenaea graveolens	Scented Bush-pea		R	2	2022	**Possible**
Pultenaea kraehenbuehlii	Tothill Bush-pea		R	2	2018	**Unlikely**
Ranunculus glabrifolius	Shining Buttercup		V	2	2000	**Possible**
Rytidosperma laeve	Smooth Wallaby-grass		*R*	2	2017	**Possible**
Rytidosperma tenuius	Short-awn Wallaby-grass		R	2	2022	**Likely**
Schizaea fistulosa	Narrow Comb-fern		V	2	2008	**Unlikely**
Schoenus latelaminatus	Medusa Bog-rush		V	2	2012	**Unlikely**
Schoenus lepidosperma ssp. *lepidosperma*	Slender Bog-rush		R	2	2018	**Unlikely**
Scutellaria humilis	Dwarf Skullcap		R	2	2021	**Unlikely**
Senecio pinnatifolius var. *pinnatifolius*			R	2	2015	**Possible**
Sphaerolobium minus	Leafless Globe-pea		R	2	2008	**Unlikely**
Sprengelia incarnata	Pink Swamp-heath		R	2	2017	**Unlikely**

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
Thelymitra aristata	Great Sun-orchid		E	2	2008	**Possible**
Thelymitra batesii			R	2	2021	**Possible**
Thelymitra circumsepta	Naked Sun-orchid		E	2	2018	**Unlikely**
Thelymitra grandiflora	Great Sun-orchid		R	2	2019	**Possible**
Thelymitra ixioides	Spotted Sun-orchid		E	2	2013	**Possible**
Thelymitra latifolia	Blue Star Sun-orchid		V	2	2004	**Possible**
Thelymitra matthewsii	Spiral Sun-orchid	VU	E	1	Likely	**Unlikely**
Thysanotus tenellus	Grassy Fringe-lily		R	2	2015	**Unlikely**
Todea barbara	King Fern		E	2	2018	**Unlikely**
Veronica derwentiana ssp. *homalodonta*	Mount Lofty Speedwell	CE	E	1	Likely	**Unlikely**
Xanthosia tasmanica	Southern Xanthosia		R	2	2015	**Possible**
Xyris operculata	Tall Yellow-eye		R	2	2008	**Unlikely**

Conservation status: Aus: Australia (EPBC Act). SA: South Australia (NPW Act).
Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level.
PMST result: Likelihood of species or species habitat to occur within 5 km of the Project Area.
Source of Information:
1: PMST (DCCEEW 2023) – 5 km buffer applied to Project Area;
2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area.

4.2.4. Threatened fauna

The PMST (DCCEEW 2023) identified 11 nationally listed threatened fauna species as known or likely to occur within 5 km of the Project Area, consisting of eight birds and two mammals. A BDBSA search identified two additional nationally listed threatened fauna species that have records within 5 km of the Project Area (Table 12), which did not appear on the PMST (DEW 2022b). In total, five threatened fauna species were assessed as likely to occur within the Project Area based on survey effort, suitable habitat and recent records:

- Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare;
- Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare;
- Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and
- Southern Brown Bandicoot (*Isoodon obesulus obesulus*) – nationally Endangered and State Vulnerable.

One additional nationally listed threatened species was assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:

- White-throated Needletail (*Hirundapus caudacutus*) – nationally Vulnerable and migratory and State Vulnerable.

A BDBSA search identified 29 additional State listed fauna species that have records within 5 km of the Project Area (Table 12) (DEW 2022b). A total of 10 of these species were assessed as highly likely / known or likely to occur within the Project Area based on survey effort, recent records and suitable habitat:

- Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area;
- Elegant Parrot (*Neophema elegans elegans*) – State Rare;
- Jacky Winter (*Microeca fascinans fascinans*) – State Rare;
- Little Eagle (*Hieraaetus morphnoides*) – State Vulnerable;
- Peregrine Falcon (*Falco peregrinus macropus*) – State Rare;
- Scarlet Robin (*Petroica boodang boodang*) – State Rare;
- Square-tailed Kite (*Lophoictinia isura*) – State Endangered;
- White-winged Chough (*Corcorax melanorhamphos*) – State Rare;
- Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and
- Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area.

An additional 16 species were assessed as possible to occur within the Project Area based on recent records and suitable habitat.

BDBSA fauna records located within 5 km of the Project Area are provided in Appendix 6.

Birdlife Australia fauna records located within 5 km of the Project Area are provided in Appendix 7.

A detailed likelihood assessment of threatened fauna species information including distribution and preferred habitat information for the Project Area is provided in Appendix 8.

Table 12. Threatened fauna and migratory species, identified by the PMST and/or BDBSA search in the Project Area (green shading = known / highly likely or likely to occur, orange shading = possible to occur) (DCCEEW 2023; DEW 2022b).

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
AMPHIBIA						
Pseudophryne bibronii	Brown Toadlet		R	2	2009	**Possible**
AVES						
Anhinga novaehollandiae novaehollandiae	Australasian Darter		R	2, 3	2018 / 2018	**Possible**
Biziura lobata menziesi	Musk Duck		R	2, 3	2015 / 2002	**Possible**
Botaurus poiciloptilus	Australasian Bittern	EN	E	1	Known	**Unlikely**
Cereopsis novaehollandiae novaehollandiae	Cape Barren Goose		R	3	2009	**Possible**
Charadrius mongolus	Lesser Sand Plover	EN	E	3	2002	**Unlikely**
Climacteris affinis	White-browed Treecreeper		R	2	2021	**Possible**
Corcorax melanorhamphos	White-winged Chough		R	2, 3	2020 / 2020	**Likely**
Falco hypoleucos	Grey Falcon	VU	R	1	Likely	**Unlikely**
Falco peregrinus macropus	Peregrine Falcon		R	2, 3	2015 / 2020	**Likely**
Falcunculus frontatus frontatus	Eastern Shriketit		R	2, 3	2006 / 2006	**Possible**
Grantiella picta	Painted Honeyeater	VU	R	1	Likely	**Unlikely**
Hieraaetus morphnoides	Little Eagle		V	2	2019	**Likely**
Hirundapus caudacutus	White-throated Needletail	VU, Mi (T)	V	1	Likely	**Possible**
Hylacola cauta cauta	Shy Heathwren		R	3	1998	**Possible**
Hylacola pyrrhopygia parkeri	Chestnut-rumped Heathwren	EN	E	1, 2, 3	Known / 2020 / 2020	**Likely**

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
Leipoa ocellata	Malleefowl	VU	V	1	Likely	**Unlikely**
Lewinia pectoralis pectoralis	Lewin's Rail		V	2	2010	**Possible**
Lophoictinia isura	Square-tailed Kite		E	2	2019	**Likely**
Melithreptus gularis gularis	Black-chinned Honeyeater		V	2, 3	2002 / 2000	**Possible**
Microeca fascinans fascinans	Jacky Winter		R	2, 3	2018 / 2001	**Likely**
Neophema elegans elegans	Elegant Parrot		R	2	2021	**Likely**
Oxyura australis	Blue-billed Duck		R	3	2018	**Possible**
Pachycephala inornata	Gilbert's Whistler		R	3	2007	**Possible**
Petroica boodang boodang	Scarlet Robin		R	2, 3	2022 / 2020	**Likely**
Petroica phoenicea	Flame Robin		V	3	2003	**Possible**
Plectorhyncha lanceolata	Striped Honeyeater		R	2	2020	**Possible**
Polytelis anthopeplus monarchoides	Regent Parrot	VU	V	2	1996	**Unlikely**
Rostratula australis	Australian Painted Snipe	EN	E	1	Likely	**Unlikely**
Stagonopleura bella samueli	Beautiful Firetail	EN	R	1, 3	2020	**Likely**
Turnix varius varius	Painted Buttonquail		R	2	2012	**Possible**
Zanda funerea whiteae	Yellow-tailed Black Cockatoo		V	2, 3	2022 / 2020	**Highly Likely / Known**
Zapornia tabuensis	Spotless Crake		R	2	2010	**Possible**
Zoothera lunulata halmaturina	Bassian Thrush	EN	R	1, 2, 3	Known / 2022 / 2018	**Likely**
MAMMALIA						
Antechinus agilis	Agile Antechinus		E	2	2021	**Possible**
Antechinus flavipes	Yellow-footed Antechinus		V	2	2021	**Likely**
Isoodon obesulus obesulus	Southern Brown Bandicoot	EN	V	1, 2	Known / 2021	**Likely**

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
Pteropus poliocephalus	Grey-headed Flying-fox	VU	R	1, 2	Likely / 2020	**Likely**
Trichosurus vulpecula	Common Brushtail Possum		R	2	2022	**Highly Likely / Known**
REPTILIA						
Egernia cunninghami	Cunningham's Skink		E	2	2022	**Unlikely**
Varanus rosenbergi	Heath Goanna		V	2	2014	**Unlikely**
Varanus varius	Lace Monitor		R	2	2013	**Unlikely**

Conservation status: Aus: Australia (EPBC Act). SA: South Australia (NPW Act).
Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.
PMST result: Likelihood of species or species habitat to occur within 5 km of the Project Area.
Source of Information:
1: PMST (DCCEEW 2023) – 5 km buffer applied to Project Area;
2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;
3: Birdlife Australia (DEW 2022b) – 5 km buffer applied to Project Area.

4.2.5. Migratory fauna

The PMST (DCCEEW 2023) identified five nationally listed migratory species as known or likely to occur within 5 km of the Project Area (Table 13). In total, two nationally listed migratory species were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:

- Fork-tailed Swift (*Apus pacificus*) – nationally migratory;
- Satin Flycatcher (*Myiagra cyanoleuca*) – nationally migratory and State Endangered.

BDBSA fauna records indicate that the Satin Flycatcher (*Myiagra* cyanoleuca) has been previously recorded within 5 km of the Project Area. BDBSA fauna records located within 5 km of the Project Area are provided in Appendix 6.

A detailed likelihood assessment of nationally listed migratory species information including distribution and preferred habitat information for the Project Area is provided in Appendix 9.

Table 13. Migratory species, identified by the PMST and/or BDBSA search in the Project Area (orange shading = possible to occur) (DCCEEW 2023; DEW 2022b).

Scientific name	Common name	Conservation status		Source	PMST likelihood/ Year of last record	Likelihood of occurrence within the Project Area
		Aus	SA			
Apus pacificus	Fork-tailed Swift	Mi (Ma)		1	Likely	**Possible**
Gallinago hardwickii	Latham's Snipe	Mi (W)	R	1	Likely	**Unlikely**
Myiagra cyanoleuca	Satin Flycatcher	Mi (T)	E	1, 2	Likely / 2005	**Possible**
Rhipidura rufifrons	Rufous Fantail	Mi (T)		1	Known	**Unlikely**
Tringa nebularia	Common Greenshank	Mi (T)		1	Likely	**Unlikely**

Conservation status: Aus: Australia (EPBC Act). SA: South Australia (NPW Act).
Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.
PMST result: Likelihood of species or species habitat to occur within 5 km of the Project Area.
Source of Information:
1: PMST (DCCEEW 2023) – 5 km buffer applied to Project Area;
2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;

4.3. Cumulative impacts

When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must consider the potential cumulative impact, both direct and indirect, that is reasonably likely to result from a proposed clearance activity.

Direct impacts of the proposal include the complete removal of 1.716 ha of native vegetation and 62 scattered trees.

All construction access and earthworks fall within the works extent of the Project Area.

Potential indirect impacts of the proposal include:

- Any clearance required by the SA Country Fire Service such as fuel reduced zones around the hotel and hotel pods, but also any clearance for fire mitigation measures such as fire breaks, fire access tracks and turn around points;
- Any altered hydrology (raised or lowered water table, flooding, impounding water or reduced water supply) that will impact on the condition or health of native vegetation;
- Any possible impacts from temporary dust generation during construction works, including smothering of vegetation;
- Any potential impacts on the root zone of vegetation, such as adding fill to adjust ground level, compaction of soils, severing of roots through trenching for infrastructure, and the construction of hard surfaces which may reduce the infiltration of water; and
- Any vegetation that will be significantly reduced in size and isolated from other vegetation such that it will potentially compromise its long-term ecological function and viability.

4.4. Addressing the Mitigation Hierarchy

When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must have regard to the mitigation hierarchy. The NVC will also consider, with the aim to minimize, impacts on biological diversity, soil, water and other natural resources, threatened species or ecological communities under the EPBC Act or listed species under the NP&W Act.

a) Avoidance – outline measures taken to avoid clearance of native vegetation

The area in which the 18 pods are proposed to be constructed will impact on several scattered trees and an extensive amount of vegetation association A1b. scattered trees are planned for retention in this area and will be avoided. These trees will still be accounted for as a result of applicable CFS Buffers (see Section 5).

The proposed new vehicle access in the southern part of the Project Area utilises an existing partially cleared, albeit unofficial walking entrance and avoids better quality vegetation adjacent to this area. The proposed area for the carpark adjacent to the Scent Factory redevelopment also avoids direct impacts to vegetation associations A1b and A3 (see Figure 4) See Section 4.1.5 for photos of the areas proposed for the new vehicle access and car park.

b) Minimization – if clearance cannot be avoided, outline measures taken to minimize the extent, duration and intensity of impacts of the clearance on biodiversity to the fullest possible extent (whether the impact is direct, indirect or cumulative).

The proposed footprint of the main hotel building was selected based on the existing site footprint, minimising additional impact to surrounding vegetation despite the proposed footprint being larger.

Efforts to minimise the extent, duration and intensity of impacts on the clearance of native vegetation around the pods has been considered at multiple stages of the planning process. A total of 13 iterations (as of 30/08/2022) have been documented which include a reduction in the number of pods, and relocation of where these pods are proposed to be located. Initial designs included plans for up to 50 pods to be constructed in the northern extent of the Project Area requiring clearance of a substantial amount of native vegetation. Further detail on these iterations is provided in Attachment 9.

Where applicable, reasonable and feasible measures to prevent pollution of waterways and drainage lines in the area downstream of the proposed works during and post construction will be implemented.

Installation of exclusion fencing and signage to delineate the limits of clearing and vegetation to be retained will be installed in order to minimise disturbance in the Project Area.

Furthermore, clearing of vegetation, including the clearing of native vegetation and fauna habitat, will be minimised to the greatest extent practicable through the selection of plant (machinery) that will avoid impact on retained trees.

c) Rehabilitation or restoration – outline measures taken to rehabilitate ecosystems that have been degraded, and to restore ecosystems that have been degraded, or destroyed by the impact of clearance that cannot be avoided or further minimized, such as allowing for the re-establishment of the vegetation.

The rehabilitation or restoration of some areas that are impacted by the clearance of native vegetation will be achieved through revegetation, with a preference for species local to the Adelaide Hills. Some areas will not be able to be rehabilitated due to CFS constraints and the need to maintain specific bushfire attack level ratings.

d) Offset – any adverse impact on native vegetation that cannot be avoided or further minimized should be offset by the achievement of a significant environmental benefit that outweighs that impact.

The NVC will only consider an offset once avoidance, minimization and restoration have been documented and fulfilled. The SEB Policy explains the biodiversity offsetting principles that must be met.

An offset in the form of a payment into the native vegetation fund is the preferred option for Mount Lofty Estate Pty Ltd.

4.5. Principles of Clearance (Schedule 1, *Native Vegetation Act 1991*)

Table 14. Assessment against the Principles of Clearance.

Principle of clearance	Considerations
Principle 1(a) – it comprises a high level of diversity of plant species	Relevant information A total of 89 flora species (48 native and 41 introduced) were observed within the Project Area during the field assessment: • A1a – 28 flora species (11 native and 17 introduced species); • A1b – 40 flora species (21 native and 19 introduced species); • A1c – 27 flora species (14 native and 13 introduced species); • A2 – 40 flora species (27 native and 13 introduced species); and • A3 – 15 flora species (2 native and 13 introduced species). Native Plant Species Diversity Scores: A1a – 8 A1b – 16 A1c – 12 A2 – 14 A3 – 2
	Assessment against the principles At Variance A1b, A1c and A2 Not at Variance A1a and A3
	Moderating factors that may be considered by the NVC There is a substantial amount of native vegetation within the Project Area and or local vicinity comprising a number of native species.
Principle 1(b) – significance as a habitat for wildlife	Relevant information Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation (including exotic vegetation associated with the golf course) within the Project Area. The understorey in areas of native vegetation not directly associated with the golf course was heavily degraded and introduced flora species such as *Fumaria capreolata* (White-flower Fumitory), *Iris* sp. (Iris) and *Rubus fruticosus aggregate* (Blackberry) were dominant in these areas. Five vegetation associations and 151 scattered trees, including 16 *Acacia melanoxylon* (Blackwood), 52 *Eucalyptus obliqua* (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna Gum), 76 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and six *Exocarpos cupressiformis* (Native Cherry) were recorded within the Project Area. A total of 106 scattered trees, which includes 10 *Acacia melanoxylon* (Blackwood), 44 *Eucalyptus obliqua* (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna

Principle of clearance	Considerations
	Gum), 48 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum), three *Exocarpos cupressiformis* (Native Cherry) from poor to excellent in health. Vegetation associations were heavily degraded and introduced flora species were present in large numbers (particularly in A3). All trees were of a mature age and ranged from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species. A total of 26 fauna species were recorded within the Project Area, 23 were birds and three were mammals. Two of these species are introduced fauna. No fauna species listed under the EPBC Act were recorded within the Project Area. Two fauna species listed under the NPW Act were recorded in the Project Area: • Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare; and • Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable. A total of 15 threatened fauna species listed under the EPBC Act and/or NPW Act were assessed as highly likely / known to occur within the Project Area based on survey effort, suitable habitat and recent records: • Bassian Thrush (*Zoothera lunulata halmaturina*) – nationally Endangered and State Rare; • Beautiful Firetail (*Stagonopleura bella samueli*) – nationally Endangered and State Rare; • Chestnut-rumped Heathwren (*Hylacola pyrrhopygia parkeri*) – nationally Endangered and State Endangered; • Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare and observed within the Project Area; • Elegant Parrot (*Neophema elegans elegans*) – State Rare; • Grey-headed Flying-fox (*Pteropus poliocephalus*) – nationally Vulnerable and State Rare; and • Jacky Winter (*Microeca fascinans fascinans*) – State Rare; • Little Eagle (*Hieraaetus morphnoides*) – State Vulnerable; • Peregrine Falcon (*Falco peregrinus macropus*) – State Rare; • Scarlet Robin (*Petroica boodang boodang*) – State Rare; • Southern Brown Bandicoot (*Isoodon obesulus obesulus*) – nationally Endangered and State Vulnerable. • Square-tailed Kite (*Lophoictinia isura*) – State Endangered; • White-winged Chough (*Corcorax melanorhamphos*) – State Rare; • Yellow-footed Antechinus (*Antechinus flavipes*) – State Vulnerable; and • Yellow-tailed Black Cockatoo (*Zanda funerea whiteae*) – State Vulnerable and observed within the Project Area. An additional 17 fauna species listed under the EPBC Act and/or NPW Act were assessed as possible to occur within the Project Area based on survey effort, suitable habitat and recent records. Vegetation Associations Threatened Fauna Score – 0.1 (All VAs)

Principle of clearance	Considerations
	Unit biodiversity Score: A1a – 18.15 A1b – 17.61 A1c – 14.79 A2 – 33.39 A3 – 1.79 Trees; Fauna Habitat Score – 1.8 (all trees) Biodiversity Score – from 0.33 to 11.25
	Assessment against the principles Seriously at Variance A1a, Alb, A1c, A2, A3 and all trees
	Moderating factors that may be considered by the NVC Two threatened fauna species listed under the NPW Act were recorded in the Project Area and many other threatened fauna species were assessed as likely or possible to occur within the Project Area. Pockets of remnant native vegetation were often degraded by the presence of introduced flora species and fragmented from more intact remnant native vegetation but may be used by fauna as wildlife corridors to more intact and better quality native vegetation, particularly to the surrounding areas in MGCP. Similarly, a total of 52 of the 106 scattered trees that area proposed to be cleared within the Project Area contain hollows which could provide suitable breeding habitat for fauna species. Moreover, all these scattered trees provide suitable perching and foraging habitat for a number of fauna species within the Project Area. Given there are areas of better quality bushland surrounding the Project Area, in MGCP for instance, the clearance of 1.716 ha and 106 scattered trees is unlikely to lead to a long-term decrease in the population size of threatened fauna species or reduce their occupancy. Clearance is however likely to further fragment pockets of remnant native vegetation that provide wildlife corridors to better quality habitat surrounding the Project Area. The habitat is not considered to be critical to the survival of threatened fauna species and clearance is unlikely to lead to a decline in species or interfere with the recovery of any species. Introduced fauna species are present within the Project Area. Clearance of native vegetation is unlikely to introduce more invasive fauna species into the Project Area.
Principle 1(c) – plants of a rare, vulnerable or endangered species	Relevant information Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation (including exotic vegetation associated with the golf course) within the Project Area. The understorey in areas of native vegetation not directly associated with the golf course was heavily degraded and introduced flora species such as *Fumaria capreolata* (White-flower Fumitory), *Iris* sp. (Iris) and *Rubus fruticosus aggregate* (Blackberry) were dominant in these areas. Five vegetation associations and 151 scattered trees, including 16 *Acacia melanoxylon* (Blackwood), 52

Principle of clearance	Considerations
	Eucalyptus obliqua (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna Gum), 76 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and six *Exocarpos cupressiformis* (Native Cherry) were recorded within the Project Area. A total of 106 scattered trees, which includes 10 *Acacia melanoxylon* (Blackwood), 44 *Eucalyptus obliqua* (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna Gum), 48 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and three *Exocarpos cupressiformis* (Native Cherry) from poor to excellent in health. Vegetation associations were heavily degraded and introduced flora species were present in large numbers (particularly in A3). All trees were of a mature age and ranged from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species. No flora species listed under the EPBC Act were recorded within the Project Area. One flora species listed under the NPW Act as Rare was recorded in the Project Area: • *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum). This species was present in large numbers throughout the Project area in remnant patches of native vegetation and as scattered trees. The following flora species listed under the NPW Act were determined as likely to occur in the Project Area: • *Acacia gunnii* (Ploughshare Wattle) – State Rare; • *Deyeuxia densa* (Heath Bent-grass) – State Rare; • *Deyeuxia minor* (Small Bent-grass) – State Vulnerable; • *Dianella longifolia* var. *grandis* (Pale Flax-lily) – State Rare; • *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) – State Rare and observed within the Project Area; • *Gastrodia sesamoides* (Potato Orchid) – State Rare; • *Rytidosperma tenuius* (Short-awn Wallaby-grass) – State Rare. An additional 30 flora species listed under the NPW Act were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat. Threatened Flora Score(s) – All VAs – 0 All trees of species *Eucalyptus viminalis* ssp. *viminalis* (0.3) All other trees (0)
	<u>Assessment against the principles</u> <u>At Variance</u> All trees of species *Eucalyptus viminalis* ssp. *viminalis*

Principle of clearance	Considerations
	Not at Variance All VAs All other tree species
	Moderating factors that may be considered by the NVC One flora species listed under the NPW Act as Rare was recorded in the Project Area and many other threatened flora species were assessed as likely or possible to occur within the Project Area. The understorey in some areas of native vegetation not directly associated with the golf course was heavily degraded and introduced flora species were abundant, particularly in VA A3. However, some vegetation associations, such as A2 had a high presence of native species including spring flowering species such as *Pterostylis spp.* and *Bulbine bulbosa* for example. A total of 25 of the 62 scattered trees proposed for clearance are of the species *Eucalyptus viminalis* ssp. *viminalis* which is currently listed as Rare under the NPW Act. Many of these trees including those not listed under the NPW Act provide suitable perching, foraging, and breeding habitat for a number of fauna species within the Project Area. Given there are areas of better-quality bushland surrounding the Project Area, in MGCP for instance, the clearance of 1.716 ha and 106 scattered trees is unlikely to lead to a long-term decrease in the population size of threatened flora species or reduce their occupancy. Clearance is however likely to further fragment pockets of remnant native vegetation and fragment interconnecting pockets of scattered trees, such as the State Rare *Eucalyptus viminalis* ssp. *viminalis*. The habitat is not considered to be critical to the survival of threatened flora species and clearance is unlikely to lead to a decline in species or interfere with the recovery of any species. Introduced flora species are present in large numbers within the Project Area. Clearance of native vegetation is unlikely to introduce more invasive flora species into the Project Area.
Principle 1(d) – the vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered	Relevant information No threatened communities under the EPBC Act or threatened ecosystems under the DEW Provisional list of threatened ecosystems are considered present within the clearance area. Threatened Community Score: 1
	Assessment against the principles Not at Variance
	Moderating factors that may be considered by the NVC N/A
Principle 1(e) – it is significant as a remnant of vegetation in an area which has been	Relevant information Uraidla IBRA Association remnancy – 26% Mount Lofty Ranges IBRA Subregion remnancy – 15% Five vegetation associations and 151 scattered trees, including 16 *Acacia melanoxylon* (Blackwood), 52 *Eucalyptus obliqua* (Messmate Stringybark), one *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-

Principle of clearance	Considerations
extensively cleared	bark Manna Gum), 76 State Rare *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and six *Exocarpos cupressiformis* (Native Cherry) were recorded within the Project Area. All trees were of a mature age and ranged from poor to excellent in health. Some trees contain hollows which could provide suitable habitat for fauna species. Total Biodiversity Score – 447.54
	Assessment against the principles Seriously at Variance
	Moderating factors that may be considered by the NVC Native vegetation within the Uraidla IBRA Association has been extensively cleared in some areas. The Project Area is directly adjacent to MGCP and vegetation associations and scattered trees within the Project Area represent some of the vegetation that has not been cleared in this area. Areas within the Project Area have been cleared for the construction of the golf course but species within the Project Area have not been selectively removed within the Uraidla IBRA Association. Remnants that remain within the Project Area are in moderate condition but weed incursions are present, particularly on the edge of VA A1a.
Principle 1(f) – it is growing in, or in association with, a wetland environment	Relevant information Cox Creek runs through the Project Area from the adjacent MGCP. There are also three artificially constructed lakes or dams to the north of the Stirling Golf Club clubhouse and in the northern section of the Project Area. The areas of impact within the Project Area are not located within Cox Creek or any of the three artificially constructed lakes or dams.
	Assessment against the principles Not at Variance
	Moderating factors that may be considered by the NVC N/A
Principle 1(g) – it contributes significantly to the amenity of the area in which it is growing or is situated	Relevant information Remnant pockets of native vegetation coexist with large remnant scattered trees and planted vegetation (including exotic vegetation associated with the golf course) within the Project Area. Five vegetation associations and 151 scattered trees of species *Acacia melanoxylon* (Blackwood), *Eucalyptus viminalis* ssp. *cygnetensis* (Rough-bark Manna Gum), *Eucalyptus obliqua* (Messmate Stringybark), *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) and *Exocarpos cupressiformis* (Native Cherry). All trees were of a mature age and ranged from poor to excellent in health. Vegetation associations were heavily degraded and introduced flora species were present in large numbers

Principle of clearance	Considerations
	(particularly in A3). Some trees contain hollows which could provide suitable habitat for fauna species. As such, any vegetation within the area would likely contribute to the amenity of the area.
	N/A
	Moderating factors that may be considered by the NVC N/A

Principles of Clearance (h-m) will be considered by comments provided by the local NRM Board or relevant Minister. The Data Report should contain information on these principles where relevant and where sufficient information or expertise is available.

4.6. Risk assessment

The level of risk associated with the application

Table 15. Summary of the level of risk associated with the application.

Total clearance	No. of trees	106
	Area (ha)	1.716
	Total biodiversity Score	447.54
Seriously at variance with principle 1(b), 1(c) or 1 (d)		1 (b)
Risk assessment outcome		Level 4

4.7. NVC guidelines

Other information that demonstrates that the clearance complies with any relevant NVC guidelines related to the activity

N/A

5. Clearance summary

A 35m clearance buffer from the eastern building face as a result of CFS constraints is applied. This applies to BAM A1a. A 20m CFS buffer is applicable elsewhere.

All BAM scoresheets have a loss factor of 1.0 applied and do not contain any trees. This is to reflect the clearance of understorey only.

Details of correspondence with NVC regarding the 35m buffer to the eastern most point of the hotel, and details on applicable loss factors is provided in Attachment 10.

Clearance Area(s) Summary table

BAMS

Block	Site	Species diversity score	Threatened Ecological community	Threatened plant score	Threatened fauna score	UBS	Area (ha)	Total Biodiversity score	Loss factor	Loadings	Reductions	SEB Points required	SEB payment	Admin Fee
A	1a	8	1	0	0.1	18.15	0.261	4.74	1	0	0	4.98	$6,352.72	$349.40
A	1b	16	1	0	0.1	17.61	1.307	23.01	1	0	0	24.16	$31,055.06	$1,708.03
A	1c	12	1	0	0.1	14.79	0.048	0.71	1	0	0	0.75	$951.78	$52.35
A	2	14	1	0	0.1	33.39	0.013	0.44	1	0	0	0.46	$593.02	$32.62
A	3	2	1	0	0.1	1.79	0.087	0.16	1	0	0	0.16	$207.78	$11.43
						Total	**1.716**	**29.06**				**30.51**	**$39,160.36**	**$2,153.83**

Scattered trees Summary table

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Total Biodiversity score	Loss factor	SEB Points required	SEB Payment (inclusive of admin and GST)
6	2	1.8	0.3	7.34	1.0	7.71	$10,067.76
7	1	1.8	0	1.23	1.0	1.29	$1,688.57
8	1	1.8	0	2.54	1.0	2.67	$3,490.97
9	1	1.8	0.3	8.58	1.0	9.01	$11,775.36
10	1	1.8	0	4.35	1.0	4.56	$5,963.30
11	1	1.8	0	0.42	1.0	0.44	$571.03
12	1	1.8	0.3	2.13	1.0	2.24	$2,923.52
13	1	1.8	0.3	8.71	1.0	9.15	$11,952.29
14	1	1.8	0.3	5.95	1.0	6.25	$8,160.51
15	1	1.8	0	2.42	1.0	2.54	$3,314.38
16	1	1.8	0.3	3.91	1.0	4.11	$5,367.26
17	1	1.8	0.3	2.27	1.0	2.38	$3,115.17
18	1	1.8	0.3	2.50	1.0	2.62	$3,423.04
19	1	1.8	0.3	7.03	1.0	7.39	$9,649.96
20	1	1.8	0	0.59	1.0	0.62	$805.50
21	1	1.8	0	2.02	1.0	2.12	$2,768.51
22	1	1.8	0	0.54	1.0	0.57	$745.41
23	1	1.8	0	1.99	1.0	2.09	$2,735.33
24	1	1.8	0.3	11.25	1.0	11.82	$15,440.72
26	1	1.8	0.3	1.13	1.0	1.19	$1,552.06
27	1	1.8	0.3	2.12	1.0	2.23	$2,914.60
28	1	1.8	0.3	9.08	1.0	9.53	$12,450.63
29	1	1.8	0.3	6.09	1.0	6.40	$8,356.70
30	1	1.8	0.3	7.01	1.0	7.36	$9,618.26
31	1	1.8	0.3	2.03	1.0	2.13	$2,782.90
32	1	1.8	0.3	3.51	1.0	3.69	$4,815.90
33	1	1.8	0.3	4.39	1.0	4.61	$6,018.15
34	1	1.8	0.3	7.01	1.0	7.36	$9,618.26
35	1	1.8	0.3	4.05	1.0	4.25	$5,554.08

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Total Biodiversity score	Loss factor	SEB Points required	SEB Payment (inclusive of admin and GST)
36	1	1.8	0.3	4.53	1.0	4.76	$6,216.52
37	1	1.8	0.3	4.84	1.0	5.09	$6,646.17
41	1	1.8	0.3	6.14	1.0	6.44	$8,418.64
42	1	1.8	0.3	4.15	1.0	4.36	$5,697.00
43	1	1.8	0	3.66	1.0	3.85	$5,026.51
44	1	1.8	0.3	1.42	1.0	1.49	$1,941.57
45	1	1.8	0.3	2.43	1.0	2.56	$3,340.35
46	1	1.8	0	2.50	1.0	2.63	$3,432.31
47	1	1.8	0.3	4.27	1.0	4.48	$5,857.64
48	1	1.8	0	2.51	1.0	2.64	$3,449.57
49	1	1.8	0	2.51	1.0	2.64	$3,442.93
50	1	1.8	0	6.66	1.0	6.99	$9,132.02
51	1	1.8	0	4.07	1.0	4.27	$5,577.73
52	1	1.8	0	4.51	1.0	4.74	$6,188.97
53	1	1.8	0.3	9.60	1.0	10.08	$13,173.55
54	1	1.8	0.3	4.67	1.0	4.90	$6,406.20
55	1	1.8	0	2.59	1.0	2.72	$3,554.36
56	1	1.8	0	4.47	1.0	4.69	$6,134.13
57	1	1.8	0	2.35	1.0	2.47	$3,220.73
58	1	1.8	0.3	7.63	1.0	8.01	$10,470.21
59	1	1.8	0	3.61	1.0	3.80	$4,958.68
60	1	1.8	0.3	7.00	1.0	7.35	$9,600.17
61	1	1.8	0.3	4.29	1.0	4.50	$5,882.15
62	1	1.8	0.3	1.19	1.0	1.25	$1,636.57
63	1	1.8	0	0.52	1.0	0.55	$713.93
64	1	1.8	0	1.36	1.0	1.43	$1,865.96
65	1	1.8	0.3	3.64	1.0	3.82	$4,989.77
66	1	1.8	0.3	3.64	1.0	3.82	$4,987.02
67	1	1.8	0	3.48	1.0	3.66	$4,780.19
68	1	1.8	0.3	2.42	1.0	2.54	$3,315.03

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Total Biodiversity score	Loss factor	SEB Points required	SEB Payment (inclusive of admin and GST)
69	1	1.8	0	1.33	1.0	1.40	$1,827.71
70	1	1.8	0	3.34	1.0	3.50	$4,576.57
71	1	1.8	0	1.11	1.0	1.17	$1,524.20
72	1	1.8	0	2.00	1.0	2.10	$2,745.98
73	1	1.8	0	1.93	1.0	2.02	$2,641.84
74	1	1.8	0	4.48	1.0	4.70	$6,146.76
75	1	1.8	0	3.31	1.0	3.48	$4,542.06
76	1	1.8	0	3.83	1.0	4.02	$5,251.70
77	1	1.8	0	1.18	1.0	1.23	$1,612.80
78	1	1.8	0	4.23	1.0	4.44	$5,796.67
79	1	1.8	0	0.96	1.0	1.01	$1,318.95
80	6	1.8	0	2.01	1.0	2.11	$2,752.18
81	1	1.8	0	3.64	1.0	3.82	$4,991.60
82	1	1.8	0	3.95	1.0	4.15	$5,419.37
83	1	1.8	0	6.49	1.0	6.82	$8,909.50
84	1	1.8	0	5.93	1.0	6.23	$8,141.61
85	1	1.8	0	6.55	1.0	6.88	$8,985.67
86	1	1.8	0	3.57	1.0	3.75	$4,893.27
87	1	1.8	0.3	6.33	1.0	6.65	$8,690.62
88	1	1.8	0.3	2.53	1.0	2.66	$3,472.90
89	1	1.8	0	3.73	1.0	3.91	$5,114.49
96	1	1.8	0.3	7.39	1.0	7.76	$10,140.97
100	1	1.8	0.3	1.11	1.0	1.17	$1,526.13
104	1	1.8	0.3	4.38	1.0	4.59	$6,002.59
105	1	1.8	0.3	8.30	1.0	8.71	$11,381.15
120	1	1.8	0	4.45	1.0	4.68	$6,111.03
121	1	1.8	0	4.47	1.0	4.70	$6,138.34
122	1	1.8	0.3	9.08	1.0	9.53	$12,456.01
123	1	1.8	0.3	8.21	1.0	8.62	$11,265.13
124	1	1.8	0	0.42	1.0	0.44	$578.38

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Total Biodiversity score	Loss factor	SEB Points required	SEB Payment (inclusive of admin and GST)
125	1	1.8	0	7.12	1.0	7.48	$9,769.86
126	1	1.8	0	4.49	1.0	4.71	$6,159.40
127	1	1.8	0	4.84	1.0	5.09	$6,645.06
131	1	1.8	0	1.41	1.0	1.48	$1,938.28
132	1	1.8	0	4.10	1.0	4.30	$5,621.27
133	1	1.8	0.3	7.01	1.0	7.36	$9,611.47
134	1	1.8	0	4.59	1.0	4.82	$6,292.15
135	1	1.8	0.3	7.55	1.0	7.93	$10,360.47
139	1	1.8	0	6.56	1.0	6.88	$8,995.76
144	1	1.8	0	7.31	1.0	7.69	$10,034.45
145	1	1.8	0.3	4.40	1.0	4.62	$6,041.54
Total	**106**			**418.48**		**439.41**	**$574,122.61**

Totals summary table

	Total Biodiversity score	Total SEB points required	SEB Payment	Admin Fee	Total Payment
Application	447.54	469.92	583,352.41	$32,084.39	$615,436.80

Economies of Scale Factor	0.5
Rainfall (mm)	917 - 926

6. Significant Environmental Benefit

A Significant Environmental Benefit (SEB) is required for approval to clear under Division 5 of the *Native Vegetation Regulations 2017*. The NVC must be satisfied that as a result of the loss of vegetation from the clearance that an SEB will result in a positive impact on the environment that is over and above the negative impact of the clearance.

ACHIEVING AN SEB

Indicate how the SEB will be achieved by ticking the appropriate box and providing the associated information:

☐ Establish a new SEB Area on land owned by the proponent.

☐ Use SEB Credit that the proponent has established.

☐ Apply to have SEB Credit assigned from another person or body.

☐ Apply to have an SEB to be delivered by a Third Party.

☒ Pay into the Native Vegetation Fund.

PAYMENT SEB

If a proponent proposes to achieve the SEB by paying into the Native Vegetation Fund, summary information must be provided on the amount required to be paid and the manner of payment:

The total SEB offset required for the clearance of 1.716 ha and 106 scattered trees is **$615,436.80**, which includes a **$32,084.39** administration fee.

7. References

Atlas of Living Australia (ALA) (2022). *Caleana major* R.Br. Available at: https://bie.ala.org.au/species/https://id.biodiversity.org.au/taxon/apni/51399670 [Accessed 22/08/2022].

Arborman Tree Solutions (2022a). *Preliminary Tree Assessment* (ATS6360-035GolRdPTA). Report to Trice – Project & Development Managers. Arborman Tree Solutions, Adelaide.

Arborman Tree Solutions (2022b). *Arboricultural Impact Assessment and Development Impact Report Site: Stirling Golf Club, 35 Golflinks Road, Stirling* (ATS6360-035GolRdDIR). Report to Trice – Project & Development Managers. Arborman Tree Solutions, Adelaide.

Baker-Gabb, D., & V.G. Hurley (2011). National Recovery Plan for the Regent Parrot (eastern subspecies) *Polytelis anthopeplus monarchoides*. Department of Sustainability and Environment, Melbourne. Available from: http://www.environment.gov.au/biodiversity/threatened/recovery-plans/national-recovery-plan-regent-parrot-eastern-subspecies-polytelis-anthopeplus-monarchoides.

Bates, R. (2009). South Australian Native Orchids. Compact Disc. Adelaide: Native Orchid Society of South Australia.

Benshemesh, J. (2007). National Recovery Plan for Malleefowl. Department for Environment and Heritage, South Australia. Available from: http://www.environment.gov.au/resource/national-recovery-plan-malleefowl-leipoa-ocellata.

Birdlife Australia (2022). Online resource. Retrieved from: https://birdlife.org.au/all-about-birds/australias-birds/find-a-bird [Verified 11 August 2022].

Brophy, J.J., Craven, L.A. and Doran, J.C., (2013). Melaleucas: their botany, essential oils and uses. Australian Centre for International Agricultural Research (ACIAR).

Bruce, M.J., Bryant, D.B., Kohout, M., Macak, P.V., Batpurev, K. and Sinclair, S.J., 2022. Southern brown bandicoots, Isoodon obesulus obesulus, occupy the margins of artificial waterways, in preference to bushland remnants or roadside vegetation. *Wildlife Research*.

Carter, O. & G. Sutter (2010). National Recovery Plan for the Clover Glycine *Glycine latrobeana*. Department of Sustainability and Environment, Melbourne. Available from: http://www.environment.gov.au/resource/national-recovery-plan-clover-glycine-glycine-latrobeana.

Cogger, H. (2014). Reptiles and amphibians of Australia. CSIRO publishing.

Croft SJ, Pedler JA, Milne TI (2008b) Bushland Condition Monitoring Manual – Southern Mt Lofty Ranges Region. Nature Conservation Society of South Australia, Adelaide.

Cutten JL, Hodder MW (2002). Scattered tree clearance assessment in South Australia: streamlining, guidelines for assessment and rural industry extension. Biodiversity Assessment Services, Department of Water, Land and Biodiversity Conservation, Adelaide.

Department of Agriculture, Water and the Environment (DAWE) (2021a). National Recovery Plan for the Painted Honeyeater (*Grantiella picta*). Department of Agriculture, Water and the Environment, Canberra. Available from: http://www.dcceew.gov.au/environment/biodiversity/threatened/publications/recovery/painted-honeyeater-2022.

Department of Agriculture, Water and the Environment (DAWE) (2021b). National Recovery Plan for the Grey-headed Flying-fox *Pteropus poliocephalus*. Canberra: Commonwealth of Australia. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/recovery/grey-headed-

Department of Agriculture, Water and the Environment (DAWE) (2022). Conservation Advice for *Zoothera lunulata halmaturina* (western Bassian thrush). Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/67121-conservation-advice-22042022.pdf.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2021). *Phytophthora dieback*. Available at: https://www.dcceew.gov.au/environment/invasive-species/diseases-fungi-and-parasites/phytophthora-cinnamomi-disease [Accessed 31/08/2022].

Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2022a) Australia's bioregions (IBRA). Available at: https://environment.gov.au/land/nrs/science/ibra [Accessed 11/08/2022].

Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2023). *EPBC Act Protected Matters Report - reports created 30/03/2023*. Department of Agriculture, Water and the Environment.

Department for Environment and Heritage (DEH) (2006) *Management Plan Mount George Conservation Park 2006*. Department for Environment and Heritage, Adelaide.

Department for Environment and Water (DEW) (2022a) NatureMaps. Available at: https://data.environment.sa.gov.au/NatureMaps [Accessed 11/08/2022].

Department for Environment and Water (DEW) (2022b). Biological Databases of South Australia (BDBSA) data extract: Recordset number DEWNRBDBSA220816-1. Adelaide.

Department for Environment and Water (DEW) (2022c). Grey-headed flying fox. Retrieved from Green Adelaide: https://www.greenadelaide.sa.gov.au/discover/native-animals/grey-headed-flying-fox#:~:text=Grey%2Dheaded%20flying%20foxes%20(Pteropus,to%20extinction%20locally%20and%20nationally.

Duncan, M (2010). National Recovery Plan for the Spiral Sun Orchid *Thelymitra matthewsii*. Department of Sustainability and Environment, Melbourne. Available from: http://www.environment.gov.au/biodiversity/threatened/recovery-plans/national-recovery-plan-spiral-sun-orchid-thelymitra-matthewsii.

EBS Ecology (2021) Mount Lofty Golf Estates Ecological Assessment Letter Report. Report to C/- Venture Capital Developments Pty Ltd. EBS Ecology, Adelaide.

EBS Heritage (2021) Mount Lofty Golf Estates Cultural Heritage Desktop Assessment. Report to Venture Capital Development Pty Ltd. EBS Heritage, Adelaide.

EBS Ecology (2022a) Mount Lofty Golf Estate Ecological Flora and Fauna Assessment. Report to Trice – Project & Development Managers. EBS Ecology, Adelaide.

Eby, P., Law, B. (2008). Ranking the feeding habitats of Grey-headed flying foxes for conservation management. A report for The Department of Environment and Climate Change (NSW) and The Department of Environment, Water, Heritage and the Arts.

FMG Engineering (2021). *Preliminary Geotechnical Investigation Report Civil Engineering at Stirling Golf Club*. Report produced for Venture Capital Developments Pty Ltd.

Garnett S & Baker GB (Eds) (2021). *The Action Plan for Australian Birds 2020*. CSIRO publishing, 2021.

Gregory, P. (2020). Shy Heathwren (*Hylacola cauta*), version 1.0. In Birds of the World (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.shyhea1.01

Higgins PJ, Peter JM & Cowling SJ (Eds) (2006). Handbook of Australian, New Zealand and Antarctic Birds. Volume 7 Boatbill to Starlings, Part B Dunnock to Starlings. Oxford University Press, Melbourne.

Jones, David L. (2006). A complete guide to native orchids of Australia including the island territories. Frenchs Forest, N.S.W.: New Holland. p. 71.

Kelly, L. T., & Bennett, A. F. (2008). Habitat requirements of the yellow-footed antechinus (*Antechinus flavipes*) in box–ironbark forest, Victoria, Australia. Wildlife research, 35(2), 128-133.

McDonald-Madden, E., Schreiber, E.S.G., Forsythm D.M., Choquenot, D., Clancy, T.F. (2005). Factors affecting Grey-headed Flying-fox (*Pteropus poliocephalus*: Pteropodidae) foraging in the Melbourne metropolitan area, Australia. Austral Ecology 30: pp. 600-608.

Morcombe, M. (2021). Field guide to Australian birds. Archerfield, Queensland: Steve Parish.

Moritz, K.N. & D.C. Bickerton (2010). Recovery Plan for the Osborn's Eyebright *Euphrasia collina* ssp. *osbornii*. Report to the Recovery Planning and Implementation Section, Australian Government Department of the Environment, Water, Heritage and the Arts, Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/recovery-plans/national-recovery-plan-endangered-osborns-eyebright-euphrasia-collina-subsp-osbornii.

Native Vegetation Council (NVC) (2020a). Bushland Assessment Manual July 2020. Native Vegetation Council, Adelaide. Available at: https://www.environment.sa.gov.au/topics/native-vegetation/clearing/vegetation-assessments.

Native Vegetation Council (NVC) (2020b). Scattered Tree Assessment Manual July 2020. Native Vegetation Council, Adelaide. Available at: https://www.environment.sa.gov.au/topics/native-vegetation/clearing/vegetation-assessments.

Pickett, M. (2007). Assessment of the Distribution, Habitat and Conservation Status of the Chestnut-rumped Heathwren Hylacola pyrrhopygia parkeri in the Mount Lofty Ranges. Department for Environment and Heritage (Unpublished report).

Pizzey, G., & Knight, F. (2013). Pizzey and Knight Birds of Australia Digital Edition Version 1.3. Macleod: Gibbon Multimedia (Aus) Pty Ltd.

Quarmby, J.P. (2010) Recovery Plan for Twelve Threatened Orchids in the Lofty Block Region of South Australia 2010. Department of Environment and Natural Resources, South Australia.

R architecture (2021). Mount Lofty Golf Course Master Plan. Report produced for Venture Capital Developments Pty Ltd, Melbourne, Vic.

SA Seed Conservation Centre (SSCC) (2018). Seeds of South Australia Species Information. Botanic Gardens of South Australia. https://spapps.environment.sa.gov.au/SeedsOfSA/scientificsearch.html

Seaman, R.L. (2002). Wetland Inventory for the Mount Lofty Ranges. Department for Environment and Heritage, Adelaide.

Schoenjahn, J., Pavey, C.R., Walter, G.H. 2020. Ecology of the Grey Falcon *Falco hypoleucos* – current and required knowledge. Emu 120: 74-82.

Sharp D. and Simon B.K. (2002) AusGrass: Grasses of Australia (Version 1.0 July 2002). Australian Biological Resources Study, Canberra, and the Environmental Protection Agency, Queensland. Available at: https://keys.lucidcentral.org/keys/v3/AusGrass/key/AusGrass/Media/Html/Ausgrass%20welcome.htm [Accessed 22/08/2022]

Sirisena, U.M., 2010. Systematic studies on *Thysanotus* R. Br. (Asparagales: Laxmanniaceae) (Doctoral dissertation).

The South Australian Government Gazette (2020). No. 97, *Development Act 1993*, 17 December, p. 5848. Printed by authority of S. Smith, Government Printer, South Australia. [Viewed 05 September 2022 https://governmentgazette.sa.gov.au/].

Strahan, R. & van Dyck, S. (2008). The mammals of Australia. Sydney: New Holland Publishers.

Threatened Species Scientific Committee (TSSC) (2009). Commonwealth Listing Advice on *Veronica derwentiana* ssp. *homalodonta* (Mount Lofty Speedwell). Department of the Environment, Water, Heritage and the Arts. Canberra, ACT: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/82836-listing-advice.pdf.

Threatened Species Scientific Committee (TSSC) (2016a). Conservation Advice *Pterostylis cucullata* leafy greenhood. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/15459-conservation-advice-01042016.pdf.

Threatened Species Scientific Committee (TSSC) (2016b). Conservation Advice *Isoodon obesulus obesulus* southern brown bandicoot (eastern). Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/68050-conservation-advice-05052016.pdf.

Threatened Species Scientific Committee (TSSC) (2021). Conservation Advice *Caladenia behrii* Pink-lipped Spider-orchid. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/11161-conservation-advice-29092021.pdf.

Van Weenen, J. (2015). More grey-headed flying foxes calling Adelaide home as colony grows. The Advertiser, accessed at: https://www.adelaidenow.com.au/lifestyle/sa-weekend/more-greyheaded-flying-foxes-calling-adelaide-home-as-colony-grows/news-story/e4953ad4931a5efd615ed7356cd3728e

Willson, A. & J. Bignall (2009). Regional Recovery Plan for Threatened Species and Ecological Communities of Adelaide and the Mount Lofty Ranges, South Australia. Department for Environment and Heritage, South Australia. Available from: http://www.environment.gov.au/biodiversity/threatened/recovery-plans/threatened-species-and-ecological-communities-adelaide-and-mount-lofty.

8. Appendices

Appendix 1. List of flora species observed in the Project Area

Scientific Name	Common Name	EPBC Act	NPW Act
*Acacia mearnsii**	Black Wattle		
Acacia melanoxylon	Blackwood		
Acaena echinata	Sheep's Burr		
Acrotriche serrulata	Cushion Ground-berry		
Agapanthus praecox ssp. *Orientalis**			
*Allium triquetrum**	Three-cornered Garlic		
Anagallis sp.*			
Arthropodium sp.	Vanilla-lily		
Banksia marginata	Silver Banksia		
*Briza maxima**	Large Quaking-grass		
Bulbine bulbosa	Bulbine-lily		
Bursaria spinosa ssp. *spinosa*	Sweet Bursaria		
Caesia calliantha	Blue Grass-lily		
Callitris gracilis	Southern Cypress Pine		
Cassytha sp.	Dodder-laurel		
*Cenchrus clandestinus**	Kikuyu		
Craspedia variabilis	Billy-buttons		
*Cytisus scoparius**	English Broom		
*Dactylis glomerata**	Cocksfoot		
Daviesia leptophylla	Narrow-leaf Bitter-pea		
Dianella revoluta var. *revoluta*	Black-anther Flax-lily		
Dichondra repens	Kidney Weed		
Dillwynia hispida	Red Parrot-pea		
Diuris pardina	Spotted Donkey-orchid		
Drosera whittakeri	Scented Sundew		
Epacris impressa	Common Heath		
Eucalyptus obliqua	Messmate Stringybark		
Eucalyptus viminalis ssp. *cygnetensis*	Rough-bark Manna Gum		
Eucalyptus viminalis ssp. *viminalis*	Manna Gum		R
Exocarpos cupressiformis	Native Cherry		
*Freesia cultivar**	Freesia		
*Fumaria capreolata**	White-flower Fumitory		
*Galium aparine**	Cleavers		
*Genista monspessulana**	Montpellier Broom		
Geranium sp.	Geranium		

Scientific Name	Common Name	EPBC Act	NPW Act
Gonocarpus sp.	Raspwort		
Hakea sp.	Hakea/Needlewood		
*Hedera helix**	English Ivy		
Hibbertia sp.	Guinea-flower		
*Hypochaeris glabra**	Smooth Cat's Ear		
Iris sp.*	Iris		
Ixodia achillaeoides ssp. *alata*	Hills Daisy		
Kennedia prostrata	Scarlet Runner		
Lepidosperma semiteres	Wire Rapier-sedge		
Leptospermum continentale	Prickly Tea-tree		
Leptospermum myrsinoides	Heath Tea-tree		
Lomandra densiflora	Soft Tussock Mat-rush		
Lomandra juncea	Desert Mat-rush		
Lomandra micrantha ssp. *micrantha*	Small-flower Mat-rush		
Lomandra multiflora ssp.	Many-flower Mat-rush		
Luzula meridionalis	Common Wood-rush		
*Moraea flaccida**	One-leaf Cape Tulip		
*Moraea setifolia**	Thread Iris		
Narcissus sp.*			
*Onopordum acanthium**	Scotch Thistle		
Oxalis perennans	Native Sorrel		
*Oxalis pes-caprae**	Soursob		
*Oxalis purpurea**	One-o'clock		
*Pentameris pallida**	Pussy Tail		
*Phalaris aquatica**	Phalaris		
*Pinus radiata**	Radiata Pine		
*Pittosporum undulatum**	Sweet Pittosporum		
Plantago lanceolata var.*	Ribwort		
Platylobium obtusangulum	Holly Flat-pea		
Pteridium esculentum ssp. *esculentum*	Bracken Fern		
Pterostylis nana	Dwarf Greenhood		
Pterostylis nutans	Nodding Greenhood		
Pterostylis pedunculata	Maroon-hood		
Pultenaea daphnoides	Large-leaf Bush Pea		
*Quercus ilex**			
*Ranunculus arvensis**			
*Rhamnus alaternus**	Blowfly Bush		
Romulea sp.*	Onion-grass		
*Rosa canina**	Dog Rose		
*Rubus fruticosus aggregate**	Blackberry		
Rumex sp.*	Dock		

Scientific Name	Common Name	EPBC Act	NPW Act
Senecio hypoleucus	Pale Groundsel		
*Senecio pterophorus**	African Daisy		
Sonchus sp.*	Sow-thistle		
*Sporobolus africanus**	Rat-tail Grass		
Stackhousia monogyna	Creamy Candles		
Styphelia humifusa	Cranberry Heath		
Tetratheca pilosa	Hairy Pink-bells		
Themeda triandra	Kangaroo Grass		
*Ulex europaeus**	Gorse		
*Viburnum tinus**	Laurestinus		
Vicia sativa ssp.*	Common Vetch		
*Vinca major**	Blue Periwinkle		
Watsonia sp.*	Watsonia		

Conservation status:
Aus: Australia (EPBC Act). SA: South Australia (NPW Act). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (T): listed as a Migratory Terrestrial species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.
*** indicates an introduced species.**

Appendix 2. List of fauna species observed in the Project Area

Scientific Name	Common Name	EPBC Act	NPW Act	Number of individuals
AVES				
Acanthiza lineata	Striated Thornbill			3
Acanthorhynchus tenuirostris	Eastern Spinebill			2
Anthochaera carunculata	Red Wattlebird			1
Cacatua galerita	Sulphur-crested Cockatoo			1+
Cacatua sanguinea gymnopis	Little Corella			1+
Caligavis chrysops	Yellow-faced Honeyeater			2
Chenonetta jubata	Maned Duck			1+
Colluricincla harmonica	Grey Shrikethrush			1
Cormobates leucophaea	White-throated Treecreeper			2
Corvus mellori	Little Raven			1
Dacelo novaeguineae novaeguineae	Laughing Kookaburra			3
Dicaeum hirundinaceum hirundinaceum	Mistletoebird			1
Egretta novaehollandiae	White-faced Heron			1 (flying over)
Gymnorhina tibicen	Australian Magpie			1+
Malurus cyaneus	Superb Fairywren			1+
Phaps chalcoptera	Common Bronzewing			1
Platycercus elegans	Crimson Rosella			2
Rhipidura albiscapa	Grey Fantail			1
Smicrornis brevirostris	Weebill			1+
Strepera versicolor	Grey Currawong			1
Trichoglossus moluccanus moluccanus	Rainbow Lorikeet			2
*Turdus merula merula**	Common Blackbird			1+
Zanda funerea whiteae	Yellow-tailed Black Cockatoo		V	4
MAMMLIA				
MACROPODIDAE	Kangaroos			1
*Oryctolagus cuniculus**	European Rabbit			1+
Trichosurus vulpecula	Common Brushtail Possum		R	scat observed only

Conservation status:

Aus: Australia (EPBC Act). SA: South Australia (NPW Act). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (T): listed as a Migratory Terrestrial species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.

*** indicates an introduced species.**

Appendix 3. Scattered tree using fauna species in the Project Area

Scientific name	Common name	EPBC Act	NPW Act	MLR	Resource use	Habitat / status
AVES	**Birds**					
Ninox boobook	Australian Boobook			NT	P, H	w
Aegotheles cristatus cristatus	Australian Owlet-nightjar			RA	H	w
Daphoenositta chrysoptera pileata	Black-capped Sittella/Varied Sittella			VU	F	w
Melithreptus gularis gularis	Black-chinned Honeyeater		V	CR	P, F	w
Climacteris picumnus picumnus	Brown Treecreeper			VU	P, H	w
Melithreptus brevirostris	Brown-headed Honeyeater			NT	P, F	w
Melopsittacus undulatus	Budgerigar			RA	P, H	s
Nymphicus hollandicus	Cockatiel			RA	P, H	s
Artamus cyanopterus	Dusky Woodswallow			RA	P	w
Neophema elegans elegans	Elegant Parrot		R	VU	P, H	w
Chalcites basalis	Horsfield's Bronze Cuckoo			NT	P	s
Microeca fascinans fascinans	Jacky Winter		R	CR	P	w
Hieraaetus morphnoides	Little Eagle		V	EN	P	w
Anas superciliosa	Pacific Black Duck			RA	H	s
Geopelia placida placida	Peaceful Dove			VU	P	w
Falco peregrinus macropus	Peregrine Falcon		R	RA	P, H, N	w/r
Parvipsitta porphyrocephala	Purple-crowned Lorikeet			NT	P, H, F	w/s
Merops ornatus	Rainbow Bee-eater			VU	P	s
Psephotus haematonotus haematonotus	Red-rumped Parrot			NT	P, H	w/r
Pachycephala rufiventris	Rufous Whistler			NT	P, F	w/s
Todiramphus sanctus sanctus	Sacred Kingfisher			NT	P, H	w
Petroica boodang boodang	Scarlet Robin		R	VU	P	w
Zosterops lateralis	Silvereye			NT	P, F	w/s
Pardalotus punctatus	Spotted Pardalote			NT	P, F	w/s

Scientific name	Common name	EPBC Act	NPW Act	MLR	Resource use	Habitat / status
Lophoictinia isura	Square-tailed Kite		E	EN	P	s
Plectorhyncha lanceolata	Striped Honeyeater		R	EX	P, F	w
Petrochelidon nigricans	Tree Martin			NT	P, H	w/s
Artamus superciliosus	White-browed Woodswallow			RA	P	s
Melithreptus lunatus	White-naped Honeyeater			NT	P, F	w
Ardea pacifica	White-necked Heron			VU	P, N	s
Rhipidura leucophrys leucophrys	Willie Wagtail			NT	P, N, F	w/r
Acanthiza nana	Yellow Thornbill			NT	P, F	w
Acanthiza chrysorrhoa	Yellow-rumped Thornbill			NT	P, N	w/r
Zanda funerea whiteae	Yellow-tailed Black Cockatoo		V	VU	P, H	w
MAMMALIA	**Mammals**					
Trichosurus vulpecula	Common Brushtail Possum		R	LC	H, N, F	w/r
Pseudocheirus peregrinus	Common Ringtail Possum			RA	H, N, F	w/r
Pteropus poliocephalus	Grey-headed Flying-fox	VU	R	RA	P, F	r

EPBC Act: Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable

NPW Act: CE = Critically endangered, E = Endangered, V = Vulnerable, R = Rare

MLR: LC = Least Concern (Common), NT = Near Threatened (Uncommon), RA = Rare, VU = Vulnerable, EN = Endangered, CR = Critically Endangered

Resource use: P = perching/roosting, N = nesting, H = using hollow for nesting/roosting, F = feeding

Habitat/status: s = seasonal (includes waterbirds using trees near seasonal wetlands, seasonal and nomadic species), w = woodland birds that occasionally use adjacent scattered trees, r=species that can reside in scattered trees.

Sources: BSBSA records within 5 km of the Project Area (DEW 2022b), Scattered Tree Assessment Manual (NVC 2020b).

-

Appendix 4. BDBSA flora recorded within 5 km of the Project Area

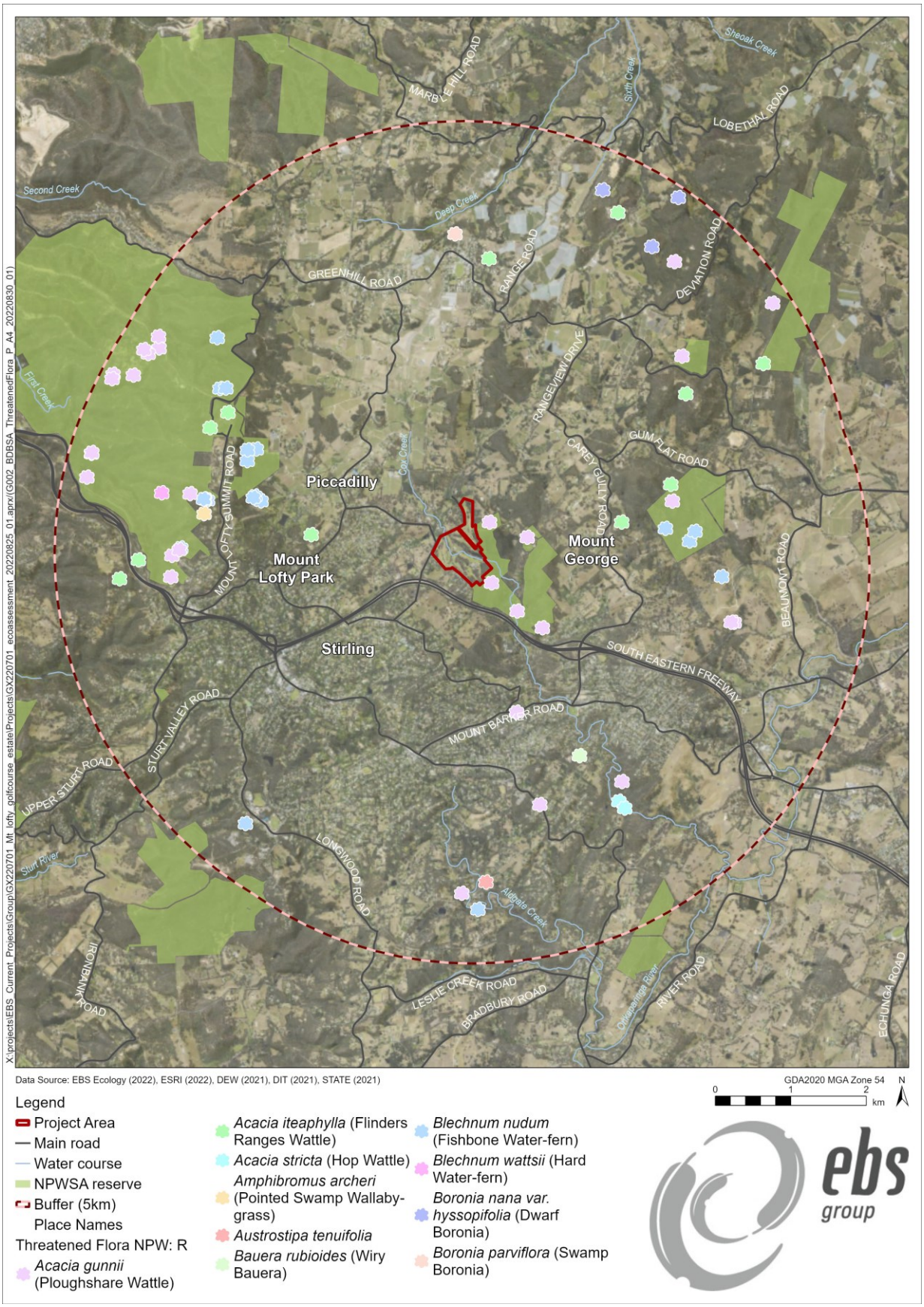

Figure 10. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 1 of 5).

-

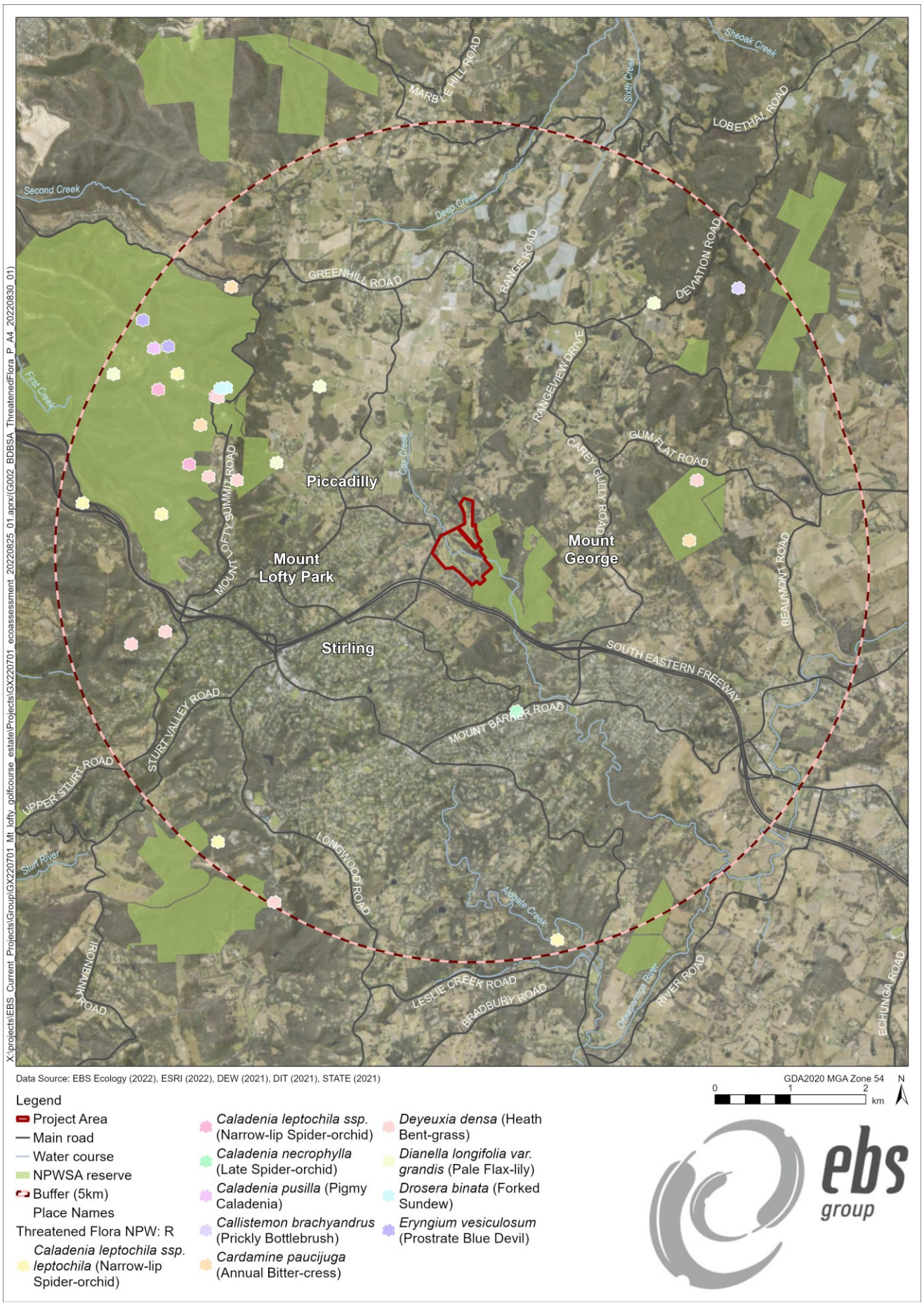

Figure 11. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 2 of 5).

-

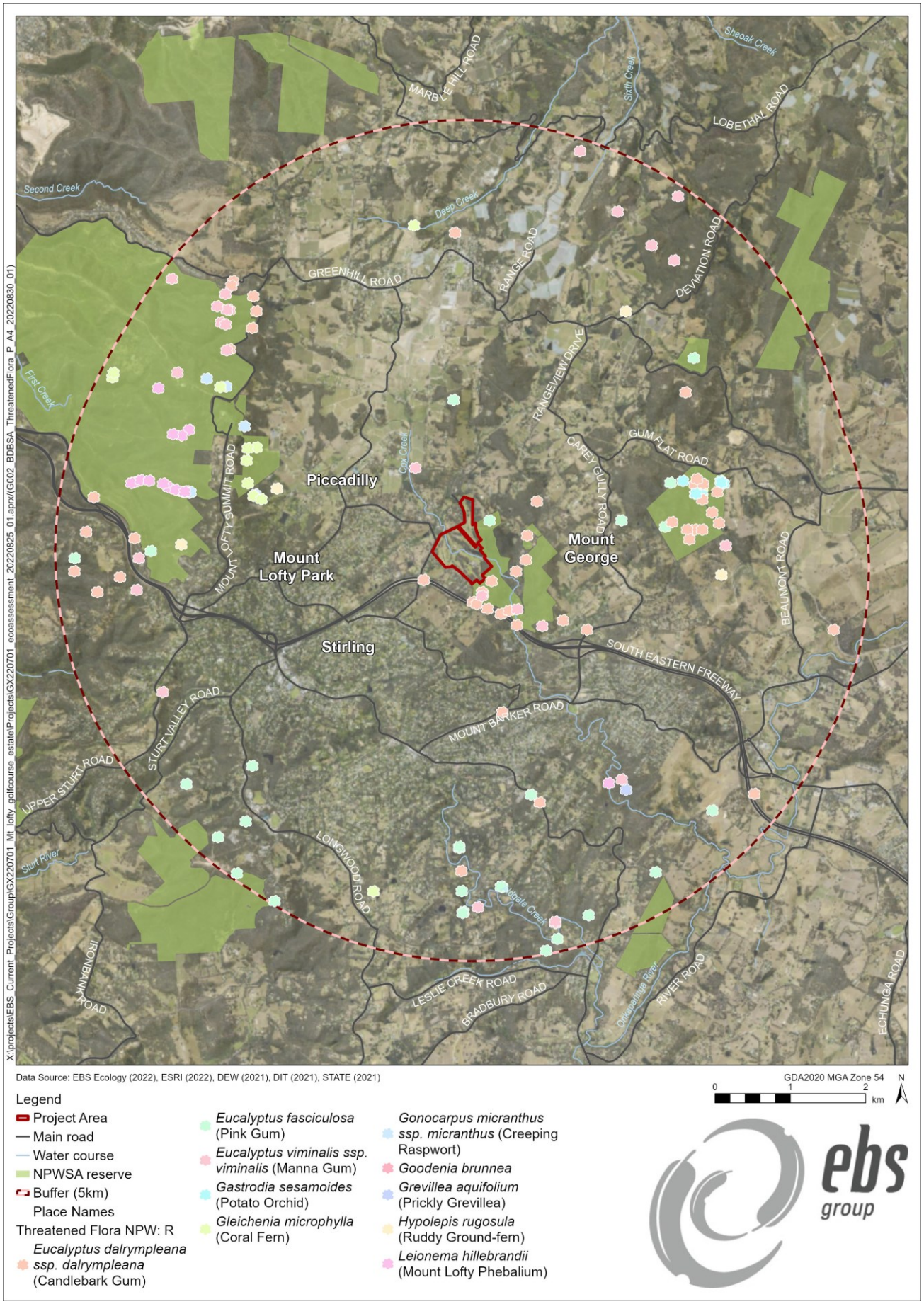

Figure 12. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 3 of 5).

-

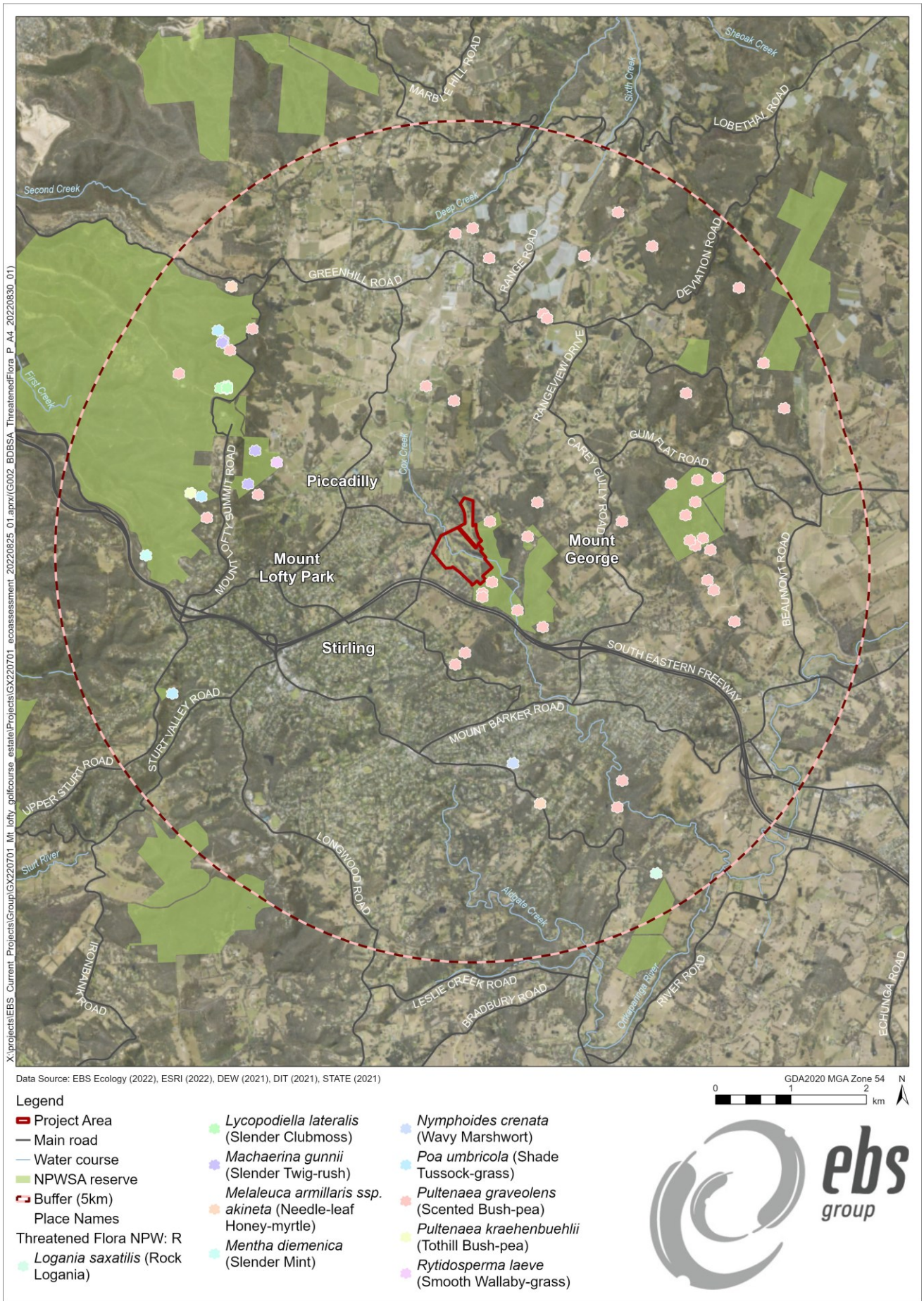

Figure 13. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 4 of 5).

-

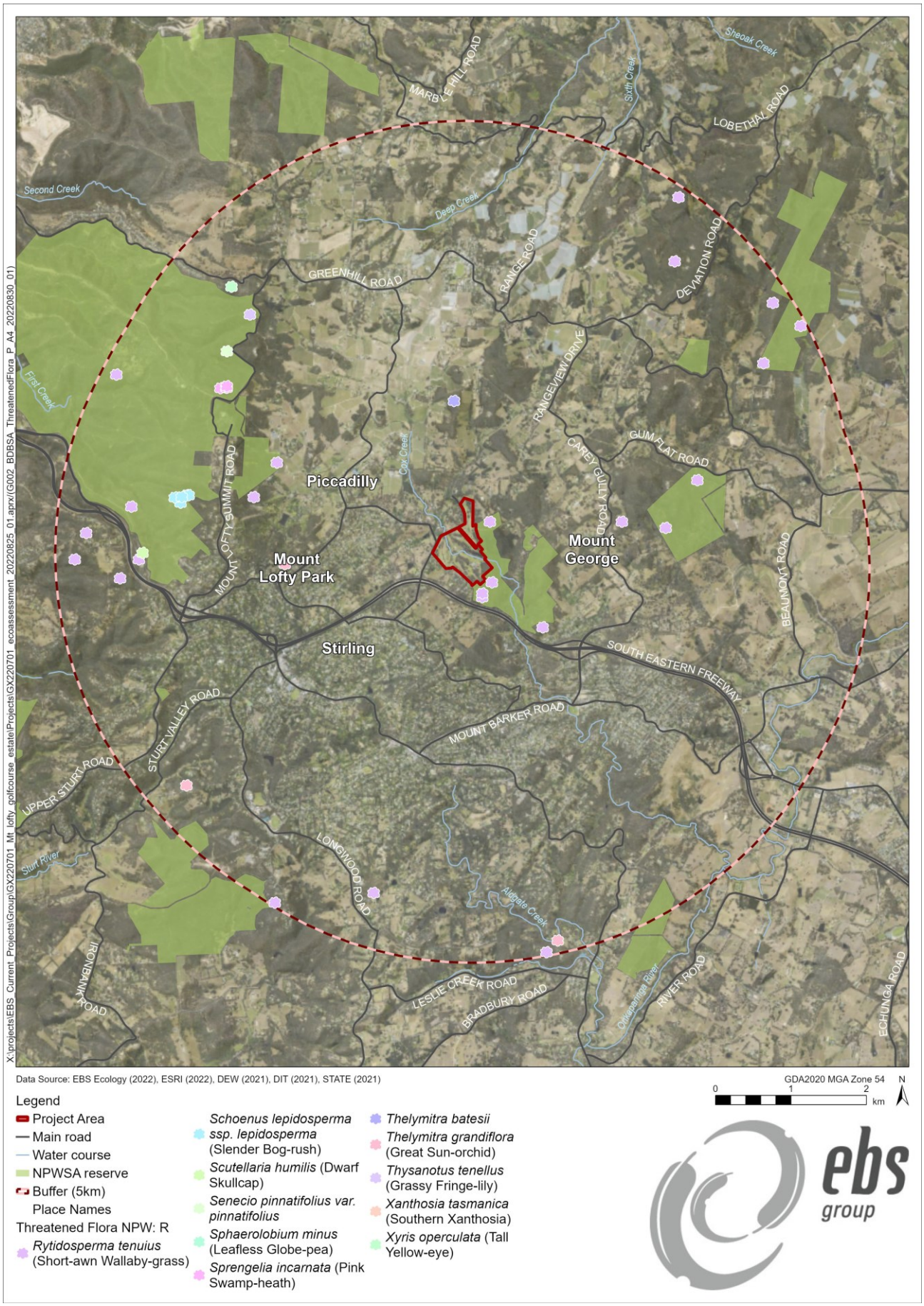

Figure 14. BDBSA flora record for State listed Rare species, located within 5 km of the Project Area (Map 5 of 5).

-

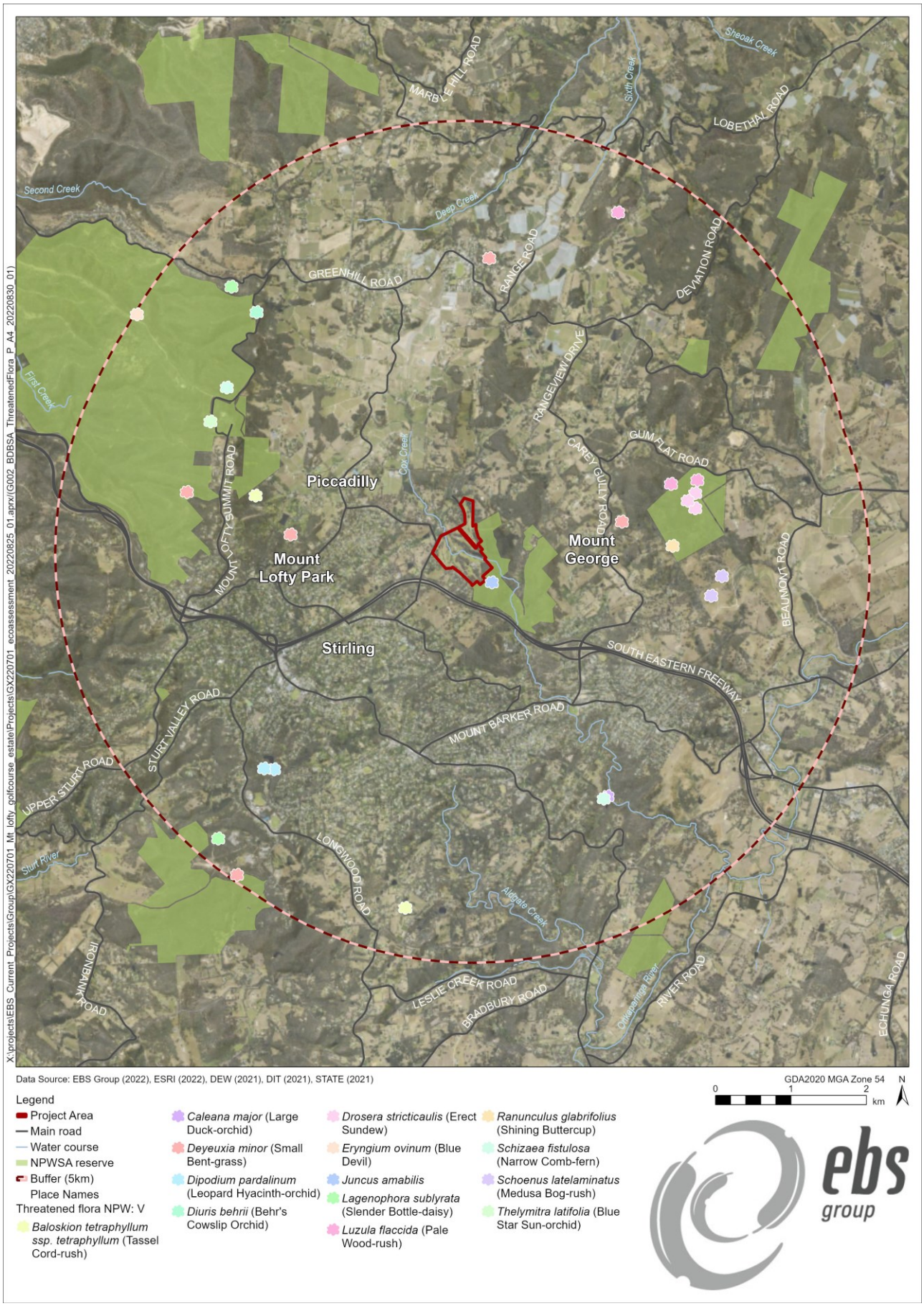

Figure 15. BDBSA flora record for State listed Vulnerable species, located within 5 km of the Project Area.

-

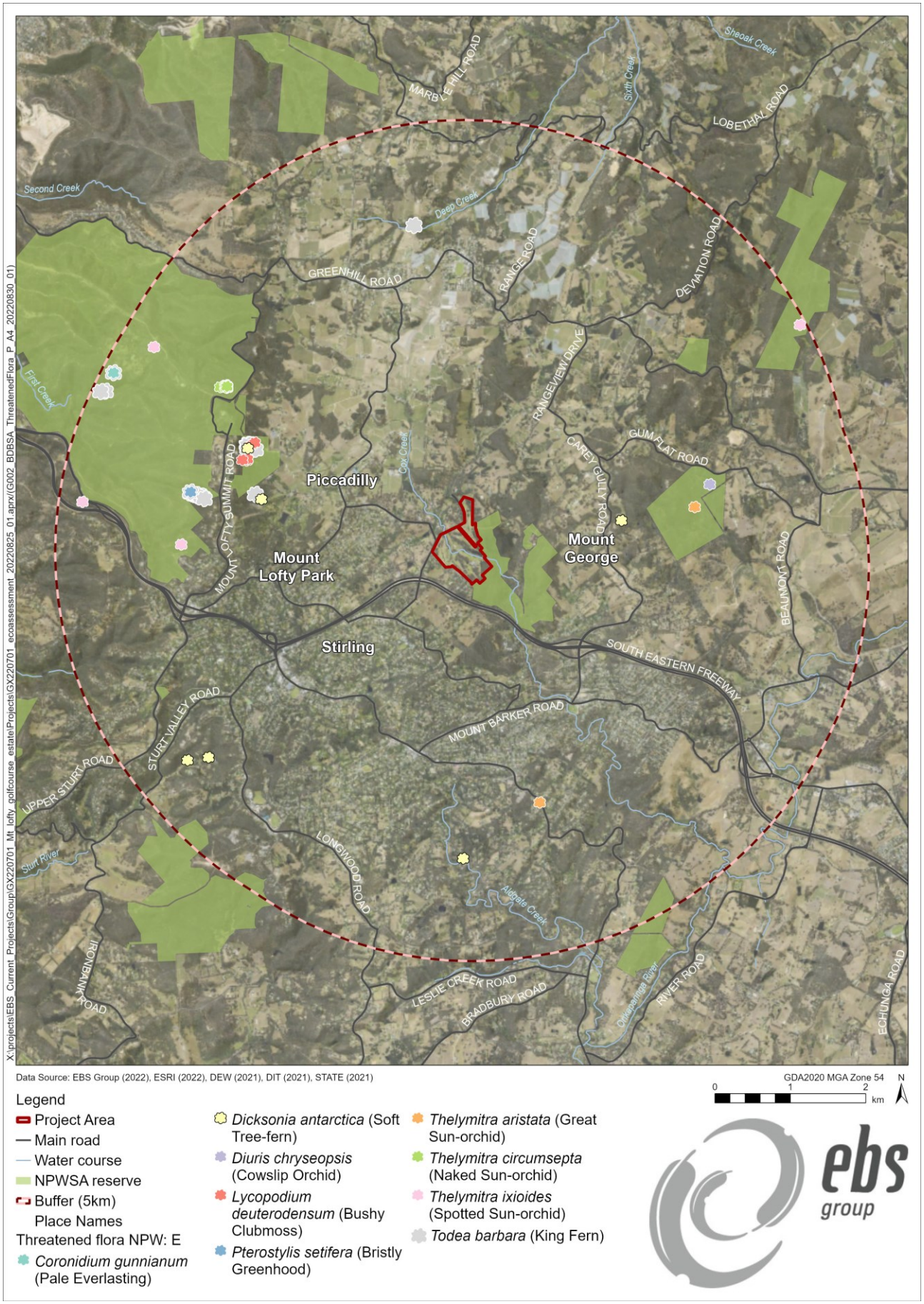

Figure 16. BDBSA flora record for State listed Endangered species, located within 5 km of the Project Area.

-

Appendix 5. Assessment of likelihood of national (EPBC Act) and State (NPW Act) listed threatened flora identified by the PMST (DCCEEW 2023) and BDBSA (DEW 2022b) to occur in the Project Area (green shading = known / highly likely or likely to occur, orange shading = possible to occur).

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Acacia gunnii	Ploughshare Wattle		R	2	2022	Usually on rocky hillsides and amongst rocky outcrops in open forest, associated with *Eucalyptus obliqua* and *Eucalyptus baxteri* (SSCC 2018).	**Likely** – Some suitable habitat within the Project Area and *E obliqua* observed during the field survey.
Acacia iteaphylla	Flinders Ranges Wattle		R	2	2022	Naturally occurs in the Flinders Ranges, across to the Gawler Ranges, and on the Eyre Peninsula. Naturalised beyond its native range in some parts of south-eastern and southern SA (SSCC 2018).	**Possible** – Some suitable within the Project Area. Although widely planted, regeneration of this species is likely.
Acacia stricta	Hop Wattle		R	2	2005	Found primarily in small, localised areas in the southeast of SA between Millicent and Mount Gambier in association with *Eucalyptus baxteri* over a heathy understorey, often in damp areas (SSCC 2018).	**Unlikely** – Despite recent records, this species is generally confined to the southeast of SA.
Amphibromus archeri	Pointed Swamp Wallaby-grass		R	2	2018	Grows in damp areas such as lagoons, waterholes, and swamps, often on predominantly sandy soils. Found in KI, in the Mount Lofty Ranges and in the southeast of SA (SSCC 2018).	**Possible** – Recent records and some suitable habitat including water sources are present in the Project Area, though not within proposed areas of impact.
Austrostipa tenuifolia			R	2	2018	Found on the Eyre Peninsula, Mount Lofty Ranges, the Murray, and the upper South-east in South Australia, growing sandy soils in grassland or grassy woodland associated with *Callitris* or *Allocasuarina* (SSCC 2018).	**Possible** – Recent records, though associated vegetation community is not present in Project Area.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Baloskion tetraphyllum ssp. *tetraphyllum*	Tassel Cord-rush		V	2	2012	Very limited occurrences in the lower South-east of South Australia, between Millicent and Mount Gambier, usually in swamping areas (SSCC 2018).	**Unlikely** – Despite recent records, this species is generally confined to the southeast of SA.
Bauera rubioides	Wiry Bauera		R	2	2011	Found on Kangaroo Island and in the southern Mount Lofty Ranges in South Australia, growing in damp heathland and heathy forests (SSCC 2018).	**Unlikely** – Despite recent records, this species is generally confined to Kangaroo Island.
Blechnum nudum	Fishbone Water-fern		R	2	2022	Found on Kangaroo Island and southern Mount Lofty Ranges in South Australia, growing along stream banks in shaded gullies (SSCC 2018).	**Unlikely** – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
Blechnum wattsii	Hard Water-fern		R	2	2010	SA: SL KI SE. The habitat of this species is usually identical to those of *Blechnum minus* and *Blechnum nudum*. These three species always co-occur and are often intermingled within the same clump. Grows in wet forest types such as rainforest, wet eucalypt forest and riparian vegetation where it can form the dominant groundcover. Grows in great profusion in permanently damp areas and is most abundant on stream banks and near waterfalls. It can sometimes form extensive colonies on flatter sites or in gully bottoms.	**Unlikely** – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
Boronia nana var. *hyssopifolia*	Dwarf Boronia		R	2	2022	Occurs in the SE region of SA. Growing in sandy heath with *Eucalyptus obliqua, Leptospermum continentale, Stylidium graminifolium, Thelionema caespitosum* and dune crests with *Eucalyptus baxteri* association.	**Possible** – Some suitable habitat within the Project Area including *Eucalyptus spp.*
Boronia parviflora	Swamp Boronia		R	2	2018	Found on the western end of Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia growing in wet heath and swampy areas (SSCC 2018).	**Unlikely** – Minimal suitable swampy habitat in Project Area. Isolated nearby record not positively identified.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Caladenia argocalla	White-beauty Spider-orchid	EN	E	1	Species or species habitat likely to occur within area	Endemic to the Mount Lofty Ranges Region of SA. Occurs in intact grassy woodlands often with *E. leucoxylon* (South Australian Blue Gum) and *Allocasuarina verticillata* (Drooping Sheoak). Usually grows on a gentle slope with a southerly aspect and in clay loam soils. Flowering from late September to October (Quarmby 2010).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Caladenia behrii	Pink-lipped Spider-orchid	EN	E	1	Species or species habitat likely to occur within area	Occurs on the Fleurieu Peninsula of SA. Grows in fertile, shallow loams, amongst *Eucalyptus goniocalyx* / *E. fasciculosa* woodland and amongst *E. obliqua* / *E. microcarpa* / *E. leucoxylon* woodland. The understorey is usually open and shrubby. Also recorded amongst *E. fasciculosa* & *Xanthorrhoea semiplana*. Generally found in quartzite-derived soils on steep south facing slopes but also on ridge tops and occasionally near creek beds. Often grows alongside bushwalking paths, vehicle tracks or roads due to the openness of these locations (TSSC 2021).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Caladenia gladiolata	Bayonet Spider-orchid	EN	E	1	Species or species habitat likely to occur within area	Occurs singly or in small groups in shrubby or grassy woodland and forest in well-drained soils dominated by *Eucalyptus leucoxylon, Eucalyptus cladocalyx* or *Eucalyptus fasciculosa*. Only known from a few populations (Quarmby 2010).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Caladenia leptochila ssp. *leptochila*	Narrow-lip Spider-orchid		R	2	2020	Found growing in clay or gravelly soils in shrubby forest in the Mount Lofty Ranges (Jones, 2006).	**Possible** – Recent records and some suitable habitat is present in the Project Area.
Caladenia necrophylla	Late Spider-orchid		R	2	2008	Mainly occurs in the south-east region of SA but has also been found in EP, KI, MU regions. Grows in heathy open forest, coastal shrub, heathland, tea-tree scrub.	**Unlikely** – Despite recent records, this species is generally confined to the southeast of SA.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Caladenia pusilla	Pigmy Caladenia		R	2	2013	SA: FR EP SL KI SE. Within the Eyre Peninsula region grows in Koppio Hills and Blue gum woodland. On KI, grows on mounds near river, sandy clay in heath. Within the Southern Lofty region, grows in stringybark scrub.	**Possible** – Some suitable habitat within the Project Area including stringybark scrub.
Caladenia rigida	Stiff White Spider-orchid	EN	E	1	Species or species habitat likely to occur within area	Inhabits ridge tops and hillslopes in grey-brown loam often associated with coarse quartzite gravel or sandstone pebbles. Vegetation is usually an open-forest with a relatively open understorey of low shrubs and sedges (Quarmby 2010).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Caleana major	Large Duck-orchid		V	2	2000	Usually found in Eucalyptus woodland, coastal or swampy shrubland and heathland. Forms small colonies in white sands in open *Eucalyptus baxteri* forest and often associated with *Banksia ornata* (ALA 2022).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Callistemon brachyandrus	Prickly Bottlebrush		R	2	2019	Found along the Murray River in South Australia mainly between Swan Reach and Waikerie growing in the sandy soils of alluvial flats (SSCC 2018).	**Unlikely** – Despite recent records, this species is generally confined to the mid-Murray region of SA.
Cardamine paucijuga	Annual Bitter-cress		R	2	2011	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing in rich soils in moist to dry habitats (SSCC 2018).	**Possible** – Some suitable habitat within the Project Area.
Coronidium gunnianum	Pale Everlasting		E	2	2006	Found in the southern Mount Lofty Ranges, Burra Gorge and a single record from the lower South-east in South Australia, growing in grasslands and riverine woodlands on soils that are prone to inundation (SSCC 2018).	**Possible** – Some suitable habitat within the Project Area.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Deyeuxia densa	Heath Bent-grass		R	2	2021	Commonly in heaths, sedgelands and in stream banks in damp, open to lightly shaded sites.	**Likely** – Some suitable habitat within the Project Area and recent records.
Deyeuxia minor	Small Bent-grass		V	2	2020	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower-South-east growing in damp areas under light eucalypt cover or margins of wet sclerophyll forest (SSCC 2018).	**Likely** – Some suitable habitat within the Project Area and recent records.
Dianella longifolia var. *grandis*	Pale Flax-lily		R	2	2019	Occurs under a variety of overstorey Eucalypt species but is a grassy woodland specialist, e.g., Blue Gum, Candlebark, Manna Gum, Stringybark and Grey Box.	**Likely** – Some suitable habitat within the Project Area and recent records.
Dicksonia antarctica	Soft Tree-fern		E	2	2020	SA: SL SE. Grows in numerous types of plant communities and is particularly abundant in wet forest communities. It occurs in forest types ranging from rainforest to sheltered gullies within dry sclerophyll forest and subalpine forest.	**Unlikely** – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
Dipodium pardalinum	Leopard Hyacinth-orchid		V	2	2012	Occurs from Naracoorte on the Victorian border to the Mount Lofty Ranges. In the Adelaide-Mount Lofty region the species is found in *Eucalyptus obliqua* woodland growing in association with *Acacia myrtifolia, Xanthorrhoea semiplana* ssp. *tateana* and *Pteridium esculentum* (Willson and Bignall 2009).	**Possible** – Recent records and some suitable habitat is present in the Project Area including *Eucalyptus obliqua,* though associated understorey species not present.
Diuris behrii	Behr's Cowslip Orchid		V	2	2015	Found in the southern Flinders Ranges and the Mount Lofty Ranges with a few records from Eyre Peninsula growing in native grassland, open woodland and grassy forest; grows on more fertile soils, especially amongst *Themeda* sp. (Kangaroo Grass) and *Triodia* on gentle slopes and flats (SSCC 2018).	**Possible** – Recent records and some suitable habitat is present in the Project Area.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Diuris chryseopsis	Cowslip Orchid		E	2	1998	Presumed extinct in the Mt Lofty Ranges (but may have been rediscovered in Kuitpo Native Forest Reserve) and found only between Naracoorte and Mount Gambier in South Australia, growing in damper grassy patches in woodland around waterholes, along creeks, on cooler slopes in rich, moist soils (SSCC 2018).	**Unlikely** – No recent records and this species is generally confined to the southeast of SA.
Drosera binata	Forked Sundew		R	2	2017	Found in the southern Mount Lofty Ranges, on the western end on Kangaroo Island and in the lower South-east in South Australia, growing in wet sand and sandy peat in swamps, on creek banks and seepage lines in rock-faces (SSCC 2018).	**Possible** – Recent records and some suitable habitat is present in the Project Area.
Drosera stricticaulis	Erect Sundew		V	2	1998	Found on southern Eyre Peninsula and on Dutchmans Stern in the Flinders Ranges in South Australia, growing on sandy clay-loam along watercourses and granite outcrops (SSCC 2018).	**Unlikely** – No recent records and this species is generally confined to the Eyre Peninsula in SA.
Eryngium ovinum	Blue Devil		V	2	2013	Found in the wetter parts of the Mount Lofty Ranges and a few sites in the lower South-East in South Australia, growing in open woodland on damp clay and sandy soils (SSCC 2018).	**Possible** – Recent records and some suitable habitat is present in the Project Area.
Eryngium vesiculosum	Prostrate Blue Devil		R	2	2010	Found scattered in South Australia, from the Lake Eyre region to the lower South-east, growing in sandy flats in low-lying damp areas (SSCC 2018).	**Possible** – Recent records and some suitable habitat is present in the Project Area.
Eucalyptus dalrympleana ssp. *dalrympleana*	Candlebark Gum		R	2	2022	Often in poorer sandy soils, in woodland or as an emergent in low shrublands. Commonly associated with *E. baxteri, E. cosmophylla, E. diversifolia, E. leptophylla and E. leucoxylon* (Nicolle, 2013).	**Possible** – Very recent records, some suitable habitat and associated species are present within the Project Area.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Eucalyptus fasciculosa	Pink Gum		R	2	2021	Grows on moist, well-drained alluvial soils near watercourses but also grows on drier sites at higher altitudes. Tolerates snow and some flooding (Nicolle, 2013).	**Possible** – Very recent records and some suitable habitat is present within the Project Area.
Eucalyptus viminalis ssp. *viminalis*	Manna Gum		R	2	2022	Generally recorded as growing in mallee scrubland but has also been found growing in coastal heathlands, sclerophyll forests and woodlands. It is also found in heathy openings in wet sclerophyll forest and in a swamp at Mt Compass (Nicolle, 2013).	**Known / Highly Likely** – Recorded within the Project Area.
Euphrasia collina ssp. *osbornii*	Osborn's Eyebright	EN	E	1	Species or species habitat known to occur within area	Confined to SA. Has been collected in the Upper SE (Yumali-Meningie Road), on eastern KI. (Dudley Peninsula-W of Cape Willoughby), Eyre Peninsula (Venus Bay), Yorke Peninsula, Northern Lofty region (Clare, Burra), Southern Lofty region (inc. Fleurieu Peninsula and Mt Compass) and the Flinders Ranges. Generally recorded as growing in mallee scrubland but has also been found growing in coastal heathlands, sclerophyll forests and woodlands. It is also found in heathy openings in wet sclerophyll forest and in a swamp at Mt Compass (Moritz and Bickerton 2010).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Gastrodia sesamoides	Potato Orchid		R	2	2021	Found in the southern Mount Lofty Ranges, Kangaroo Island and the lower South-east in South Australia, growing in areas of high rainfall in wet sclerophyll forests, dry sclerophyll forests, woodlands and riparian areas (SSCC 2018).	**Likely** – Some suitable habitat within the Project Area and recent records.
Gleichenia microphylla	Coral Fern		R	2	2022	Found southern Mount Lofty and the lower South- East in South Australia, growing in sunny damp sites around swamps and at bases of cliffs in open forest (SSCC 2018).	**Unlikely** – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Glycine latrobeana	Clover Glycine	VU	V	1	Species or species habitat likely to occur within area	Inhabits native grasslands, dry sclerophyll forests, woodlands and low open woodlands, typically with a grassy ground layer, and growing on undulating plains. Prefers gentle south-west facing ridge slopes and lower south facing river valley slopes (Carter and Sutter 2010).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Gonocarpus micranthus ssp. *micranthus*	Creeping Raspwort		R	2	2018	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing on wet, peaty soils and is generally confined to damp or boggy situations (SSCC 2018).	**Possible** – Recent records and some suitable habitat is present in the Project Area.
Goodenia brunnea			R	2	2018	This goodenia grows in rocky situations and near watercourses primarily in the far north-west of South Australia.	**Unlikely** – No recent records and this species is generally confined to the far northwest of SA.
Grevillea aquifolium	Prickly Grevillea		R	2	1997	On calcareous sand in sclerophyllous woodland, and in heath on sands, limestone pavements and sandstone outcrops.	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Hypolepis rugosula	Ruddy Ground-fern		R	2	2022	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing along shady streams or open wetter areas. Where it forms dense thickets. It is frequently in ditches or on embankments beside tracks (SSCC 2018).	**Unlikely** – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
Juncus amabilis			V	2	2009	Found in the southern Mount Lofty Ranges and the South-east in South Australia, growing damp sites.	**Unlikely** – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Lagenophora sublyrata	Slender Bottle-daisy		V	2	2019	Found on Kangaroo Island, southern Mount Lofty Ranges and lower South-east in South Australia, growing in moist gullies and near water (SSCC 2018).	**Possible** – Recent records and some suitable habitat is present in the Project Area.
Leionema hillebrandii	Mount Lofty Phebalium		R	2	2022	Found in heathy woodland and forest gullies. Often in open rocky habitat along steep gullies.	**Possible** – Very recent records and some suitable habitat is present in the Project Area.
Logania saxatilis	Rock Logania		R	2	1996	Occurs in the FR, NL, MU, SL regions of SA. Associated with Grassy Woodlands in the foothills and hills face of the Southern Lofty Ranges.	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Luzula flaccida	Pale Wood-rush		V	2	2020	Found in the southern Mount Lofty Ranges and the lower South-east in South Australia, growing in moist rather shady sites in grassy woodland or open grassland (SSCC 2018).	**Possible** – Very recent records and some suitable habitat is present in the Project Area.
Lycopodiella lateralis	Slender Clubmoss		R	2	2017	The species occurs in scattered swampy places in the vicinity of Mt Compass, Mt Lofty and on KI.	**Unlikely** – Recent records nearby and some suitable habitat within the Project Area but Project impact area does not incorporate creek / watercourse.
Lycopodium deuterodensum	Bushy Clubmoss		E	2	2009	Found in one location in the southern Mount Lofty Ranges in South Australia, growing on steep hill slopes over sandstone and quartzite on the edge of a gully swamp within open stringybark forest with a dense understorey of bracken, sedges, shrubs, herbs and grasses (SSCC 2018).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Machaerina gunnii	Slender Twig-rush		R	2	2018	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing in wet heathlands and swampy woodlands (SSCC 2018).	**Unlikely** – No recent records nearby despite some suitable habitat within the Project Area.
Melaleuca armillaris ssp. *akineta*	Needle-leaf Honey-myrtle		R	2	2008	Found primarily in the Gawler Ranges of South Australia, where it grows on ridges and granite outcrops (Brophy et al. 2013).	**Unlikely** – No very recent records and this species is generally confined to the Gawler Ranges in SA.
Mentha diemenica	Slender Mint		R	2	2011	This species is scattered throughout *Eucalyptus ovata* dominated woodland.	**Possible** – Recent records and some suitable habitat is present in the Project Area.
Nymphoides crenata	Wavy Marshwort		R	2	1995	Fresh water to 1.5 m deep in swamps, lagoons, channels and streams; also frequent in temporarily inundated depressions.	**Unlikely** – No recent records nearby despite some suitable habitat within the Project Area.
Poa umbricola	Shade Tussock-grass		R	2	2018	Associated with woodland communities where it is often straggling among rocks.	**Unlikely** – Despite recent records, rocky outcrops in which this species requires are not present.
Prasophyllum pallidum	Pale Leek-orchid	VU	R	1	Species or species habitat likely to occur within area	Pale Leek-orchid is known singly or in groups in better soils of woodland and grassy open forest. Recorded in woodlands and forests dominated by *Eucalyptus leucoxylon, E. goniocalyx, E. fasciculosa, E. microcarpa, Callitris gracilis/Eucalyptus fasciculosa*, and *Allocasuarina verticillata* (Bates 2009).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Prasophyllum pruinosum	Plum Leek-orchid	EN	E	1	Species or species habitat known to occur within area	It has been recorded in the Adelaide and MLR region from eight geographically isolated and distinct locations, which extend from the Barossa Valley to Belair NP. Preferred habitat includes open woodland and grassy forest, in the open or in the shelter of broom-like shrub growing in fertile loams, usually with other leek-orchids (Bates, 2009).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Pterostylis cucullata	Leafy Greenhood	VU	E	1	Species or species habitat likely to occur within area	There are two subspecies of *Pterostylis cucullata. One is a* coastal ssp. that occurs in stabilised coastal sand dunes, on open ground but under a scrub layer. The other ssp. is a montane variety which occurs on riverbanks or protected alluvial flood plains (TSSC 2016a).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Pterostylis setifera	Bristly Greenhood		E	2	2018	Found in a variety of habitats, in SA in open areas of mallee type vegetation and small red sand dune areas covered with *Callitris.*	**Unlikely** – Despite recent records no mallee habitat is present within the Project Area.
Pultenaea graveolens	Scented Bush-pea		R	2	2022	Found in the southern Flinders Range and the southern Mount Lofty Ranges in South Australia, with a single record from Kangaroo Island, growing in dry sclerophyll woodland (SSCC 2018).	**Possible** – Very recent record and some suitable habitat within the Project Area.
Pultenaea kraehenbuehlii	Tothill Bush-pea		R	2	2018	Endemic to South Australia and found only in the Tothill Range except for one record from Cleland National Park, growing in open grassland to open low woodland sometime dominated by *Allocasuarina verticillata* (SSCC 2018).	**Unlikely** – Project Area not within known isolated population, and no suitable habitat occurs.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Ranunculus glabrifolius	Shining Buttercup		V	2	2000	Found only in Mount George Conservation Park in SA where it occurs in damp ground in depressions or beside watercourses.	**Possible** – Recent records and only found in Mount George Conservation Park which is adjacent to the Project Area. Project impact area does not incorporate creek / watercourse.
Rytidosperma laeve	Smooth Wallaby-grass		*R*	2	2017	Ecologically variable, from alpine moorland to open grassland or light woodland, often in seasonally damp habitats (Sharp and Simon 2022).	**Possible** – Recent records and some suitable habitat is present in the Project Area.
Rytidosperma tenuius	Short-awn Wallaby-grass		R	2	2022	Grows in altitudes between 5–750 m, on Tablelands usually in somewhat damp habitats, rarely dominant; along the coastal shelf a very common constituent of disturbed road verges.	**Likely** – Very recent records and some suitable habitat is present in the Project Area.
Schizaea fistulosa	Narrow Comb-fern		V	2	2008	In SA, this species is usually found on raised soil mounds in swamps or under scrub in moist situations. It is often found associated with *S. bifida*. There appear to be intermediate forms between these two species in SA.	**Unlikely** – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
Schoenus latelaminatus	Medusa Bog-rush		V	2	2012	Grows in seasonally wet areas along creek beds and in marshy paddocks.	**Unlikely** – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Schoenus lepidosperma ssp. *lepidosperma*	Slender Bog-rush		R	2	2018	Grows in damp areas in heath or woodland in sandy soils.	**Unlikely** – Some suitable habitat within the Project Area including water sources, though not within areas of proposed impact.
Scutellaria humilis	Dwarf Skullcap		R	2	2021	Grows in various habitats, often in moist sheltered areas, particularly along creeks or gullies; widespread from coastal to inland districts. Single isolated record from Cleland National Park, most records further south on Fleurieu Peninsula.	**Unlikely** – Despite recent records the Project Area is outside of its typical distribution.
Senecio pinnatifolius var. *pinnatifolius*			R	2	2015	Commonly found in moist gullies where they are locally widespread. Predominantly occurs in areas of moderate to high rainfall.	**Possible** – Recent records and some suitable habitat is present in the Project Area.
Sphaerolobium minus	Leafless Globe-pea		R	2	2008	Scattered mainly across higher rainfall areas in sclerophyll forests, woodlands and heathlands.	**Unlikely** – No recent records nearby despite some suitable habitat within the Project Area.
Sprengelia incarnata	Pink Swamp-heath		R	2	2017	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing in wet heathland, sedgeland and other swampy vegetation on peaty or sandy soils (SSCC 2018).	**Unlikely** – Despite recent records, Cleland National Park is the closest area that this species occurs in. It is unlikely to occur in the Project Area.
Thelymitra aristata	Great Sun-orchid		E	2	2008	Found primarily in the south-east in South Australia, north of Mt Gambier, growing in clay or gravel soils in forest or scrubland around swamp margins in damp sands (SSCC 2018). Past records from Mount George Conservation Park adjacent the Project Area.	**Possible** – Recent records and some suitable habitat is present in the Project Area.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Thelymitra batesii			R	2	2021	Endemic to South Australia and found in the southern Flinders Ranges and the Mount Lofty Ranges, growing in heathy woodlands and heathy open forest on sandy and gravelly clay loam soils (SSCC 2018).	**Possible** – Very recent records and some suitable habitat is present in the Project Area.
Thelymitra circumsepta	Naked Sun-orchid		E	2	2018	Occurs in the SL region of SA. Found among low shrubs in open forest or in open rocky sites on well-drained and moisture retentive soils.	**Unlikely** – despite recent records, no suitable rocky or open forest sites occur in Project Area.
Thelymitra grandiflora	Great Sun-orchid		R	2	2019	Occurs singly or as small clumps of plants in forest clearings, woodland and scrub in well drained gravelly clay soils which may be laterite or podsols, or mixed with sand, extending to dry rocky ridges in better soils (Bates 2009).	**Possible** – Very recent records and some suitable habitat is present in the Project Area.
Thelymitra ixioides	Spotted Sun-orchid		E	2	2013	Found in the southern Mount Lofty Ranges and the lower South-east in South Australia, growing in woodland or swampy ground (SSCC 2018).	**Possible** – Recent records and some suitable habitat is present in the Project Area.
Thelymitra latifolia	Blue Star Sun-orchid		V	2	2004	In SA found from the southern Flinders Ranges southward through the Mount Lofty Ranges to the South-east. Found in woodlands in various soil types from leached pale sands to yellow gravelly clays and may occur near swamps.	**Possible** – Recent records and some suitable habitat is present in the Project Area.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Thelymitra matthewsii	Spiral Sun-orchid	VU	E	1	Species or species habitat likely to occur within area	Currently known to occur in Vic., SA and NZ. Favours open forests and woodlands in well-drained sand and clay loams. It is a post-disturbance coloniser that is usually found in open areas around old quarries and gravel pits, on road verges, disused tracks and animal trails. In SA, it is known from three fairly old collections from KI and SW of Keith. It has recently been found to occur south of Meningie, and on western KI. Widely but sporadically distributed in Vic and SA. Grows in heathy open forest and woodlands on well-drained sand, gravel and clay loams, especially where there has been soil disturbance. Open ground layer is common (Duncan 2010).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Thysanotus tenellus	Grassy Fringe-lily		R	2	2015	Perennial Fringed lily species located in SA where it prefers *Eucalyptus* woodlands, *Lomandra effusa* Open Sedgelands, *Dodonaea lobulata* shrublands and Bluebush shrublands (Sirisena 2010).	**Unlikely** – No recent records nearby despite some suitable habitat within the Project Area.
Todea barbara	King Fern		E	2	2018	Occurs in the MLR where it occurs in swamps, swampy gullies and creek beds. All extant populations occur adjacent to permanent water, springs or soaks.	**Unlikely** – Recent records nearby and some suitable habitat within the Project Area but Project impact area does not incorporate creek / watercourse.
Veronica derwentiana ssp. *homalodonta*	Mount Lofty Speedwell	CE	E	1	Species or species habitat likely to occur within area	Occurs in moist areas, gullies, creeklines and high rainfall areas. Largely occurs in *Eucalyptus obliqua* Forests with or without additional overstorey species (such as *Eucalyptus fasciculosa, Eucalyptus viminalis* ssp. *cygnetensis* & *Eucalyptus leucoxylon*) (TSSC 2009).	**Unlikely** – No recent records despite some suitable habitat within the Project Area.
Xanthosia tasmanica	Southern Xanthosia		R	2	2015	Found on Kangaroo Island and the southern Mount Lofty Ranges in South Australia, growing in shallow sand on rocky coastal heath and in woodland SSCC 2018).	**Possible** – Recent records and some suitable habitat is present in the Project Area.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Xyris operculata	Tall Yellow-eye		R	2	2008	Found on Kangaroo Island, southern Mount Lofty Ranges and the lower South-east in South Australia, growing in wet heathlands and swampy areas (SSCC 2018).	**Unlikely** – No recent records and this species is generally confined to the areas around Mount Compass and on Kangaroo Island.

Conservation status:

Aus: Australia (EPBC Act). SA: South Australia (NPW Act). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.

PMST result: Likelihood of species or species habitat to occur within 5 km of the Project Area.

Source of Information:

1: PMST (DCCEEW 2023) – 5 km buffer applied to Project Area;

2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;

Abbreviations within Distribution and preferred habitat:

EP: Eyre Peninsula; FP: Fleurieu Peninsula; FR: Flinders Ranges; KI: Kangaroo Island; MLR: Mount Lofty Ranges; MU: Murraylands; NL: Northern Lofty; NP: National Park; NSW: New South Wales QLD: Queensland; SL: Southern Lofty; SE: Southeast / South-Eastern; SW: South-Western; Tas: Tasmania; Vic: Victoria; WA: Western Australia; YP: Yorke Peninsula.

-

Appendix 6. BDBSA fauna recorded within 5 km of the Project Area

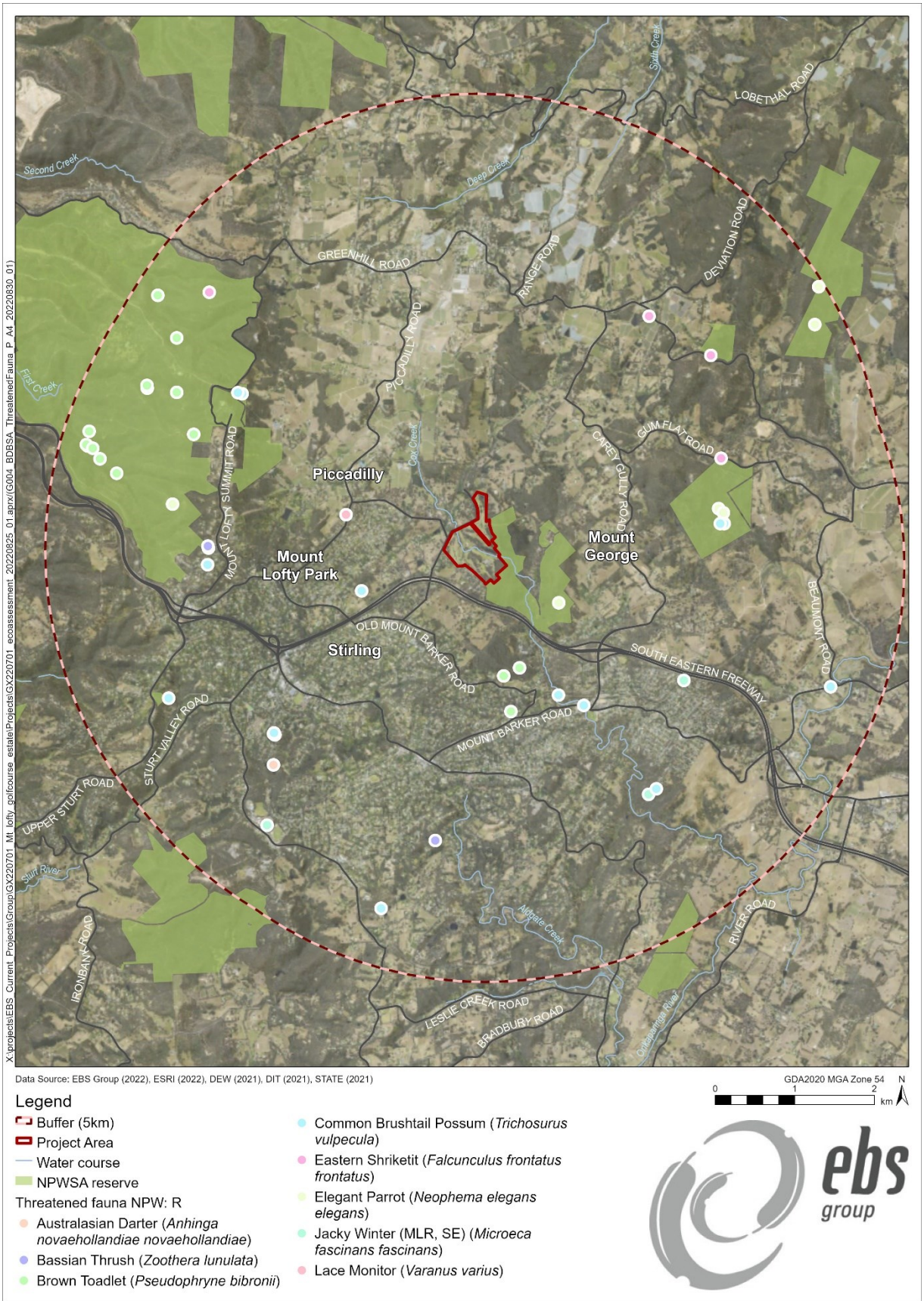

Figure 17. BDBSA fauna record for State listed Rare species, located within 5 km of the Project Area (Map 1 of 2).

-

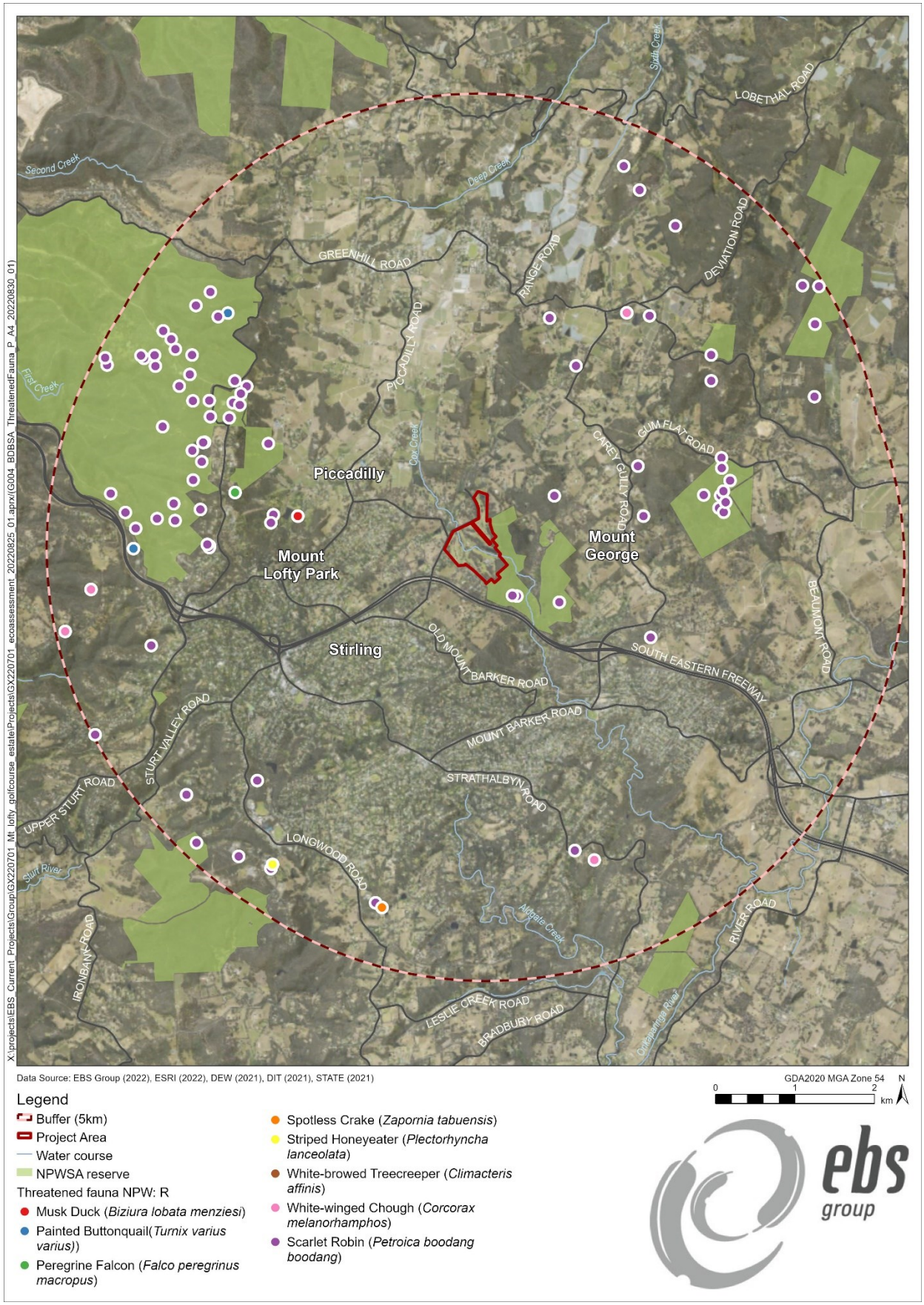

Figure 18. BDBSA fauna record for State listed Rare species, located within 5 km of the Project Area (Map 2 of 2).

-

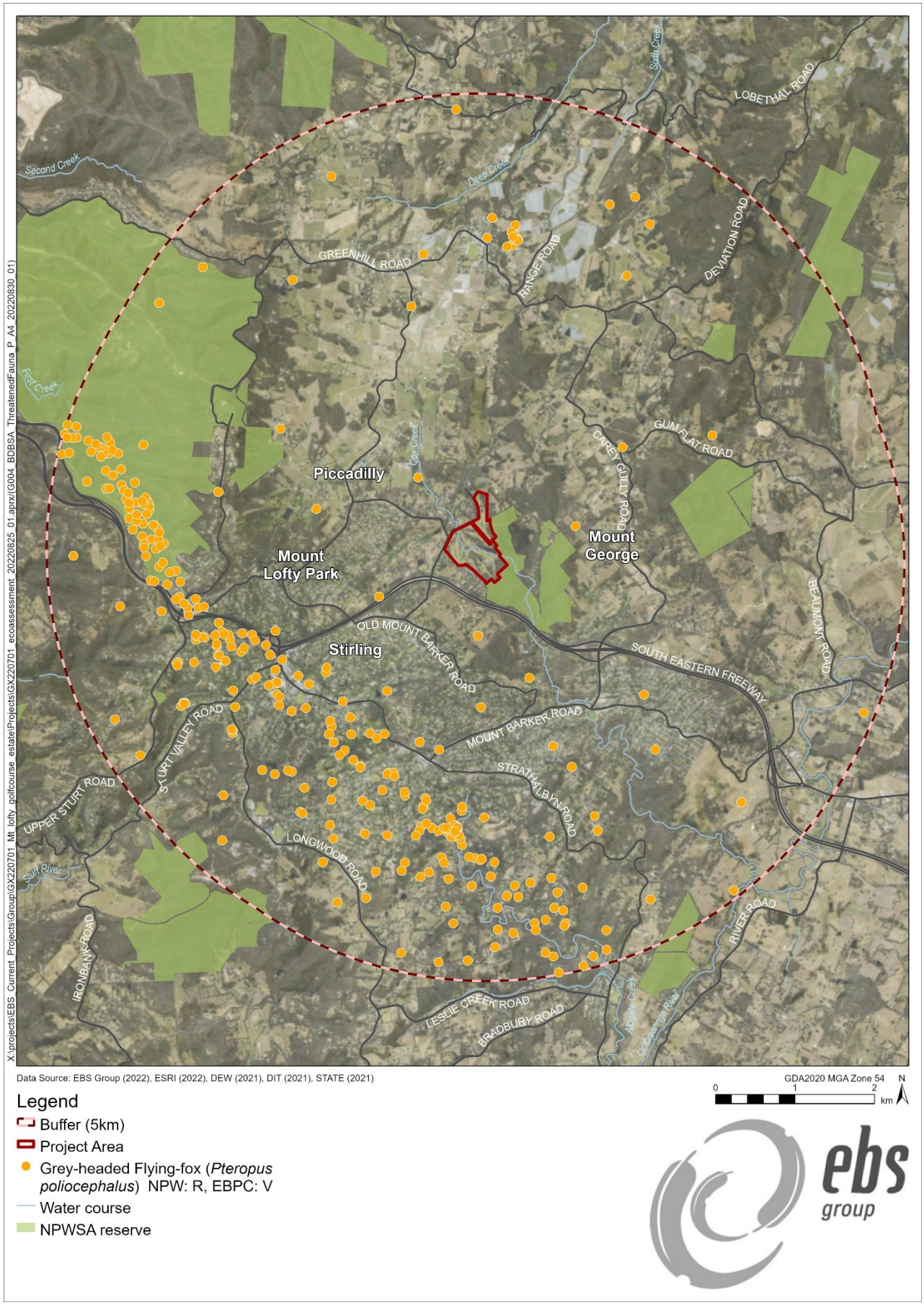

Figure 19. BDBSA fauna record for *Pteropus poliocephalus* (Grey-headed Flying-fox), located within 5 km of the Project Area.

-

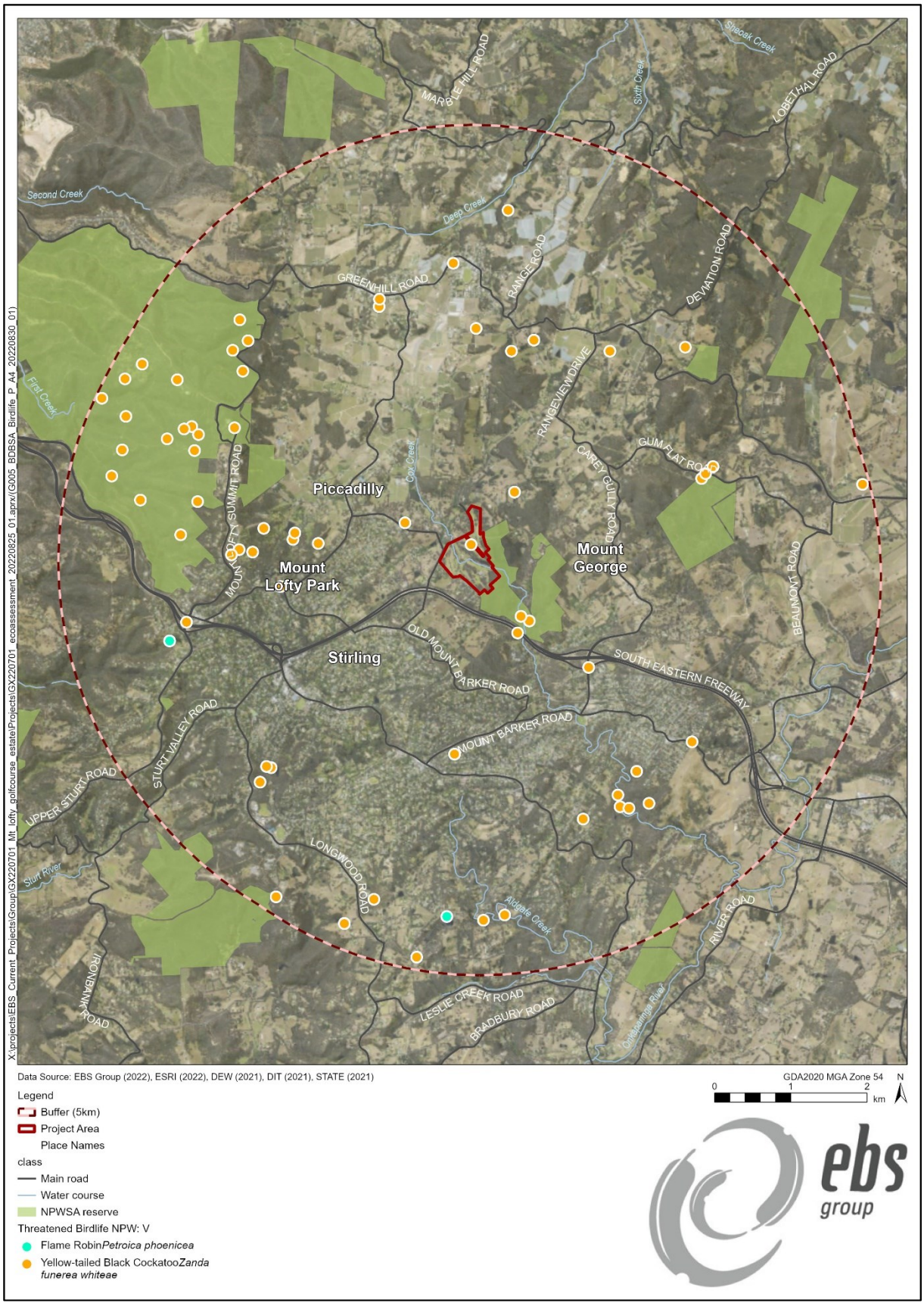

Figure 20. BDBSA fauna record for State listed Vulnerable species, located within 5 km of the Project Area.

-

Figure 21. BDBSA fauna record for State listed Endangered species, located within 5 km of the Project Area.

-

Appendix 7. BDBSA Birdlife recorded within 5 km of the Project Area

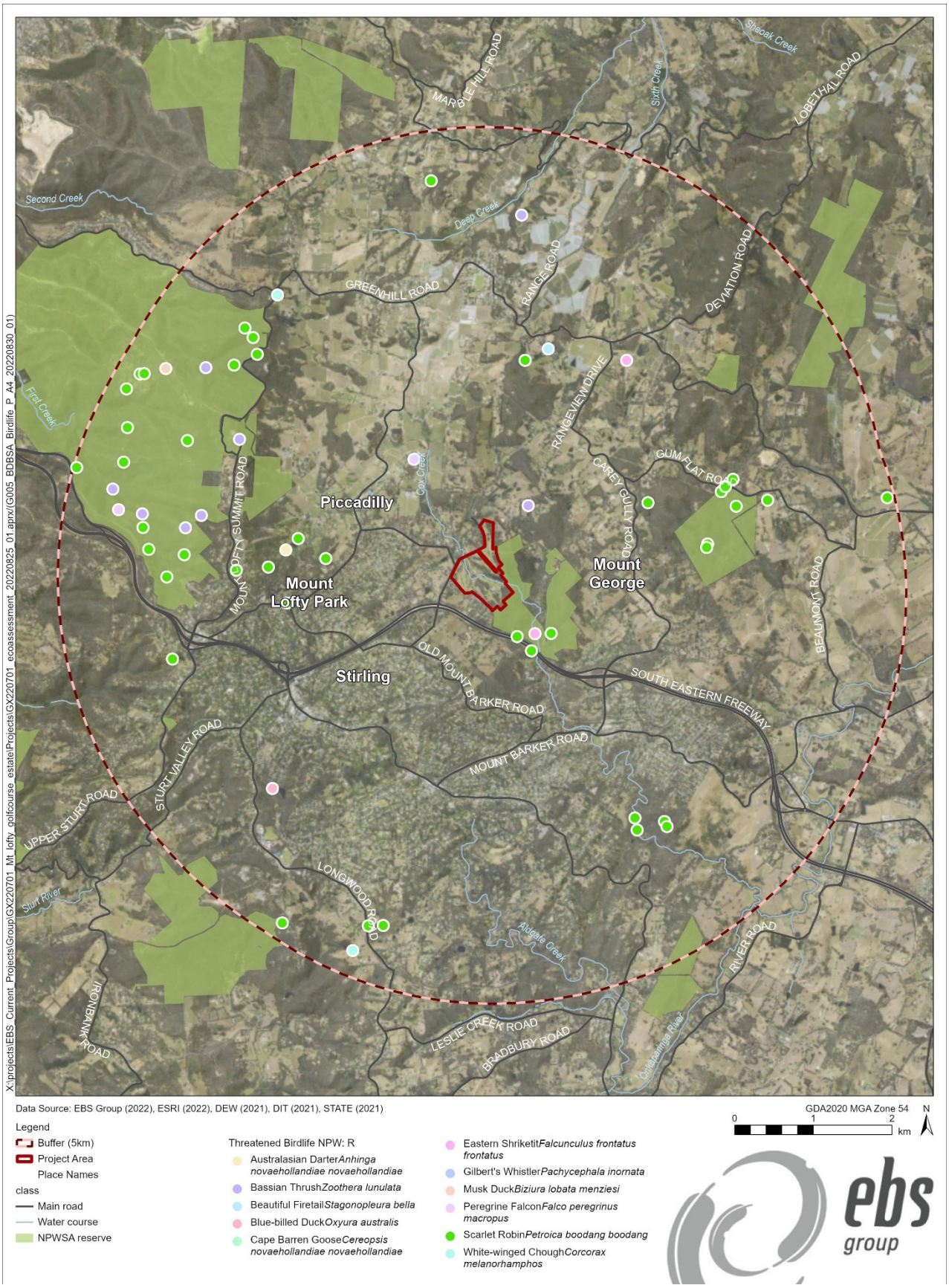

Figure 22. BDBSA Birdlife record for State listed Rare species, located within 5 km of the Project Area.

-

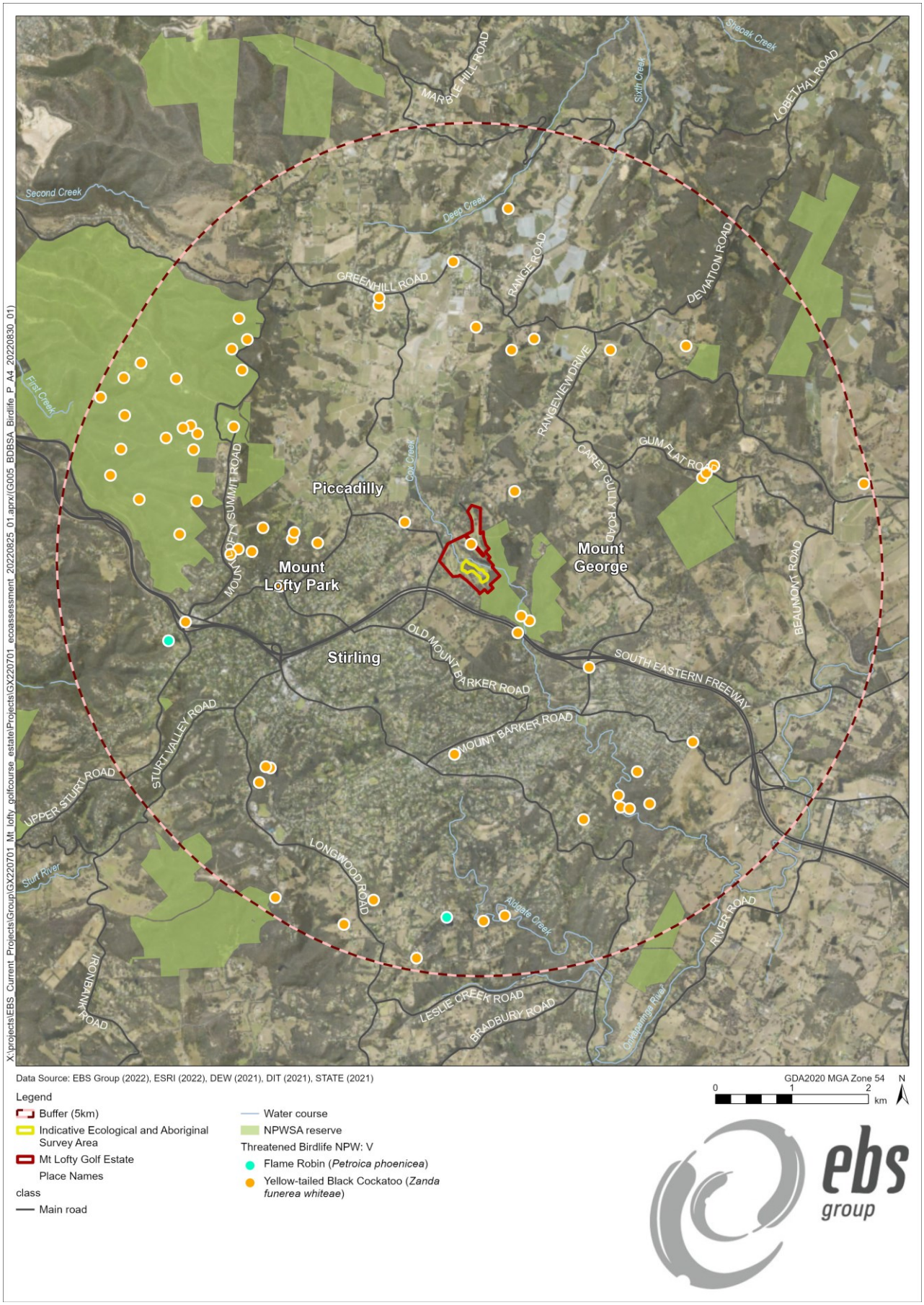

Figure 23. BDBSA Birdlife record for State listed Vulnerable species, located within 5 km of the Project Area.

-

Appendix 8. Assessment of likelihood of national (EPBC Act) and State (NPW Act) listed threatened fauna identified by the PMST (DCCEEW 2023) and BDBSA (DEW 2022b) to occur in the Project Area (exclusively marine species have been omitted) (green shading = known / highly likely or likely to occur, orange shading = possible to occur).

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
AMPHIBIA (AMPHIBIANS)							
Pseudophryne bibronii	Brown Toadlet		R	2	2009	In SA, it occurs in the SE, KI, MLR and FR regions. Found in damp areas with cover provided by logs and stones. Occupies forests, heathlands and grasslands. Occasionally utilizes small temporary dams and vegetated roadside drainage lines and ditches which are characterized by leaf litter and grassy debris (Wilson and Bignall 2009).	**Possible** – Some suitable habitat within the Project Area including water sources, most recent nearby record over 10 years old.
AVES (BIRDS)							
Anhinga novaehollandiae novaehollandiae	Australasian Darter		R	2, 3	2018 / 2018	Habitat is lakes, rivers, swamps; rarely coastal (Pizzey and Knight 2013).	**Possible** – Some suitable habitat within the Project Area including water sources.
Biziura lobata menziesi	Musk Duck		R	2, 3	2015 / 2002	Lakes, reservoirs and wetlands including well-vegetated swamps and fresh and brackish habitats (Pizzey and Knight 2013).	**Possible** – Some suitable habitat within the Project Area including permanent water sources.
Botaurus poiciloptilus	Australasian Bittern	EN	E	1	Species or species habitat known to occur within area	Freshwater wetlands and rarely in estuaries or tidal wetlands, favouring wetlands dominated by sedges, rushes and reeds growing over a muddy or peaty substrate (Pizzey and Knight 2013).	**Unlikely** – No recent records despite suitable habitat present.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Cereopsis novaehollandiae novaehollandiae	Cape Barren Goose		R	3	2009	Mostly inhabits small, windswept and generally uninhabited offshore islands, but ventures to adjacent mainland farming areas in search of food in summer (Birdlife Australia 2022).	**Possible** – Some suitable habitat within the Project Area including water sources and open grassy areas.
Charadrius mongolus	Lesser Sand Plover	EN	E	3	2002	Likes tidal mudflats, sand flats and shelly beaches, salt marshes and mangroves (Pizzey and Knight 2013).	**Unlikely** – No suitable habitat, migratory species which does not depend on vegetation present in the Project Area
Climacteris affinis	White-browed Treecreeper		R	2	2021	Distributed across southern arid and semi-arid areas of Australia, from Western Australia, through South Australia, New South Wales and into north-western Victoria. Habitat is Acacia woodlands, belah and Callitris.	**Possible** – Some suitable habitat within the Project Area but vagrant species to general area.
Corcorax melanorhamphos	White-winged Chough		R	2, 3	2020 / 2020	Prefers drier forests, woodlands of *Eucalyptus* sp., crops and pastures (Pizzey and Knight 2013).	**Likely** – Some suitable habitat within the Project Area and recent records.
Falco hypoleucos	Grey Falcon	VU	R	1	Species or species habitat likely to occur within area	The species is mainly found where annual rainfall is less than 500 mm and is essentially always confined to the arid and semi-arid zones. The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter (Schoenjahn et al. 2020).	**Unlikely** – No recent records and habitat within the Project Area is unsuitable.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Falco peregrinus macropus	Peregrine Falcon		R	2, 3	2015 / 2020	Found everywhere from woodlands to open grasslands and coastal cliffs – though less frequently in desert regions. This species prefers open habitats such as grasslands, tundra and meadows and nests on cliff faces and in crevices (Pizzey and Knight 2013).	**Likely** – Some suitable habitat within the Project Area. Likely to occur as flyover only.
Falcunculus frontatus frontatus	Eastern Shriketit		R	2, 3	2006 / 2006	Eucalyptus woodlands and forest, within a wide range of woodland/forest communities. Prefers dense grasslands, often on the edges of open forests, and bracken (Birdlife Australia 2022).	**Possible** – Some suitable habitat within the Project Area, most recent nearby record over 15 years old.
Grantiella picta	Painted Honeyeater	VU	R	1	Species or species habitat likely to occur within area	Forest, woodland, dry scrub, often with abundant mistletoe. Dependent on mistletoe berries (DAWE 2021a).	**Unlikely** – No recent records despite some suitable habitat.
Hieraaetus morphnoides	Little Eagle		V	2	2019	Occurs in sparse populations in eastern South Australia where it prefers grasslands and grassy woodlands but will inhabit a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones (Birdlife Australia 2022).	**Likely** – Some suitable habitat within the Project Area. Likely to occur as flyover only.
Hirundapus caudacutus	White-throated Needletail	VU, Mi (T)	V	1	Species or species habitat likely to occur within area	Almost exclusively aerial in Australia, recorded most commonly above wooded areas (Pizzey and Knight 2013).	**Possible** – Some suitable habitat present. Possible to occur as flyover only.
Hylacola cauta cauta	Shy Heathwren		R	3	1998	Prefers dense shrubby or heath understorey in mallee woodland, mallee shrubland or mallee heath in coastal and semi-arid regions, often where spinifex (*Triodia*) occurs and with dense shrubs such as Banksia, Hakea and Grevillea, also tea-tree (*Leptospermum*) and cypress pine (*Callitris*) (Gregory, 2020).	**Possible** – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Hylacola pyrrhopygia parkeri	Chestnut-rumped Heathwren	EN	E	1, 2, 3	Species or species habitat known to occur within area / 2020 / 2020	Inhabits heaths of coastal, mountain and hinterland areas, dense undergrowth of forests and woodlands. Found in South-eastern Australia. In SA occurs in the SE, Adelaide Mount Lofty Ranges and Northern Yorke districts (Wilson and Bignall 2009).	**Likely –** known to occur in adjacent Mount Gorge CP, may utilise Project Area fringe from time to time, though unlikely to be core habitat as the understorey vegetation was open, disturbed and weedy in most places.
Leipoa ocellata	Malleefowl	VU	V	1	Species or species habitat likely to occur within area	In South Australia, the Malleefowl is distributed from the south-east, north to the Murray-Mallee region and west to Streaky Bay, south of 32°S. The species also occurs west of the Eyre Peninsula. Occupies shrublands and low woodlands that are dominated by mallee vegetation. It also occurs in other habitat types including eucalypt or native pine Callitris woodlands, acacia shrublands, Broombush Melaleuca uncinata vegetation or coastal heathlands (Benshemesh 2007).	**Unlikely** – No recent records and no mallee habitat within the Project Area.
Lewinia pectoralis pectoralis	Lewin's Rail		V	2	2010	Swamp woodlands; ruches, reeds, rank grass in swamps, creeks paddocks; wet heaths, tree ferns; samphire in saltmarsh.	**Possible** – Some suitable habitat within the Project Area including water sources.
Lophoictinia isura	Square-tailed Kite		E	2	2019	The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses (Pizzey and Knight 2013).	**Likely** – Some suitable habitat within the Project Area. Likely to occur as flyover only.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Melithreptus gularis gularis	Black-chinned Honeyeater		V	2, 3	2002 / 2000	The Black-chinned Honeyeater is found in the upper levels of open eucalypt forests and woodlands dominated by box and ironbark eucalypts. It is often found along waterways, especially in arid and semi-arid areas and in northern Australia. It is occasionally seen in gardens and street trees (Birdlife Australia 2022).	**Possible** – Some suitable habitat within the Project Area.
Microeca fascinans fascinans	Jacky Winter		R	2, 3	2018 / 2001	Widely distributed throughout mainland Australia. Prefer open woodland (Eucalypt and mallee) with an open shrub layer and bare ground. Often seen in farmland and parks (Morcombe, 2021).	**Likely** – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
Neophema elegans elegans	Elegant Parrot		R	2	2021	Wide variety of habitats, including grasslands, shrublands, mallee, woodlands and thickets, bluebush plains, heathlands, saltmarsh and farmland (Pizzey and Knight 2013).	**Likely** – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
Oxyura australis	Blue-billed Duck		R	3	2018	Habitat is permanent swamps with dense vegetation. Large open lakes, tidal inlets and bays (Pizzey and Knight 2013).	**Possible** – Some suitable habitat within the Project Area including permanent water sources.
Pachycephala inornata	Gilbert's Whistler		R	3	2007	Usually inhabit semi-arid mallee or box–ironbark eucalypt, acacia, cypress-pine or Belah shrublands and woodlands (Birdlife Australia 2022).	**Possible** – Some suitable habitat within the Project Area.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Petroica boodang boodang	Scarlet Robin		R	2, 3	2022 / 2020	This species occurs in foothill forests, woodlands and watercourses. In autumn-winter, they occur in more open habitats such as river red gum woodlands, golf courses, parks, orchards and gardens (Birdlife Australia 2022).	**Likely** – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
Petroica phoenicea	Flame Robin		V	3	2003	Endemic to south-eastern Australia, and ranges from near the Queensland border to southeast South Australia and also in Tasmania. Breeds in eucalypt forests and woodlands, with access to open areas, such as subalpine woodland, recently burnt forest, recently logged forest and pine plantations (Birdlife Australia 2022).	**Possible** – Some suitable habitat within the Project Area.
Plectorhyncha lanceolata	Striped Honeyeater		R	2	2020	The Striped Honeyeater is found in eastern Australia, mainly inland, from the Yorke Peninsula, South Australia to the coast of New South Wales, around Toukley, and north to Charters Towers, Queensland. The Striped Honeyeater is found in forests and woodlands, often along rivers, as well as mangroves and in urban gardens (Birdlife Australia 2022).	**Possible** – Some suitable habitat within the Project Area but vagrant species to general area.
Polytelis anthopeplus monarchoides	Regent Parrot	VU	V	2	1996	The Regent Parrot (eastern) is confined primarily to the semi-arid interior of south-eastern mainland Australia. It inhabits riparian or littoral River Red Gum (*Eucalyptus camaldulensis*) forests or woodlands and adjacent Black Box (*E. largiflorens*) woodlands (Baker-Gabb and Hurley 2011).	**Unlikely** – No very recent records despite some suitable habitat.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Rostratula australis	Australian Painted Snipe	EN	E	1	Species or species habitat likely to occur within area	The Australian Painted Snipe inhabits many different types of shallow, brackish or freshwater terrestrial wetlands, especially temporary ones which have muddy margins and small, low-lying islands. Suitable wetlands usually support a mosaic of low, patchy vegetation, as well as lignum and Canegrass (Birdlife Australia 2022).	**Unlikely** – No recent records despite some suitable habitat.
Stagonopleura bella samueli	Beautiful Firetail	EN	R	1, 3	2020	Occurs in the AMLR/Eyre Peninsula region of SA where it resides in a wide range of Eucalypt dominated vegetation communities that have a grassy understorey, including woodland, forest and mallee. Only small pockets have been observed near the coast (Birdlife Australia 2022).	**Likely** – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
Turnix varius varius	Painted Buttonquail		R	2	2012	These birds range almost continuously, in appropriate habitat, from about the Atherton Tableland in Qld, round the coast to the EP and north to the southern Flinders Ranges in SA, avoiding only the driest regions of Qld and NSW. Temperate and eastern tropical forests and woodlands form the habitats of this species (Morcombe 2021).	**Possible** – Some suitable habitat within the Project Area.
Zanda funerea whiteae	Yellow-tailed Black Cockatoo		V	2, 3	2022 / 2020	Eucalyptus forests and woodlands. Plantations of Eucalyptus and introduced Pinus sp. (Pizzey and Knight 2013)	**Highly Likely / Known** – Observed during the field survey and some suitable habitat is present in the Project Area.
Zapornia tabuensis	Spotless Crake		R	2	2010	Mostly found in well vegetated freshwater wetlands with rushes and reeds. Will also frequent muddy areas, reedbeds or wetlands.	**Possible** – Some suitable habitat within the Project Area including water sources.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Zoothera lunulata halmaturina	Bassian Thrush	EN	R	1, 2, 3	Species or species habitat known to occur within area / 2022 / 2018	Damp, densely forested areas and gullies are favoured by the Bassian Thrush, usually with a thick canopy overhead and leaf-litter below (DAWE 2022).	**Likely** – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
MAMMALIA (MAMMALS)							
Antechinus agilis	Agile Antechinus		E	2	2021	Forests in the south-eastern corner of Australia. Prefers areas with dense ground cover and hiding places such as fallen logs.	**Possible** – Some suitable habitat within the Project Area generally confined to the far southeast of SA.
Antechinus flavipes	Yellow-footed Antechinus		V	2	2021	Inhabits dry forests on the inland side of the Great Dividing Range, Australia (Kelly et al. 2008).	**Likely** – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.
Isoodon obesulus obesulus	Southern Brown Bandicoot	EN	V	1, 2	Species or species habitat known to occur within area / 2021	This species prefers dense ground cover, tall grass and low shrubbery. They live near swamps and rivers as well as in thick scrub in drier areas. They make their nests on the ground and in logs. The nests consist of sticks, leaves, grass, and soil (TSSC 2016b).	**Likely** – Some suitable habitat within the Project Area. Very suitable habitat adjacent to the Project Area in Mount George Conservation Park.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Pteropus poliocephalus	Grey-headed Flying-fox	VU	R	1, 2	Foraging, feeding or related behaviour likely to occur within area / 2020	Grey-headed Flying-foxes forage up to 40 km from their roost at Botanic Park each night. Food plants are typically planted trees, both native and exotic, that provide fruit or a rich source of nectar (DAWE 2021b). This species may occur within the Project Area; however, they would only be expected to visit for short periods if suitable flower or fruit resources are available.	**Likely** – Some suitable foraging habitat within the Project Area. Project Area is less than 50 km from nearest camp at Botanic Park in Adelaide
Trichosurus vulpecula	Common Brushtail Possum		R	2	2022	Utilises various woodland habitats and suburban environs. Feeds on flowers, fruit, buds and leaves of native vegetation. Requires hollows (within dead or alive tree) or on ground for daytime nesting (Strahan & van Dyck 2008).	**Highly Likely / Known** – Some suitable habitat including hollows within the Project Area. Scat from this species was observed within the Project Area.
REPTILIA (REPTILES)							
Egernia cunninghami	Cunningham's Skink		E	2	2022	Occurs in forests and rock outcrops where they bask on top of outcrops and will scurry between rock ledges to shelter.	**Unlikely** – despite very recent records, no rock outcrops are present in the Project Area for shelter.

-

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
Varanus rosenbergi	Heath Goanna		V	2	2014	Habitat across southern Australia includes coastal heaths, humid woodlands, and wet and dry sclerophyll forests (Cogger 2014).	**Possible –** recent records within 10 years. Species occupies large ranges which incorporate heath, wet and dry forest, and woodlands, such as those found in the Project Area. No termite mounds observed in Project Area but may occur nearby.
Varanus varius	Lace Monitor		R	2	2013	This species is a large arboreal lizard which is found in eastern and south-eastern Australia from Cape York Peninsula (Queensland) to south-eastern South Australia. Lace Monitors occur in well-timbered areas from dry woodlands to cool temperate forests in southern Australia (Cogger, 2014). Restricted distribution in SA, occurring in upper reaches of the SA Murray Darling Basin and isolated population in the southern Flinders Ranges.	**Unlikely** – outside of known distribution. Nearby record is isolated and thought to be escapee from Cleland Wildlife Park.

Conservation status:
Aus: Australia (EPBC Act). SA: South Australia (NPW Act). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.
PMST result: Likelihood of species or species habitat to occur within 5 km of the Project Area.
Source of Information:
1: PMST (DCCEEW 2023) – 5 km buffer applied to Project Area;
2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;
3: Birdlife Australia (DEW 2022b) – 5 km buffer applied to Project Area.
Abbreviations within Distribution and preferred habitat:
EP: Eyre Peninsula; FP: Fleurieu Peninsula; FR: Flinders Ranges; KI: Kangaroo Island; MLR: Mount Lofty Ranges; MU: Murraylands; NL: Northern Lofty; NP: National Park; NSW: New South Wales QLD: Queensland; SL: Southern Lofty; SE: Southeast / South-Eastern; SW: South-Western; Tas: Tasmania; Vic: Victoria; WA: Western Australia; YP: Yorke Peninsula.

-

Appendix 9. Assessment of likelihood of nationally (EPBC Act) listed migratory species identified by the PMST (DCCEEW 2023) and BDBSA (DEW 2022b) to occur in the Project Area (exclusively marine species have been omitted) (orange shading = possible to occur).

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
AVES (BIRDS)							
Apus pacificus	Fork-tailed Swift	Mi (Ma)		1	Species or species habitat likely to occur within area	Widespread but almost exclusively aerial. Mostly occur over inland plains and dry or open habitats.	**Possible** – Some suitable habitat present. Possible to occur as flyover only.
Gallinago hardwickii	Latham's Snipe	Mi (W)	R	1	Species or species habitat likely to occur within area	This is a wetland species which prefers shallow water dominated by tussocks, sedges, rushes and reeds (Pizzey and Knight 2013).	**Unlikely** – No recent records despite some suitable habitat.
Myiagra cyanoleuca	Satin Flycatcher	Mi (T)	E	1, 2	Species or species habitat likely to occur within area / 2005	Known inhabitant of forest, woodland, mangroves and coastal heath scrub. Prefers dense, wet gullies of heavy eucalypt forest in breeding season (Morcombe, 2021).	**Possible** – Some suitable habitat within the Project Area.
Rhipidura rufifrons	Rufous Fantail	Mi (T)		1	Species or species habitat known to occur within area	Occur in moist eucalypt forests and rainforests, where they usually inhabit the dense, shady undergrowth of gullies (Birdlife Australia 2022).	**Unlikely** – No recent records and habitat within the Project Area is unsuitable.
Tringa nebularia	Common Greenshank	Mi (T)		1	Species or species habitat likely to occur within area	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 (Morcombe 2021).	**Unlikely** – No recent records despite some suitable habitat.

Conservation status:

-

Aus: Australia (EPBC Act). SA: South Australia (NPW Act). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Mi (W): listed as a Migratory Wetland species under the EPBC Act. Mi (T): listed as a Migratory Terrestrial species under the EPBC Act. Mi (Ma): listed as a Migratory Marine species under the EPBC Act.

PMST result: Likelihood of species or species habitat to occur within 5 km of the Project Area.

Source of Information:

1: PMST (DCCEEW 2023) – 5 km buffer applied to Project Area;

2: BDBSA (DEW 2022b) – 5 km buffer applied to Project Area;

Abbreviations within Distribution and preferred habitat:

EP: Eyre Peninsula; FP: Fleurieu Peninsula; FR: Flinders Ranges; KI: Kangaroo Island; MLR: Mount Lofty Ranges; MU: Murraylands; NL: Northern Lofty; NP: National Park; NSW: New South Wales QLD: Queensland; SL: Southern Lofty; SE: Southeast / South-Eastern; SW: South-Western; Tas: Tasmania; Vic: Victoria; WA: Western Australia; YP: Yorke Peninsula.

-

EBS Ecology
112 Hayward Avenue
Torrensville, SA 5031
www.ebsecology.com.au
t. 08 7127 5607