Thaxted Park Golf Course Code Amendment

Ecological Flora and Fauna Assessment

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Prepared by EBS Ecology for Ekistics Planning and Design

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GLOSSARY AND ABBREVIATION OF TERMS

Area 1	Area for rezoning in the north of Thaxted Park Golf Course Land
Area 2	Area for rezoning in the south of Thaxted Park Golf Course Land
BDBSA	Biological Databases of South Australia
CEMP	Construction Environmental Management Plan
Com.	Commonwealth
DEW	Department for Environment and Water
DEWNR	Department of Environment, Water and Natural Resources
DIT	Department for Infrastructure and Transport
DOE	Department of the Environment
Ekistics	Ekistics Planning and Design
EBS	EBS Ecology
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
GHFF	Grey-headed Flying-fox
IBRA	Interim Biogeographical Regionalisation of Australia
LSA Act	*Landscape South Australia Act 2019*
NPW Act	*National Parks and Wildlife Act 1972*
NV Act	*Native Vegetation Act 1991*
NVC	Native Vegetation Council
NVIS	Native Vegetation Information System
MNES	Matters of National Environmental Significance
PMST	Protected Matters Search Tool
Project	Rezoning of two areas of Thaxted Park Golf Course
Affected Area	Selected locations of the Thaxted Park Golf Course, located at Lot 1002 Golf Course Drive, Woodcroft. Delineated as Area 1 and Area 2.
SA	South Australia
SEB	Significant Environmental Benefit
SPRAT	Species Profile and Threats Database
ssp.	subspecies
TEC	Threatened Ecological Community

EXECUTIVE SUMMARY

Creation Homes (SA) Pty. Ltd. (Creation Homes) propose to rezone two land parcels which presently form part of the Thaxted Park Golf Course land, located at Lot 1002 Golf Course Drive, Woodcroft, in South Australia. Ekistics Planning and Design (Ekistics) was previously engaged by Creation Homes to undertake 'Phase 1' of the Code Amendment process, which included the preparation of the *'Proposal to Initiate an Amendment to the Planning and Design Code'*, to commence the rezoning process. Noting the intention to rezone the land for residential purposes, environmental investigations are necessary to demonstrate that the subject land is suitable to the various uses contemplated for the proposed zone, including sensitive land uses in the form of low to medium residential development.

EBS Ecology were engaged by Ekistics to undertake environmental investigations in the two areas (Area 1 in the north and Area 2 in the south) within the existing golf course that are proposed to be rezoned from recreational to residential. Area 1 consists of 3.160 ha and Area 2 is 3.926 ha. Both areas are currently part of the Thaxted Park Golf Course land with scattered remnant and planted trees.

EBS Ecology were engaged to determine potential key risks to significant native flora, fauna and/or communities associated with the Project, and to provide detail on the requirements to avoid and minimise the Projects ecological impact.

Desktop Assessment

Seven Nationally threatened flora species listed under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) were identified as potentially occurring within 5 kilometres (km) of the Affected Area, all were assessed as unlikely to occur within the Affected Area itself.

Six State threatened flora species listed under the *National Parks and Wildlife Act 1972* (NPW Act) were identified within 5 km of the Affected Area, of these 2 were assessed as potentially occurring within the Affected Area: *Eryngium ovinum* (Blue Devil) and *Eucalyptus fasciculosa* (Pink Gum).

Sixteen EPBC Act listed threatened fauna species were identified as potentially occurring within 5 km of the Affected Area. Of these, eight were migratory species unlikely to occur within the Affected Area. Seven species were assessed as unlikely to occur within the Affected Area due to the absence of suitable habitat. Only one species was assessed as potentially occurring within the Affected Area: *Pteropus poliocephalus* (Grey-headed Flying-fox).

Seven State listed threatened fauna species were identified as occurring within 5 km of the Affected Area. Of these, four were assessed as potentially occurring within the Affected Area (*Melithreptus gularis gularis* (Black-chinned Honeyeater); *Petroica boodang boodang* (Scarlet Robin); *Falcunculus frontatus frontatus* (Eastern Shriketit); and *Trichosurus vulpecula* (Common Brushtail Possum).

An additional area to the south of Area 1 is being considered by the client for an accesses road. Nine trees not assessed in the 2021 field survey were identified as potentially being considered native vegetation under the NV Act in this area. If the plan to construct an access road goes ahead, a field assessment to the requirements of the NV Act and subsequent application to clear native vegetation will be required.

Field Assessment

All vegetation within the two Affected Areas were broadly mapped as native, or planted. The *Native Vegetation Act 1991* (NV Act) applies in the Affected Area and all native vegetation occurring within the Affected Area was assessed under the requirements of the NV Act. Fauna and signs of fauna were recorded opportunistically during assessment of vegetation and all trees within the Affected Area were actively searched for hollows.

Area 1 consists of areas of native vegetation, scattered planted trees, scattered native trees and trees connected to nearby woodlands. Area 2 consists of areas of native vegetation, scattered planted trees and scattered native trees all with a degraded exotic grass understorey.

One-hundred and thirty-four (134) scattered trees consisting of three different native species were assessed using Scattered Tree Assessment Method, developed by the Native Vegetation Council. Of these, 117 were *Eucalyptus camaldulensis* (Red Gum), 12 were *Eucalyptus leucoxylon* (South Australian Blue Gum) and 7 were *Eucalyptus microcarpa* (Grey Box). None of these species are Nationally or State listed threatened, however the Grey Box trees form part of a Grey box woodland nearby, however after assessment the trees within the Affected Area do not qualify as the Threatened Ecological Community (TEC).

Forty-three weed species were observed in the Affected Area, one weed of national significance, five are declared weeds and sixteen environmental weeds.

Scats of the State listed threatened fauna species Common Brushtail Possum (*Trichosurus vulpecula*) were identified within the Affected Area during the field survey.

Discussion

The vegetation within the Area 1 consisted of more scattered trees considered native vegetation than the Area 2 and was surrounded by more vegetation with a high ecological value, particularly as it connects to woodlands in the broader landscape.

The Affected Area is considered to potentially provide habitat for the following three fauna species of State conservation significance (as listed under the NPW Act): *Melithreptus gularis gularis* (Black-chinned Honeyeater); *Petroica boodang boodang* (Scarlet Robin); and *Trichosurus vulpecula* (Common Brushtail Possum). In particular, the Common Brushtail Possum may use hollow-bearing scattered trees within the Affected Area, and the Black-chinned Honeyeater may use scattered trees for foraging. Any future removal of large *Eucalyptus* trees and/or trees with hollows may have impacts on these two species.

The native vegetation within the Affected Area consists of 134 native scattered trees, some of which have hollows. Given the high number of trees considered native vegetation within the Affected Area, should a residential development go ahead, some of these should be incorporated into green spaces. In particular, this should include location 3 within Area 1, location 6 in Area 1 and scattered trees within the Project boundary at location 7 of the Area 2 where appropriate.

Area 1 contains considerably more native vegetation, more areas of connected woodland and fewer hollows than Area 2. If development was to go ahead in the future, there is likely to be more impacts to fauna and more trees requiring removal in Area 1, even if suitable efforts are undertaken to avoid and minimise impacts to vegetation.

Recommendations

To remove any native vegetation within the Affected Area, the following is required:

- A Native Vegetation Clearance Application to remove vegetation under the *Native Vegetation Act 1991* or under the Native Vegetation Regulations 2007, will be required if any of the native vegetation is planned to be removed and/or impacted by the project.
- A Significant Environmental Benefit (SEB) and/or payment into the Native Vegetation Council Fund will be required for native vegetation clearance.

Based on the results of the desktop assessment and on-ground field assessment, broad recommendations to avoid, minimise and mitigate any adverse impacts to the environment are as follows:

- Where possible, confine developments to already cleared areas (such as the golf course greens and fairways);
- In future developments, consider incorporating green spaces into the design, in particular, trees within locations 1, 3, 6 and 7.
- Where possible, avoid impacts on native trees that provide high biodiversity value and potential resources for native fauna (in particular tree numbers 24, 78 and 114 that have large and medium hollows or very high biodiversity value);
- Where possible, avoid impacting *Eucalyptus microcarpa* trees that are adjacent to, and form part of, *Eucalyptus microcarpa* woodlands (Tree number 82, 83, 84, 85, 86 and 88);
- Ensure potential impacts of any future works on the watercourses are considered and mitigation measures undertaken within the Affected Areas;
- Ensure that design plans and construction methods minimise impacts to all vegetation, including tree protection zones, as much as possible;
- Prune instead of removing vegetation where possible;
- Document vegetation management and mitigation measures in a project specific Construction Environmental Management Plan (CEMP); and
- Manage and minimise the spread of Declared and Environmental weeds (as per the *Landscape South Australia Act 2019*) across the Affected Area to prevent their spread into surrounding areas (for example, *Asparagus asparagoides* (Bridal Creeper)); and
- Ensure a weed management plan is established prior to any construction to prevent weed spread into neighbouring land.

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1 INTRODUCTION

Creation Homes (SA) Pty. Ltd. (Creation Homes) propose to rezone two land parcels which presently form part of the Thaxted Park Golf Course, located at Lot 1002 Golf Course Drive, Woodcroft, in South Australia. Ekistics Planning and Design (Ekistics) was previously engaged by Creation Homes to undertake 'Phase 1' of the Code Amendment process, which included the preparation of the *'Proposal to Initiate an Amendment to the Planning and Design Code'*, to commence the rezoning process. Noting the intention to rezone the land for residential purposes, environmental investigations are necessary to demonstrate that the subject land is suitable to the various uses contemplated for the proposed zone, including sensitive land uses in the form of low to medium residential development.

EBS Ecology were engaged by Ekistics to undertake environmental investigations in the two areas (north and south sections) within the existing golf course that are proposed to be rezoned from recreational to residential (Figure 1). Area 1 consists of 3.160 ha and Area 2 is 3.926 ha. Both areas are currently part of Thaxted Park Golf Course land with scattered remnant and planted trees (Figure 2).

EBS Ecology were engaged to determine potential key risks to significant native flora, fauna and/or communities associated with the Project, and to provide detail on the requirements to avoid and minimise the Projects ecological impact.

1.1 Objectives

The overall aim of the flora and fauna assessment was to assess and quantify the potential ecological impacts associated with undertaking the code amendment process.

Specifically, the objectives of the Project were to:

- Conduct an desktop assessment to identify:
    - Areas of important environmental value, including vegetation protected under the *Native Vegetation 1991*;
    - all vegetation subject to the NV Act and the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) in the area affected by the Project;
    - Fauna habitat and/or fauna species of conservation significance at a State and National level (listed under the *National Parks and Wildlife Act 1972* (NPW Act) and EPBC Act;
    - Any implications for the presence of environmentally important and/or protected flora and fauna within the Affected Area; and
    - Following further instruction from the client, consider the fauna and flora implications of an additional access from Golf Course Drive.
- Conduct a field inspection to:
    - Ground-truth outcomes of the desktop assessment;
    - Determine the type, condition and species composition of vegetation in the Affected Areas;
    - Identify fauna species and suitable habitat present in the Affected Areas;

- Assess and describe the ecological features and values of the Affected Area in accordance with *Native Vegetation Act 1991* requirements; and
- Identify any "Declared" plants under the *Landscape South Australia Act 2019* (LSA Act) that may be significant in relation to the Project requirements.

Various information sources were reviewed for the purposes of the study, including past records of flora and fauna within five kilometres of the Affected Area, aerial imagery, spatial data, and habitat information specific to threatened biodiversity. The current report presents findings of the desktop and field assessment in line with desktop and field methodologies required under the *Native Vegetation Act 1991* and N*ative Vegetation Regulations 2017* (the Regulations).

1.2 Proposed Land Use of Site

Creation Homes are seeking to rezone the Affected Areas to the General Neighbourhood Zone or Golf Course Estate Zone. As such, a range of possible land use options for the two locations are considered, including:

- Ancillary accommodation;
- Community facility;
- Consulting room;
- Dwellings;
- Educational establishment;
- Golf Course;
- Retirement facility;
- Shops;
- Office;
- Place of worship;
- Pre-school;
- Recreational area;
- Residential flat building;
- Sporting clubrooms;
- Student accommodation;
- Supported accommodation; and
- Tourist accommodation.

1.3 General Location Map

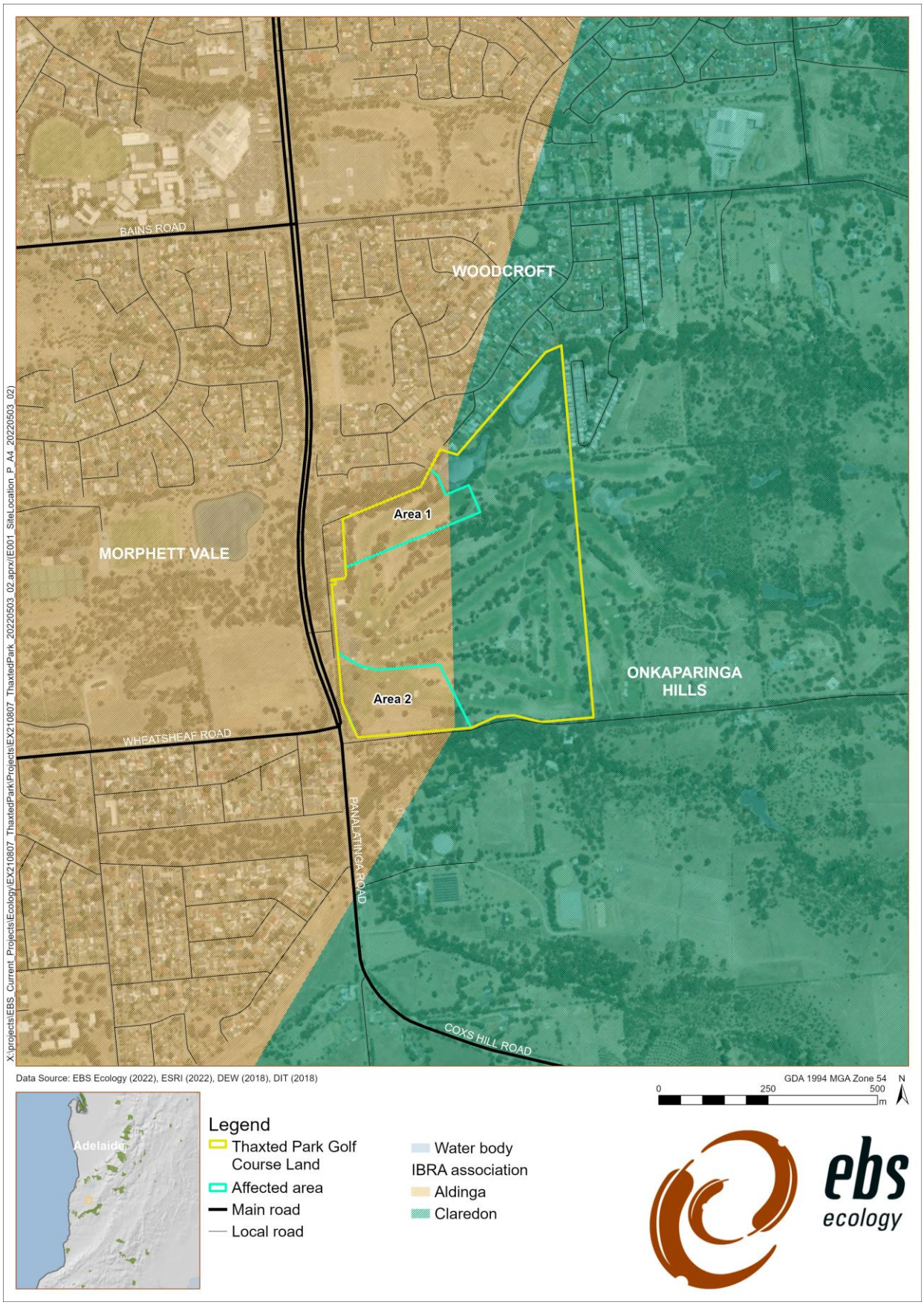


Figure 1. Location of the Affected Area.

1.4 Map of Areas Proposed to be Rezoned

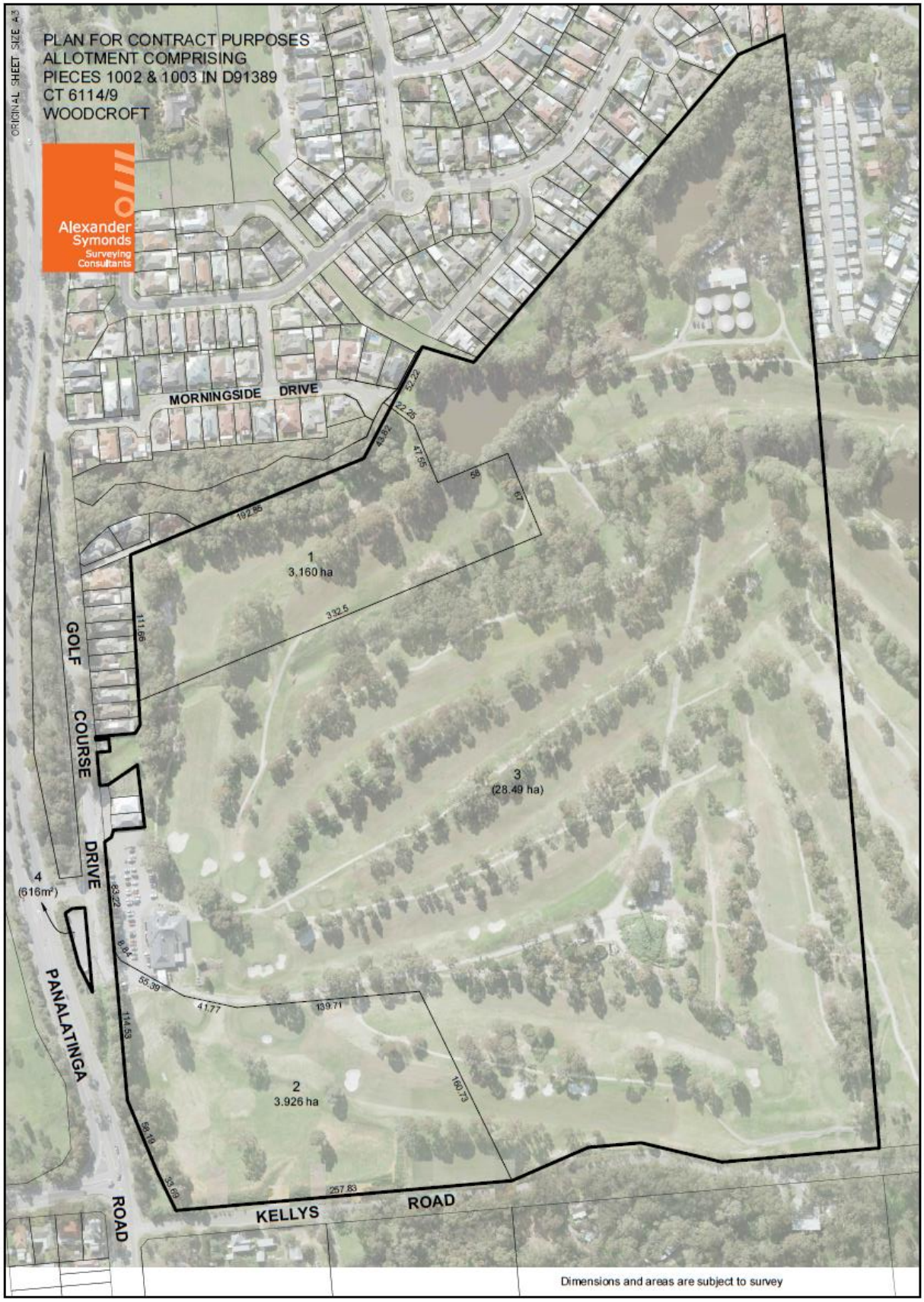


Figure 2. Current locations of the areas proposed for rezoning (Designs provided by Ekistics on 22/09/2021).

2 COMPLIANCE AND LEGISLATIVE SUMMARY

2.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Environment Protection and Biodiversity Conservation Regulations 2000* provide a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places – defined in the Act as 'matters of national environmental significance'. Any action that has, will have, or is likely to have a significant impact on matters of national environmental significance (MNES) requires referral under the EPBC Act.

2.2 Native Vegetation Act 1991

The *Native Vegetation Act 1991* (NV Act) applies in the Affected Area. Therefore, native vegetation must not be cleared unless approval is granted by the Native Vegetation Council (NVC) in accordance with *Section 29* of the Act or it is permitted under Division 5 of the *Native Vegetation Regulations 2017* (NV reg).

The future use of this land will determined whether it requires approval under the NV Act or NV regulations.

2.3 National Parks and Wildlife Act 1972

Native plants and animals in South Australia are protected under the NPW Act. It is an offence to take a native plant or protected animal without approval. Threatened plant and animal species are listed in Schedules 7 (Endangered species), 8 (Vulnerable species) and 9 (Rare species) of the Act. Persons must not:

- Take a native plant on a reserve, wilderness protection area, wilderness protection zone, land reserved for public purposes, a forest reserve or any other Crown land;
- Take a native plant of a prescribed species on private land;
- Take a native plant on private land without the consent of the owner (such plants may also be covered by the NV Act);
- Take a protected animal or the eggs of a protected animal without approval;
- Keep protected animals unless authorised to do so; and
- Use poison to kill a protected animal without approval.

Conservation rated flora and fauna species listed on Schedules 7, 8, or 9 of the NPW Act are known to or may occur within the Affected Area. Persons must comply with the conditions imposed upon permits and approvals.

2.4 Landscape South Australia Act 2019

The *Landscape South Australia Act 2019* (LSA Act) recently replaced the *Natural Resources Management Act 2004* (NRM Act). Under the LSA Act, new regional landscape boards have been established. The aim

is to deliver NRM related services to regional communities, including effective water management, pest plant and animal control, soil and land management and support for broader sustainable primary production programs. Under the LSA Act, landholders have a legal responsibility to manage declared pest plants and animals and prevent land and water degradation.

2.5 Planning, Development and Infrastructure Act 2016

The Affected Area is located in an area for which the current *Planning, Development and Infrastructure Act 2016* (PDI Act) requirements in regard to 'Regulated/Regulated Significant Trees' are as follows:

- Regulated Tree - Any tree with a trunk circumference of 2.0 m or more – or, in the case of trees with multiple trunks; that have trunks with a total circumference of 2.0 m or more and an average circumference of 625 mm or more – measured at a point 1.0 m above natural ground level; or
- Regulated Significant Tree - Any tree with a trunk circumference of 3.0 m or more – or, in the case of trees with multiple trunks; that have trunks with a total circumference of 3.0 m or more and an average circumference of 625 mm or more – measured at a point 1.0 m above natural ground level; or
- Any tree identified as a significant tree in a Development Plan.

Exemptions to these regulations are in place for trees that are either:

- on the list of specific tree species exemptions (see regulation 3F(4)(b) of the *Planning Development and Infrastructure (General) Regulations 2017*); or
- located within 10 metres of an existing dwelling or existing inground swimming pool; or
- belonging to a class of plants to which a declaration by the Minister under Part 9 Division 1 of the Landscape South Australia Act 2019 applies; or
- to a tree that may not be cleared without the consent of the Native Vegetation Council under the *Native Vegetation Act 1991*;

Development Approval, in accordance with the *Planning, Development and Infrastructure Act 2016* will be required to prune (including root impacts) or remove any Regulated or Regulated Significant trees, which are not protected by the *Native Vegetation Act 1991*.

3 METHODS

3.1 Desktop Assessment

3.1.1 Database Searches

Desktop research was undertaken in preparing this report. This included database searches and a review of literature relevant to the Affected Area to determine if any ecological constraints exist for the proposed Project. These searches helped to identify a list of threatened species and ecological communities and MNES that are known or likely to occur in the Affected Area.

The following databases and resources were reviewed:

- Commonwealth Protected Matters Search Tool (PMST) to identify all MNES potentially within 5 kilometres (km) of the Affected Area. MNES include threatened species, ecological communities and migratory species listed under the EPBC Act.
- Records from BDBSA Supertables, filtered to those since 1995, within 5 km of the Affected Area, with <1 km accuracy from NatureMaps (NatureMaps 2021).
- Records from Atlas of Living Australia were assessed to determine threatened species within the Affected Area.
- Species Profile and Threats Database (SPRAT) for entities listed under the EPBC Act, available at https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl
- Other relevant websites, reports, fact sheets and papers.

3.1.2 Threatened Entities Likelihood of Occurrence

The likelihood of threatened species and communities predicted as occurring by database searches were assessed as to the likelihood of their presence within the Affected Areas. The following assessment categories were used:

Table 1. Likelihood assessment criteria.

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 provides 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 provides 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 survey

A field survey of the Affected Area was undertaken by two EBS ecologists on 30th September– 1st October 2021.

Vegetation was assessed broadly as native or planted as well as all species recorded. Where trees were considered native vegetation, the Scattered Tree Assessment Method (STAM) was undertaken.

3.2.1 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 2020c). Uncommon and threatened fauna species that can utilize scattered trees were entered into the Scattered Tree Scoresheet by cross-referring the NatureMaps data extract and the lists of '*scattered tree using fauna'* in the *Scattered Tree Assessment Manual* (NVC 2020c). 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).

3.2.2 Weeds

Any declared weed species detected on site within the Affected Area were identified.

3.2.3 Fauna

All observations of fauna occurring within the Affected Area were recorded while on site, and habitat was assessed for signs of fauna (scats, tracks, traces). The value of habitat within the Affected Area was qualitatively assessed, with species of National and State significance in mind. All trees within the Affected Area were actively searched for hollows.

3.3 Limitations

The ecological assessment was made of the extent of the Affected Area (as depicted in Figure 2). No allowance has been made for any future changes that might increase or change the area of the impact footprint. The findings and conclusions expressed by EBS Ecology are based solely upon information in existence at the time of the assessment.

3.3.1 Desktop Assessment

Threatened species records include only those that were returned based on the database searches at the time of the assessment and may include records that have not been adequately verified or may not include all species that could occur in the Affected Area. Furthermore, limitations exist with the PMST, and NatureMaps data collection methods and so the type of presence that can be determined from the data is indicated in general terms. Consider the following limitations:

- NatureMaps only includes verified flora and fauna records submitted to Department for Environment and Water (DEW) or partner organisation, and it is recognised that knowledge is often poorly captured, and the presence of species may not be adequately represented by database records. In particular, some threatened species records are denatured and so records will not occur in this data. For some threatened species, the Atlas of Living Australia was used to determine their presence in the Affected Area.
- Records were filtered to a spatial reliability of less than 1 km and records since 1995, however spatial reliability of NatureMaps data ranges from 0-5 km to over 100 km, and therefore additional species may occur, but have been discounted due to unreliable data collection.
- DEW gives no warranty that the data is accurate or fit for any particular purpose of the user or any other person to whom the user discloses the information.

3.3.2 Field Assessment

Due to the size of the Affected Area, and areas already designated as being retained, not all vegetation patches were searched and assessed in detail throughout the extent of the Affected Area. As such, additional flora species, including threatened species and Declared weeds may be present within the site. Additionally, some flora species may have gone undetected due to seasonal conditions and / or timing of the survey (e.g. if they were dormant, inconspicuous or lacked distinguishable features such as flowers or seeds at the time of survey). All trees within the Affected Areas were assessed for the presence of hollows, regardless of whether they were planted or native.

Fauna records were limited to opportunistic observations at the time of the survey, and may not have been undertaken within the optimal survey time for species of interest (i.e. dawn / dusk for birds). Therefore, species additional to those recorded during the field survey are likely to occur within the Affected Area, and the likelihood of occurrence of species identified in the desktop assessment is based on vegetation and habitat features assessed in the vegetation assessment.

4 DESKTOP ASSESSMENT RESULTS

4.1 Environmental Setting

The Affected Area occurs within Green Adelaide Landscape Management Region and the City of Onkaparinga Local Government Area.

The Interim Biogeographical Regionalisation of Australia (IBRA) identifies geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. The bioregions are further refined into subregions and environmental associations. The Affected Area is located in the Flinders Lofty Block IBRA Bioregion, Mount Lofty Ranges IBRA Subregion. The western side is in the Aldinga IBRA Environmental Association, and the eastern side is in the Clarendon IBRA Environmental Association.

Approximately 15% (46,342 ha) of the Mount Lofty Ranges IBRA Subregion is mapped as remnant vegetation and of this, 27% (12,706 ha) is formerly conserved and protected.

Approximately 34% (9449 ha) of the Clarendon IBRA Environmental Association and 3% (902) of the Aldinga IBRA Environmental Association is mapped as remnant vegetation. Of this, 27% (2527 ha) and 44% (399 ha) is formerly conserved and protected, respectively (Table 2).

Table 2. IBRA bioregion, subregion, and environmental association environmental landscape summary.

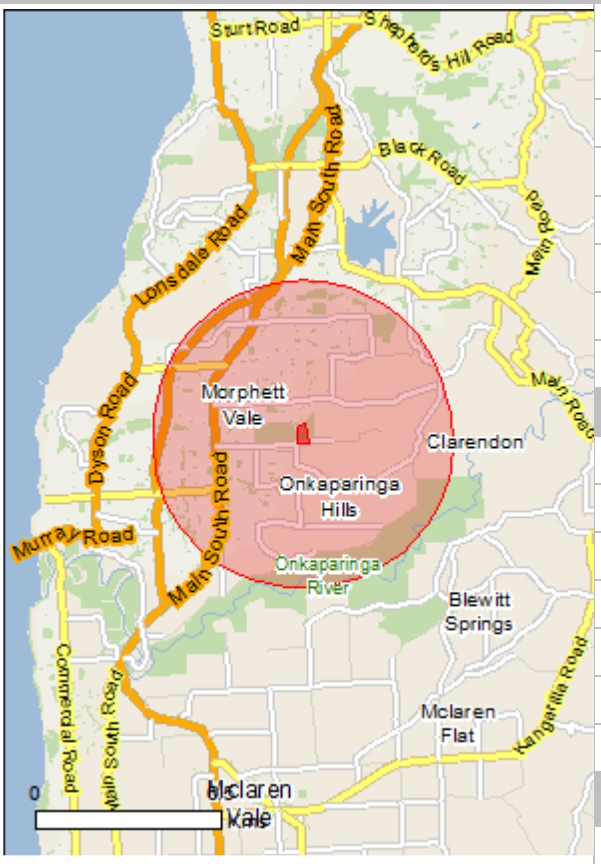
Flinders Lofty Block IBRA bioregion	
Temperate to arid Proterozoic ranges, alluvial fans and plains, and some outcropping volcanics, with the semi-arid to arid north supporting native cypress, black oak (belah) and mallee open woodlands, Eremophila and Acacia shrublands, and bluebush/saltbush chenopod shrublands on shallow, well-drained loams and moderately-deep, well-drained red duplex soils. The increase in rainfall to the south corresponds with an increase in low open woodlands of *Eucalyptus obliqua* and *E. baxteri* on deep lateritic soils, and *E. fasciculosa* and *E. cosmophylla* on shallower or sandy soils.	
Mount Lofty Ranges IBRA subregion	
This subregion extends from north of the Fleurieu Peninsula to the Barossa Valley, and is predominantly an undulating to low hilly upland with steeper marginal ranges and hills. The Barossa Valley is the lowest area in this subregion and represents a structural basin. The rest of the subregion consists of hilly uplands on sandstone and shale with northerly trending strike ridges and dissected lateritic tableland remnants. Low open woodland commonly dominated by *Eucalyptus obliqua* and *E. baxteri* are found in higher rainfall areas on deep, lateritic soils. Shallower or sandy soils support *E. fasciculosa*, *E cosmophylla* and in the northern part of the region *E. goniocalyx*. *E. leucoxylon* dominates the woodlands on podzolised soils in the lower rainfall areas, *E. viminalis ssp. cygnetensis* dominate the wetter and cooler woodlands and *E. odorata* characterises drier sites. Eucalypts give way to drooping sheoak (*Allocasuarina verticillata*) in the most arid woodlands and in coastal situations on shallow rocky soils.	
Remnant vegetation	Approximately 15% (46342 ha) of the subregion is mapped as remnant native vegetation, of which 27% (12706 ha) is formally conserved.
Landform	Hills and valleys; alternating subparallel hilly ridges and valleys with a general N-S trend in north. In south, hilly dissected tableland.
Geology	Dissected lateritized surface in south.
Soil	Hard setting loams with red clayey subsoils, highly calcareous loamy earths, Hard setting loams with mottled yellow clayey subsoil, Coherent sandy soils, Cracking clays.

Vegetation	Eucalyptus woodlands with a shrubby understorey.
Conservation significance	129 species of threatened fauna, 270 species of threatened flora. 4 wetlands of national significance.
Clarendon IBRA environmental association	
Remnant vegetation	Approximately 34% (9449 ha) of the association is mapped as remnant native vegetation, of which 27% (2527 ha) is formally conserved.
Landform	Hilly uplands with dissected lateritic tableland remnants.
Geology	Siltstone, shale, laterite and alluvium.
Soil	Hard pedal red duplex soils, hard apedal mottled-yellow soils, sandy apedal mottled-yellow soils and reddish dense loams.
Vegetation	Open forest of messmate stringybark and brown stringybark, woodland of SA blue gum, swamp gum and river red gum and open scrub of pink gum and SA blue gum.
Conservation significance	62 species of threatened fauna, 169 species of threatened flora. 1 wetlands of national significance.
Aldinga IBRA environmental association	
Remnant vegetation	Approximately 3% (902 ha) of the association is mapped as remnant native vegetation, of which 44% (399 ha) is formally conserved.
Landform	Fans with areas of calcrete on the surface, merging into a gently undulating plain with occasional laterite-capped tableland remnants.
Geology	Cliffs alternate with beaches and dunes along the coastline.
Soil	Hard pedal red duplex soils, grey self-mulching cracking clays, hard pedal mottled-yellow duplex soils, sandy pedal mottled yellow soils and whitish calcareous sands.
Vegetation	Tussock sedgelands, open heath of coast daisy bush and coast beard heath and low woodland of pink gum.
Conservation significance	77 species of threatened fauna, 53 species of threatened flora. 2 wetlands of national significance.

4.2 Matters of National Environmental Significance

The EPBC Act PMST report identified 30 threatened species and 15 migratory species protected under the EPBC Act, which may be relevant to the Affected Area. Table 3 summarizes the results of the PMST report and the relevant MNES are discussed further below. Note that some of these matters are not impacted by or relevant to the Project (i.e. Marine species) and these matters are therefore not discussed further.

Table 3. MNES identified by the PMST.

Search Area (5 km buffer)	Matters of National Environmental Significance	Identified within the Search Area
	World Heritage Properties	None
	National Heritage Places	None
	Wetlands of International Importance	None
	Great Barrier Reef Marine Park	None
	Commonwealth Marine Areas	None
	Threatened Ecological Communities	1
	Listed Threatened Species	30
	Listed Migratory Species	15
	Other Matters Protected by the EPBC Act	
	Commonwealth Land	1
	Commonwealth Heritage Places	None
	Listed Marine Species	22
	Whales and Other Cetaceans	None
	Critical Habitats	None
	Commonwealth Reserves Terrestrial	None
	Australian Marine Parks	None
	Extra Information	
	State and Territory Reserves	2
	Regional Forest Agreements	None
	Invasive Species	36
	Nationally Important Wetlands	None
	Key Ecological Features (Marine)	None

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

4.3 Threatened Ecological Communities

One TEC was identified by the PMST as potentially occurring within a 5 km buffer of the Affected Area (Table 4). An area of vegetation within the golf course that abuts the area proposed to be included in the rezoning contains *Eucalyptus microcarpa* (Grey Box) with poor quality understorey. Six trees that form part of this area have been assessed as scattered trees (due to not having touching canopies and exotic understorey). However, these trees may be considered to be part of a larger are that may qualify as a TEC, however, the broader area was not assessed. All other vegetation assessed within the Affected Area was deemed unlikely to be considered part of this TEC as there was little to no native understorey.

Table 4. Threatened Ecological Communities potentially occurring within the Affected Area

Threatened Ecological Community Description	Conservation Status		Likelihood of occurrence within search area	Likelihood of occurrence in the Affected Area
	SA	AUS		
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia		E	Likely to occur	Possible

4.4 Threatened Flora

4.4.1 Nationally Listed Flora

The PMST listed seven nationally listed flora species that have records within 5 km of the Affected Area since 1995, with <1 km reliability (Table 5). One was listed as 'known' to occur and six as 'likely' to occur within the search area:

- *Caladenia gladiolata* (Bayonet Spider-orchid) (Commonwealth (Com): EN; SA: E);
- *Glycine latrobeana* (Clover Glycine) (Com: VU; SA: V);
- *Olearia pannosa ssp. pannosa* (Silver Daisy-bush) (Com: VU; SA: V);
- *Prasophyllum pallidum* (Pale leek-orchid) (Com: VU; SA: R);
- *Prasophyllum pruinosum* (Plum leek-orchid) (Com: EN; SA: E);
- *Pterostylis cucullata* (Leafy Greenhood) (Com: VU; SA: E);
- *Veronica derwentiana ssp. homalodonta* (Mount Lofty Speedwell) (Com: CR; SA: E).

Of these, all were assessed as unlikely to occur within the Affected Area due to either the highly disturbed understorey or the absence of suitable habitat.

4.4.2 State Listed Flora

A BDBSA search identified 6 State listed flora species that have records within 5 km of the Affected Area since 1995, with <1 km reliability (Table 5). Four of these species were considered unlikely to occur due to the absence of suitable habitat in the Affected Area. Two State listed species were assessed as potentially occurring within the Affected Area (discussed further in Section 4.4.3):

- *Eryngium ovinum* (Blue Devil) (SA: V);
- *Eucalyptus fasciculosa* (Pink Gum) (SA: R);

Records of threatened flora species with records within 5 km of the Affected Area are presented in Figure 3.

Table 5. Likelihood of occurrence of threatened flora species identified in the desktop assessment. The data source and threat levels are described in the table footer.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record/likelihood PMST	Species known habitat preferences	Likelihood of use for habitat – Comments
Acacia dodonaeifolia (Hop-bush Wattle)	R		1	2009	Endemic to South Australia. The two main areas are Eyre Peninsula (southern part) and Southern Lofty regions. Mainly in woodland open forest vegetation formation. Soils; hard acidic, yellow duplex, red shallow porous loamy, sandy alkaline yellow duplex. Rainfall 500-700 mm.	Unlikely – highly disturbed understorey.
Austrostipa gibbosa (Swollen Spear-grass)	R		1	2010	In SA grows in FR, NL, MU, SL and SE regions. Grows in rich loamy soils along creeks and in other seasonally wet places. Also prefers open forests and woodlands or grasslands with *Eucalyptus odorata*, *Acacia pycnantha*, *Allocasuarina verticillata* and *Rytidosperma setaceum*. In the MLR found in foothills in and around Sturt Gorge and Sheppard's Hill RP's.	Unlikely – highly disturbed understorey.
Austrostipa oligostachya (Fine-head Spear-grass)	E		1	2010	In SA found in SL and SE regions. Within the Mount Lofty Ranges the preferred broad vegetation groups are Grassy Woodland and Grassland. At Mount Bold Reservoir found on the upper reaches on the river's edge. At Mount Crawford found on loamy flats with *Rytidosperma sp*. At Black Hill CP found upslope in Eucalyptus camaldulensis open woodland. Also occurs in coastal swamps. At the Waitpinga/Victor Harbor region, the plants are thinly scattered amongst other native grasses in ephemerally wet areas.	Unlikely – highly disturbed understorey.
Caladenia gladiolata (Bayonet Spider-orchid)	E	EN	2	Likely to occur	Endemic to SA. Emerges in winter and produces a single flower stem in Aug-Sep. Grows in woodland dominated by South Australian Blue Gum (*Eucalyptus leucoxylon*), Sugar Gum (*E. cladocalyx*) or Pink Gum (*E. fasciculosa*). Grows on moderate to steep slopes in sandy loam soils with scattered shale and quartzite.	Unlikely – highly disturbed understorey.
Drosera praefolia (Early Sundew)	R		1	2002	Occurs in the SL and KI regions of SA. Recent record from Sturt Gorge RP. Prefers open woodland communities.	Unlikely – highly disturbed understorey.
Eryngium ovinum (Blue Devil)	V		1	1997	Widespread, chiefly in inland districts. Grows in damp clayey or sandy soils of open woodland and disturbed roadside sites and pastures.	Possible – however, highly disturbed understorey.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record/likelihood PMST	Species known habitat preferences	Likelihood of use for habitat – Comments
Eucalyptus fasciculosa (Pink Gum)	R		1	2009	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).	Likely – nearby records, suitable habitat.
Glycine latrobeana (Clover Glycine)	V	VU	2	Likely to occur	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.	Unlikely – highly disturbed understorey.
Olearia pannosa ssp. pannosa (Silver Daisy-bush)	V	VU	2	Likely to occur	Endemic to SA where it is scattered throughout agricultural areas. Collections have been made in the EP, YP, FR, Southern MLR, Northern MLR, Murray Basin and SE botanical districts and a single collection from KI. Is generally found in sandy, flat areas and in hilly, rocky areas in woodland or mallee communities dominated by a wide range of eucalypt, Melaleuca and Callitris species.	Unlikely – no suitable habitat within the Affected Area.
Prasophyllum pallidum (Pale Leek-orchid)	R	VU	2	Known to occur	Pale Leek-orchid is known singly or in groups in better soils of woodland and grassy open forest (Bates, 2009) from the Flinders Ranges to the Northern and Southern Lofty regions of SA (Jessop & Toelken, 1986). Belair NP contains the largest known conserved population in the AMLR. Recorded in woodlands and forests dominated by *Eucalyptus leucoxylon*, *E. goniocalyx, E. fasciculosa, E. microcarpa, Callitris gracilis/Eucalyptus fasciculosa*, and *Allocasuarina verticillata* over *Lissanthe strigosa*, *Amphipogon strictus* and *Tricoryne elatior*.	Unlikely – highly disturbed understorey.
Prasophyllum pruinosum (Plum leek-orchid)	E	EN	2	Likely to occur	The Plum Leek-orchid is endemic to SA, where 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 suitable habitat on site.
Pterostylis cucullata (Leafy Greenhood)	E	VU	2	Likely to occur	2 subspecies: one coastal and the other montane/inland. Coastal: stabilised coastal sand dunes, on open ground but under a scrublayer.	Unlikely – no suitable habitat within the Affected Area.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record/likelihood PMST	Species known habitat preferences	Likelihood of use for habitat – Comments
					Montane: river banks or protected alluvial flood plains (DAWE, 2021b).	
Veronica derwentiana ssp. homalodonta (Mount Lofty Speedwell)	E	CE	2	Likely to occur	Endemic to SA. Occurs in the southern Mount Lofty Ranges, to the east and south of Adelaide and on Kangaroo Island. Occurs in moist areas, gullies, creeklines and high rainfall areas (Briggs & Ehrendorfer 1992). Largely occurs in *Eucalyptus obliqua* Forests with or without additional overstorey species (such as *Eucalyptus fasciculosa*, *Eucalyptus viminalis ssp. cygnetensis* & *Eucalyptus leucoxylon*) (DEWHA, 2009).	Unlikely – highly disturbed understorey.
Source; 1- NatureMaps, 2 - Protected matters search tool. NPW Act; E= Endangered, V = Vulnerable, R= Rare. EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable.						

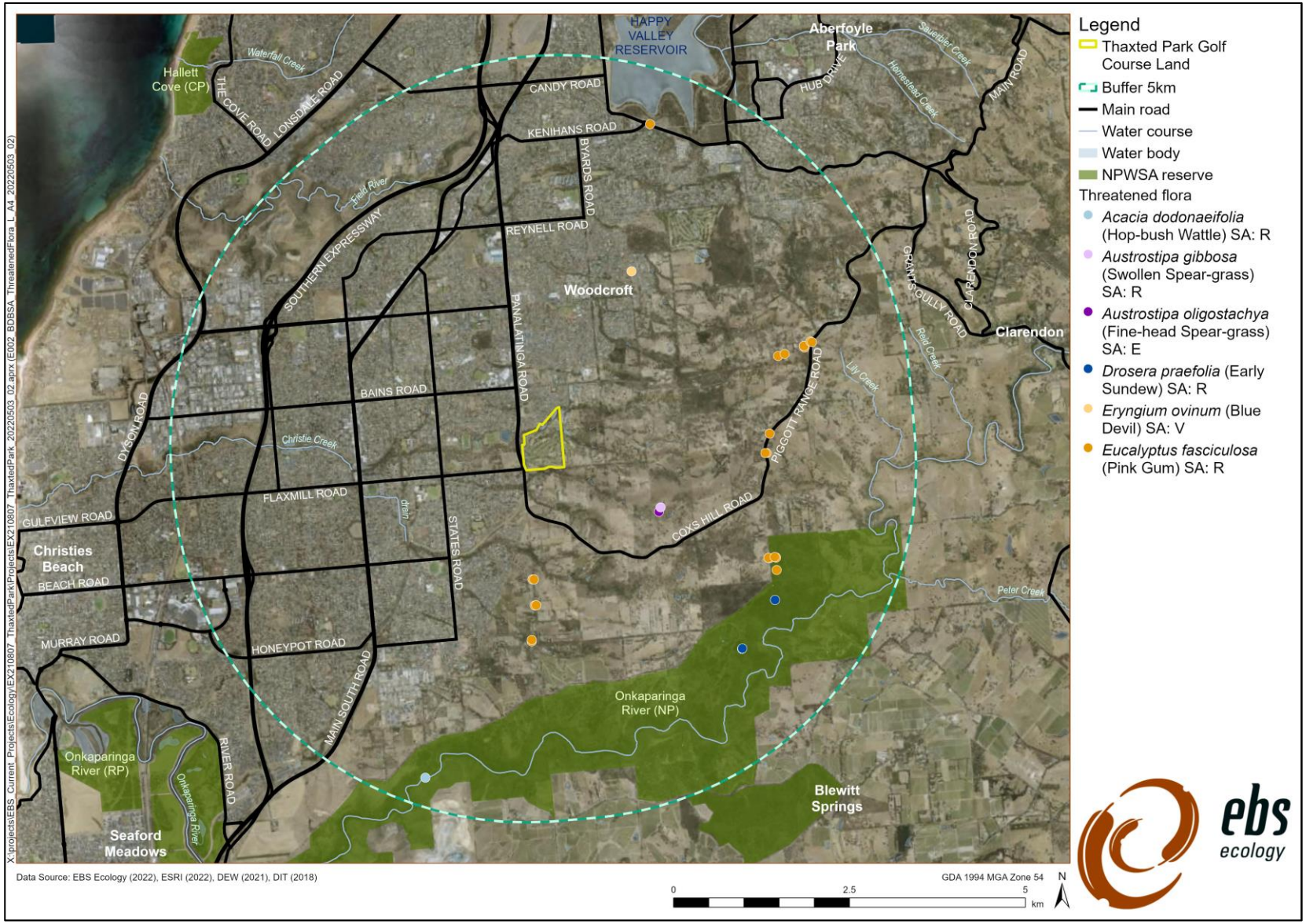


Figure 3. Location of threatened flora within 5 km of the Affected Area based on NatureMaps records.

4.4.3 Threatened Flora Species Information

NPW Act listed species

***Eryngium ovinum* (Blue Devil) – Vulnerable in SA**

This species is a perennial that occurs in grassland and grassy woodlands, chiefly in inland districts. It grows in damp clayey or sandy soils of open woodland and disturbed roadside sites and pastures. There is only one nearby record on private property. This species is considered to potentially occur on the less managed areas of the golf course, adjacent to native vegetation, however, it was not observed during the field survey.

***Eucalyptus fasciculosa* (Pink Gum) – Rare in SA**

This species often occurs on poorer sandy soils, in woodland or as an emergent in low shrublands. It is commonly associated with *E. baxteri*, *E. cosmophylla*, *E. diversifolia*, *E. leptophylla* and *E. leucoxylon* (Nicolle, 2013). There are recent nearby records of the species as scattered trees, however, it was not observed in the Affected Area during the survey.

4.5 Threatened Fauna

4.5.1 Nationally Listed Fauna

The PMST identified 16 threatened fauna species listed as 'known to occur' or 'likely to occur' within the 5 km search area around the Affected Area, consisting of:

- 5 birds
- 2 mammals
- 1 amphibian
- 8 migratory or marine species

Of the 16 fauna species identified as known or likely to occur within 5 km of the Affected Area, eight were migratory or marine and assessed as unlikely to occur within the Affected Area due to the absence of suitable habitat. Of the remaining eight species, four were listed as 'known to occur' and four were listed as 'likely to occur' within 5 km of the Affected Area (Table 6).

Of these only *Pteropus poliocephalus* (Grey-headed Flying-fox) was assessed as likely to occur within the Affected Area, and is discussed further in Section 5.4.

4.5.2 State Listed Fauna

A NatureMaps search identified 7 State listed threatened fauna species with records of high reliability (< 1 km) within 5 km of the Affected Area since 1995, including five birds, one mammal and one reptile (Table 6).

Of these, 4 species were assessed as unlikely to occur within the Affected Area due to the absence of suitable habitat. Of the remaining three species, two were assessed as *possible* and two *likely* to occur within the Affected Area:

- *Melithreptus gularis gularis* (Black-chinned Honeyeater) (SA: V);

- *Petroica boodang boodang* (Scarlet Robin) (SA: R);
- *Trichosurus vulpecula* (Common Brushtail Possum) (SA: R).

These species are described further in Table 6 and Section 5.4.

All species with records within 5 km of the Affected Area are presented in Figure 4.

Table 6. Likelihood of occurrence of threatened species identified in the desktop assessment. The data source and threat levels are described in the table footer.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record/likelihood PMST	Species known habitat preferences	Likelihood of use for habitat – Comments
Birds						
Actitis hypoleucos (Common Sandpiper)	R	Mi	3	Known to occur	Varied coastal and interior wetlands: narrow muddy edges of billabongs, river pools, mangroves, among rocks reefs and rocky beaches (Pizzey & Knight, 2007).	Unlikely – no suitable habitat in the Affected Area.
Apus pacificus (Fork-tailed Swift)		Mi	3	Likely to occur	Widespread but almost exclusively aerial. Mostly occur over inland plains and dry or open habitats.	Unlikely - possible as flyover, but unlikely to use habitat within Affected Area.
Botaurus poiciloptilus (Australasian Bittern)		EN	3	Known to occur	Found mainly in freshwater wetlands and, rarely, in estuaries or tidal wetlands, favouring wetlands dominated by sedges, rushes and reeds growing over a muddy or peaty substrate.	Unlikely – no suitable habitat within the Affected Area.
Corcorax melanorhamphos (White-winged Chough)	R		1	2017	White-winged Choughs are found in open forests and woodlands. They tend to prefer the wetter areas, with lots of leaf-litter, for feeding, and available mud for nest building (BirdLife Australia, 2021).	Unlikely – no suitable habitat within the Affected Area.
Chrysococcyx osculans (Black-eared Cuckoo)		Ma	3	Likely to occur	The Black-eared Cuckoo is found in drier country where species such as mulga and mallee form open woodlands and shrublands. It is often found in vegetation along creek beds. The Black-eared Cuckoo is common across northern Australia. It is migratory, moving into the sub-coastal areas of south-east and south-west Australia for the summer (Birds in Backyards, 2021).	Unlikely – no suitable habitat in the Affected Area.
Falco hypoleucos (Grey Falcon)		VU	3	Likely to occur	The species is mainly found where annual rainfall is less than 500 mm, except when wet years are followed by drought, when the species might become marginally more widespread, although it is essentially confined to the arid and semi-arid zones at all times. 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 (Threatened Species Scientific Committee, 2008).	Unlikely – would only occur as flyover, unlikely to use habitat on site.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record/likelihood PMST	Species known habitat preferences	Likelihood of use for habitat – Comments
Gallinago hardwickii (Latham's Snipe)	R	Mi, Ma	3	Known to occur	This is a wetland species (Pizzey and Knight, 2007).	Unlikely – although there is a small dam within the Affected Area, this species is unlikely to occupy that waterbody.
Grantiella picta (Painted Honeyeater)		VU	3	Likely to occur	Forest, woodland, dry scrub, often with abundant mistletoe. Dependent on mistletoe berries (Morecombe, 2021).	Unlikely – no suitable habitat on site.
Haliaeetus leucogaster (White-bellied Sea-Eagle)		Ma	3	Likely to occur	This species is distributed along the coastline (including offshore islands) of mainland Australia and Tasmania. Distribution also extends inland along some of the larger waterways, especially in eastern Australia. The inland limits of the species are most restricted in south-central and south-western Australia, where it is confined to a narrow band along the coast. Found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands.	Unlikely – No nearby records, and Affected Area is not within suitable areas for this species.
Melanodryas cucullata cucullata (Hooded Robin)	R		1	2005	Habitat is dry eucalypt forests, woodlands, mallee and scrublands (Pizzey and Knight, 2007).	Unlikely – no suitable habitat within the Affected Area.
Melithreptus gularis gularis (Black-chinned Honeyeater)	V		1	2010	Occupy dry Eucalypt woodland with an annual rainfall range of 400-700 mm, particularly associations containing ironbark and box. Favoured habitats incorporate a mixture of mature and regenerating woodland Eucalypts, although adjacent scattered paddock trees are also used (DEH, 2008).	Possible – suitable habitat within the Affected Area and nearby records in areas with scattered trees.
Myiagra cyanoleuca (Satin Flycatcher)		Mi, Ma	3	Likely to occur	Known inhabitant of forest, woodland, mangroves and coastal heath scrub. Prefers dense, wet gullies of heavy eucalypt forest in breeding season (Morcombe, 2011).	Unlikely – no suitable habitat within the Affected Area.
Pandion haliaetus (Osprey)		Mi	3	Likely to occur	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands (DOE, 2014).	Unlikely – no suitable habitat within the Affected Area.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record/likelihood PMST	Species known habitat preferences	Likelihood of use for habitat – Comments
Petroica boodang boodang (Scarlet Robin)	R		1	2000	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.	Possible – although nearby records are in Onkaparinga NP.
Rostratula australis (Australian Painted Snipe)		EN, Ma	3	Known to occur	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, 2021).	Unlikely – no suitable habitat within the Affected Area.
Thinornis cucullatus cucullatus (Hooded Plover)	V	VU, Ma	3	Known to occur	Sandy beaches of ocean estuaries, coastal lakes and inland salt lakes. Nesting on beach above high-tide mark (Morcombe 2021).	Unlikely – no suitable habitat in the Affected Area.
Tringa nebularia (Common Greenshank)		Mi	3	Likely to occur	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum Muehlenbeckia or canegrass or sometimes tea-tree (Melaleuca) (DOE 2014).	Unlikely – no suitable habitat within the Affected Area.
Turnix varius varius (Painted Buttonquail)	R		1	2009	These birds range almost continuously, in appropriate habitat, from about the Atherton Tableland in Qld, round the coast to the Eyre Peninsula 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. They appear to prefer closed canopies with some understory and deep leaf litter on the ground (BirdLife Australia, 2020).	Unlikely – no suitable habitat within the Affected Area.
Mammals						
Isoodon obesulus obesulus (Southern Brown Bandicoot)		EN	3	Known to occur	This species prefers dense ground cover, tall grass and low shrubbery. They live near swamps and rivers as well as in thick	Unlikely – no recent records and highly disturbed understorey so

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record/likelihood PMST	Species known habitat preferences	Likelihood of use for habitat – Comments
					scrub in drier areas. They make their nests on the ground and in logs. The nests consist of sticks, leaves, grass, and soil.	habitat in Affected area is unsuitable.
Pteropus poliocephalus (Grey-headed Flying-fox)	R	VU	1, 3	2020, Likely to occur	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. This species may occur within the Affected Area, however, they would only be expected to visit for short periods if suitable flower or fruit resources are available.	Likely – recent records within 5 km of the Affected Area.
Trichosurus vulpecula (Common Brushtail Possum)	R		1, 3	2002	Anywhere where trees with suitable hollows occur, including open forests and woodlands but also urban areas and cities. The species can be common in urban areas (Strahan, 2004).	Likely – some suitable habitat (hollows) and recent records within 5 km of the Affected Area.
Reptiles						
Egernia cunninghami (Cunningham's Skink)	E		1	2008	Forests and open woodlands usually in areas with rock outcrops (Atlas of Living Australia, ND).	Unlikely – no suitable habitat within the Affected Area.
Amphibians						
Litoria raniformis (Growling Grass Frog)		VU	3	Likely to occur	Three distinct groups of records in SA. One group is located in the far south-east of the state (to near Keith) and adjoining Victorian populations, one group along the Murray River from Victoria to the coast, and a small group in the Mt Lofty Ranges. The group in the Mount Lofty Ranges probably represents an unintentionally introduced population originating from captive stock and is likely to have now died out.	Unlikely – No nearby records and no suitable habitat within the Affected Area.
Source; 1- NatureMaps, 3 - Protected matters search tool NPW Act; E= Endangered, V = Vulnerable, R= Rare EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable						

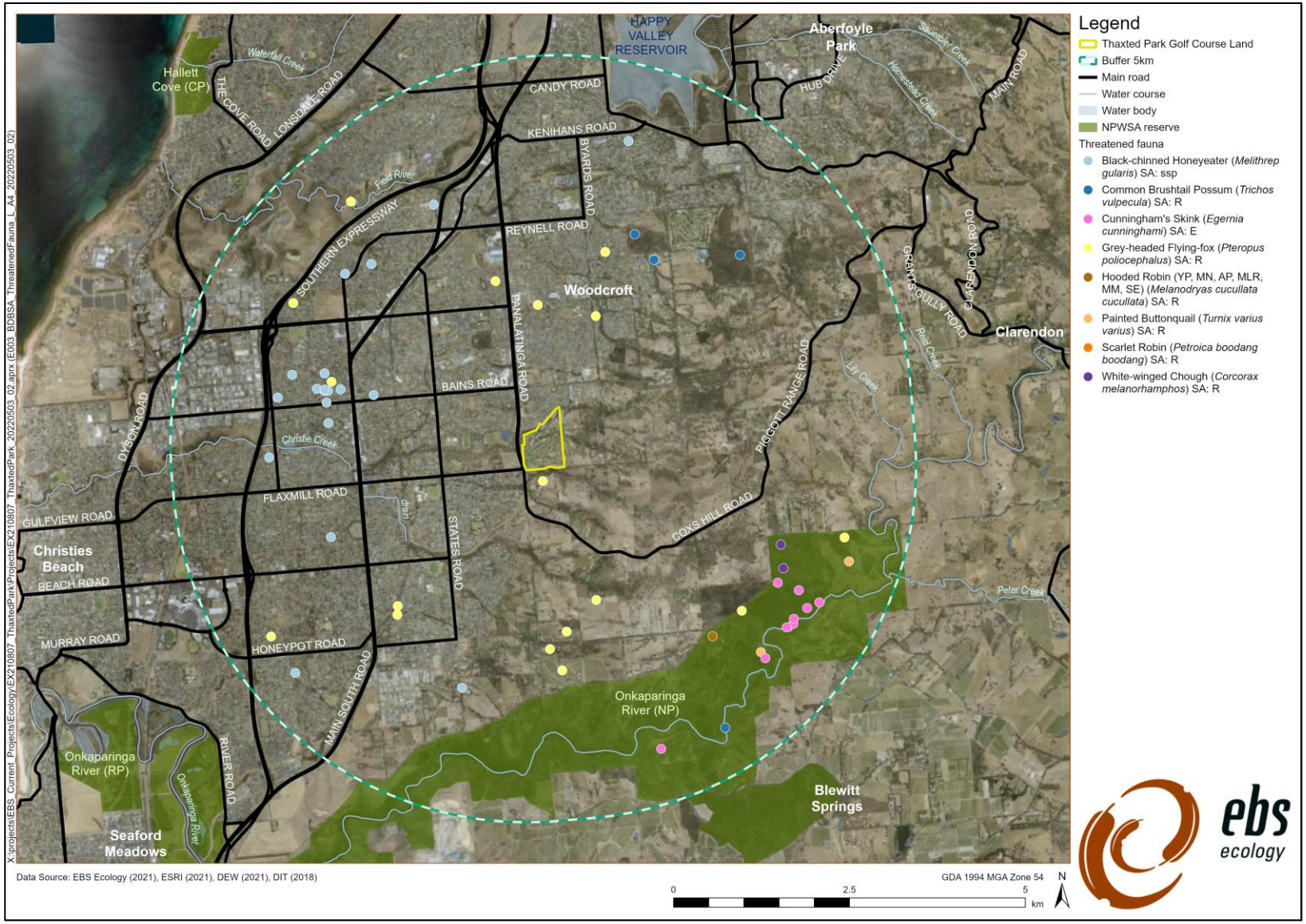


Figure 4. Location of threatened fauna within 5 km of the Affected Area based on NatureMaps records.

4.6 Region Context

The golf course is surrounded by residential developments to the North and west and connects to the Hill's Face Zone to the east. The landscape to the east of the Affected Area consists of patches of cleared land and remnant vegetation along hill tops.

Additionally, vegetation within the greater Mount Lofty Ranges has been largely cleared (with approximately 15% of the area consisting of remnant native vegetation (Table 2)), therefore any remnant vegetation is has important value for fauna species. In particular, Broad Native Vegetation Information System (NVIS) mapping shows the golf course surrounded by areas of partially connected native vegetation of *Eucalyptus microcarpa* woodland and *Eucalyptus camaldulensis* woodlands. The surrounding context of the vegetation in relation to the Hills Face Zone mean that the vegetation of *Eucalyptus camaldulensis* and *Eucalyptus microcarpa* near the golf course may act as corridors for wildlife to move through, in particular to the north of Area 1 (Figure 5).

There are three watercourses within the golf course near the areas proposed to be rezoned. A seasonally inundated creek occurs to the north of Area 1 containing large native *Eucalyptus camaldulensis* (River Red Gum) trees with a semi-degraded understorey currently being revegetated. Nearby the creek is a man-made dam that had Maned ducks present during the survey. To the south of Area 1 is degraded creek line with overstorey of *Eucalyptus microcarpa* trees. Impacting on any of the watercourses may have implications for the movement of water through the landscape and may impact waterbirds that may use the site.

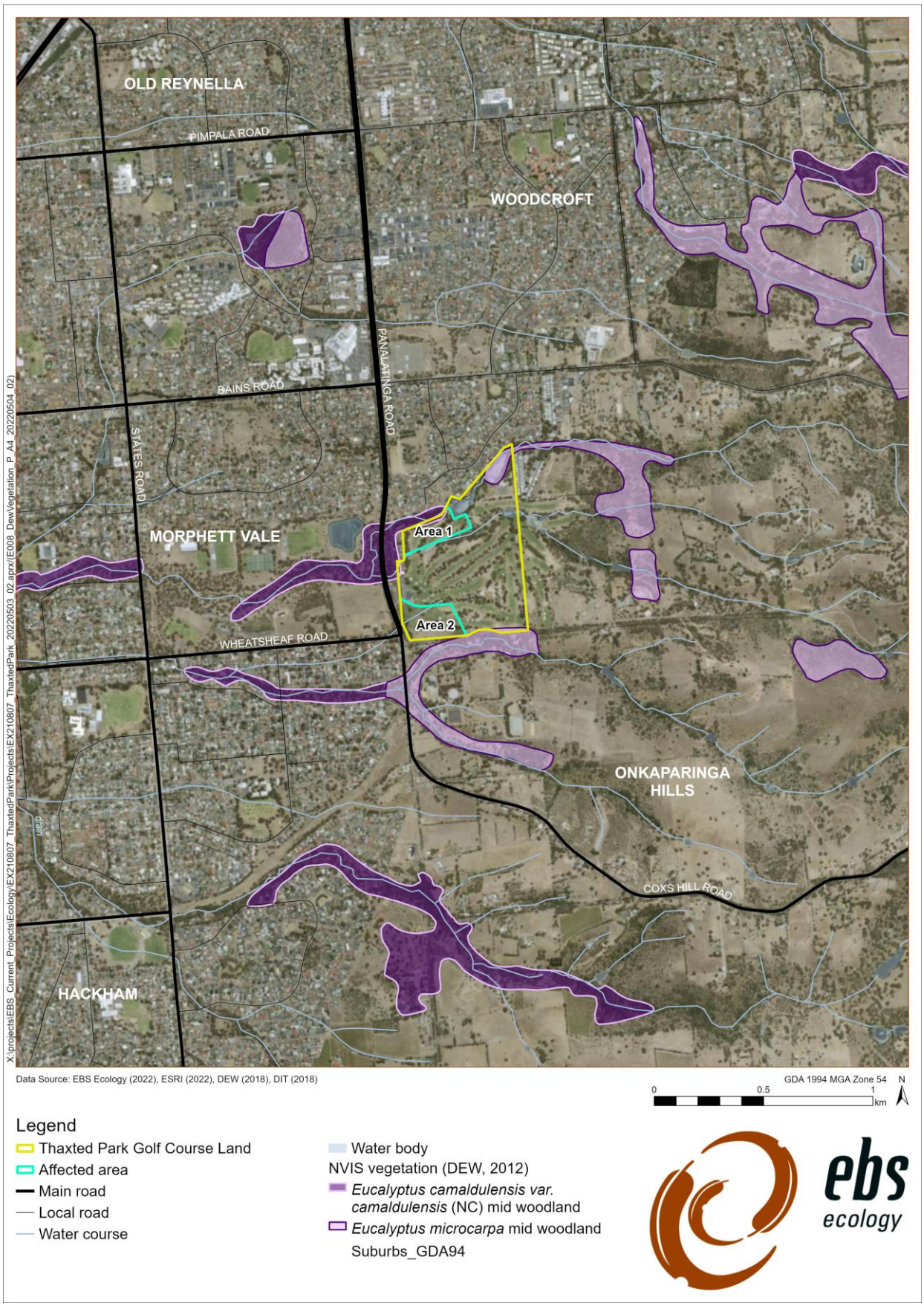


Figure 5. Affected Area in relation to areas mapped as important native vegetation (based on NVIS Vegetation Mapping (DEW, 2012)) and waterbodies present.

4.7 Area considered for future road access

An area off of Golf Course Drive is being considered for a future road access (Figure 7). To accommodate this road, some vegetation may need to be removed. This area was not assessed as part of the 2021 field survey, as such the following provides a desktop assessment of potential native vegetation within this area based on the arborist report by Nicolle (2022) and imagery from google maps.

Based on Nicolle (2022), nine trees considered native vegetation under the NV Act, or possibly native vegetation have been identified within the area. Possible native vegetation within this area consists of:

- Three *Eucalyptus microcarpa* trees along the roadside which are likely to be considered native vegetation under the NV Act (Figure 6);
- Two *Eucalyptus camaldulensis* trees considered semi-remnant (seeded post European settlement) by Nicolle (2022) in the east of the area (no images available); and
- Four *Eucalyptus camaldulensis* trees considered planted or semi-remnant by Nicolle (2022) in the east of the area (no images available).

If the plan to construct an access road goes ahead, a field assessment to the requirements of the NV Act and subsequent application to clear native vegetation will be required.

Figure 6. Images of the three *Eucalyptus microcarpa* trees along Golf Course Drive (source: Google maps)

5 FIELD SURVEY RESULTS

5.1 Vegetation within Affected Area

Area 1 consists of areas of native vegetation, scattered planted trees, scattered native trees and trees connected to nearby woodlands. A description of the vegetation within Area 1 is as follows:

- To the north is a riparian zone with large *Eucalyptus camaldulensis* trees and an understorey of mixed, native plants, exotic plants and revegetated plants (Figure 7, location 1). The majority of the *E. camaldulensis* woodland is outside of the Affected Area, however, trees connected to this woodland occur within the Project boundary or have branches overhanging the Affected Area.
- To the south are scattered *Eucalyptus microcarpa* trees connected to a larger area of *Eucalyptus microcarpa* woodland with a degraded understorey (Figure 7, location 6). This area does not classify as the Threatened Ecological Community due to the absence of suitable understorey, however this is still an area of high environmental value for fauna.
- Throughout the centre of Area 1 are scattered trees that are a mix of native remnant and planted non-native trees) (Figure 7, locations 2, 4, 5). One of the trees within this area contains hollows (Figure 8).
- Along the western boundary, abutting residential houses is an area of predominantly native remnant trees with a degraded exotic grass understorey (Figure 7, location 3). This area has 3 trees containing hollows (Figure 8). This is an area of high ecological value for hollow using fauna.

Area 2 consists of areas of native vegetation, scattered planted trees and scattered native trees. A description of the vegetation within Area 2 is as follows:

- Scattered trees of native vegetation with a degraded exotic grass understorey (Figure 7, location 7). This area also includes large scattered remnant trees that occur outside of the cadastral boundary but have overhanging branches that may be impacted by any future works. This area has a high ecological value for fauna.
- Scattered native trees on the fairway, these trees are large, but do not have hollows (Figure 9).
- To the east of Area 2 are strips of native remnant and planted non-native trees (Figure 7, location 11). Within this area are three trees with hollows (Figure 9). These trees are important areas for hollow using fauna.
- To the south-east of the Affected Area outside of the cadastral boundary is a *Eucalyptus microcarpa* woodland which has some trees with overhanging branches. These branches may be impacted by any future works.

Figure 7. Broad vegetation mapping of the vegetation within the Affected Area. Areas outside the two Affected Areas were investigated but not assessed.

Figure 8. Locations of trees with hollows in Area 1, and the number of hollows present within the Affected Area.

Figure 9. Locations of trees with hollows in the Area 2, and the number of hollows present within the Affected Area.

5.2 Native Vegetation within Affected Area

One-hundred and thirty-four (134) scattered trees consisting of three different native species were assessed within the Affected Areas as native vegetation under the NV Act (a list of the trees is provided in Appendix 1). Of these, 117 were *Eucalyptus camaldulensis* (Red Gum), 10 were *Eucalyptus leucoxylon* (South Australian Blue Gum) and 7 were *Eucalyptus microcarpa* (Grey Box). The locations of the scattered trees are provided in Figure 10 and Figure 11.

Native vegetation within the Affected Area relevant to the rezoning is largely limited to scattered trees over exotic grasses and forbs. Of these, eighteen trees occur outside of the cadastral boundary, but have overhanging limbs that may be impacted by the rezoning should residential development go ahead.

Figure 10. Scattered trees within Area 1 of the Affected Area including trees located outside of the fence line that have overhanging branches.

Figure 11. Scattered trees within Area 2 of the Affected Area.

5.3 Flora

Sixty (60) flora species were observed within the Affected Area, 17 of which were native and 43 were introduced (Table 7).

Of the introduced species within the Affected Area, one is a weed of national significance (*Asparagus asparagoides f. asparagoides*), five are declared weeds (*Cynara cardunculus ssp. flavescens, Echium plantagineum, Gazania sp., Olea europaea ssp.* & *Rosa canina*). An additional sixteen introduced species are environmental weeds. These weed species are scattered throughout the Affected Area not managed as part of the golf course green.

Table 7. List of flora observed within the Affected Area.

Species	Common Name	Introduced (Y/N)
Acacia paradoxa	Kangaroo Thorn	N
Acacia pycnantha	Golden Wattle	N
Aira sp.	Hair-grass	N
Anagallis sp.		*
Arthropodium strictum	Common Vanilla-lily	N
Asparagus asparagoides f. asparagoides	Bridal Creeper	WoNS
Asphodelus fistulosus	Onion Weed	Env. weed
Austrostipa mollis	Soft Spear-grass	*
Austrostipa scabra ssp.	Rough Spear-grass	*
Avena barbata	Bearded Oat	Env. weed
Brachypodium distachyon	False Brome	*
Briza maxima	Large Quaking-grass	*
Briza minor	Lesser Quaking-grass	Env. weed
Bromus diandrus	Great Brome	*
Cenchrus clandestinus	Kikuyu	Env. weed
Centaurea sp.	Centaury	*
Crassula alata var. alata	Three-part Crassula	*
Cynara cardunculus ssp. flavescens	Artichoke Thistle	Declared
Cyperaceae sp.	Sedge Family	N
Echium plantagineum	Salvation Jane	Declared
Ehrharta longiflora	Annual Veldt Grass	Env. weed
Einadia nutans ssp.	Climbing Saltbush	N
Elymus sp.	Wheat-grass	*
Eucalyptus camaldulensis ssp. camaldulensis	River Red Gum	N
Eucalyptus cosmophylla	Cup Gum	N
Eucalyptus leucoxylon ssp. leucoxylon	South Australian Blue Gum	N
Eucalyptus microcarpa	Grey Box	N
Eutaxia microphylla	Common Eutaxia	N
Foeniculum vulgare	Fennel	Env. weed
Fumaria capreolata	White-flower Fumitory	*
Gazania sp.	Gazania	Declared
Goodenia amplexans	Clasping Goodenia	N
Helichrysum sp.	Everlasting	N

Species	Common Name	Introduced (Y/N)
Holcus lanatus	Yorkshire Fog	*
Hordeum vulgare	Barley	Env. weed
Kickxia sp.	Toadflax	*
Lepidium africanum	Common Peppercress	*
Lolium sp.	Ryegrass	Env. weed
Maireana sp.	Bluebush/Fissure-plant	N
Malva sp.	Mallow	*
Medicago sp.	Medic	*
Melia azedarach	White Cedar	*
Olea europaea ssp.	Olive	Declared
Olearia ramulosa	Twiggy Daisy-bush	N
Oxalis perennans	Native Sorrel	N
Oxalis pes-caprae	Soursob	*
Phalaris aquatica	Phalaris	Env. weed
Pinus halepensis	Aleppo Pine	*
Pinus radiata	Radiata Pine	Env. weed
Piptatherum miliaceum	Rice Millet	Env. weed
Plantago coronopus ssp.	Bucks-horn Plantain	*
Prunus sp.	Plum	*
Rapistrum rugosum ssp. rugosum	Turnip Weed	Env. weed
Romulea rosea var. australis	Common Onion-grass	Env. weed
Rosa canina	Dog Rose	Declared
Rumex sp.	Dock	*
Rytidosperma sp.	Wallaby-grass	N
Schinus molle	Pepper-tree	Env. weed
Sonchus oleraceus	Common Sow-thistle	Env. weed
Vicia sativa ssp.	Common Vetch	Env. weed

***Weed species, Env. Weed = environmental weed, Declared = declared weed, WoNS = Weed of National Significance.**

5.4 Fauna and Habitat for Fauna

Seventeen (17) fauna species or signs of fauna species were observed within the Affected Area during the field survey, consisting of 13 birds, 1 amphibian, and three mammals, one of which is an introduced species (Red Fox) (Appendix 2). Scats of the NPW Act Rare Common Brushtail Possum (*Trichosurus vulpecula*) were observed in both Area 1 and Area 2.

Four species were identified by the desktop assessment as potentially occurring within the Affected Area. Species habitat preferences and likelihood of using the vegetation within the Affected Area are described as follows:

***Pteropus poliocephalus* (Grey-headed Flying-fox) – Vulnerable in Australia and Rare in South Australia**

Grey-headed Flying-Foxes (GHFF) have one camp within South Australia in the Adelaide Parklands approximately 25 km from the Affected Area. Vegetation beyond camps is likely to be used for foraging only and the probability of GHFF's using scattered trees decreases with increasing distance from camp. The location of the Affected Areas are approximately 22 km from the known GHFF camp. As a result, the vegetation within the Affected Area is unlikely to be important habitat for GHFF's, but the species may use vegetation within the Affected Area for foraging.

***Melithreptus gularis gularis* (Black-chinned Honeyeater) – Vulnerable in South Australia**

Black-chinned Honeyeaters occupy dry Eucalypt woodland with an annual rainfall range of 400-700 mm, particularly occurring in associations containing smooth barked *Eucalyptus* species. Favoured habitats incorporate a mixture of mature and regenerating woodland Eucalypts, although adjacent scattered paddock trees are also used (DEH, 2008). Understorey is not a requirement for this species. There are nearby records and the vegetation within the Affected Area has suitable habitat. Therefore, it is deemed that this species may occur within the Affected Area.

***Petroica boodang boodang* (Scarlet Robin) – Rare in South Australia**

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. There is nearby suitable habitat, however, nearby records are located within Onkaparinga Hills National Park, an area with better quality vegetation. Therefore, this species may occur in the Affected Area.

***Trichosurus vulpecula* (Common Brushtail Possum) – Rare in South Australia**

Scats of this species were observed during the field survey, therefore it is deemed that this species is known to occur within the Affected Area and uses vegetation within the proposed rezoning areas. This species occurs anywhere where trees with suitable hollows occur, including open forests and woodlands, but also urban areas and cities (Strahan, 2004). A total of 21 hollows in 11 trees were present within the areas proposed for rezoning. This includes native remnant trees and non-native planted trees. Of those, two are currently of an appropriate size to be used by possums. The remainder may develop hollows that would be appropriate for possums over time (given they are already of an age and condition to produce hollows). Eighteen of the 21 hollows are present within Area 1 (Figure 8) and 3 hollows are present within Area 2 (Figure 9).

6 DISCUSSION

The vegetation around the Affected Area consists of residential land predominantly to the west and north, and patchy remnant vegetation to the east and south. The vegetation consists of native scattered trees intermixed with planted non-native and native trees. The quality of the understorey vegetation in this site is considered poor as the majority of the site has previously been disturbed, in particular the understorey, largely by the golf course greens.

6.1 Impacts to threatened species

No plants in the Affected Areas were listed threatened species. *Eucalyptus microcarpa* woodland does occur within the Affected Area, however this does not qualify as the EPBC listed Threatened Ecological Community due to the absence of suitable understorey.

The scats of one fauna species of state conservation significance were observed in the Affected Area during the field survey, the Common Brushtail Possum.

One species of national conservation significance (as listed under the EPBC Act) was identified in the desktop assessment as potentially occurring within 5 km of the Affected Area: *Pteropus poliocephalus* (Grey-headed Flying-fox). Given this area is located approximately 25 km from the primary Grey-headed Flying-fox camp, the Affected Area is unlikely to constitute critical habitat for these species.

The Affected Area is considered to potentially provide habitat for the following three fauna species of State conservation significance (as listed under the NPW Act): *Melithreptus gularis gularis* (Black-chinned Honeyeater); *Petroica boodang boodang* (Scarlet Robin); and *Trichosurus vulpecula* (Common Brushtail Possum). In particular, the Common Brushtail Possum may use hollow-bearing scattered trees within the Affected Area, and the Black-chinned Honeyeater may use scattered trees for foraging. The removal of large Eucalyptus trees and trees with hollows may have impacts on these two species.

6.2 Presence of Fauna Habitat

Tall *Eucalyptus sp.* trees within the Affected Area are suitable foraging trees for the state listed Vulnerable Black-chinned Honeyeater. Where possible, trees of *Eucalyptus* species should be retained. Additionally, there are native remnant trees and planted non-native trees within the Affected Area that contains hollows suitable for use by the Common Brushtail Possum. In particular, these trees occur in 7 trees within Area 1 and 3 trees in the Area 2. Some of these hollows occur in trees recommended above to be included within green spaces.

6.3 Impacts to Native Vegetation

Native vegetation within the Affected Area relevant to the rezoning is largely limited to scattered trees over exotic grasses and forbs. The native vegetation within the Affected Area consists of 134 native scattered trees, some of which have hollows. Of these, eighteen trees occur outside of the cadastral boundary, but have overhanging limbs that may be impacted by the rezoning should residential development go ahead.

Given the high number of trees considered native vegetation within the Affected Area, should a residential development go ahead, some of these should be incorporated into green spaces. In particular, this should

include location 3 within Area 1, location 6 in Area 1 and scattered trees within the Project boundary at location 7 of Area 2 where appropriate (Figure 7). Restoration of the understorey of these areas should also be considered, including removal of declared and environmental weeds. Consideration should also be given to reducing any potential impact that may occur to watercourses that may be impacted.

6.4 Impacts to Area 1 and Area 2

Area 1 consists of areas of native vegetation, scattered planted trees, scattered native trees and trees connected to nearby woodlands. Area 2 consists of areas of native vegetation, scattered planted trees and scattered native trees.

Area 1 contains considerably more native vegetation than Area 2. In Area 1, native vegetation occurs throughout the Affected Area and there are wooded water courses to the north and south that may be impacted if future works go ahead. The vegetation surrounding Area 1 is also of a high ecological value, given that it can be a corridor for fauna movement.

The native vegetation predominantly occurs around the fringes of Area 2, has fewer hollows and has less connected vegetation.

If development was to go ahead in the future, there is likely to be more impacts to fauna and more trees requiring removal in Area 1, even if suitable efforts are undertaken to avoid and minimise impacts to vegetation.

7 RECOMMENDATIONS

To remove any native vegetation within the Affected Area, the following is required:

- A Native Vegetation Clearance Application to remove vegetation under the *Native Vegetation Act 1991* or under the Native Vegetation Regulations 2007, will be required if any of the native vegetation is planned to be removed and/or impacted by the project.
- A Significant Environmental Benefit (SEB) and/or payment into the Native Vegetation Council Fund will be required for native vegetation clearance.

Based on the results of the desktop assessment and on-ground field assessment, broad recommendations to avoid, minimise and mitigate any adverse impacts to the environment are as follows:

- Where possible, confine developments to already cleared areas (such as the golf course greens);
- In future developments, consider incorporating green spaces into the design, in particular, trees within locations 1, 3, 6 and 7;
- Where possible, avoid impacts on native trees that provide high biodiversity value and potential resources for native fauna (in particular tree numbers 24, 78 and 114 that have large and medium hollows or very high biodiversity value);
- Where possible, avoid impacting *Eucalyptus microcarpa* trees that are adjacent to, and form part of, *Eucalyptus microcarpa* woodlands (Tree number 82, 83, 84, 85, 86 and 88);
- Ensure potential impacts of any future works on the watercourses are considered and mitigation measures undertaken within the Affected Areas to maintain water flow;
- Ensure that design plans and construction methods minimise impacts to all vegetation, including tree protection zones, as much as possible;
- Prune instead of removing vegetation where possible;
- Document vegetation management and mitigation measures in a project specific Construction Environmental Management Plan (CEMP);
- Manage and minimise the spread of Declared and Environmental weeds (as per the *Landscape South Australia Act 2019*) across the Affected Area to prevent their spread into surrounding areas (for example, *Asparagus asparagoides* (Bridal Creeper)); and
- Ensure a weed management plan is established prior to any construction to prevent weed spread into neighbouring land.

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9 APPENDICES

Appendix 1. Details of the scattered trees within Area 1 and Area 2.

Tree #	Tree spp.	No. of trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score
Clarendon IBRA Association							
29	*Eucalyptus camaldulensis var camaldulensis*	1	15.0		97	0	3.80
83	*Eucalyptus microcarpa*	1	3.0		7	5	0.20
85	*E. microcarpa*	2	2.5		5	5	0.18
86	*E. microcarpa*	1	5.0		31.5	5	0.49
87	*Eucalyptus leucoxylon ssp leucoxylon*	1	5.0		23	10	0.35
Aldinga IBRA Association							
1	*E. camaldulensis var camaldulensis*	1	17.0		134	5	6.16
2	*E. camaldulensis var camaldulensis*	1	15.0		113	0	4.51
3	*E. camaldulensis var camaldulensis*	1	16.0		112	5	4.52
4	*E. camaldulensis var camaldulensis*	1	9.0		24	5	0.54
5	*E. camaldulensis var camaldulensis*	1	9.0		32	0	1.03
6	*E. camaldulensis var camaldulensis*	1	10.5		34	0	1.16
7	*E. camaldulensis var camaldulensis*	1	8.0		24	0	0.54
8	*E. camaldulensis var camaldulensis*	1	12.5		41	5	1.42
9	*E. camaldulensis var camaldulensis*	1	12.0		41	2	1.41
10	*E. leucoxylon ssp leucoxylon*	1	12.0		46	5	2.06
11	*E. camaldulensis var camaldulensis*	1	6.5		28	10	0.50
12	*E. leucoxylon ssp leucoxylon*	1	3.0		8.5	0	0.26
13	*E. camaldulensis var camaldulensis*	1	5.0		12	5	0.31
14	*E. leucoxylon ssp leucoxylon*	1	0.5		3	0	0.17
15	*E. camaldulensis var camaldulensis*	1	8.0		26	5	0.54
16	*E. camaldulensis var camaldulensis*	2	8.0		40	5	1.12
19	*E. camaldulensis var camaldulensis*	3	8.0		23.5	5	0.51
20	*E. leucoxylon ssp leucoxylon*	1	8.0		26	15	0.52
21	*E. camaldulensis var camaldulensis*	1	5.0		11	2	0.31
23	*E. camaldulensis var camaldulensis*	13	2.0		4	0	0.20
24	*E. camaldulensis var camaldulensis*	1	16.5	1 large	119	5	7.19
31	*E. camaldulensis var camaldulensis*	1	15.0		92	35	3.28
32	*E. camaldulensis var camaldulensis*	1	15.0		55	5	2.43
33	*E. camaldulensis var camaldulensis*	1	13.0	1 small	75	5	3.82
35	*E. camaldulensis var camaldulensis*	1	8.0		28	5	0.57
36	*E. camaldulensis var camaldulensis*	1	12.0		53	0	2.16
37	*E. camaldulensis var camaldulensis*	1	10.0		66	5	2.15
38	*E. camaldulensis var camaldulensis*	1	14.0		61	0	2.54
39	*E. camaldulensis var camaldulensis*	1	14.0		89	0	3.92
40	*E. camaldulensis var camaldulensis*	1	4.5		18	60	0.18
41	*E. camaldulensis var camaldulensis*	1	10.0		75	15	2.19
42	*E. camaldulensis var camaldulensis*	1	14.0		54	0	2.38
43	*E. camaldulensis var camaldulensis*	1	11.0		79	15	2.38
44	*E. camaldulensis var camaldulensis*	1	13.0	1 small	99	5	4.32
45	*E. camaldulensis var camaldulensis*	1	9.0		46	0	1.31
46	*E. camaldulensis var camaldulensis*	1	14.0	5 small	100	0	6.29
47	*E. camaldulensis var camaldulensis*	1	13.0		57	5	2.26
48	*E. camaldulensis var camaldulensis*	1	13.0		93	5	3.86
49	*E. camaldulensis var camaldulensis*	1	14.0		50	5	1.93
50	*E. camaldulensis var camaldulensis*	1	11.0		45	5	1.37
51	*E. camaldulensis var camaldulensis*	1	11.0		13.5	0	0.39
52	*E. camaldulensis var camaldulensis*	1	7.0		24	10	0.43
53	*E. camaldulensis var camaldulensis*	1	6.0		19.5	5	0.46
54	*E. camaldulensis var camaldulensis*	5	8.0		48	5	1.98
55	*E. camaldulensis var camaldulensis*	4	12.0		73	0	3.40

Tree #	Tree spp.	No. of trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score
56	*E. camaldulensis var camaldulensis*	1	13.0		54	5	2.10
57	*E. camaldulensis var camaldulensis*	1	12.0		55	10	1.27
58	*E. camaldulensis var camaldulensis*	1	8.0		9.5	20	0.22
59	*E. camaldulensis var camaldulensis*	1	4.0		52.5		0.38
61	*E. camaldulensis var camaldulensis*	1	9.0		53.5	5	1.36
62	*E. camaldulensis var camaldulensis*	1	9.0		55	5	1.38
63	*E. camaldulensis var camaldulensis*	1	9.0		28	5	0.60
64	*E. camaldulensis var camaldulensis*	1	9.0	5 small	74		1.09
65	*E. camaldulensis var camaldulensis*	1	9.0		64	5	2.42
66	*E. camaldulensis var camaldulensis*	1	13.0		57.5	5	2.38
67	*E. camaldulensis var camaldulensis*	1	14.0		93	5	4.02
68	*E. camaldulensis var camaldulensis*	1	15.0		9.5	5	0.30
69	*E. camaldulensis var camaldulensis*	3	6.0		35	5	1.11
70	*E. camaldulensis var camaldulensis*	1	10.0		16	10	0.35
71	*E. camaldulensis var camaldulensis*	1	6.0		9	5	0.30
72	*E. camaldulensis var camaldulensis*	1	6.0		9	15	0.25
73	*E. camaldulensis var camaldulensis*	1	5.0		19	10	0.49
74	*E. camaldulensis var camaldulensis*	1	10.0		60		0.43
75	*E. camaldulensis var camaldulensis*	1	9.0		110	5	4.32
76	*E. camaldulensis var camaldulensis*	1	15.0		53	5	2.08
77	*E. camaldulensis var camaldulensis*	1	12.0		109	5	4.13
78	*E. camaldulensis var camaldulensis*	1	15.0	1 large	92	5	6.14
82	*E. microcarpa*	1	8.0		63	5	2.18
84	*E. microcarpa*	1	8.0		50	5	1.44
88	*E. microcarpa*	1	7.0		45	5	1.28
89	*E. camaldulensis var camaldulensis*	1	12.0		76	10	2.50
90	*E. camaldulensis var camaldulensis*	1	13.0	1 small	133	5	5.95
91	*E. camaldulensis var camaldulensis*	1	13.0		143	5	4.58
92	*E. camaldulensis var camaldulensis*	1	14.0		98	5	3.94
95	*E. camaldulensis var camaldulensis*	1	11.0		111	10	3.57
96	*E. leucoxylon ssp leucoxylon*	1	16.0		130	0	6.42
97	*E. leucoxylon ssp leucoxylon*	1	13.0		107	5	4.17
99	*E. leucoxylon ssp leucoxylon*	1	15.0		106	0	4.67
101	*E. camaldulensis var camaldulensis*	1	13.0		95	5	3.74
102	*E. leucoxylon ssp leucoxylon*	1	12.0		52	5	2.19
103	*E. leucoxylon ssp leucoxylon*	1	6.5		26	0	0.54
104	*E. camaldulensis var camaldulensis*	1	12.0		97	5	3.62
105	*E. camaldulensis var camaldulensis*	1	12.0		114	5	3.90
106	*E. camaldulensis var camaldulensis*	1	13.0		106	5	3.92
107	*E. camaldulensis var camaldulensis*	1	8.0		45	5	1.18
108	*E. camaldulensis var camaldulensis*	1	12.0		87	5	3.46
109	*E. camaldulensis var camaldulensis*	1	14.0		57.5		0.56
110	*E. camaldulensis var camaldulensis*	1	14.0		93	5	3.86
111	*E. camaldulensis var camaldulensis*	1	9.0		26	5	0.57
112	*E. camaldulensis var camaldulensis*	1	8.0		14	5	0.40
113	*E. camaldulensis var camaldulensis*	1	10.0		27.5	0	0.98
114	*E. camaldulensis var camaldulensis*	1	16.0	3 small	187	15	7.69
115	*E. camaldulensis var camaldulensis*	1	12.0		64	5	2.31
116	*E. camaldulensis var camaldulensis*	1	9.0		98	5	2.56
117	*E. camaldulensis var camaldulensis*	1	10.0		33	5	1.06
118	*E. camaldulensis var camaldulensis*	1	10.0		47	5	1.34
119	*E. camaldulensis var camaldulensis*	1	7.0		31	5	0.58
120	*E. camaldulensis var camaldulensis*	1	4.5		13.5	5	0.31
122	*E. camaldulensis var camaldulensis*	1	11.0		42	5	1.33
123	*E. camaldulensis var camaldulensis*	1	3.0		6	5	0.22
124	*E. camaldulensis var camaldulensis*	1	9.0		24	5	0.54
125	*E. camaldulensis var camaldulensis*	1	10.0		33	5	1.06
126	*E. camaldulensis var camaldulensis*	1	6.0		16	5	0.37
127	*E. camaldulensis var camaldulensis*	1	12.0		81	5	3.37
Area proposed for road access							

Tree #	Tree spp.	No. of trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score
-	*E. microcarpa*	1	Survey required				
-	*E. microcarpa*	1	Survey required				
-	*E. camaldulensis var camaldulensis*	1	Survey required				
-	*E. camaldulensis var camaldulensis*	1	Survey required				
-	*E. camaldulensis var camaldulensis*	1	Survey required				
-	*E. camaldulensis var camaldulensis*	1	Survey required				
-	*E. camaldulensis var camaldulensis*	1	Survey required				
-	*E. camaldulensis var camaldulensis*	1	Survey required				
-	*E. camaldulensis var camaldulensis*	1	Survey required				

Appendix 2. List of fauna observed within the Affected Area.

Species	Common Name	Conservation rating		
		Aus	SA	
Anas gracilis	Grey Teal			Observed
Cacatua galerita	Sulphur-crested Cockatoo			Observed
Cacatua sanguinea	Little Corella			Observed
Chenonetta jubata	Maned Duck			Observed
Crinia insignifera	Sign-bearing froglet			Observed
Dacelo novaeguineae	Laughing Kookaburra			Observed
Eolophus roseicapilla	Galah			Observed
Glossopsitta concinna	Musk Lorikeet			Observed
Gymnorhina tibicen	Australian Magpie			Observed
Hirundo neoxena	Welcome Swallow			Observed
Manorina melanocephala	Noisy Miner			Observed
Ocyphaps lophotes	Crested Pigeon			Observed
Phascolarctos cinereus	Koala			Claw marks
Platycercus eximius	Eastern Rosella			Observed
Trichoglossus moluccanus	Rainbow Lorikeet			Observed
Trichosurus vulpecula	Common Brushtail Possum		R	Scats
*Vulpes vulpes**	Red Fox			Scats

***introduced species**
NPW Act; E= Endangered, V = Vulnerable, R= Rare
EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable

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