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BIODIVERSITY ASSESSMENT OF DEFERRED LANDS

Stage 2: Biodiversity Survey and Reporting – Draft 3

25 MAY 2022

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NORTHERN BEACHES COUNCIL

Biodiversity Assessment of Deferred Lands

Biodiversity Survey and Reporting - Public Display Copy

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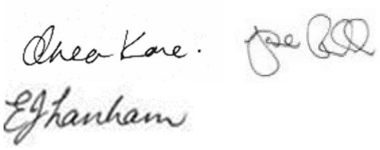

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GLOSSARY AND ACRONYMS

Term	Meaning
Acronyms	
BAM	NSW Biodiversity Assessment Method as outlined under the BC Act
BC Act	NSW *Biodiversity Conservation Act 2016*
BOM	Bureau of Meteorology
CUS	*Coastal Upland Swamp in the Sydney Basin Bioregion*
CoA	Commonwealth of Australia
Council	Northern Beaches Council
CMA	Catchment Management Area
DAWE	Commonwealth Department of Agriculture, Water and Environment
DPI	NSW Department of Primary Industries
DPIE (EES)	NSW Department of Planning, Industry and Environment (Environment, Energy and Science)
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999
GIS	Geographic Information System
GPS	Global Positioning System
LEP	Local Environmental Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance
OEH (now DPIE (EES))	NSW Office of Environment and Heritage
PCT	Plant Community Type
PMST	Protected Matters Search Tool
SAT	Spot Assessment Technique
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
VIS	Vegetation Information System
Definitions	
The deferred lands area	Covers the Northern Beaches Deferred Lands area (**Figure 1-1**), these two terms are used interchangeably throughout the report
Study area	
Stage 1 report	Refers to the first report for this project, *Biodiversity Assessment of Deferred Lands: Stage 1: Review of Existing Information – DRAFT* (Arcadis 2021)

EXECUTIVE SUMMARY

Northern Beaches Council was created with the merger of Pittwater, Warringah and Manly Local Government areas in 2016. One of the tasks of the Council is to develop an integrated Local Environmental Plan for the new Northern Beaches Local Government Area. Included in this new plan will be approximately 1,100 hectares of land that once was within the Warringah Local Government Area but was not included in the previous Warringah Local Environment Plan (2011). Zoning and planning controls for this area were deferred by the NSW State Government. For this area to be included in a future Northern Beaches Local Environmental Plan, its attributes, including ecological values must be assessed.

Arcadis Australia Pacific Pty Ltd (Arcadis) have been engaged by Northern Beaches Council to prepare this report as part of a package of works detailed in the *RFQ 2020/102 Review of Existing Information and Biodiversity Survey of the Deferred Lands*. This project has been undertaken in two stages. The Stage 1 report *Biodiversity Assessment of Deferred Lands - Stage 1: Review of Existing Information- Draft* examined previous records and available desktop information. This current report represents Stage 2 of the project and focuses on biodiversity surveys to develop a greater understanding of the Threatened Ecological Communities (TECs), threatened species and their habitats present within the deferred lands area. It also includes an analysis of the conservation value of the deferred lands area.

Flora surveys included ground-truthing existing vegetation mapping, plot sampling of threatened ecological communities and targeted searches for threatened flora. Reference sites containing known populations of the targeted threatened flora species were visited to monitor flowering times and assist in detection of these species within the deferred lands area. Areas of suitable habitat were then searched for these species.

Sixteen Plant Community Types (PCTs) were identified in the deferred lands area, based on previous regional mapping in the desktop assessment undertaken for Stage 1 of this project. Ground-truthing of PCTs determined that the regional mapping is mostly accurate, with some minor differences in mapped PCT boundaries and classifications, and most of the vegetation is in good condition. No additional PCTs were identified.

There were two mapped TECs with substantial occurrence (ie greater than one hectare in total area) within the deferred lands area: *Coastal Upland Swamp in the Sydney Basin Bioregion*, listed as Endangered under the *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and *Duffys Forest Ecological Community in the Sydney Basin Bioregion*, listed as Endangered under the BC Act only.

After the completion of on ground surveys, drone footage was collected to refine the mapped occurrence of TECs, especially the boundaries of *Coastal Upland Swamp in the Sydney Basin Bioregion*. Updated mapping shows that there is an estimated 15.53 hectares of *Coastal Upland Swamp in the Sydney Basin Bioregion* and approximately 22.45 hectares of *Duffys Forest Ecological Community in the Sydney Basin Bioregion*

Four threatened flora species were recorded in the current study, and populations of an additional two species are known to occur based on existing records:

- *Eucalyptus camfieldii* (Camfield's Stringybark), Vulnerable under the EPBC and BC Acts;
- *Genoplesium baueri* (Bauer's Midge Orchid), Endangered under the EPBC and BC Acts;
- *Grevillea caleyi* (Caley's Grevillea), Critically Endangered under the EPBC Act and Critically Endangered under the BC Act (not found during current surveys, but known through previous records);
- *Persoonia hirsuta* (Hairy Geebung) Endangered under the EPBC and BC Acts (not found during current surveys, but known through previous records);
- *Pimelea curviflora var. curviflora,* Vulnerable under the EPBC and BC Acts;
- *Tetratheca glandulosa,* Vulnerable under the BC Act only.

There are large areas of potential habitat for threatened flora species in the study area; based on the distribution of existing records and habitat inspection, it is considered likely that there are larger populations of some threatened flora species in the study area, particularly on upper slopes.

Six fauna habitat types were recognised as part of the desktop assessment in Stage 1 of this project and verified during habitat assessments for Stage 2. Five of these habitats consisted of mapped remnant vegetation, the sixth was cleared land with minimal fauna habitat. The percentage of each habitat type is shown below:

- Freshwater Wetlands (~0.01% of the deferred lands area);
- Heath (~27% of the deferred lands area);

- Rainforest (~0.1% of the deferred lands area);
- Ridgetop Woodland (~30% of the deferred lands area);
- Riparian Forest (~24% of the deferred lands area);
- Cleared areas (~19% of the deferred lands area).

There were 112 fauna species recorded during Stage 2 field surveys, with 16 of these listed under state or Commonwealth legislation. Most of these species have been recorded previously, however highlights from this survey included:

- Good activity for a number of threatened microbat species including Little Bent-wing Bat, Large Bent-wing Bat, East Coast Freetail-bat and Greater Broad-nosed Bat. Little Bent-wing Bat and Large Bent-wing Bat are species subject to Serious and Irreversible Impacts under the BC Act, while Greater Broad-nosed Bat and East Coast Free-tail Bat have not been previously recorded or recorded rarely (respectively) in the deferred lands area;
- Many observations of Glossy Black-cockatoo, either flying overhead, in vegetation or calling. No nesting was observed. Evidence of foraging (chewed *Allocasuarina* cones) was also found in suitable habitat throughout much of the study area;
- Positive identification of Spotted-tailed Quoll which has only rarely been recorded in the study area, and not since 2018. Sign of this species was found in proximity to a suburban area, on the eastern edge of the study area;
- Location of a Koala by a community member, in between two parts of the deferred lands area (Wakehurst Parkway), during the Stage 2 survey period. This observation suggests that this species utilises the deferred lands area at least on occasion, although was not detected during our surveys.

The final component of this project was to develop a map showing the conservation value of the deferred lands, based on five criteria developed in *Biodiversity Assessment of Deferred Lands: Stage 1: Review of Existing Information – DRAFT* and are shown below:

- Threatened species habitat (extent and quality);
- Threatened ecological communities (extent and quality);
- Proximity to protected bushland;
- Wildlife corridors;
- Riparian land/water sustainability.

The deferred lands area was mapped into four ecological value categories, from low conservation significance to very high. These categories are:

- Green – low conservation significance – this covers 242.40 hectares, 17% of the deferred lands area;
- Orange – moderate conservation significance – this covers 221.6 hectares, 16% of the deferred lands area;
- Red – high conservation significance- this covers 728.8 hectares, 52% of the deferred lands area;
- Purple – very high conservation significance – this covers 213.1 hectares, 15% of the deferred lands area.

In summary, the deferred lands area contains significant habitat for threatened flora and fauna and contains patches of national and state listed TECs. It also provides a significant buffer and connectivity of suitable habitat from the protected Garigal National Park. In future planning of the area, these values must be retained to assist in protecting the biodiversity of the Northern Beaches Local Government Area. Much of the deferred lands has high or very high ecological value. More accessible areas and those adjacent to current cleared areas still have ecological value, as fauna habitat or buffer zones and wildlife corridors. Balancing those values with the needs of an expanding population within the Northern Beaches LGA will be the challenge for planning for the future of the deferred lands.

STAGE 2: BIODIVERSITY SURVEY AND REPORTING

Photos: Jessica Rooke

1 INTRODUCTION

1.1 Background

Arcadis Australia Pacific Pty Ltd (Arcadis) has been engaged by Northern Beaches Council (Council) to prepare this report as a part of a package of works detailed in the *RFQ 2020/102 Review of Existing Information and Biodiversity Survey of the Deferred Lands*. This project has two stages: a desktop assessment and a field survey and conservation value assessment. The Stage 1 report *Biodiversity Assessment of Deferred Lands - Stage 1: Review of Existing Information- Draft* (Arcadis 2021) ('Stage 1 report) examines previous records and available information. This report represents Stage 2 of the project and focuses on biodiversity surveys to develop a greater understanding of the Threatened Ecological Communities (TECs), threatened species and their habitats present within the deferred lands area. It also includes an analysis of the conservation value of the area and recommendations for next steps after this project concludes.

The deferred lands area and surrounding locality represents an important location for regional biodiversity and provides habitat connectivity and wildlife corridors to key conservation areas including Ku-ring-gai Chase and Garigal National Parks. Currently, a growing population in the Northern Beaches is leading to increased pressure for new land releases and development within the deferred lands area.

The challenge Council faces is to maintain and improve threatened species and ecological communities amidst these pressures. Consequently, detailed information regarding areas of high ecological value within the deferred lands area is critical to prioritising areas of high biodiversity value for conservation during land use planning.

Council is currently midway through a three-year strategic land-use planning program to prepare a single Local Environmental Plan (LEP) and Development Control Plan (DCP) for the Northern Beaches Council Local Government Area (LGA). Input on the ecological values of the deferred lands is a critical component to progressing this strategic land-use planning program.

1.2 Study area

The deferred lands, formerly part of the Warringah Local Government Area (LGA) (now amalgamated into the Northern Beaches Council) cover an area approximately 1,400 hectares (ha) in size (**Figure 1-1).** The lands lie adjacent to Garigal National Park to the north and west, and are bounded by the suburbs of Cromer, Narraweena, Beacon Hill, Oxford Falls, Frenchs Forest, Belrose and Belrose North.

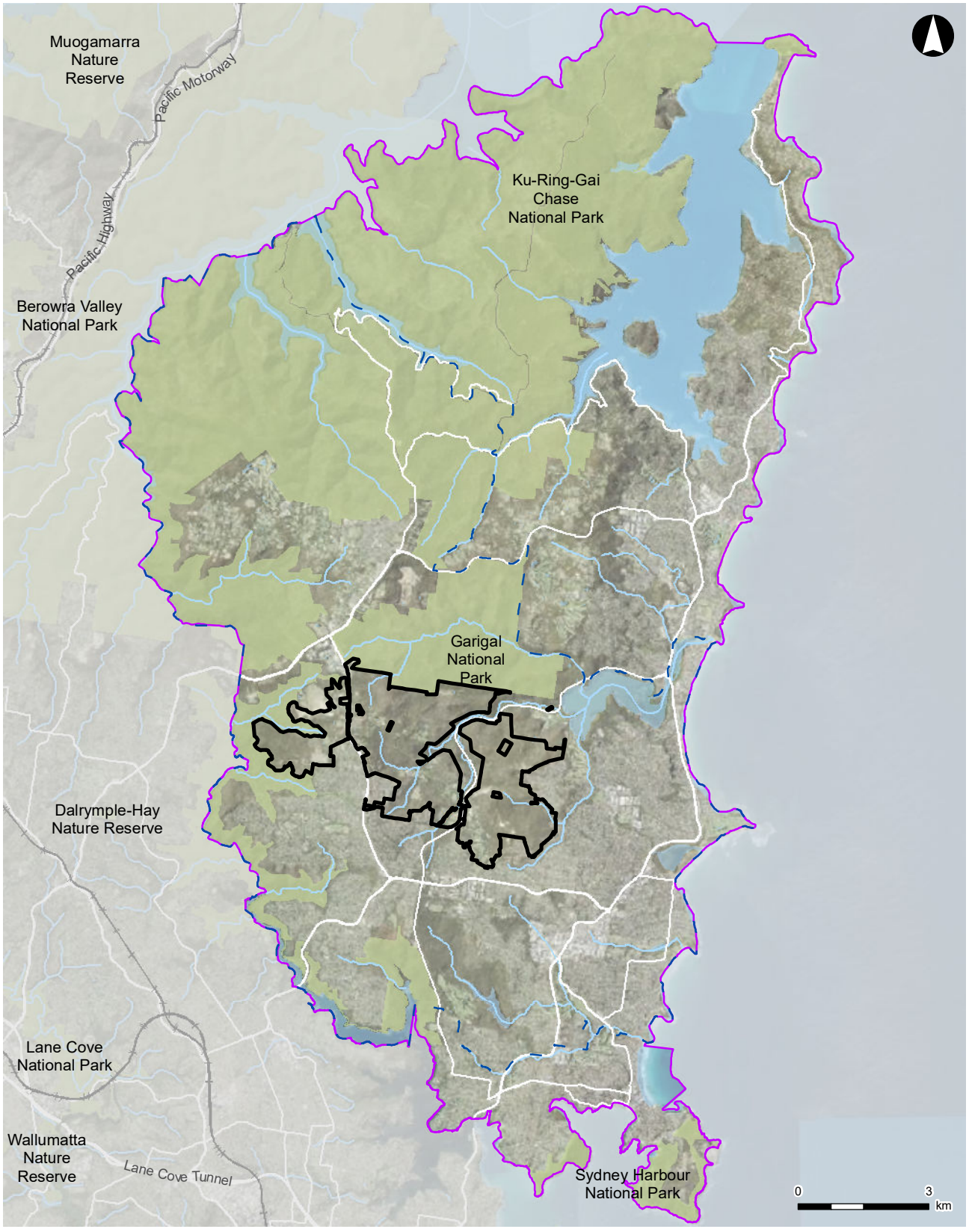
The landscape of the deferred lands is categorised by rugged, rolling to very steep hills on Hawkesbury sandstone with areas of hanging valleys and sandstone plateaus. A variety of soil landscapes occur within the deferred lands area, including Gymea, Lambert, Oxford Falls, Somersby, Lucas Heights, Hornsby, Hawkesbury and Disturbed Terrain. Vegetation is typical of sclerophyll forest, eucalypt woodland and heathland, which exist in varying conditions and patch sizes across the area. Current land use within the deferred lands is predominantly urban residential, with a large area of remnant native vegetation (connected to Garigal and Ku-ring-gai Chase National Parks) used for public recreation (e.g., hiking).

The deferred lands area contains several major creeks and their tributaries, including Deep Creek, Snake Creek, Oxford Creek, Middle Creek and Wheeler Creek. Most of these creeks and their tributaries have been assessed as fair, very good or excellent based on their water quality, macroinvertebrate assemblage, in-stream features and geomorphology (OEH, 2016b). The deferred lands area and study area cover the same boundaries (**Figure 1-1**) and are used interchangeably in this report.

1.3 Objectives

This report details surveys and assessments that build on the literature review conducted for this project in the *Biodiversity Assessment of Deferred Lands: Stage 1 Review of Existing Information – Draft* (Arcadis, 2021) "Stage 1 Report". Specifically, this report covers the Stage 2 component of the project which includes the following objectives:

- Refine and ground-truth native vegetation mapping;
- Identify areas of TECs (including detailed survey and mapping of Coastal Upland Swamp (CUS) and Duffys Forest TECs);
- Identify and locate threatened flora species listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and/or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Identify and locate threatened fauna species and their habitats listed under the BC Act and/or EPBC Act;
- Utilise this information, and other ecological information to provide a preliminary map of the conservation values across the study area.



LEGEND

- Deferred lands / study area
- Northern Beaches Local Government Area
- Historical Warringah Local Government Area boundary
- NPWS Reserve
- Main road
- Railway
- Watercourse

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Figure 1-1: Regional context and study area

2 METHODS

2.1 Personnel

A list of personnel involved in Stage 2 Biodiversity Surveys of the deferred lands and an overview of their qualifications and experience is provided in **Table 2-1**.

Table 2-1 Personnel involved in biodiversity surveys of the deferred lands 2020 – 2021

Personnel name	Qualifications	Experience
Elvira Lanham	B. Environmental Science (Life Sciences) (Hons.) PhD Reptile Ecology – Flinders University of South Australia BAM Accredited Assessor (BAAS20012)	26 years
Jane Rodd	B. Science (Ecology) BAM Accredited Assessor (BAAS17030) Practicing member, Ecological Consultants Association of NSW	21 years
Jess Rooke	B. Advanced Science (Biological Science) (Hons. Ecology) University Medal in Ecology	7 years
Kate Carroll	B. Science (Ecology) (Hons.) BAM Accredited Assessor (BAAS17070) Practicing member, Ecological Consultants Association of NSW	14 years
Meredith Leal	B. Environmental Management/Arts (Ecology)	6 years
Thea Kane	B. Environmental Management (Geography)	3 years
Georgina Cowley	B. Marine Science Practicing member for Surveying and Spatial Sciences Institute (SSSI)	14 years
David James	B. Science (Hons.) (Zoology and Marine Biology) Birds Australia Taxonomic Advisory Committee Birds Australia Records Committee Oriental Bird Club: General Member Australasian Seabird Group: Committee Member and Editor 1997-2002 Indian Ocean Seabird Associated: Foundation Member Townsville-Thuringowa Landcare Association: Committee Member and NHT Project Manager 1997-2002	35 years
Brad Law	B.Sc. (Hons) – University of Sydney 1986 PhD Zoology – University of Sydney 1992 ARC Post-doctoral Fellow – James Cook university 1996 Brad is co-editor of Australia's oldest zoological journal: Australian Zoologist and has published more than 130 peer-reviewed papers.	35 years
Andrew Lothian	B. Science (Ecology) (Hons. Ecology) Executive Council Member for Ecological Consultants Association of NSW Scientific member for Royal Zoological Society of NSW	16 years
Georgeanna Story	B. Science (Hons.) Scat and hair id specialist PhD Student	25 years
Glenn Hoye	Bachelor of Science (Honours), University of Newcastle Microbat echolocation call analysis specialist	30+ years

Personnel name	Qualifications	Experience
Jake McManus –	Chief Remote Pilot at UAVIS (Commercial Unmanned Aerial Vehicle Services Company) Drone pilot	11 years

2.2 Background research

Thirty-one documents were sourced and considered as part of the Stage 1 assessment, including documents outlining previous surveys within the former Warringah LGA (Kavanagh *et. al*, 2015) (Department of Environment and Climate Change, 2008a) (PJ Smith Ecological Consultants, 2000, 2005, 2009). A summary of the literature reviewed is replicated from the Stage 1 report in Appendix A.

Prior to survey, the following data sources were also reviewed:

- Biodiversity Values Map (DPIE, 2020a);
- BioNet Threatened Biodiversity Data Collection (DPIE, 2022b);
- BioNet Vegetation Information System (VIS) (DPIE, 2022c);
- Fisheries NSW Spatial Data Portal (DPI, 2020a);
- NSW Weed Wise (DPI, 2020b);
- Directory of Important Wetlands of Australia;
- BOM Atlas of Ground Water Dependent Ecosystems;
- Atlas of Living Australia.

In addition, database searches were undertaken in October 2020 to identify state and Commonwealth records of threatened entities that occur or have the potential to occur within 10 kilometres of the deferred lands area. These searches were undertaken again in May 2022 to identify additional threatened species records since surveys were completed in 2021, these database searches include some records from surveys undertaken for this project. Additional database searches were undertaken in relation to fisheries, weeds and vegetation types. Database searches are detailed below in **Table 2-2**. Full details on the literature review for this project can be found in the Stage 1 report and BioNet records are provided in Appendices F & G.

Table 2-2 Database searches conducted by Arcadis in October 2020 and updated in May 2022

Database	Purpose of search	Date of database search
NSW BioNet Wildlife Atlas *Managed by the NSW Department of Planning, Industry and Environment (DPIE) Environment, Energy and Science (EES) branch (formerly the Office of Environment and Heritage (OEH))*	Used to compile a list of threatened species records listed under the BC Act and EPBC Act to within 10 kilometres of the deferred lands area.	26 October 2020 11 May 2022
Protected Matters Search Tool (PMST) *Managed by the Commonwealth Department of the Environment and Energy (DAWE)*	Used to compile a list of potentially occurring MNES listed under the EPBC Act to within 10 kilometres of the deferred lands area.	26 October 2020 12 May 2022
NSW BioNet Vegetation Information System (VIS) Classification database *Managed by DPIE (EES)*	Provides information on Plant Community Types (PCTs) and their relationship to a vegetation formation and vegetation class.	26 October 2020
NSW BioNet Threatened Species Data Collection	Contains information for all listed threatened species, populations and communities.	26 October 2020

Database	Purpose of search	Date of database search
Managed by DPIE (EES)		
NSW WeedWise *Managed by NSW Department of Primary Industries (DPI)*	Identifies species listed as priority weeds for a LGA and their control requirements.	26 October 2020

2.3 Geospatial Information Systems

2.3.1 Data collection

Information from the desktop review was uploaded onto Collector geographic information system (GIS) software which was accessed and modified by field staff during surveys. Handheld field tablets were used to collect these data. Data was then transferred to the portal for viewing and updating, where required.

2.3.2 Portal development

A GIS portal was created for the project which made data available to view by Council and all members of the Arcadis project team. The ArcGIS Enterprise portal is a component of the ArcGIS Enterprise GIS Arcadis uses to provide spatial information to Arcadis' clients. It allows users to share maps and other geospatial data and information with a group of users and they can access, interrogate, and print the data.

For this project, publicly available ecologically relevant layers were prepared and published to the ArcGIS Web Server. Additional information relevant to the study area was added, as well as field data collected during surveys, using the ArcGIS Collector program. The portal allows access to GIS in a user-friendly, malleable and easy to access format. To retain its currency, information on the portal needs to be checked and updated regularly.

2.4 Field surveys

2.4.1 Overview

Field surveys were carried out across the deferred lands area between October 2020 and June 2021 to target specific threatened species and to provide survey results in accordance with current biodiversity assessment guidelines (details are provided in Stage 1 report and replicated in Appendix B of this report). All work was carried out under the following licences: Scientific Licence – provided by DPIE (licence number: SL100646) and DPI Animal Ethics Committee (licence TRIM 13/339). The weather records from the closest weather station, Terrey Hills (station 066059), for the survey dates are detailed in Appendix C.

Field surveys were generally undertaken on fine weather days and days with high forecast temperatures, rain and wind were avoided where possible. However, windy and wet conditions were encountered and did influence surveys, especially of microbat echolocation calls and some camera traps. These limitations are discussed further in Section 2.4.4.

Maximum temperatures on field survey days ranged from 31.8 degrees during November 2020 to 18.3 degrees in May 2021. November 6th 2021 recorded the most rain of all survey days, which was around 17.4mm. Wetter and windier conditions were encountered during periods when passive monitors such as anabats and camera traps were deployed. Winds were over 45 km/hr and rainfall in

December and February was above 28mm. A detailed record of weather conditions for all surveys is shown in Appendix C.

2.4.2 Flora surveys

Vegetation surveys were undertaken over 23 days between November 2020 and June 2021. These consisted of ground truthing of regional vegetation mapping and PCT identification, rapid assessment points, Biodiversity Assessment Method (BAM) vegetation integrity plots and targeted surveys for threatened flora species. The flora survey effort within the study area is illustrated in **Figure 2-2** and a full flora species list was collected.

Vegetation mapping and PCT identification

The vegetation mapping is based on the most recent regional mapping that encompasses the study area, which is the vegetation of the Sydney Metropolitan Catchment Management Area (CMA) area (OEH 2016a). Sixteen PCTs were mapped by OEH (2016a) within the study area. This mapping has been refined based on ground truthing, aerial photograph interpretation and desktop review of other studies within the deferred lands area.

Rapid assessment points

A total of 64 rapid assessment points were used to sample the PCTs in the study area. Each rapid assessment point consisted of an approximately 20 metre by 20 metre area centred on the point. The data collected at each rapid assessment point entailed:

- Identifying and recording dominant canopy, mid-stratum, shrubs and ground cover species.
- Assessing vegetation condition, noting diversity of species in each vegetation stratum, evidence of weed occurrence and structural attributes including hollow-bearing trees (HBTs), coarse woody debris, presence/absence of mature trees and height and diameter at breast height (dbh) of trees.

Rapid assessment points were deployed based on a 200-metre square grid overlaid on the study area and subsequently refined to identify accessible areas. The initial survey grid encompassed 134 points within accessible areas; only 64 were completed due to inaccessible terrain in some areas as well as time constraints.

Biodiversity Assessment Method vegetation integrity plots

Nine vegetation integrity plots were used to sample TEC's and over-cleared vegetation types, where accessible. These quantitative site surveys were conducted in accordance with the methodology described in the BAM, as summarised in **Figure 2-1**. **Figure 2-1** also shows the plot layout of nested 20 metre by 50 metre, 20 metre by 20 metre and one metre by one metre sub-quadrats used for the assessment of condition attributes at each plot site.

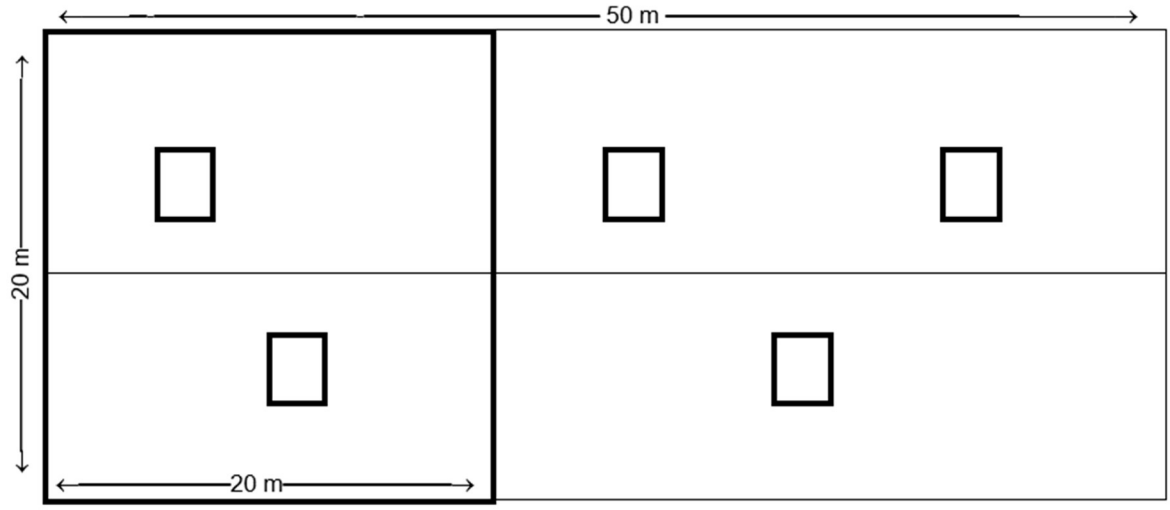

Figure 2-1 Schematic diagram illustrating the vegetation plot layout

Table 2-3 Data collected from vegetation integrity plots

Attribute	Data collected
Location	Geographic co-ordinates (easting and northing; grid type MGA 94, Zone 56) – collected using GPS.
Native and exotic species richness and cover	All plant species identified within the 20 metre by 20 metre nested quadrat were recorded. The cover (percentage of area of quadrat covered) and abundance of each species present was estimated. The growth form, stratum/layer and whether each species was native, exotic, or a high threat weed was recorded.
Number of trees with hollows	The number of living and dead trees with hollows within the 50 metre by 20 metre quadrat was recorded. A hollow was only recorded if: (a) the entrance could be seen; (b) the estimated entrance width was at least five centimetres; (c) the hollow appeared to have depth; (d) the hollow was at least one metre above the ground; and the (e) the centre of the tree was located within the sampled quadrat.
Tree stem size diversity and number of large trees	Tree stem size diversity was recorded by measuring the dbh (i.e. 1.3 metres from the ground) of living trees (greater than five centimetres dbh) within each 50 metre by 20 metre quadrat. For multi-stemmed living trees, only the largest stem was included in the count. The number of large trees was determined by counting all trees with a dbh greater than the specified dbh of large trees for each vegetation formation, as noted in the VIS Classification Database (DPIE, 2020c).
Evaluation of regeneration	Presence/absence of overstorey species present at the site that were regenerating (defined as seedlings or saplings with a diameter at breast height less than or equal to five centimetres.
Total length of fallen logs	Cumulative total of logs within each 50-metre by 20 metre quadrat with a diameter of at least 10 centimetres and a length of at least 0.5 metres.
Litter cover	Estimation of the average percentage groundcover of litter (i.e. leaves, seeds, twigs, branchlets and branches with a diameter less than 10 centimetres which is detached from a living plant) from within five sub-plots that measured one metre by one metre square spaced evenly on either side of the 50 metre central transect.

Flora habitat assessments

The results of the searches of BioNet records and PMST were used to prepare a list of threatened flora species and ecological communities known or considered likely to occur within the study area. The list was then refined based on suitability of habitat features present within the site investigation area, including associated PCTs, soil and geological associations. A habitat assessment was then undertaken to determine the likelihood for each of these threatened entities to occur within the study area.

The 'likelihood of occurrence' for each threatened entity from the database searches and literature review is provided in Appendix **C** of the *Biodiversity Assessment of Deferred Lands Stage 1: Review of Existing Information Report – Draft (*Arcadis, 2021).

Targeted flora surveys

Rapid Assessment Points

Targeted surveys for threatened flora species with suitable habitat were conducted at all rapid assessment points. Targeted searches consisted of searches of all areas within an approximately 20 metre radius of the rapid assessment point, and were completed for all threatened flora species with a moderate or high likelihood of occurrence in the study area and with suitable potential habitat in the sampled PCT. The locations of these rapid assessment points are shown on **Figure 2-2.**

Confirmation of existing records

The locations of all post-1990 records of threatened flora species with an accuracy of 50 metres or less within the study area were inspected, where accessible, to confirm whether the species was still present and assess the habitat features of the known species locations. Random meander searches for threatened flora species were conducted within areas of similar habitat surrounding the existing records.

Threatened orchid searches

Areas of potential habitat for the threatened flora species *Genoplesium baueri* were surveyed using the parallel field traverse technique. This survey technique consists of surveyors walking in parallel traverses, with the spacing between traverses determined in accordance with Table 1 of the guideline document *Surveying threatened plants and their habitats* (DPIE, 2020e) which specifies that five metre spacing is appropriate for surveying herbs and forbs in dense vegetation. The timing of the surveys adheres to the survey timing requirements for *Genoplesium baueri* (February to March) as specified in the Threatened Species Profile database (DPIE (EES), 2020); the species was surveyed over three separate days and a reference site was checked prior to survey each day (see below for further details). The approximate locations of the searches are shown on **Figure 2-1.**

The orchid expert Wendy Grimm, who has monitored populations of *Genoplesium baueri* in the Ku-ring-gai area for over 12 years (Grimm, Weston, Manea, & Leishman, 2020), was consulted for advice on habitat and reference populations for this species.

Reference populations

Cryptic species are species which are difficult to detect and/or distinguish from other species. For cryptic species considered likely to occur within the study area, such as orchid species, *Genoplesium baueri,* the field survey included visiting a reference population to identify the flowering time. By surveying during flowering times, survey times were optimised, as the detectability of the plant was increased.

Two reference populations of *Genoplesium baueri* were visited to confirm the species were in flower immediately prior to undertaking targeted surveys within the study area, and to provide an indicator of

habitat types. One of the reference populations is located within the study area. Two additional reference populations were inspected to confirm habitat variables for the species.

Orthomosaic drone photography

The threatened ecological community *Coastal Upland Swamp in the Sydney Basin Bioregion* (CUS) has been mapped in several locations in the study area, and this TEC was prioritised for ground truthing. Some of the areas mapped as CUS were difficult to access therefore a drone was deployed to take high resolution photographs of five areas where larger patches or multiple patches of CUS have been mapped or observed in the field (**Plate 2-1**).

Plate 2-1 View of study area as captured by drone (October 2021)

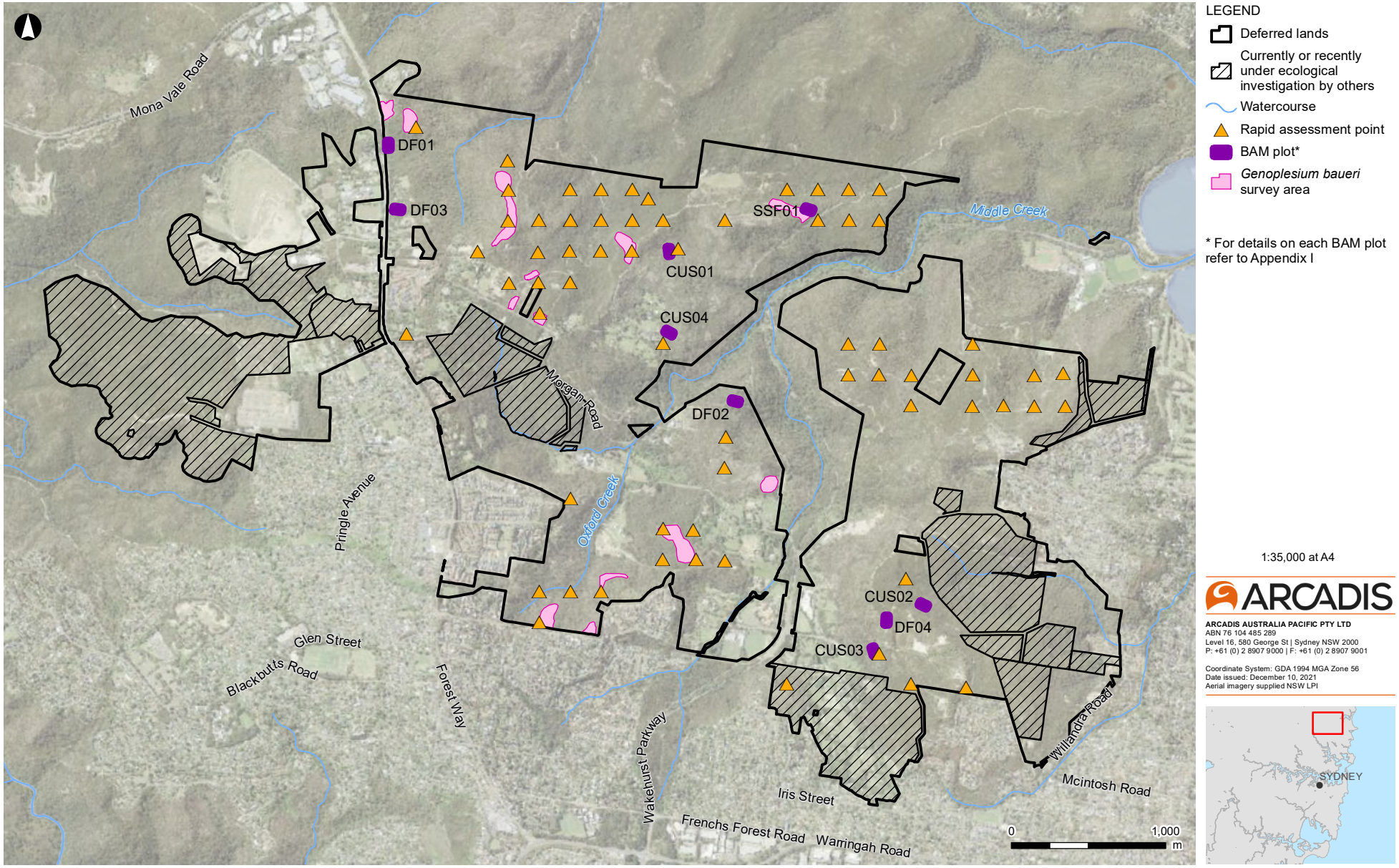

Figure 2-2: Flora survey methods

2.4.3 Fauna surveys

Fauna habitat assessment

Terrestrial fauna habitat assessments were undertaken at 77 locations across the study area (**Figure 2-3**). The focus of these assessments was to determine the condition and features of fauna habitat at sample sites across the study area. In addition, these surveys ground-truthed the fauna habitat stratification that had been applied during the Stage 1 desktop assessment. In addition to broader habitat values were collected. These included:

- Hollow-bearing trees (HBT);
- Termite mounds;
- Soaks, drains, still pools suitable for tadpole habitat;
- Flowering trees;
- Nests, tracks and other signs of fauna use.

Targeted searches for microbat roosting habitat within caves with honeycombing was also undertaken. Fauna habitat values identified were also used following targeted surveys to determine significant areas of habitat for threatened fauna recorded or considered likely to occur within the study area.

Targeted threatened fauna surveys

Overview

The fauna survey effort described below was carried out by Arcadis between October 2020 and June 2021. Targeted surveys were undertaken for all threatened fauna species recorded previously in the study area or with a moderate or higher chance of occurrence (shown in Stage 1 report and also in **Table 5-1**). Fauna survey methods employed for each threatened species are summarised in **Table 2-4** below and locations are shown in **Figure 2-3**.

Table 2-4 Fauna survey types and targeted species

Survey type	Target species	Timing survey was undertaken
Diurnal bird survey	Ecosystem credit birds, migratory birds, species credit birds, such as Glossy Black-Cockatoo	Throughout survey period
Microbat habitat searches	Microbat species	Throughout survey period
Koala Spot Assessment Technique (SAT)	Koala	Spring/Summer 2020
Audiomoth deployment	Koala	December 2020
Call play-back/spotlighting	Red-crowned Toadlet, Giant Burrowing Frog, Green and Golden Bell Frog	September 2020 – February 2021.
	Black Bittern, Bush Stone-curlew	April & May 2021
Spotlighting and stag watching	Barking Owl, Gang-gang Cockatoo, Grey-headed Flying-fox, Masked Owl, Powerful Owl, Sooty Owl, Squirrel Glider	Spring 2020 (Gang-gang Cockatoo) and Autumn 2021 (all other species)

Survey type	Target species	Timing survey was undertaken
Ultrasonic call detection	Eastern Coastal Free-tailed Bat, Eastern False Pipistrelle, Greater Broad-nosed Bat, Large Bent-winged Bat, Large-eared Pied Bat, Little Bent-winged Bat, Southern Myotis, Yellow-bellied Sheathtail-bat	Summer 2020/2021
Baited camera traps	Eastern Pygmy-possum, New Holland Mouse, Rosenberg's Goanna (Rosenbergs Goanna), Southern Brown Bandicoot (eastern), Spotted-tailed Quoll	Spring 2020 and Autumn 2021
Hair tubes	Eastern Pygmy-possum, New Holland Mouse, Southern Brown Bandicoot (eastern), Spotted-tailed Quoll, Squirrel Glider	Summer 2020/2021
Nest boxes	Eastern Pygmy-possum	Installed in October 2020 and checked Autumn and Winter 2021

Diurnal bird surveys

Diurnal bird surveys were undertaken throughout the study period at 29 locations across the study area. Surveys targeted threatened and migratory birds. The surveys involved two-hectare, 20-minute searches in the early morning by an experienced ornithologist (David James) in areas of suitable habitat. Identification was by observation, call and/or indirect evidence (such as nests or feathers). Potential breeding and/or roosting habitat was also identified where it occurred and opportunistic records of other species or signs of species was also made. Locations of the diurnal bird surveys undertaken are shown in **Figure 5-2**.

Koala surveys

Spot assessment technique

Koala SATs were utilised to identify the presence and activity of Koala (*Phascolarctos cinereus*) in and adjacent to the study area, in suitable habitat. Seven SAT surveys were carried out in accordance with the method prescribed by Steve Phillips and John Callaghan (2011) and summarized below:

- A tree (the centre tree) that meets one or more of the following selection criteria was located
- A tree of any species beneath which one or more Koala faecal pellets have been observed and/or
- A tree in which a Koala has been observed and/or
- Any other tree known or considered to be potentially important for Koala, or of interest for other assessment purposes.
- The 29 nearest trees to the centre tree were identified.

A 2-minute search for faecal pellets was undertaken beneath each of the 30 identified trees. This involved an inspection of the undisturbed ground surface within a distance of 100 centimetres around the base of each tree, followed (if no faecal pellets are initially detected) by a more thorough inspection involving disturbance of the leaf litter and ground cover within the prescribed search area. Locations of Koala SAT points are shown in **Figure 2-3**.

Audiomoths

Audiomoths are small electronic devices that detect and record sound. These devices were deployed in eight locations across 25 monitoring nights targeting male Koalas, as detected by vocalisations, at these locations. Each Audiomoth was set for 3-7 days and recorded from sunset to sunrise. The survey period was hampered by heavy rain and wind for 1-2 nights. Acoustic files from the sites were

scanned for male Koala bellows in AVIANZ software using an algorithm to detect male Koala bellows and record in .wav files. Since sounds produced by different sources can have characteristics that are superficially similar or overlap, the classifier picked out signals from different sources with similar characteristics to the training data used in its development. For each site, signals that matched the Koala event classifier were manually validated as Koala calls or as false positives. Locations of Audiomoths survey points are shown in **Figure 2-3**.

Call detection, call play-back and spotlighting

Call play-back surveys were conducted at 13 sites across the study area over seven nights to identify threatened nocturnal birds and mammals, including Barking Owl, Masked Owl, Powerful Owl, Sooty Owl, and Giant Burrowing Frog. Call play-back surveys involved listening for calls of target species for 10 to 15 minutes in the early evening, followed by spotlighting for 10 minutes. Call play-back for each species was then undertaken intermittently for five minutes, followed by a 10-minute listening period. After all calls had been played, spotlighting and listening for calls were undertaken for 10 minutes. Where possible, wet, and windy conditions were avoided. Location of call play-back points are shown in **Figure 2-3**.

Stag watching

Stag watches were undertaken on hollows identified during diurnal surveys which provide potential roosting habitat for threatened owls. A total of 13 sites were surveyed over seven nights in the study period. The potential roost hollows were watched for 30 minutes prior to sunset and 60 minutes following sunset. Stag watching preceded spotlighting surveys (**Figure 2-3**).

Ultrasonic call detection

Two types of ultrasonic call detectors (Anabats) (Anabat Express, Titley Scientific Pty Ltd) were deployed at 12 sites within the study area for a total of at least 14 nights at each location (**Figure 2-3**). Surveys were undertaken in December and February. Weather data for these surveys is shown in Appendix C.

Calls were extracted, viewed and analysed using ‘Analook W for bat call analysis using ‘ZCA – Version 4.2n’ software (Chris Corben, Copyright © 2017). Calls were analysed in two ways, one by examination of the calls by an ecologist trained in identifying microbat calls (Jessica Rooke, Arcadis) and then also by a digital recogniser specifically developed to detect microbat calls from these data. The recogniser was developed and run by a specialist microbat biologist (Glenn Hoye, Biodiversity Monitoring Services). Ultrasonic call detectors were deployed during peak microbat activity, from November 2020 to February 2021.

Microbat habitat targeted searches

In addition to echolocation call detection, potentially suitable areas for microbat roosting were also investigated. This was a three-step process which involved an initial examination of topographic maps and aerial photographs during Stage 1 of the project. This was followed by targeted searches for features within potentially suitable areas led by microbat specialist Mr Andrew Lothian. Further post survey processing was then undertaken, which involved interrogating aerial photography and contouring. This indicated potential cliff lines and/or rock features that were similar to those found during surveys and that were potentially suitable for cave-dwelling bats. These areas were shown on fauna habitat mapping for the study area.

Baited camera traps

Baited camera traps were established within the study area across the study period to target ground and arboreal fauna species. Baited camera traps were deployed within areas of suitable habitat (determined through habitat assessment surveys) to target Eastern Pygmy Possum, New Holland Mouse, Southern Brown Bandicoot, Spotted-tailed Quoll, and Rosenberg’s Goanna (**Figure 2-3**).

A total of 32 cameras were deployed across three deployment events for a total of 1,573 camera nights. Deployment events ran from approximately November 2020 to February 2021, February to March 2021 and March to June 2021. The first deployment event included eight cameras deployed for a period of 449 camera nights. A total of seven cameras were then deployed during the second survey period for a period of 158 camera nights. A final set of 17 cameras was then deployed for a total of 738 camera nights. Details of the baited camera deployment is summarised below in **Table 2-5**. Further details on the remote camera trap deployment and a sample of camera trap photos are provided in Appendices D & E.

Cameras targeting Eastern Pygmy Possum were deployed up to two metres above the ground in high density nectar areas, facing naturally occurring bait (such as *Banksia* flowers). Honey water was added to these areas to increase attraction for this species. Cameras targeting New Holland Mouse and Southern Brown Bandicoot were deployed up to 30 centimetres above the ground near potential habitat resources, including burrows, shrubs, near diggings, and used baits comprised of a mixture of rolled oats, peanut butter and honey. Cameras targeting Spotted-tailed Quoll and Rosenberg's Goanna were deployed up to 30 centimetres above the ground near potential burrows, den and latrine sites, rocky outcrops, ridges and crevices, and used baits comprised of a mixture of sardine oil, tuna, and flour. Varying degrees of tilt were utilised to optimise angle and view of the baited area and maximise species detection. An example of camera deployment position is shown in **Plate 2-2**).

One camera deployed during the first deployment event and one deployed during the third deployment event were found during analysing to be faulty and did not capture any images during their deployment period. Four cameras also took overexposed photos for some of the time they were deployed during the March-June events, these cameras were excluded from the survey effort estimate. Excluding these dysfunctional cameras, the baited camera trap survey effort was reduced to 26 baited cameras deployed across the three deployment events for a total of 1,345 camera nights.

Table 2-5 Baited camera trap deployment summary

Deployment event	Deployment months	Number of baited cameras deployed	Total camera nights
Deployment event 1	November 2020 – February 2021	8	449
Deployment event 2	February 2021 – March 2021	7	158
Deployment event 3	March 2021 – June 2021	17	738
Total	**November 2020 – June 2021**	**32**	**1345**

Plate 2-2 Example of baited camera traps set-up within the study area

Hair sampling

One hundred and twenty hair sampling tubes were placed across four hair sampling lines across the study area. Each hair sampling line contained 10 hair sample locations spaced approximately 20 metres apart, in one straight line (**Figure 2-3**). Bait used for the hair sampling targeted threatened species and included a meat bait (comprised primarily of tuna and flour as a binding agent) and a standard bait (comprised of peanut butter, rolled oats, honey, and flour as a binding agent).

Each location along the line included three hair sampling devices, comprised of one large ground device, one small ground device, and one small arboreal device. Small hair sample devices contained standard baits and the large hair sampling devices contained meat baits.

Arboreal devices were fixed to tree trunks approximately three metres above the ground and ground devices were fixed to the ground or the base of tree trunks. Arboreal devices targeted Eastern Pygmy Possum and gliders (mainly Sugar and Feathertail Gliders). Terrestrial hairtubes targeted Southern Brown Bandicoot, New Holland Mouse and when carnivorous baits were included for larger hair tubes, Spotted-tailed Quoll (bait was used was tuna).

Hair samples were collected over 29 days after deployment and samples were then analysed by Georgeanna Storey at Scats About. Baits were refreshed approximately halfway through sampling.

Nest boxes

Thirty-one nest boxes made from harvested logs were used to target the Eastern Pygmy Possum, installed at 31 different locations in the study area in October 2020 (**Figure 2-3**). The nest boxes were checked for signs of occupancy in April, May and June 2021 and removed after checking in June 2021.

As a result of a hazard reduction burn planned within a part of the deferred lands in May 2021, a total of eight nest boxes were removed from the site at the end of May 2021. One nest box was also relocated during this period. An example of nest box set-up within the study area is shown in **Plate 2-3**.

Plate 2-3 Example of nest box set-up within the study area

Scat sampling

Fauna scat sampling was undertaken for samples found opportunistically during field surveys. Scats were collected by Arcadis ecologists and sent to Scats About for analysis.

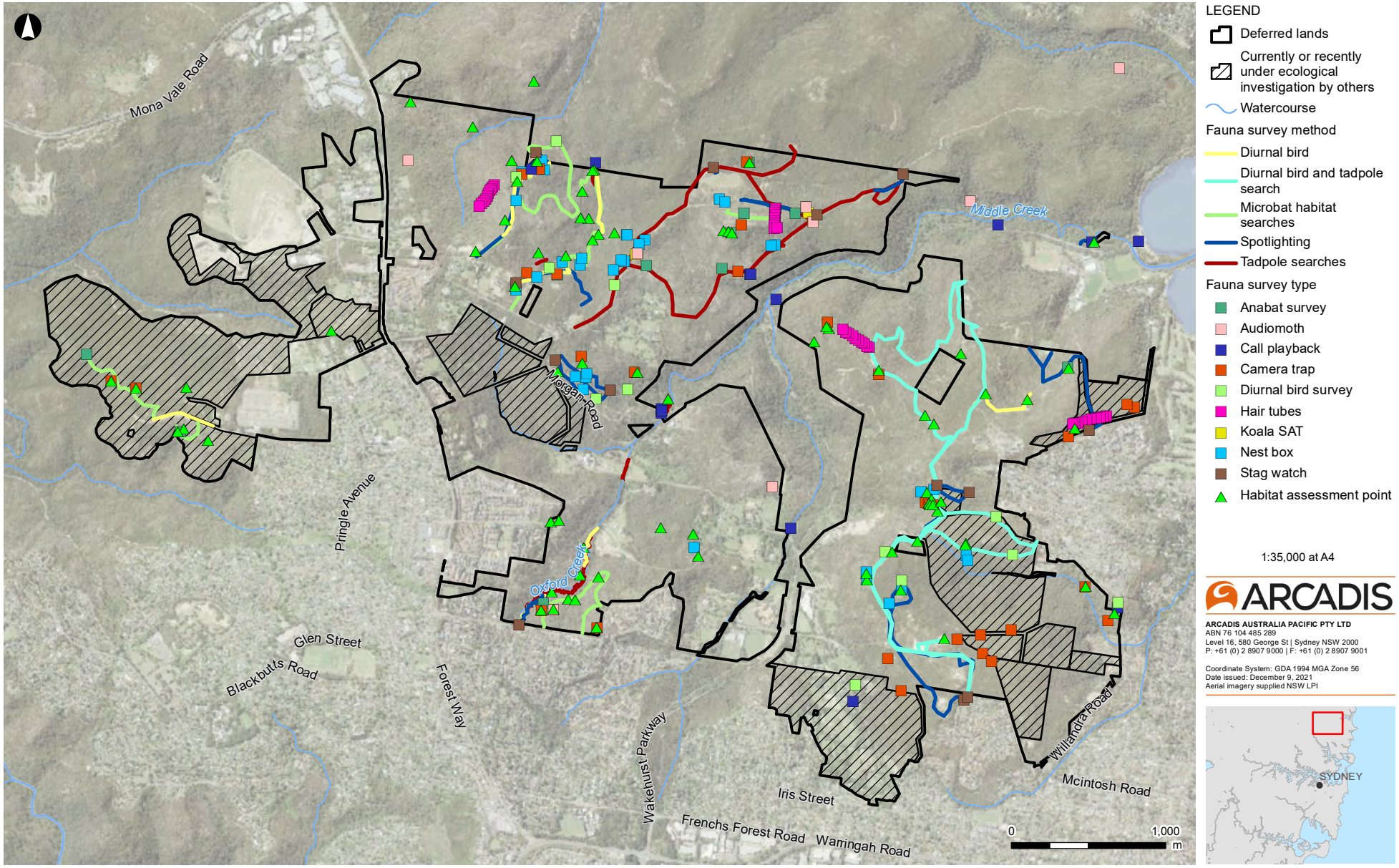

Figure 2-3: Fauna survey methods

2.4.4 Limitations

As some threatened flora species can remain cryptic throughout the year, meaning they are difficult to detect due to lack of flowers or other morphological traits, reference sites and populations were visited where possible to determine the possibility of detection within the study area, and ensure surveys were conducted at the optimal time of year.

While pockets of the deferred lands were previously well surveyed prior to current investigations, many areas were not, primarily due to restriction of access. Restricted access to private property and rugged terrain in parts of the study area also limited the geographic spread of current surveys. During current surveys, some areas were difficult, if not impossible to survey. Dense scrubby vegetation, areas with extensive fallen timber, steep slopes and sandstone cliffs all slowed down or prevented surveys, especially for many areas of heath, upland swamp and riparian gullies.

As some species are only present or apparent at certain times of the year (such as migratory birds), species recorded in the study area should be treated as an indication of species presence at the time of field surveys, not a comprehensive list. However, Arcadis has provided previous records and comparisons to previous findings to provide as full a picture of the flora and fauna of the deferred lands as possible. Given the size of the area and limitations of the survey time period (approximately one year), this will still be a sub-set of the species present.

In particular, periods of high wind and rainfall impacted on both the functioning and recording of echolocation call detectors for the detection of microbats, particularly true in mid-December 2020 and February 2021. It is likely that the activity and number of species was underestimated for this group. Baited camera traps failed during parts of the survey period, but survey effort has accounted for these failures, and they are discussed in detail in Section 2.4.3.

3 EXISTING ENVIRONMENT

3.1 Landscape features

3.1.1 Landscape context

The landscape of the deferred lands is categorised by rugged, rolling to very steep hills on Hawkesbury sandstone with areas of hanging valleys and sandstone plateaus. A variety of soil landscapes occur within the deferred lands area, including Gymea, Lambert, Oxford Falls, Somersby, Lucas Heights, Hornsby, Hawkesbury and Disturbed Terrain. Vegetation is typical of sclerophyll forest, eucalypt woodland and heathland, which exist in varying conditions and patch sizes across the area.

3.1.2 Soils and geology

The deferred lands area is located within the Belrose Coastal Slopes (Bsl) and Sydney Basin Diatremes (Dia) Mitchell Landscapes.

The Bsl Mitchell Landscape is characterised by benched hill slopes and deep valleys of the coastal fall on horizontal Triassic quartz sandstone, lithic sandstone and shales. This landscape generally has a high proportion of rock outcrop with discontinuous cliffs to five metres high. General elevation is 0 - 180 metres with a local relief (or difference in height) of 80 metres. Vegetation is comprised of low woodland in deeper soils on ridges, scrub and heath on ridges and upper benches, wet heath and swamps in hanging valleys and coastal forest in sheltered areas.

The Dia Mitchell Landscape describes a circular volcanic vent filled with layered, brecciated country rock cemented by a fine-grained basaltic matrix. Soils are dominated by sandstone detritus from the surrounding slopes but the subsoils are a fertile and well-structured clay derived from the breccia and these protected sites carry more variants of the local vegetation. General elevation varies and the local relief of positive landforms is up to 25 metres.

The deferred lands area is underpinned by three main Soil Landscape Groups – Hawkesbury, Lambert and Oxford Falls (Cardno, 2018), small patches of Warriewood and Gymea are also present. Descriptions of the key attributes of these soil types are shown in **Table 3-1**. Mapping of the deferred lands soil types is shown in Cardno (2018).

Table 3-1 Main soil landscapes in the deferred lands area (from Cardno, 2018)

Soil Landscape name	Description
Hawkesbury	Majority of the study area: Rugged, rolling to very steep hills. Narrow crests and ridges, narrow incised valleys, steep side slopes with rocky benches, broken scarps and boulders. Attributes of this soil include extreme erosion hazard, mass movement, steep slopes and highly permeable soil.
Lambert	Incursion in the south of the study area: Undulating to rolling low hills. Broad ridges, gently to moderately inclined slopes, wide rock benches with low broken scarps, small hanging valleys and areas of poor drainage. Attributes of this soil include very high erosion hazard, seasonally perched water tables, and shallow highly permeable soil.
Oxford Falls	Patchily distributed, especially in the western part of the study area. Hanging valleys with occasional broad benches and broken scarps, valley floors are relatively wide, gently inclined and often poorly drained. Attributes include very high soil erosion hazard, perched water tables and swamps, highly permeable soil and localized rock outcrop.
Warriewood	Primarily to the north-east of the study area, small patches are located in the south-east of the study area: The Warriewood soil landscape is typically found in swales

Soil Landscape name	Description
	and infilled coastal lagoons on Quaternary sands. These soils are deep and are prone to localised flooding and run-off, have high water tables and are highly permeable (Chapman and Murphy, 1989 in Cardno, 2018).
Gymea	Patches are located throughout the study area: Soils of the Gymea Group are derived from Hawkesbury Sandstone and consist of medium-to coarse-grained quartz sandstone with minor shale and laminate lenses. The limitations of this soil landscape group are the high soil erosion hazard and very low soil fertility.

Most of the study area is characterised as low risk for Possible Acid Sulfate Soils (Rating 5 for Acid Sulfate Soil Class), however some locations along the creeks draining into Narrabeen Lagoon have a higher risk (2 and 3) (Cardno, 2018).

3.1.3 Aquatic habitats

The study area is located south-west of the Narrabeen Lagoon and forms much of the catchment area of the lagoon. A number of smaller tributaries of the Narrabeen Lagoon are within the deferred lands area, including Deep Creek, Middle Creek, Snake Creek, South Creek, Trefoil Creek, and Wheeler Creek (**Figure 3-1**).

A number of the abovementioned tributaries are listed as Key Fish Habitat, including Deep Creek, Middle Creek and South Creek. There are no wetlands within the Study Area, the closest wetland is located approximately 4 kilometres north-east of the study area. Creeks, streams and drainage lines have recently been investigated (BMT, 2020) and this detailed mapping of stream orders is used in this report to illustrate riparian habitats within the deferred lands area (Section 5).

3.1.4 Previous ecological studies

The Stage 1 report reviewed previous studies of the ecology of the deferred lands. Fifteen studies have been conducted since 2000, with three providing relatively comprehensive assessments of a majority of the study area (Kavanagh et al. 2015, DECC 2008, and Travers Bushfire & Ecology). A summary of previous survey effort is shown in **Figure 3-1** and further detail can be found in Stage 1 report.

Northern Beaches Council

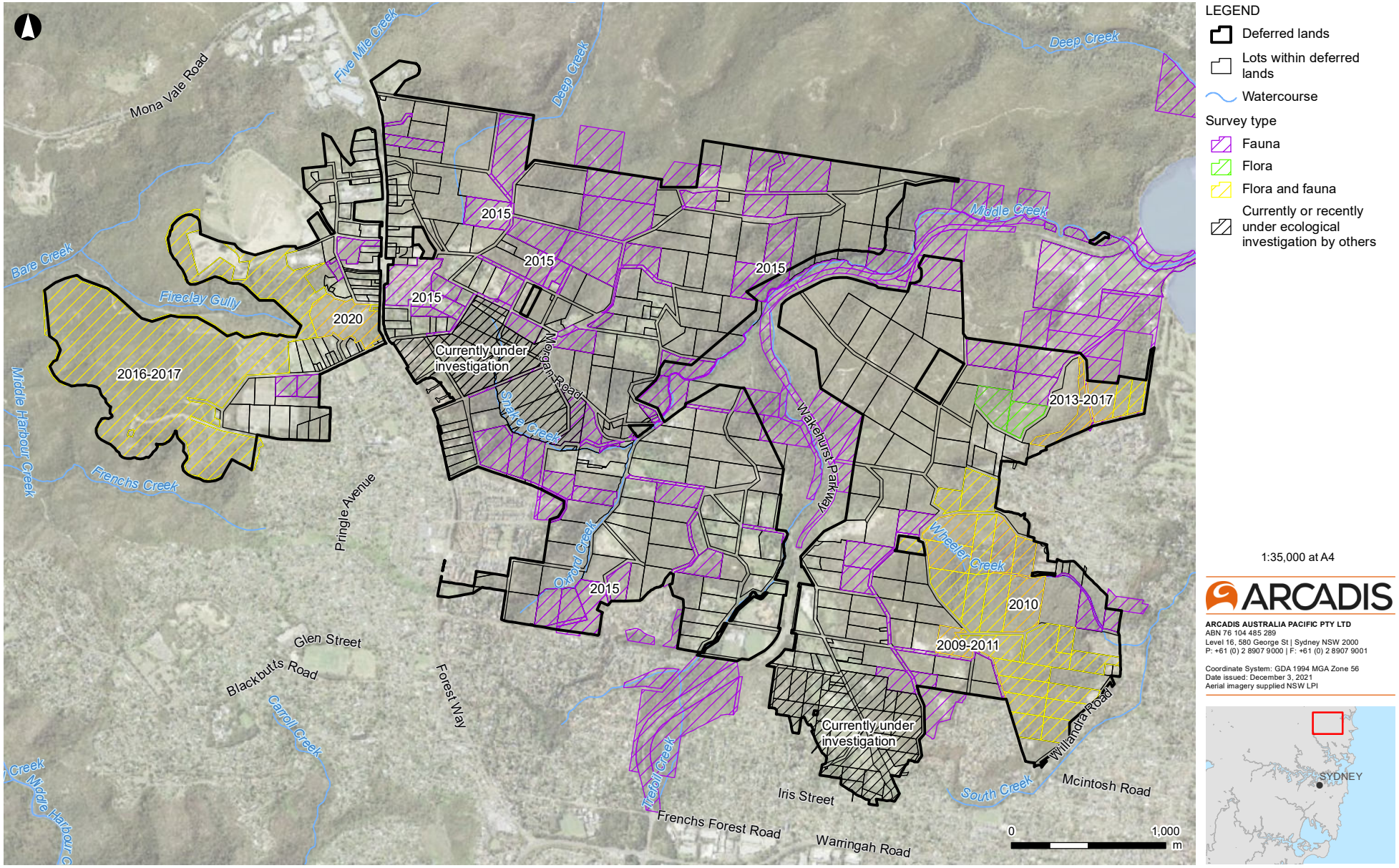

Figure 3-1: Previous locations and survey effort of previous studies

4 FLORA RESULTS

4.1 Vegetation

4.1.1 Plant Community Types

OEH (2016a) mapped the vegetation of the Sydney Metropolitan CMA, which encompasses the deferred lands area. Sixteen PCTs were mapped by OEH (2016a) within the subject land, as listed in **Table 4-1**. Nine of the PCTs within the study area were sampled using rapid assessment points or vegetation plots (**Table 4-1**). The remaining seven PCTs were not sampled; this was either due to the small area of the PCT within the study area, with most under one hectare, and/or due to difficulties accessing the mapped areas.

Ground truthing of the PCTs in the study area found that the regional mapping (OEH, 2016a) is generally accurate, with some minor differences in mapped PCT boundaries and classifications. The PCTs that are associated with the sandstone plateaux and gully that characterise the study area are largely differentiated based on their landscape position. The sampled PCTs are described below in Sections 4.1.1.1 to 4.1.1.3. Mapping of PCTs and TECs are shown on **Figure 4-1 and 4-2** respectively.

Table 4-1 Map units and corresponding PCTs mapped by OEH (2016a) within the deferred lands area

OEH (2016a) map unit code	OEH (2016a) map unit name	PCT number	PCT name	Area (ha) mapped by OEH (2016a)	Area (ha) mapped following ground truthing
PCTs sampled					
S_HL09	Coastal Sandstone Rock Plate Heath	881	Hairpin Banksia – *Kunzea ambigua* – *Allocasuarina distyla* heath on coastal sandstone plateaux, Sydney Basin Bioregion	16.24	16.26
S_DSF09	Coastal Sandstone Gully Forest	1250	Sydney Peppermint – Smooth-barked Apple – Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion	306.38	295.34
S_DSF08	Coastal Sandstone Riparian Forest	1780	Sydney Peppermint / Coachwood – Water Gum open forest in protected sandstone gullies around Sydney and the Central Coast	21.28	21.24
S_DSF11	Sydney North Exposed Sandstone Woodland	1783	Red Bloodwood – Scribbly Gum / Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast	394.23	396.79
S_DSF14	Sydney Ironstone Bloodwood-Silvertop Ash Forest	1786	Red Bloodwood – Silvertop Ash – Stringybark open forest on ironstone in the Sydney region	32.50	22.45
S_FrW01	Coastal Upland Damp Heath Swamp	1803	Banksia – Needlebush – Tea-tree damp heath swamps on coastal sandstone plateaus of the Sydney basin	18.43	13.36

OEH (2016a) map unit code	OEH (2016a) map unit name	PCT number	PCT name	Area (ha) mapped by OEH (2016a)	Area (ha) mapped following ground truthing
S_FrW02	Coastal Upland Wet Heath Swamp	1804	Needlebush – Banksia wet heath swamps on coastal sandstone plateaus of the Sydney basin	1.08	2.17
S_HL08	Coastal Sandstone Heath-Mallee	1824	Mallee – Banksia – Tea-tree – Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin	334.78	334.82 Plus 9.92 ha of regenerating shrubland
S_WSF06	Coastal Shale-Sandstone Forest	1845	Smooth-barked Apple – Red Bloodwood – Blackbutt tall open forest on shale sandstone transition soils in eastern Sydney	2.89	5.03
PCTs not sampled					
S_FrW03	Coastal Freshwater Wetland	781	Coastal freshwater lagoons of the Sydney Basin Bioregion and South East Corner Bioregion	0.13	0.13
S_RF03	Coastal Warm Temperate Rainforest	905	Lilly Pilly – Coachwood warm temperate rainforest on moist sheltered slopes and gullies, Sydney Basin Bioregion and South East Corner Bioregion	0.40	0.40
S_DSF04	Coastal Enriched Sandstone Dry Forest	1776	Smooth-barked Apple – Red Bloodwood open forest on enriched sandstone slopes around Sydney and the Central Coast	0.89	0.77
S_FoW01	Coastal Alluvial Bangalay Forest	1794	Bangalay – Smooth-barked Apple / She-oak open forest on sandy alluvium in coastal parts of the Sydney region	0.41	0.41
S_FoW02	Coastal Flats Swamp Mahogany Forest	1795	Swamp Mahogany / Cabbage Tree Palm – Cheese Tree – Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney basin	0.14	0.14
S_RF02	Coastal Sandstone Gallery Rainforest	1828	Coachwood – Lilly Pilly – Water Gum gallery rainforest in sandstone gullies of the Sydney basin	0.52	0.52
S_WSF02	Coastal Enriched Sandstone Moist Forest	1841	Smooth-barked Apple – Turpentine – Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region	13.34	13.36
Total				**1,143.64 (excludes cleared areas)**	**1,133.11 (excludes cleared areas)**

4.1.1.1 Hairpin Banksia – Kunzea ambigua – Allocasuarina distyla heath on coastal sandstone plateaux, Sydney Basin Bioregion (PCT 881)

Attribute	PCT 881 in the study area
Vegetation formation	Heathlands
Vegetation class	Sydney Coastal Heaths
PCT Name	Hairpin Banksia – *Kunzea ambigua* – *Allocasuarina distyla* heath on coastal sandstone plateaux, Sydney Basin Bioregion
PCT	881
Conservation status	BC Act: not listed EPBC Act: not listed
Estimate of percent cleared	21%
Condition	Good
Species relied upon for PCT identification	*Allocasuarina distyla, Darwinia fascicularis, Kunzea ambigua, Banksia ericifolia, Lepyrodia scariosa, Actinotus minor*

Description: Hairpin Banksia – *Kunzea ambigua* – *Allocasuarina distyla* heath on coastal sandstone plateaux, Sydney Basin Bioregion (PCT 881) occurs on exposed sandstone plates on Hawkesbury sandstone ridgetops across Sydney's coastal plateaus. PCT 881 is recognised as a stunted open to clumped heath or shrub community with a patchy groundcover of sedges and forbs which is present with a mosaic of bare rock and moss (DPIE, 2020c).

PCT 881 is present on the sandstone ridgetops across the study area, particularly in the central section to the west of Wakehurst Parkway. These areas consist of exposed sandstone plateaus and rock plates with moss gardens frequently present. The vegetation comprises clumps of low, dense heath forming around areas of exposed sandstone largely absent of vegetation.

A canopy is generally absent from PCT 881 within the study area, with *Eucalyptus stricta* (Blue Mountains Mallee Ash) and *Angophora hispida* (Dwarf Apple) sparsely occurring. *Allocasuarina distyla* is often dominant in the shrub layer, with *Darwinia fascicularis* and *Banksia ericifolia* (Heath-leaved Banksia) also frequently present. Less frequently occurring shrubs include *Leptospermum squarrosum, Kunzea ambigua* (Tick Bush), *Phebalium squarrosum* (Scaly Phebalium) and *Grevillea speciosa* (Red Spider Flower).

The ground layer comprises a sparse cover of forbs and sedges including *Lepyrodia scariosa, Micromyrtus ciliata* (Fringed Heath-myrtle), *Actinotus minor* (Lesser Flannel Flower) and *Lepidosperma laterale* (Variable Sword-sedge).

No weed species were recorded within PCT 881 across the study area during surveys. The vegetation is deemed to be in good condition and consistent with the description for PCT 881 as provided in the VIS database.

4.1.1.2 Sydney Peppermint – Smooth-barked Apple – Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion (PCT 1250)

Attribute	PCT 1250 in the study area
Vegetation formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation class	Sydney Coastal Dry Sclerophyll Forests

Attribute	PCT 1250 in the study area
PCT Name	Sydney Peppermint – Smooth-barked Apple – Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion
PCT	1250
Conservation status	BC Act: not listed EPBC Act: not listed
Estimate of percent cleared	30%
Condition	Good
Species relied upon for PCT identification	*Angophora costata, Corymbia gummifera, Banksia serrata, Leptospermum trinervium, Platysace linearifolia, Entolasia stricta, Caustis flexuosa, Pteridium esculentum*

Description: Sydney Peppermint – Smooth-barked Apple – Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion (PCT 1250) is described as a moderately tall open forest which occupies sheltered aspects on infertile Hawkesbury sandstone. The environment is rocky and the understorey consists of a diverse mix of heath and shrub species while *Eucalyptus piperita* and *Angophora costata* are dominant in the canopy (DPIE, 2020c).

PCT 1250 covers a large area of the study area. It typically occurs on the slopes of the study area, bordering PCT 1783 and PCT 1824 which generally occur higher on the slopes and ridgetops above PCT 1250, and PCT 1780 which occurs lower in the gullies below PCT 1250.

Corymbia gummifera and *Angophora costata* occur consistently in the canopy of PCT 1250 across the study area. Other Eucalypt species present in low abundance include *Eucalyptus punctata* and *Eucalyptus oblonga. Banksia serrata* is also frequently present in the small tree layer, while C*eratopetalum gummiferum* and *Banksia ericifolia* are also common. The shrub layer varies across the study area but is generally high in diversity and frequently contains *Phebalium squarrosum, Leptospermum trinervium, Platysace linearifolia* and *Leptospermum squarrosum.*

The ground layer of PCT 1250 in the study area is abundant in graminoids including *Entolasia stricta, Lepyrodia scariosa, Caustis flexuosa* and *Gahnia sieberiana.* The forbs *Gonocarpus teucrioides* (Germander Raspwort) and *Actinotus minor* also commonly occur, while the ferns *Lindsaea linearis* (Screw Fern) and *Pteridium esculentum* (Bracken) were also recorded.

PCT 1250 is in good condition across the study area with no weed species recorded during rapid assessment points. The vegetation is consistent with the description for PCT 1250 as provided in the VIS database.

4.1.1.3 Sydney Peppermint / Coachwood – Water Gum open forest in protected sandstone gullies around Sydney and the Central Coast (PCT 1780)

Attribute	PCT 1780 in the study area
Vegetation formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation class	Sydney Coastal Dry Sclerophyll Forests
PCT Name	Sydney Peppermint / Coachwood – Water Gum open forest in protected sandstone gullies around Sydney and the Central Coast
PCT	1780
Conservation status	BC Act: not listed EPBC Act: not listed

Attribute	PCT 1780 in the study area
Estimate of percent cleared	31%
Condition	Good
Species relied upon for PCT identification	*Angophora costata, Eucalyptus piperita, Callicoma serratifolia, Banksia ericifolia, Ceratopetalum gummiferum, Dodonaea triquetra, Bauera rubioides, Sticherus flabellatus, Gleichenia dicarpa.*

Description: Sydney Peppermint / Coachwood – Water Gum open forest in protected sandstone gullies around Sydney and the Central Coast (PCT 1780) is associated with narrow sandstone gorges and minor creek lines of sandstone plateaus. This PCT is often only narrow in width and contains both riparian and rainforest species. The canopy is dominated by *Angophora costata* (Smooth-barked Apple) and *Eucalyptus piperita* (Sydney Peppermint) while the small tree layer contains a mix of species associated with riparian scrubs and hardy rainforest communities. The ground layer is dominated by small-leaved ferns (DPIE, 2020c).

Within the study area, PCT 1780 is present in narrow patches along the gullies of the study area. This is largely along Oxford Creek and Five Mile Creek.

The canopy of PCT 1780 within the study area is dominated by *Angophora costata* with a number of other eucalypts occurring in lower abundance including *Corymbia gummifera, Eucalyptus piperita, Eucalyptus punctata* and *Corymbia eximia* (Yellow Bloodwood). Species present in the small tree layer include *Callicoma serratifolia* (Black Wattle), *Banksia serrata, Banksia ericifolia* and *Ceratopetalum gummiferum* (Christmas Bush). The shrub layer is diverse across this PCT in the study area, and includes *Leptospermum squarrosum, Dodonaea triquetra* (Large-leaf Hop-bush), *Grevillea buxifolia, Persoonia levis* and *Hakea dactyloides.*

The ground layer of this PCT also has a high diversity of species, with forbs present including *Bauera rubioides, Actinotus minor* and *Scaevola ramossisima* (Purple Fan-flower) and graminoids including *Entolasia stricta, Lepyrodia scariosa* and *Xanthorrhoea media.* Ferns are also commonly occurring within this PCT in the study area, particularly *Gleichenia dicarpa* (Pouched Coral Fern) and *Sticherus flabellatus* (Umbrella Fern).

PCT 1780 is in good condition across the study area with no weed species recorded during rapid assessment points. The vegetation is consistent with the description for PCT 1780 as provided in the VIS database.

4.1.1.4 Red Bloodwood – Scribbly Gum / Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast (PCT 1783)

Attribute	PCT 1783 in the study area
Vegetation formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation class	Sydney Coastal Dry Sclerophyll Forests
PCT Name	Red Bloodwood – Scribbly Gum / Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast
PCT	1783
Conservation status	BC Act: not listed EPBC Act: not listed
Estimate of percent cleared	30%
Condition	Good
Species relied upon for PCT identification	*Eucalyptus haemastoma, Corymbia gummifera, Banksia serrata, Banksia ericifolia, Platysace linearifolia, Leptospermum trinervium, Lambertia forrmosa, Entolasia stricta, Lomandra glauca*

Description: Red Bloodwood – Scribbly Gum / Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast (PCT 1783) is recognised as an exposed heathy woodland occurring on free-draining sandy soils on exposed gully slopes, crests and ridges. It comprises a canopy of eucalypts and a shrub layer which becomes very dense in sites which have been long unburnt (DPIE, 2020c).

PCT 1783 covers a substantial portion of the study area and is present in large patches, particularly on the ridgetops and upper slopes. Sandstone plateaus and benches are often partially exposed in these areas and leaf litter cover is high.

The canopy of PCT 1783 in the study area is dominated by *Eucalyptus haemastoma* (Broad-leaved Scribbly Gum) and *Corymbia gummifera* (Red Bloodwood) with *Angophora costata* (Sydney Red Gum), *Eucalyptus punctata* (Grey Gum) and *Eucalyptus oblonga* (Stringybark) also frequently occurring. The shrub layer is generally fairly open within PCT 1783 in the study area and comprises a diverse range of shrubs. Frequently occurring shrubs include *Banksia ericifolia, Platysace linearifolia, Leptospermum trinervium* (Slender Tea-tree), *Micromyrtus ciliata* (Fringed Heath-myrtle) and *Lambertia formosa* (Mountain Devil).

The ground layer largely comprises grasses and sedges, with a range of forbs also present. Commonly occurring grasses and sedges include *Entolasia stricta* (Wiry Panic), *Lepidosperma laterale, Lepyrodia scariosa, Schoenus imberbis* and *Lomandra glauca* (Pale Mat-rush). Forbs present include *Dampiera stricta, Patersonia sericea* (Silky Purple-flag), *Actinotus minor* (Lesser Flannel Flower) and *Patersonia glabrata* (Leafy Purple-flag).

PCT 1783 is in good condition across the study area with weed species only occurring sparsely. The vegetation is consistent with the description for PCT 1783 as provided in the VIS database.

4.1.1.5 Red Bloodwood – Silvertop Ash – Stringybark open forest on ironstone in the Sydney region (PCT 1786)

Attribute	PCT 1786 in the study area
Vegetation formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation class	Sydney Coastal Dry Sclerophyll Forests
PCT Name	Red Bloodwood – Silvertop Ash – Stringybark open forest on ironstone in the Sydney region
PCT	1786
Conservation status	BC Act: Duffys Forest Ecological Community in the Sydney Basin Bioregion (endangered) EPBC Act: not listed
Estimate of percent cleared	71%
Condition	Good
Species relied upon for PCT identification	*Corymbia gummifera, Eucalyptus capitellata, Acacia ulicifolia, Banksia spinulosa, Platysace linearifolia, Entolasia stricta, Xanthosia tridentata*

Description: Red Bloodwood – Silvertop Ash – Stringybark open forest on ironstone in the Sydney region (PCT 1786) is associated with ironstone mantles layered above sandstone ridgelines and has an extensive but fragmented distribution across the lateritic soils of the suburb Duffy's Forest and the northern beaches area (OEH, 2016a). The canopy is characterised by *Corymbia gummifera, Eucalyptus sieberi, Eucalyptus capitellata* and *Eucalyptus oblonga* (OEH, 2016a).

PCT 1786 is located in a few isolated patches across the study area. The largest of these is to the east of Forest Way in the western extent of the study area, while smaller patches are mapped in the southern extent of the study area near Wakehurst Parkway and Oxford Falls Road.

This PCT is equivalent to the TEC Duffys Forest Ecological Community in the Sydney Basin Bioregion, listed as Endangered under the BC Act. This TEC is discussed further below in Section 4.1.2.

4.1.1.6 Ban;;ksia – Needlebush – Tea-tree damp heath swamps on coastal sandstone plateaus of the Sydney basin (1803)

Attribute	PCT 1803 in the study area
Vegetation formation	Freshwater Wetlands
Vegetation class	Coastal Heath Swamps
PCT Name	Banksia – Needlebush – Tea-tree damp heath swamps on coastal sandstone plateaus of the Sydney basin
PCT	1803
Conservation status	BC Act: Coastal Upland Swamp in the Sydney Basin Bioregion (endangered) EPBC Act: Coastal Upland Swamp in the Sydney Basin Bioregion (endangered)
Estimate of percent cleared	10%
Condition	Good

Attribute	PCT 1803 in the study area
Species relied upon for PCT identification	*Banksia ericifolia, Hakea teretifolia, Banksia oblongifolia, Leptospermum squarrosum, Empodisma minus, Leptocarpus tenax, Lepyrodia scariosa*

Description: Banksia – Needlebush – Tea-tree damp heath swamps on coastal sandstone plateaus of the Sydney basin (PCT 1803) occurs on impeded soils in creek headwaters and other seepage zones associated with the elevated sandstone plateau and occurs on damp rather than wet peaty soils. PCT 1803 is typically a treeless sedgeland with an overstorey of low-growing shrubs (DPIE, 2020a).

PCT 1803 is mapped as scattered patches of varying sizes across the study area. This PCT is equivalent to the TEC *Coastal Upland Swamp in the Sydney Basin Bioregion*, listed as Endangered under the BC Act and the EPBC Act. This TEC is discussed further below in section 4.1.2.

4.1.1.7 Needlebush – Banksia wet heath swamps on coastal sandstone plateaus of the Sydney basin (1804)

Attribute	PCT 1804 in the study area
Vegetation formation	Freshwater Wetlands
Vegetation class	Coastal Heath Swamps
PCT Name	Needlebush – Banksia wet heath swamps on coastal sandstone plateaus of the Sydney basin
PCT	1804
Conservation status	BC Act: Coastal Upland Swamp in the Sydney Basin Bioregion (endangered) EPBC Act: Coastal Upland Swamp in the Sydney Basin Bioregion (endangered)
Estimate of percent cleared	10%
Condition	Good
Species relied upon for PCT identification	*Banksia ericifolia, Banksia robur, Gleichenia dicarpa, Empodisma minus, Gahnia sieberiana, Lepidosperma limicola*

Description: Needlebush – Banksia wet heath swamps on coastal sandstone plateaus of the Sydney basin (PCT 1804) typically occupies zones in or next to drainage lines where water seepage is more constant than it is in more elevated parts of the swamp. PCT 1804 is a wet heath-open sedgeland community that has a sparse to dense heath layer, that can be distinguished from swamps in drier locations by the presence of *Banksia robur* (DPIE, 2020a).

PCT 1804 is mapped as scattered small patches adjoining drainage lines in the eastern half of the study area. This PCT is equivalent to the TEC *Coastal Upland Swamp in the Sydney Basin Bioregion*, listed as Endangered under the BC Act and the EPBC Act. This TEC is discussed further below in section 4.1.2.

4.1.1.8 Mallee – Banksia – Tea-tree – Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin (PCT 1824)

Attribute	PCT 1824 in the study area
Vegetation formation	Heathlands
Vegetation class	Sydney Coastal Heaths
PCT Name	Mallee – Banksia – Tea-tree – Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin
PCT	1824
Conservation status	BC Act: not listed EPBC Act: not listed
Estimate of percent cleared	10%
Condition	Good
Species relied upon for PCT identification	*Angophora hispida, Eucalyptus luehmanniana, Eucalyptus haemastoma, Banksia ericifolia, Actinotus minor, Lepyrodia scariosa, Cyathochaeta diandra*

Description: Mallee – Banksia – Tea-tree – Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin (PCT 1824) commonly occurs on exposed skeletal soils along narrow ridges and exposed slopes of the Woronora and Hornsby plateaus. It has a variable structure, from a treeless heath to a low open woodland with mallees. The shrub layer is diverse and comprises a variety of banksias, tea-trees, hakeas, wattles, grevilleas and geebungs while the groundcover comprises sedges and other monocots (DPIE, 2020a).

PCT 1824 is present in large patches across the study area, particularly on the exposed slopes to the east of Wakehurst Parkway. Within the study area PCT 1824 is present as a dense heath with generally a sparse canopy of eucalypts.

The canopy of PCT 1824 in the study area comprises scattered *Eucalyptus* species with *Eucalyptus haemastoma* (Broad-leaved Scribbly Gum), *Angophora hispida* (Dwarf Apple) and *Corymbia gummifera* (Red Bloodwood) frequently occurring. A tall, dense shrub layer is present which contains a variety of species. *Banksia ericifolia* is often dominant and consistently present across most areas of this PCT. Other frequently occurring shrubs include *Grevillea buxifolia, Darwinia fascicularis, Banksia serrata, Leptospermum squarrosum* and *Allocasuarina distyla.*

The ground layer of this PCT is highly diverse across the study area, and particularly abundant in forbs and sedges. Commonly occurring groundcover species include *Actinotus minor, Lepyrodia scariosa, Cyathochaeta diandra, Entolasia stricta, Lepidosperma laterale* and *Bauera rubioides.*

In the south-east of the study area, north of Red Hill Reserve, there is a large area of regenerating tall shrub and heath vegetation on areas that were historically cleared and subject of sand and gravel extraction. This vegetation is dominated by native shrubs characteristic of PCT 1824, including *Allocasuarina distyla, Banksia ericifolia* and *Grevillea buxifolia.* There are very few eucalypts present and the ground layer is substantially reduced, with only sparse cover of grasses and sedges. This regenerating shrubland has been mapped as 'PCT 1824' to delineate the regenerating areas.

PCT 1824 is in good condition across the study area with weed species only occurring sparsely. The vegetation is consistent with the description for PCT 1824 as provided in the VIS database.

4.1.1.9 Smooth-barked Apple – Red Bloodwood – Blackbutt tall open forest on shale sandstone transition soils in eastern Sydney (PCT 1845)

Attribute	PCT 1845 in the study area
Vegetation formation	Wet Sclerophyll Forests (Grassy sub-formation)
Vegetation class	Northern Hinterland Wet Sclerophyll Forests
PCT Name	Smooth-barked Apple – Red Bloodwood – Blackbutt tall open forest on shale sandstone transition soils in eastern Sydney
PCT	1845
Conservation status	BC Act: Not listed EPBC Act: not listed
Estimate of percent cleared	92%
Condition	Good
Species relied upon for PCT identification	*Angophora costata, Corymbia gummifera, Eucalyptus umbra, Acacia linifolia, Entolasia stricta, Pteridium esculentum*

Description: Smooth-barked Apple – Red Bloodwood – Blackbutt tall open forest on shale sandstone transition soils in eastern Sydney (PCT 1845) occurs on clay-influenced soils associated with residual shale or lateritic capping, shale bands in sandstone bedrock or shale washed downslope on exposed sandstone soils (DPIE, 2020c). It is a tall open eucalypt forest with *Corymbia gummifera, Angophora costata, Eucalyptus pilularis* (Blackbutt), *Syncarpia glomulifera, Eucalyptus resinifera* and/or *Eucalyptus umbra* in the canopy.

PCT 1845 has been identified in two patches within the study area: one between Middle Creek and Garigal National Park, as mapped by OEH (2016a), and another on a ridgetop to the north of Morgan Road, previously mapped as PCT 1786. The areas of PCT 1845 identified in the study area are described in detail in section 4.1.2 below.

4.1.2 Threatened Ecological Communities

Six of the mapped PCTs are associated with five different TECs listed under the BC Act (**Table 4-2**). Two PCTs are associated with one TEC listed under the EPBC Act: *Coastal Upland Swamp in the Sydney Basin Bioregion* (**Table 4-2**).

Table 4-2 TECs mapped by OEH (2016) within the deferred lands area

PCT number	PCT name	Corresponding TEC	BC Act Status	EPBC Act status	Area (ha) within deferred lands area
781	Coastal freshwater lagoons of the Sydney Basin Bioregion and South East Corner Bioregion	Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	E	-	0.13
1786	Red Bloodwood – Silvertop Ash – Stringybark open forest on ironstone in the Sydney region	Duffys Forest Ecological Community in the Sydney Basin Bioregion	E	-	22.45
1794	Bangalay – Smooth-barked Apple / She-oak open forest	Riverflat Eucalypt Forest on Coastal Floodplains of the	E	CE	0.41

PCT number	PCT name	Corresponding TEC	BC Act Status	EPBC Act status	Area (ha) within deferred lands area
	on sandy alluvium in coastal parts of the Sydney region	NSW North Coast, Sydney Basin and South East Corner bioregions			
1795	Swamp Mahogany / Cabbage Tree Palm – Cheese Tree – Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney basin	Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	E	-	0.14
1803	Banksia – Needlebush – Tea-tree damp heath swamps on coastal sandstone plateaus of the Sydney basin	Coastal Upland Swamp in the Sydney Basin Bioregion	E	E	13.36
1804	Needlebush – Banksia wet heath swamps on coastal sandstone plateaus of the Sydney basin				2.17
Total					38.66

CE = Critically Endangered, E = Endangered, V = Vulnerable

Three of the mapped TECs (Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions, Riverflat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions and Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions) occur as small fragments at the edges of the deferred lands (Figure 4-2). These TECs were not sampled during the current study and are not considered further in this section.

Duffys Forest Ecological Community in the Sydney Basin Bioregion

OEH (2016) mapped 32.50 ha of Red Bloodwood – Silvertop Ash – Stringybark open forest on ironstone in the Sydney region (PCT 1786) within the deferred lands area. PCT 1786 forms the TEC Duffys Forest Ecological Community in the Sydney Basin Bioregion (hereafter referred to as 'Duffys Forest TEC'). The majority of the mapped PCT within the deferred lands area is located in the north-west of the area, on the ridges adjoining both sides of Forest Way. The remainder of the mapped Duffys Forest TEC consists of two large patches in the centre and south-east of the deferred lands.

The large patch of Duffys Forest TEC mapped in the north-west of the area, adjoining the eastern side of Forest Way, was sampled with two vegetation plots (DF1 and DF3) (**Plate 4-1, Plate 4-2**). This vegetation consists of a canopy of *Eucalyptus sieberi, Eucalyptus capitellata, Eucalyptus resinifera, Angophora costata, Corymbia gummifera and Eucalyptus haemastoma* and a diverse, shrubby mid layer that includes *Acacia linifolia, Grevillea spp., Persoonia linearis* and *Pimelea linifolia.* The ground layer is dominated by grasses and sedges, with *Gahnia sieberiana, Cyathochaeta diandra, Entolasia stricta* and *Lomandra glauca* all observed to be abundant. The condition of this approximately 13 ha patch is generally good; there is some weed incursion and other edge effects at the interface with Forest Way and adjoining residential properties, where clearing has fragmented the larger patch.

The mapped patch of Duffys Forest TEC in the south-east of the study area, adjoining the dirt track to the north-west of Red Hill Reserve, was sampled with one vegetation plot (DF04) (**Plate 4-1,** Figure 2-2). The canopy is comprised of *Eucalyptus sieberi, Eucalyptus haemastoma* and *Corymbia gummifera,* with a sparse but diverse mid-layer featuring *Banksia spinulosa, Hakea sericea, Lambertia formosa* and *Leptospermum trinervium.* The ground layer was high in leaf litter and was characterised by grasses such as *Anisopogon avenaceus* and *Entolasia stricta,* and sedges such as

Lepidosperma laterale, Cyathochaeta diandra and *Lomandra glauca.* Despite its proximity to the vehicle and pedestrian track, the vegetation appears to be in good condition with minimal weed presence.

Plate 4-1 Duffys Forest TEC in the north-west of the study area (sampled in DF1)

Plate 4-2 Duffys Forest TEC in the south-east of the study area (sampled in DF04)

The mapped patch of Duffys Forest TEC in the central part of the study area, on a ridgetop to the north of Morgan Road, was sampled with one vegetation plot (DF02) (**Plate 4-3, Figure 2-2**). The vegetation in this area consists of a canopy of *Angophora costata, Eucalyptus umbra* and *Eucalyptus punctata* and a shrubby understorey dominated by *Acacia linifolia, Acacia ulicifolia, Banksia serrata, Platysace linearifolia* and *Xanthorrhoea media.* The ground layer is characterised by sedges, including *Caustis flexuosa* and *Gahnia sieberiana,* and the fern *Pteridium esculentum.* The vegetation in this location is not consistent with PCT 1786 or Duffys Forest TEC and has been revised to PCT 1845: Smooth-barked Apple – Red Bloodwood – Blackbutt tall open forest on shale sandstone transition soils in eastern Sydney, as it is very similar to the other vegetation mapped as PCT 1845 by OEH (2016a), as sampled in vegetation plot SSF1 (discussed below).

There is an additional area of Duffys Forest mapped in the deferred lands by Smith and Smith (2005), between Middle Creek and Garigal National Park. This patch is described by Smith and Smith (2005) as Angophora-White Mahogany Forest, an unusual variant of Duffys Forest restricted to this single site. OEH (2016a) mapped this area as PCT 1845: Smooth-barked Apple – Red Bloodwood – Blackbutt tall open forest on shale sandstone transition soils in eastern Sydney. The patch was sampled using one vegetation plot (SSF1) (**Plate 4-4, Figure 2-2**) to investigate whether it is consistent with Duffys Forest TEC.

The area mapped as PCT 1845 by OEH (2016a) consists of a canopy of *Eucalyptus umbra, Angophora costata, Corymbia gummifera* and *Eucalyptus punctata* and a shrub layer dominated by *Lasiopetalum ferrugineum, Grevillea sericea,* and *Podocarpus elatus.* The ground layer is dominated by *Caustis flexuosa Entolasia stricta, Pteridium esculentum* and *Macrozamia communis.* While this vegetation has some affinities with Duffys Forest TEC, it is not floristically consistent with the description in the Final Determination for this TEC.

Plate 4-3 Mapped area of Duffys Forest TEC in the centre of the study area, broadly consistent with PCT 1845 (sampled in DF02)

Plate 4-4 PCT 1845 in the north of the study area (sampled in SSF1)

Coastal Upland Swamp in the Sydney Basin Bioregion

Coastal Upland Swamp is known to have a dynamic distribution over time in response to variability in soil conditions, moisture availability and fire regimes (Keith *et al.*, 2006). Paragraph 4 of the Final Determination for CUS in the Sydney Basin Bioregion (gazetted 9 March 2012) notes that larger patches of the TEC comprise distinctive mosaics of sub-communities that include a range of structural forms, such as tall open scrubs, tall, closed scrubs, closed heaths, open graminid heaths, sedgelands and fernlands. Although trees are typically absent from the community, they may be present as scattered trees or in clumps. Paragraph 17 of the Final Determination references the sensitivity of Coastal Upland Swamp to changes in climatic moisture and notes that the boundaries of swamps and adjoining woodlands shift in response to variations in rainfall, possibly in concert with fire events, over decadal time scales.

OEH (2016a) mapped 18.43 ha of Banksia – Needlebush – Tea-tree damp heath swamps on coastal sandstone plateaus of the Sydney basin (PCT 1803) and 1.08 ha of Needlebush – Banksia wet heath swamps on coastal sandstone plateaus of the Sydney basin (PCT 1804) within the deferred lands area. Both PCTs 1803 and 1804 form part of the TEC Coastal Upland Swamp in the Sydney Basin Bioregion (hereafter referred to as 'Coastal Upland Swamp TEC'). Areas of Coastal Upland Swamp TEC are mapped as scattered patches across the deferred lands area, with larger patches located in the central northern section between the Slippery Dip Trail and Middle Creek, and in the south-east adjoining Lady Penrhyn Drive (**Figure 4-1 & Figure 4-2**).

The large patch of CUS mapped to the south-east of the Slippery Dip trail was sampled with one vegetation plot (CUS1) (**Plate 4-5, Figure 2-2**). This patch includes scattered tree cover, with about 10 percent cover of tree species such as *Eucalyptus luehmanniana, Angophora hispida, Corymbia gummifera* and *Eucalyptus haemastoma.* There is a dense heathy shrub layer dominated by *Banksia ericifolia,* with *Leptospermum squarrosum, Hakea teretifolia* and *Banksia oblongifolia* also abundant. The ground layer is characterised by high cover of the low shrub *Bauera rubioides* interspersed with sedges such as *Leptocarpus tenax, Lepidosperma forsythii, Lepyrodia scariosa* and *Ptilothrix deusta.*

Northern Beaches Council

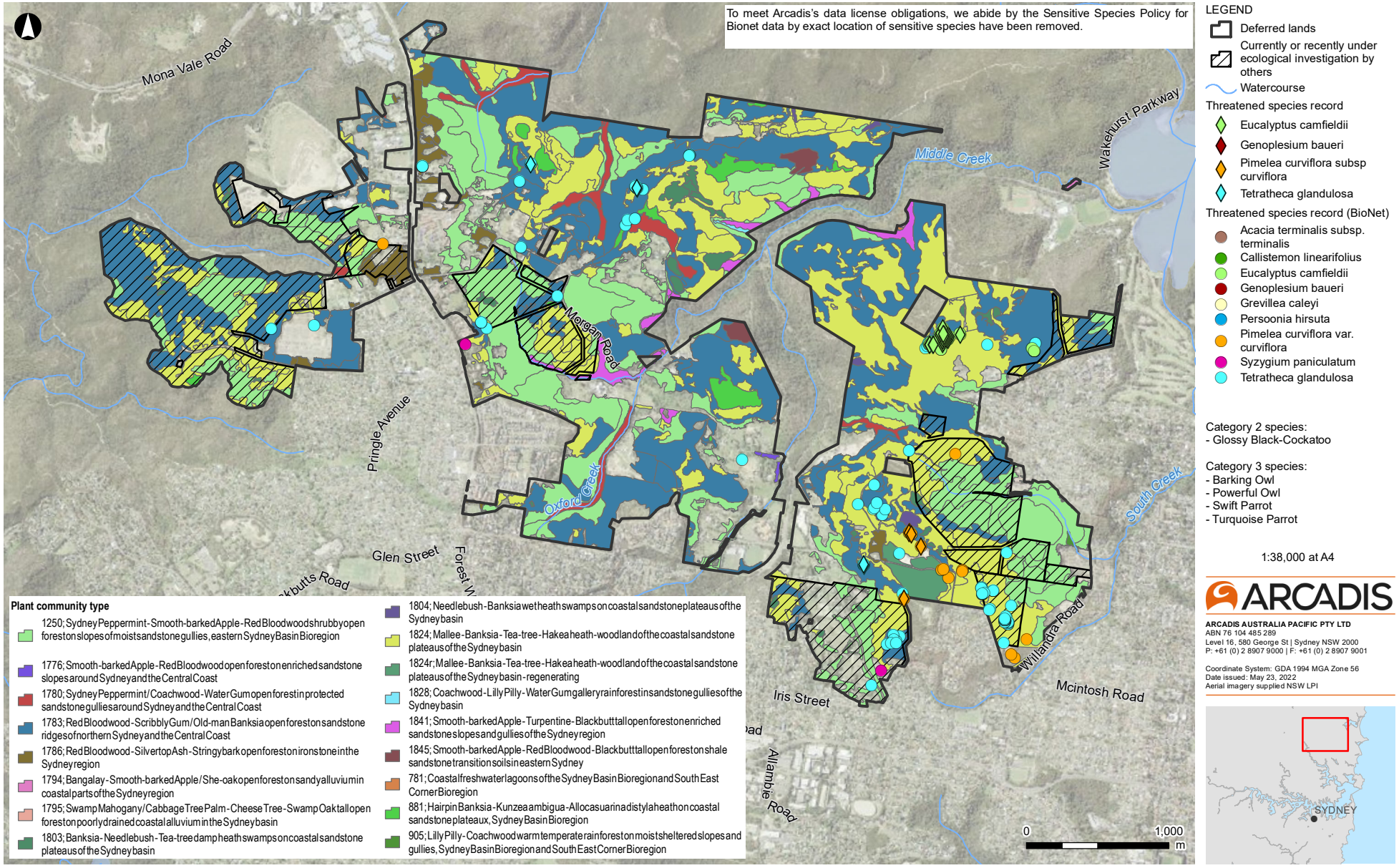

Figure 4-1b: Flora values identified within the deferred lands area

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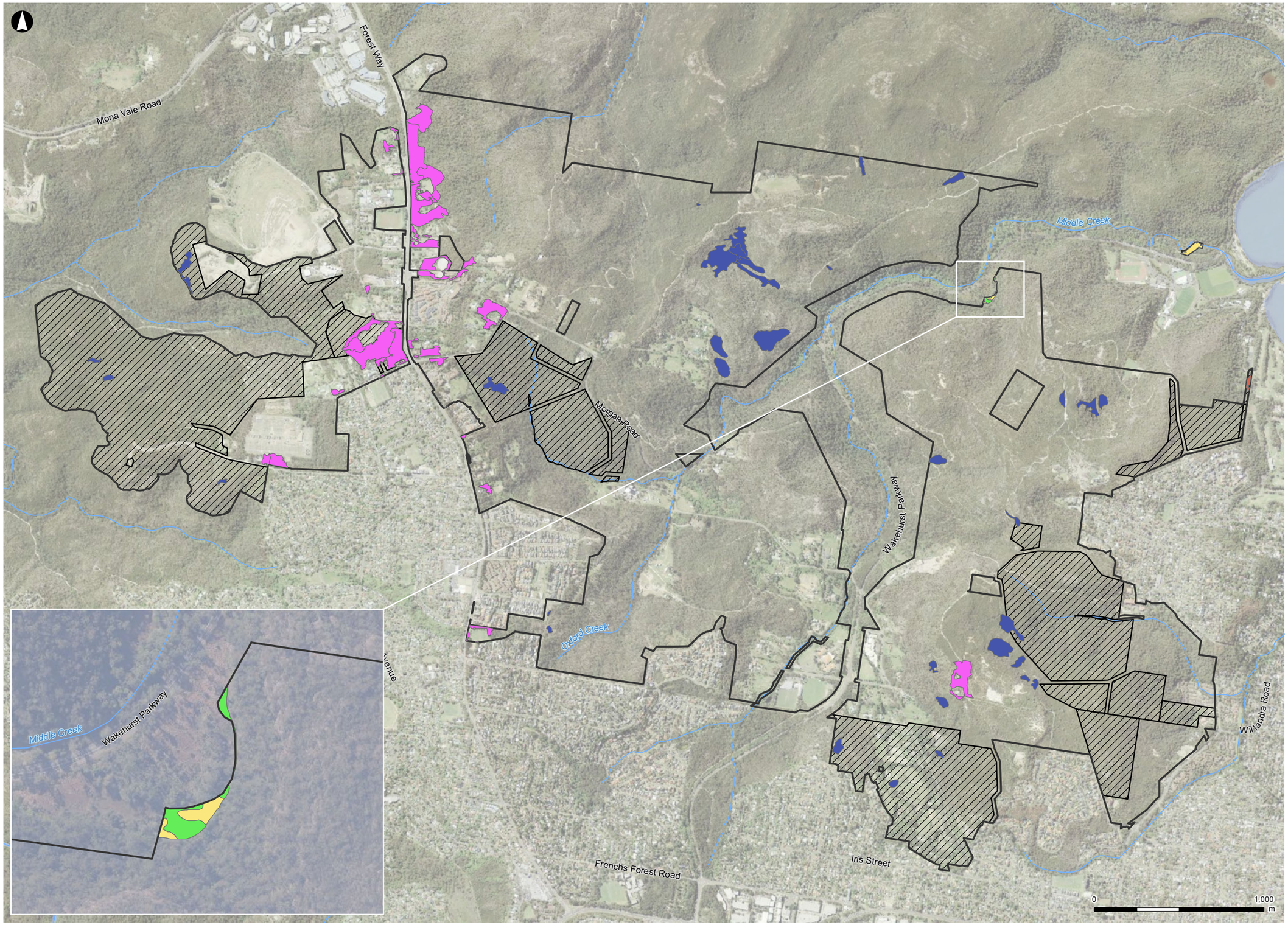

LEGEND

- Deferred lands
- Currently or recently under ecological investigation by others
- Watercourse

Threatened ecological communities (NSW)

- Coastal Upland Swamp
- Duffys Forest Ecological Community
- Freshwater Wetlands on Coastal Floodplains
- River Flat Eucalypt Forest
- Swamp Sclerophyll Forest on Coastal Floodplains

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Aerial imagery supplied NSW LPI

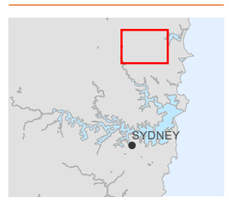

Figure 4-2: TECs identified within the deferred lands area

Plate 4-5 Coastal Upland Swamp TEC to the south-east of the Slippery Dip trail (sampled in CUS1)

Plate 4-6 Previously unmapped area of Coastal Upland Swamp TEC in the south-east of the study area (sampled in CUS2)

Another large patch of CUS mapped to the east of Kellys Way was sampled with one vegetation plot (CUS4). This vegetation is characterised by a dense shrub layer, scattered trees and more open areas of sedge and low shrub cover. The tree layer, which represents about 10 percent cover, consists of small trees of *Eucalyptus stricta* and *Angophora bakeri.* The shrub layer includes *Banksia ericifolia, Leptospermum squarrosum, Hakea gibbosa* and *Leptospermum trinervium.* The ground layer is dominated by sedges, mainly *Lepyrodia scariosa, Ptilothrix deusta* and *Lepidosperma laterale*, with the native grass *Anisopogon avenaceus* also present.

Two areas of previously unmapped Coastal Upland Swamp TEC were sampled in the south-east of the study area, to the north and north-west of Red Hill Reserve. One patch is located on a north-east facing slope; this was sampled with one vegetation plot (CUS2) (**Plate 4-6**). This vegetation contains only scattered cover of trees and shrubs, with one tree of *Eucalyptus sieberi* and a shrub layer dominated by *Banksia ericifolia, Banksia robur, Hakea teretifolia* and *Leptospermum squarrosum.* The ground layer is characterised by dense cover of sedges and ferns, with *Gleichenia dicarpa* dominant and *Empodisma minus, Gymnoschoenus sphaerocephalus, Lepidosperma limicola* and *Gahnia sieberiana* all observed to be abundant. This patch is more consistent with the PCT 1804: Needlebush – Banksia wet heath swamps on coastal sandstone plateaus of the Sydney basin.

Another previously unmapped patch is located on a steeper western facing slope, sampled with one vegetation plot (CUS3); this vegetation has elements of both sandstone heath and Coastal Upland Swamp and may be in a transitional stage. There is very low tree cover here, with only one tree of *Angophora costata* recorded in the plot. There are patches of regenerating shrubs of *Banksia ericifolia* and *Viminaria juncea,* but most of the cover comprises smaller shrubs such as *Platysace linearifolia, Bauera rubioides* and *Boronia ledifolia.* The ground layer consists of a mixture of native sedges and forbs, including *Lepidosperma forsythii, Gahnia sieberiana* and *Gonocarpus tetragynus.* The threatened flora species *Tetratheca glandulosa* was recorded within this plot.

Some of the larger mapped patches of Coastal Upland Swamp in the study area, in particular the area to the north of Lady Penrhyn Drive and the area in the north-east of the study area, were not sampled during ground-truthing. The area to the north of Lady Penrhyn Drive, although accessible, consists of very dense heath and the small areas that were inspected do not appear to support Coastal Upland Swamp. The area in the north-east was not accessed due to steep terrain. The mapping of both of these areas has been reviewed using historical aerial photos as well as orthomosaic data[1] collected

[1] An orthomosaic is a photogrammetrically orthorectified image product mosaicked from an image collection, where the geometric distortion has been corrected and the imagery has been colour balanced to produce a seamless mosaic dataset.

by drones. The area in the north-east is consistent with Coastal Upland Swamp and the boundaries have been adjusted; the area north of Lady Penrhyn Drive does not appear to be consistent with Coastal Upland Swamp given the dense tall shrub growth dominating this patch. It is possible that the boundaries of Coastal Upland Swamp in the study area will further shift over time in future in response to climatic patterns and fire regimes.

4.2 Threatened Flora

Records of ten threatened flora species occur within the deferred lands area. Of these, seven threatened species can be confirmed as naturally occurring in the area through reference to other sources, and two have a moderate likelihood of occurrence due to the presence of associated vegetation types that form potential habitat for the species. An additional 12 threatened flora species were identified during Stage 1 as having a moderate to high likelihood of occurrence in the study area, based on the presence of recent records in the locality and associated vegetation types within the deferred lands that form suitable potential habitat for these species.

A review of existing records as well as limited targeted surveys identified six threatened flora species with substantial populations in the study area. These species are discussed in detail below. Where possible, locations are mapped on **Figure 4-1.**

4.2.1 *Eucalyptus camfieldii* (Camfield's Stringybark)

Eucalyptus camfieldii (Camfield's Stringybark) is listed as Vulnerable under the BC Act and EPBC Act. The species grows either in mallee form or as a straggly tree up to 9 metres in height. The species is known to grow in shallow sandy soils overlying Hawkesbury sandstone, mostly in coastal heath on sandy ridges (DPIE (EES), 2020).

There are 12 previous records of *Eucalyptus camfieldii* located within the study area, dated from 2001 to 2018. The records comprise 112 individuals, with counts at each record ranging from one to 100 individuals. All records are located in the north-east of the study area on ridgetops and upper slopes, within areas mapped as PCT 1783 and PCT 1824.

The current surveys identified 118 trees of *Eucalyptus camfieldii* in two general locations, both of which are located in the north-east of the study area in the vicinity of previous records. There is a large patch of vegetation adjoining a walking track where *Eucalyptus camfieldii* is the dominant canopy species. Almost all records of the species collected during the current survey are located within PCT 1783. Most trees of *Eucalyptus camfieldii* were observed to have a multi-stemmed mallee form, growing up to four metres in height.

Photographs of *Eucalyptus camfieldii* in the study area are shown in **Plate 4-7** and **Plate 4-8**.

Plate 4-7 *Eucalyptus camfieldii* in the north-east of the study area

Plate 4-8 *Eucalyptus camfieldii* fruit

4.2.2 *Genoplesium baueri* (Bauer's Midge Orchid)

Genoplesium baueri (Bauer's Midge Orchid) is listed as Endangered under the BC Act and EPBC Act. The species is a small deciduous orchid 6 to 15 centimetres in height, typically flowering from February to March (DPIE (EES), 2020). The habitat for the species is stated to be dry sclerophyll forest and moss gardens over sandstone in DPIE (EES) (2020); visits to multiple reference sites for the species in the locality assisted in refining habitat features.

There is one previous record of *Genoplesium baueri* located within the study area, dated from 2017. The record comprises 34 individuals and is located in the north-west of the study area; as *Genoplesium baueri* is a category 2 sensitive species under the DPIE Sensitive Species Data Policy, records cannot be published.

The current surveys identified 9 plants of *Genoplesium baueri* in one location, in the vicinity of the previous record. The area around the previous record was subject to limited investigation during surveys in order to avoid trampling any individuals of *Genoplesium baueri,* as they were located amongst dense sedge cover and beneath a layer of native shrubs. Targeted surveys within other areas identified as containing suitable habitat for the species (**Figure 2-2)** did not identify any additional populations of *Genoplesium baueri.*

The flowering individuals observed in the reference population and in the study area are shown in **Plate 4-9** and **Plate 4-10**.

Plate 4-9 *Genoplesium baueri* at a reference site in Davidson

Plate 4-10 *Genoplesium baueri* within the study area

4.2.3 *Grevillea caleyi* (Caley's Grevillea)

Grevillea caleyi (Caley's Grevillea) is listed as Critically Endangered under the BC and EPBC Acts. This species is a medium to tall shrub growing to a height and width of 4 metres, flowering from late winter to spring. The species has a restricted range, occurring only within an approximately 8 kilometres square area around Terrey Hills (DPIE (EES), 2020). Habitat for the species consists of ridgetops between 170 and 240 metres asl, in association with laterite soils and with a canopy dominated by *Eucalyptus sieberi* and *Corymbia gummifera* (DPIE (EES), 2020). The species is commonly found within Duffys Forest TEC.

There are 49 previous records of *Grevillea caleyi* located within the study area, dating from 1930 to 2016. The records include 1247 individuals, with counts at each record ranging from one to 1000 individuals. All records are located in the north-west and west of the study area; as *Grevillea caleyi* is a category 3 sensitive species under the DPIE Sensitive Species Data Policy, records cannot be published.

The current surveys did not identify any additional plants of *Grevillea caleyi;* limited surveys were undertaken in areas of Duffys Forest in the north-west of the study area, as areas to the west of Forest Way have already been subject to numerous targeted surveys for the species, and some areas to the east of Forest Way had limited access.

4.2.4 *Persoonia hirsuta* (Hairy Geebung)

Persoonia hirsuta (Hairy Geebung) is listed as Endangered under the BC and EPBC Acts. This species is a spreading shrub growing to a height of 1.5 metres with yellow flowers and long coarse hairs on the flowers and branchlets and short stiff hairs on the leaves (DPIE (EES), 2020). The species has a scattered distribution around Sydney, and grows in sandy soils in dry open forest, woodland and heath on sandstone. *Persoonia hirsuta* usually occurs as isolated individuals or small populations (DPIE (EES), 2020).

There are 23 previous records of *Persoonia hirsuta* located within the study area, dating from 2001 to 2007. The records do not include counts for individuals and are therefore assumed to comprise 23 individuals. All records are located in the east of the study area; as *Persoonia hirsuta* is a category 3 sensitive species under the DPIE Sensitive Species Data Policy, records cannot be published.

The current surveys did not identify any additional plants of *Persoonia hirsuta;* limited targeted surveys were undertaken, given the large area of potential habitat present, and access was limited in some areas of potential habitat. Searches for *Persoonia hirsuta* in the vicinity of previous records, particularly in the south-east of the study area, did not relocate any individuals. It is noted that a large bike track has been constructed in the location of 14 of the previous records.

4.2.5 Pimelea curviflora var. *curviflora* (Curved Rice-flower)

Pimelea curviflora var. *curviflora* is listed as Vulnerable under the BC and EPBC Acts. This species is a branching subshrub 20 to 120 centimetres in height, flowering October to May (DPIE (EES), 2020), The species' range is limited to the coastal area of the Sydney and Illawarra regions, where it grows in shaley/lateritic soils over sandstone on ridgetops and upper slopes (DPIE, 2021e). The species is inconspicuous, often growing amongst dense grasses and sedges, and can survive without foliage for some time following fires (DPIE (EES), 2020).

There are 12 previous records of *Pimelea curviflora* var. *curviflora* located within the study area, dating from 2001 to 2017. The records comprise 16 individuals, with counts at each record ranging from one to three individuals. Almost all of the records are located in the south-east of the study area, except for one in the north-west.

The current surveys identified seven plants of *Pimelea curviflora* var. *curviflora* in three locations, all of which are in the south-east of the study area, although not in the immediate vicinity of previous records. All records of the species collected during the current survey are located within PCT 1783.

Photographs of *Pimelea curviflora* var. *curviflora* in the study area are shown in **Plate 4-11** and **Plate 4-12.**

Plate 4-11 Flowering individual of *Pimelea curviflora* var. *curviflora* in the study area

Plate 4-12 Non-flowering individual of *Pimelea curviflora* var. *curviflora* in the study area

4.2.6 Tetratheca glandulosa (Glandular Pink-bell)

Tetratheca glandulosa is listed as Vulnerable under the BC Act and is not listed under the EPBC Act. This species is a small, spreading shrub, growing 20 to 50 centimetres in height, flowering from July to November (DPIE (EES), 2020). The species has a limited range across north and north-western Sydney, and occurs in shale-sandstone transition habitat, mostly on ridgetops and upper slopes. This species is inconspicuous, particularly when not in flower, and it often becomes entwined among other small shrubs, sedges and grasses (DPIE (EES), 2020).

There are 98 previous records of *Tetratheca glandulosa* located within the study area, dating from 1953 to 2019. The records comprise 370 individuals, with counts at each record ranging from one to 186 individuals. The records are located across the study area, with the most individuals recorded in the south-east of the study area where there have been more intensive targeted surveys for this species.

The current surveys identified 18 plants of *Tetratheca glandulosa* in four locations, three of which are in the immediate vicinity of previous records. Targeted surveys were limited, as when surveys commenced in November 2020 it was observed that the species' flowering period appeared to have concluded. Photographs of *Tetratheca glandulosa* in the study area are shown in **Plate 4-13** and **Plate 4-14**.

Plate 4-13 Non-flowering individual of *Tetratheca glandulosa* in the study area

Plate 4-14 Late flowering individual of *Tetratheca glandulosa* in the study area (November 2020)

5 FAUNA RESULTS

5.1 Overview

There were 112 fauna species recorded during the period of the project, with 19 of these listed under state or Commonwealth legislation (a full list of previously recorded species is provided as Appendix F). A fauna species list is provided as Appendix H, showing all fauna species recorded during current surveys. Photographs of a selection of common and threatened species from automated cameras deployed across the study area are shown in Appendix D. Fauna survey findings are summarised in **Table 5-1**. Fauna habitats are detailed in Section 5.2. Key threatened fauna species are discussed in more detail in Section 5.3.

Camera traps recorded the occurrence and behaviour of many common species, and two threatened species (Eastern Pygmy Possum and Rosenberg's Goanna). Example photographs of commonly recorded species from automated cameras are shown in Appendix D, and included birds, mammals and reptiles. Audiomoths, deployed to detect Koala vocalisations did not detect Koalas and Koala scat was not detected during SAT surveys. A Koala was recorded by a member of the public during the survey period in December 2020 (**Table 5-1)**.

Table 5-1 Summary of fauna species recorded during current surveys (full list of fauna species can be found in Appendix H)

Taxa	Number of records	Threatened/migratory species recorded (further information in Section 5.3)
Birds	66	**Vulnerable under the BC Act:** Powerful Owl (*Ninox strenua*), Glossy Black-Cockatoo (*Calyptorhynchus lathami*) Little Eagle (*Hieraaetus morphnoides*) **Vulnerable and Migratory under the EPBC Act**: White-Throated Needletail (*Hirundapus caudacutus*) **Migratory under the EPBC Act**: Leaden Flycatcher (*Myiagra rubecula*), Rufous Fantail (*Rhipidura rufifrons*)
Non-flying Mammals	14 (3 introduced – Dog, Fox and Black Rat), plus Koala record	**Vulnerable under the BC Act:** Eastern Pygmy-possum (*Cercartetus nanus*) **Endangered under the BC and EPBC Acts:** *Southern Brown Bandicoot (Isoodon obesulus*) (possible) **Vulnerable under the BC Act and Endangered under the EPBC Act:** *Spotted-tailed Quoll (Dasyurus maculatus)* **Vulnerable under the BC Act and Endangered under the EPBC Act:** *Koala (Phascolarctos cinereus*) was located just outside of the study December 2020 by a member of the public (**Figure 5-1**)
Bats	15	**Vulnerable under the BC and EPBC Acts:** Grey-headed Flying-fox (*Pteropus poliocephalus)* **Vulnerable under the BC Act:** Little Bent-winged Bat **(***Miniopterus australis***),** Large Bent-winged Bat **(***Miniopterus orianae oceanensis)***,** Eastern Coastal Free-tailed Bat **(***Micronomus norfolkensis)*, Yellow-bellied Sheath-tail Bat (*Saccolaimus flaviventris***),** Greater Broad-nosed Bat **(***Scoteanax rueppellii)***,** Southern Myotis (*Myotis macropus)*
Reptiles	9	**Vulnerable under the BC Act:** Rosenberg's Goanna (*Varanus rosenbergi*)
Amphibians	8	**Vulnerable under the EPBC and BC Acts:** Giant Burrowing Frog (*Heleioporus australiacus)* **Vulnerable under the BC Act:** Red-crowned Toadlet (*Pseudophryne australis*)
Total	**112**	

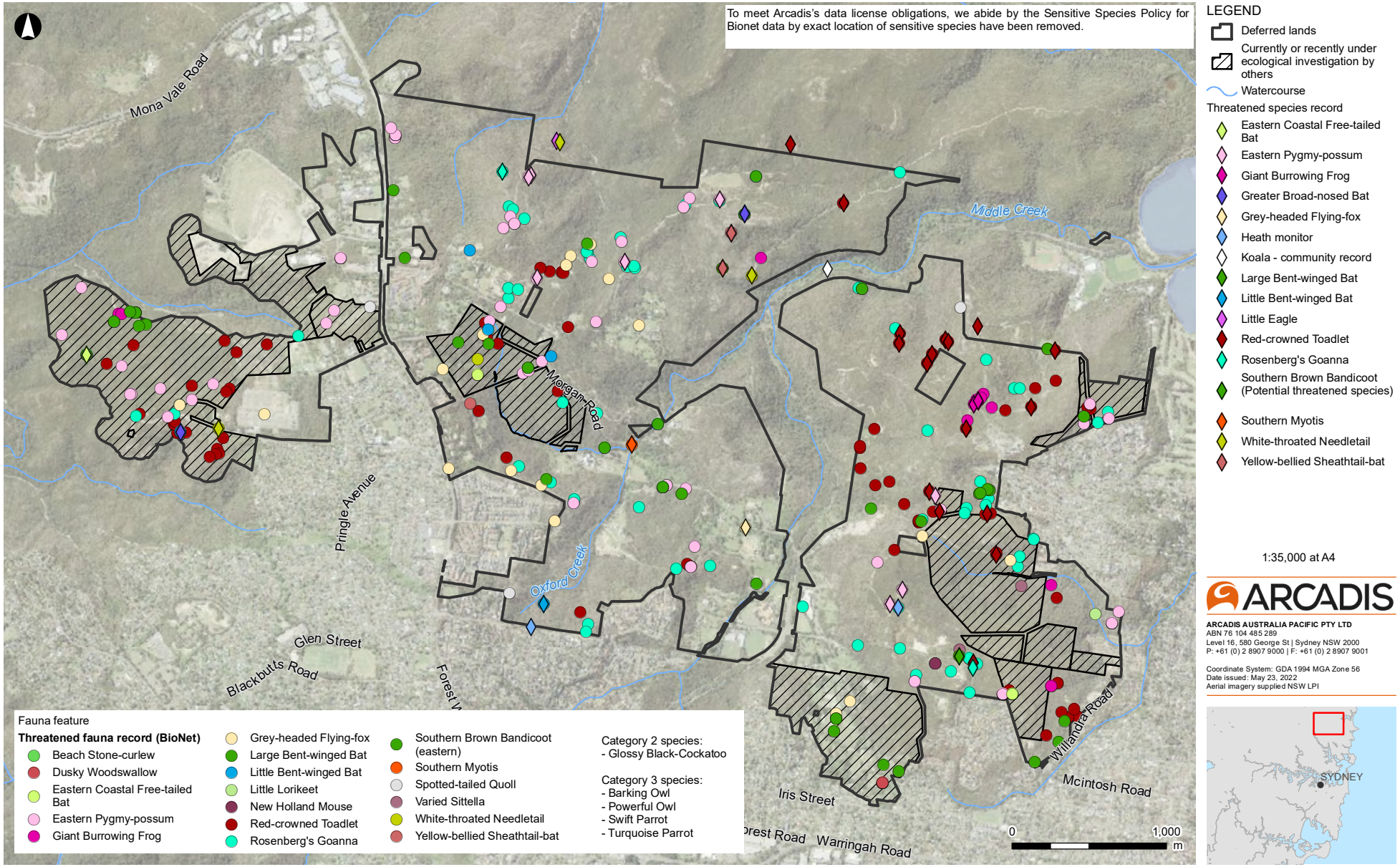

Figure 5-1b: Threatend fauna

5.2 Fauna habitat

5.2.1 Overview

For Stage 1 of this project, the PCTs mapped in the study area were classified into five fauna habitats (**Table 5-2**). These units are grouped based on geology, vegetation structure and likely resources for fauna. These habitats were ground-truthed at 77 habitat assessment points throughout the study area (**Figure 2-3**). Data collected at these points largely confirmed the accuracy of this stratification. This mapping is shown in **Figure 5-2**. The majority of the deferred lands area is one of three stratification units: Heath, Ridgetop Woodland or Riparian Forest.

A previous detailed study of the fauna of the area *Threatened Fauna of the Narrabeen Lagoon Catchment: Surveys and Status of Threatened Species* (Kavanagh *et. al.,* 2015), provided a similar breakdown of habitats, based on previous vegetation mapping of the area (Native Vegetation of the Sydney Metropolitan Area) (OEH, 2013 in Kavanagh *et. al.,* 2015). The area covered in Kavanagh *et. Al.* (2015) included additional areas to the north of the deferred lands (**Table 5-2**).

Most species that were recorded during current surveys are not listed as threatened under any legislation but are part of an intact ecosystem for that particular habitat (Appendix H).

Table 5-2: Proposed fauna habitat stratification units (from Stage 1 report) and corresponding habitat in previous fauna study that includes much of the deferred lands area (Kavanagh *et. Al.,* 2015)

Fauna stratification unit	Area (ha) within the deferred lands	Percentage (%) within the deferred lands	Corresponding habitat types in Kavanagh et al., (2015)	Area (ha) (Kavanagh et. Al., 2015) (%)
Freshwater Wetlands	0.13	0.01%	Freshwater Wetlands	5.6 (0.4%)
Heath	376.53	27%	Wet Heath and Heathlands	382.5 (27.5%)
Rainforest	0.92	0.1%	Rainforest	5.5 (0.5%)
Ridgetop Woodland	425.04	30%	Dry Sclerophyll Forests	741.1 (54%)
Riparian Forest	330.49	24%	Wet Sclerophyll Forests and Forested Wetlands	127.8 (9%)
Cleared areas	272.89	19%	Cleared areas	127.2 (9%)
Total	**1,406**	**100**		**1,390**

5.2.2 Microhabitat resources

Hollow-bearing trees

The scope of this project did not include identifying all HBTs for the deferred lands area, however as part of habitat assessment data collection, they were recorded, and areas with a higher than usual density of them (compared to other areas within the deferred lands) were recorded and are shown in **Figure 5-2**. These areas were often in proximity to streams of order three or above, in lower altitude parts of the study area. These locations are likely to provide breeding habitat for threatened species such as Glossy Black-Cockatoos, owls and microbats. Areas with high densities of HBTs are shown in **Figure 5-2,** however this was not a comprehensive survey of HBTs, so it is important to note that there would likely be many others throughout the study area.

Three areas with high numbers of HBTs are (**Figure 5-2**):

- The northern edge of the deferred lands, where it meets Garigal National Park;
- Oxford Creek, Middle and Wheeler Creeks;
- Patches throughout the mapped Riparian Forest areas.

Microbat roosting caves

Caves with suitable roosting sites for microbats, especially honeycombing, were found throughout the study area and a subset that were accessible within the time available, were mapped (**Figure 5-2**). Areas in the centre of the deferred lands, which are quite rugged and dominated by a number of ridgelines had substantial suitable habitat. **Plate 5-1** shows examples of this honeycombing that provides good habitat for roosting microbats, including threatened species.

Plate 5-1 Honeycombing in rock outcrops – potential microbat roost habitat

Surveys only sampled accessible habitat; there would likely be many more areas with this type of suitable habitat within the more inaccessible areas of the deferred lands, particularly in the central parts. A post survey desktop exercise identified further potential roosting locations, these require further ground-truthing as aerial mapping does not necessarily identify good habitat. Due to access, budget and time constraints, not all potential areas could be accessed. Recommendations on further investigations are provided in Section 7.4.2.

Nest boxes

Seven records of occupation by Eastern Pygmy Possums were made in six nest boxes during the three checking events (April – June) and one additional box was occupied by one Brown Antechinus (*Antechinus stuartii*) on two occasions (**Plate 5-2**). Nesting material consistent with both of these species was also found in a further 17 nest boxes. This material was mainly indicative of Eastern Pygmy Possum.

Plate 5-2 Brown Antechinus and Eastern Pygmy Possum located in nest boxes

Other habitat features

Waterways within the study area were recently mapped by BMT (2020) as shown in **Figure 5-2**. Waterways of varying Strahler stream orders (and therefore sizes), from large creeks to drainage lines and soaks permeate the study area and provide riparian and wetland habitat.

Termite mounds (both arboreal and terrestrial), soaks, diggings and other features associated with areas of good quality fauna habitat, and with a variety of resources were also found throughout the study area but are too numerous to map. Many termite mounds had evidence of goanna digging, suggesting use by monitor lizards for nesting, this could include the threatened Rosenberg's Goanna (Kirshner, 2015). This species was observed during previous surveys (Kavanagh *et. al*., 2015) and the current surveys.

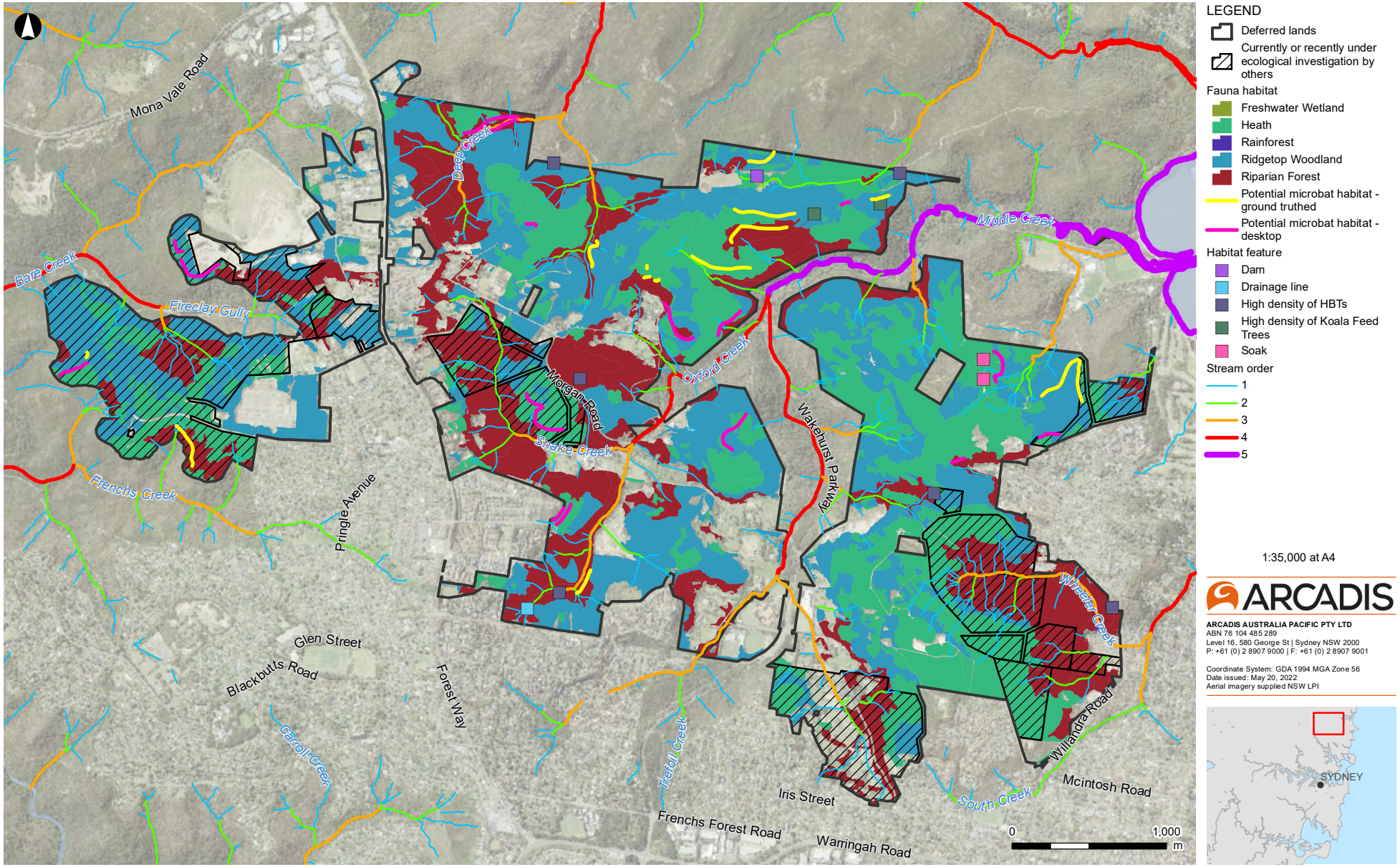

Figure 5-2: Fauna habitat

5.3 Threatened Fauna

5.3.1 Summary

In the Stage 1 report, Arcadis summarised the previous records within the deferred lands area and in the surrounding area since 1980, Arcadis also examined the habitat requirements and previous survey findings. In **Table 5-3**, the current threatened fauna survey findings are summarised and discussed in relation to previous records and findings. Thirty-four threatened fauna species were assessed including 21 listed as species credit species under the BAM (the method used for biodiversity assessment under the BC Act). The current survey confirmed 16 threatened species within the study area, with two additional possible records, both of which have previously been identified within the study area within the past 10 years. Three additional species occur just outside of the study area and may use it to forage (Black Bittern and Sooty & Barking Owls). Following this assessment of all recorded threatened fauna, key species are discussed in further detail in the following sections.

Table 5-3 Summary of previously recorded threatened species and current records (detailed habitat requirements for each of these species is provided in Appendix A)

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Species credit species? (BAM)	Number of records (BioNet) within the deferred lands area (year)*	Number of records (BioNet) within 10km (year)*	Located within the deferred lands area during current surveys?	Notes
Barking Owl	*Ninox connivens*	V	-	Yes	1 (2017)	64 (2019)	No	This species has recently been recorded within forested habitats of the Manly Lagoon foreshore, located approximately 0.5km from the eastern edge of the study area. They have also been recorded breeding at Jamieson Park in recent years, approximately 2.5km from the deferred lands. Last recorded on eBird in July 2020.
Beach Stone-curlew	*Esacus magnirostris*	CE	-		1 (1985)	2 (2013)	No	Limited habitat and not located during recent previous surveys. If it occurs, the deferred lands are rarely used.
Black Bittern	*Ixobrychus flavicollis*	V	-	-	None	44 (2019)	No	Kavanagh (et al 2015) located this species several times, mostly around the Middle Creek area, where it feeds into Narrabeen Lagoon. Habitat for this species within the study area is likely to be confined to riparian forest in proximity to Narrabeen Lagoon.
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	-	-	5 (1984)	26 (2012)	No	This species has not been detected in the study area since 1984, although more recent records are available for surrounding areas, in similar habitat.
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	V	-	-	6 (2021)	58 (2021)	Yes	We recorded the greatest number of passes for this species of any detected during surveys of the deferred lands area. Ninety passes were recorded at four sites across the study area. This species has not been recorded within the deferred lands area in 12 years, and such a significant number of passes (indicative of

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Species credit species? (BAM)	Number of records (BioNet) within the deferred lands area (year)*	Number of records (BioNet) within 10km (year)*	Located within the deferred lands area during current surveys?	Notes
								activity, not necessarily number of individuals), indicates that the population is well-established in the area. Previous surveys were concentrated in lower areas to the east. It is possible that the ridgetop and riparian woodland in the central and western parts of the deferred lands have a higher density of suitable tree hollows, where this species prefers to roost (DPIE, 2020).
Eastern Osprey	*Pandion cristatus*	V	-	Yes	None	73 (2020)	Not within study area, but found just outside	An established nest was located at the Sports Academy in Narrabeen (**Figure 5-2**), this has previously been reported (e.g Kavanagh et al., 2015). This is outside of the deferred lands area.
Eastern Pygmy-possum	*Cercartetus nanus*	V	-	Yes	77 (2021)	1,301 (2021)	Yes	There were 10 records of this species during the survey period, primarily in Heath or Heath/Woodland transition areas (**Figure 5-2**). Eastern Pygmy-possum were located by spotlighting surveys and in nest boxes. Results from this survey confirm that this is an important area for this species, as previously reported, and reflected in the large number of records for both the study area and surrounds. This was first detected during survey in 2011 for Kavanagh et. al, (2015), prior to this survey there were few records for this species within the Narrabeen Catchment.
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V	E	Yes	None	95 (2016)	No	Although habitat exists for this species within the study area, there are no previous records, although many just outside the study area.

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Species credit species? (BAM)	Number of records (BioNet) within the deferred lands area (year)*	Number of records (BioNet) within 10km (year)*	Located within the deferred lands area during current surveys?	Notes
Giant Burrowing Frog	*Heleioporus australiacus*	V	V	Yes	14 (2021)	78 (2021)	Yes	Suitable habitat not as plentiful as surrounding areas, or as expected, however there are three known breeding sites within the deferred lands area.
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	V	-	Yes	28 (2021)	284 (2021)	Yes	Several sightings and numerous signs of foraging throughout the study area. Important area for this species.
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V	-	-	3 (2021)	31 (2021)	Yes	Calls were recorded with certainty at three locations for this species: Moon Rock (2 locations) and Ralston Ave (South Gully). Thirteen passes were recorded at Moon Rock, whereas only one was confirmed at Ralston Ave. This adds to data previously collected for this species, with just two records in Middle Creek and Deep Creek in 2011-2013 (Kavanagh et. al, 2015). Roosts are in HBTs, including very large, old trees for maternity roosts (Law unpublished data in Kavanagh et. al, (2015).
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	Yes	27 (2021)	2,054 (2021)	Yes	Located foraging just west of Wakehurst Parkway during surveys, also seen flying overhead at dusk during most spotlighting surveys. Forages throughout the deferred lands area. The closest camp is at Warriewood Wetlands where an estimate of camp size in August 2019 was 500-2,4999.
Koala	*Phascolarctos cinereus*	V	E	Yes	None	143 (2021)	No (but located nearby by community member, see	SAT surveys and Audiomoth detection did not locate this species during current surveys, however this species was located during the survey period. A member of the public reported a

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Species credit species? (BAM)	Number of records (BioNet) within the deferred lands area (year)*	Number of records (BioNet) within 10km (year)*	Located within the deferred lands area during current surveys?	Notes
							further information on this species)	sighting to Council along Wakehurst Parkway (**Figure 5-1**), just outside of the study area in December 2020.
Large Bent-wing Bat (formerly the Eastern Bentwing-bat)	*Miniopterus orianae oceanensis*	V	-	Yes	37 (2021)	514 (2021)	Yes	Thirty-four passes for this species were detected at three sites, showing high activity for this species, especially in the central and western parts of the study area. This supplements previous survey results, showing a lot of activity for this species, especially at Middle and Deep Creeks (Kavanagh et. al. (2015). No roost sites were confirmed to occur within the study area, this may mean that they are cryptic and in inaccessible parts of the deferred lands, or that this species roosts in nearby areas (e.g known roost at St Michaels cave at Avalon), and forages across the study area.
Large-eared Pied Bat	*Chalinolobus dwyeri*	V	V	Yes	None	33 (2021)	Possible call (1 pass) See section 5.3.6)	Detected by Kavanagh et. al, (2015) in open, forested sections of Middle Creek and on the foreshore of Narrabeen Lagoon. Potential roost sites were located throughout the study area but no animals were found within these areas.
Little Bent-wing Bat	*Miniopterus australis*	V	-	Yes	10 (2021)	193 (2021)	Yes	Recordings of this species were made at four sites within the study area, particularly in the western and central parts of the deferred lands (Appendix H shows details of number of passes and locations). The current study increases the range of this species across the deferred lands area, with previous surveys reported in Kavanagh et. al (2015) showing it mostly confined to creek lines, especially Middle Creek.

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Species credit species? (BAM)	Number of records (BioNet) within the deferred lands area (year)*	Number of records (BioNet) within 10km (year)*	Located within the deferred lands area during current surveys?	Notes
Little Eagle	*Hieraaetus morphnoides*	V	-	Yes	None	31 (2020)	Yes	Recorded flying overhead in the north-eastern part of the study area. Has been recorded previously by Kavanagh et al, (2015) but the location was not within the report. There is potential for it to be nesting within this area but no nests were found during surveys.
Little Lorikeet	*Glossopsitta pusilla*	V	-	-	1 (2011)	68 (2021)	No	This species was located within the deferred lands area by Kavanagh et al in 2011 (reported in their 2015 report). This species is generally considered to be nomadic, with movements associated with localised flowering of preferred feed trees. For the deferred lands area this is likely to be a response to flowering events of Smooth-barked Apple (*Angophora costata*) and Red Bloodwood (*Corymbia gummifera*) (DPIE, 2019).
Masked Owl	*Tyto novaehollandiae*	V	-	Yes	None	18 (2020)	No	There have been unofficial reports of the occurrence of this species, including potential occurrence of breeding habitat. However, neither this study nor previous studies within the deferred lands (Kavanagh et al., 2015) were able to confirm its presence.
New Holland Mouse	*Pseudomys novaehollandiae*	-	V	-	1 (2017)	14 (2020)	No	None observed and no evidence found from hair tube or camera traps. Kavanagh et. al (2015) also did not locate this species. Recently recorded in the western part of the study area (**Figure 5-1**), and adjacent areas have more records. May occasionally utilise the study area, but is small, cryptic, rare and difficult to record.

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Species credit species? (BAM)	Number of records (BioNet) within the deferred lands area (year)*	Number of records (BioNet) within 10km (year)*	Located within the deferred lands area during current surveys?	Notes
Powerful Owl	*Ninox strenua*	V	-	Yes	39 (2021)	2,247 (2021)	Yes	Kavanagh et. al (2015) identified up to seven pairs within the deferred lands area in 2012/13. Current surveys confirmed the persistence of this species (recorded at three locations, by call and observation), particularly in the central part of the deferred lands, along Middle and Oxford Creeks. Numerous records of this species occur across the Sydney area.
Red-crowned Toadlet	*Pseudophryne australis*	V	-	Yes	86 (2021)	720 (2021)	Yes	Multiple records of this species were found in Spring/Summer surveys. They were concentrated in the north-eastern portion of the study area, with fewer than expected records in the west and central areas.
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	Yes	None	55 (2021)	No	Strongly associated with the western slopes of the Great Dividing Range, their populations have crashed and their distribution contracted significantly. Occasional records during prolific local flowering events of eucalypts and mistletoes.
Rosenberg's Goanna (known also as Heath Monitor)	*Varanus rosenbergi*	V	-	-	63 (2021)	21 (2021)	Yes	This species was located throughout the study area, particularly in Ridgetop woodland. As well as live sightings/camera recordings, evidence of nesting holes in termite mounds were also found, especially in February/March. The Lace Monitor (*Varanus varius*) which also occurs in the area will also utilise termite mounds for nesting (Kirshner, 2015).
Sooty Owl	*Tyto tenebricosa*			Yes	2 (2012)	None	No	This species was located for the first time in the Narrabeen Catchment in 2011-2013 as part of

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Species credit species? (BAM)	Number of records (BioNet) within the deferred lands area (year)*	Number of records (BioNet) within 10km (year)*	Located within the deferred lands area during current surveys?	Notes
								surveys for Kavanagh et. al., 2015. It has not had any confirmed reports since.
Southern Brown Bandicoot (eastern)	*Isoodon obesulus obesulus*	E	E	-	13 (2020)	386 (2020)	No.	This species is likely to occur but is difficult to detect in areas of low density.
Southern Myotis (formerly the Large-footed Myotis)	*Myotis macropus*	V	-	Yes	2 (2021)	119 (2021)	Yes	This species was observed foraging along Middle Creek, within and to the north-east of the study area.
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	-	3 (2018)	42 (2018)	Yes	This species was confirmed during current surveys, via a scat sample. This species was not detected on cameras or during spotlighting and was not located during Kavanagh et al (2015) surveys. The scat was located in the Red Hill/Wheeler creek area (**Figure 5-1**). Additional records from 2018 have been added to BioNet within and immediately adjacent to the deferred lands area since the last version of this report.
Square-tailed Kite	*Lophoictinia isura*	V	-	Yes	1 (2021)	41 (2021)	No	Habitat for this species (especially timbered watercourses) does occur within the study area, but it has not been recorded, despite recent records in adjacent areas.
Swift Parrot	*Lathamus discolor*	E	CE	Yes	1 (2009)	55 (2020)	No	Records are relatively scarce, but regular for this species in surrounding areas. Was not detected during these surveys or by Kavanagh et. al (2015). The current surveys were outside ideal timing for this species, which is generally

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Species credit species? (BAM)	Number of records (BioNet) within the deferred lands area (year)*	Number of records (BioNet) within 10km (year)*	Located within the deferred lands area during current surveys?	Notes
								Autumn-Winter, when it migrates north to the mainland from Tasmania, and can be found following foraging resources around south-eastern Australia (DPIE, 2021).
Turquoise Parrot	*Neophema pulchella*	V	-	-	1 (2017)	4 (2017)	No	Infrequently recorded within the deferred lands and surrounding areas. Prefers more open grasslands, although may use heath habitat.
Varied Sittella	*Daphoenositta chrysoptera*	V		-	2 (2011)	32 (2020)	No	This species was located during previous surveys (Kavanagh et. al., 2015), but not during the current surveys.
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V	-	Yes	None	152 (2020)	No	There is little habitat for this species within the deferred lands area, likely to be a fly over only.
White-throated Needletail	*Hirundapus caudacutus*	-	V	-	3 (2021)	146 (2021)	Yes	Several observed flying above ridgetops in western part of the study area, near Ralston Avenue.
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	-	3 (2021)	12 (2021)	Yes	Two confirmed acoustic recordings of this species, within the central part of the study area.

V = Vulnerable, E = Endangered, EP= Endangered Population, CE= Critically Endangered.

5.3.2 Eastern Pygmy-possum

As per the records reported in **Table 5-3**, this species was relatively regularly recorded throughout the Heath and Ridgetop Woodland parts of the deferred lands area. Eastern Pygmy-possum was recorded within nest boxes and during spotlighting, especially during April & May 2021, when females are most likely to be nesting and rearing young. With more than 1,000 records within 10km of the deferred lands area, heath habitats of the northern beaches are considered to be important for this species, given that in other parts of its range it is relatively rarely recorded (NSW Scientific Committee, 2001). One of the camera traps also recorded this species foraging in the *Banksia ericifolia*, an important food source for this species in the area (Appendix D).

5.3.3 Koala

As discussed in the Stage 1 report and in Kavanagh et. al., (2015) there is abundant habitat for the Koala within the deferred land areas, but there are no records of this species since 1980. During the survey period (December 2020), a member of the public reported a Koala on Wakehurst Parkway, just outside the study area (**Figure 5-1**). It seems likely that this individual would utilise the study area, given its proximity and suitable habitat. However, if Koalas occur, they are likely to be utilsing the deferred lands as transitory areas rather than resident, breeding areas. Regular, if still rare records from nearby West Head to the north-east of the study area, and further west suggest that the greater area is still used by Koalas, although population numbers appear to be low.

5.3.4 Spotted-tailed Quoll

The Spotted-tailed Quoll (*Dasyurus maculatus maculatus*) is known from the area with 42 recordings since 1980 within the deferred lands area. Current surveys detected the presence of the species on the eastern edge of the study area, in Cromer (**Figure 5-1**). Identification was through the collection of scat material and confirmed by Georgeanna Storey from Scats About. Spotted-tail Quolls were not detected on remote cameras despite specifically targeting this species. This species was not detected during previous detailed fauna surveys of the Narrabeen Lagoon Catchment, that included the study area (Kavanagh et. al., 2015). Since the previous version of this report (December 2021) two additional relevant records have been added to the BioNet database, in proximity of our record (**Figure 5-1).** One is within the deferred lands area, and one is just outside of the deferred lands area. Both are in proximity to our scat record and are noted to have been confirmed as Spotted-tailed Quoll by fauna forensics expert Barbara Triggs.

5.3.5 Glossy Black-cockatoo

Glossy Black-cockatoos were seen and heard during current surveys and numerous signs of foraging (chewed casuarina cones) were found throughout the study area (**Figure 5-1**). The species was found in numerous locations across the deferred lands area, associated with Ridgetop and Riparian woodland, particularly where *Allocasuarina* species occur (e.g Scrub She Oak (*Allocasuarina distyla*)). Birds were located on the Hilversum Track in the western portion of the study area, as well as to the east in the Cromer and Red Hill areas. Foraging and nesting resources are plentiful for this species in the deferred lands area and as such it was the most commonly recorded threatened bird species. However, it is vulnerable to land clearing, given its unique foraging requirements and that it is an obligate hollow nesting species, relying on HBTs which take more than 100 years to replace once cleared. The deferred lands are an important location for this species due to habitat clearing in other areas, resulting in local extinctions and range contractions (Australian Museum, 2020).

5.3.6 Bats

Threatened microbat species

Six threatened microbat species (all listed as Vulnerable under the BC Act) were detected within the deferred lands area during current surveys:

- Little Bent-wing Bat (*Miniopterus australis*);
- Large Bent-wing Bat (Miniopterus orianae oceanensis);
- Greater Broad-nosed Bat (*Scoteanax rueppellii);*
- Yellow-bellied Sheath-tail Bat (*Saccolaimus flaviventris);*
- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis);*
- Southern Myotis (*Myotis macropus*).

There was one possible call for the Large-eared Pied Bat (*Chalinolobus dwyeri*), which is listed under the EPBC and BC Acts, but it was not confirmed as occurring. This species has been recently detected in similar habitat, in nearby areas and caves with suitable habitat for roosting located within the deferred lands area (**Figure 5-2**). It is also considered likely to utilise the riparian areas of the study area, particularly Middle and Oxford Creeks. This species was detected at Middle Creek around 2012 (Kavanagh et. al., 2015). Details on echolocation call passes and analysis can be found in Appendix J.

The current study detected high activity for Little Bent-wing Bat, Large Bent-wing Bat and Eastern Coastal Free-tailed Bat, suggesting that suitable roosting habitat supports a local population of these species. Female Little Bent-wing and Large Bent-wing Bats utilise colonial maternal roost sites, which are unlikely to occur within the study area. This recording of activity, over a relatively short period, is a significant find for the area for these species in the Greater Sydney area.

Grey-headed Flying-fox

This species is commonly located within the study area and surrounds. Foraging habitat is abundant, although no camps are known within the deferred lands, with the nearest camps at Warriewood and Gordon. Foraging resources within the study area consists of flowering eucalypts including *Corymbia* sp., *Banksia* and rainforest tree species

5.3.7 Owls

Powerful Owls were located by call, sight and sign during the survey, particularly through the central part of the study area, along Middle and Oxford Creeks. Previous studies have shown there are seven territories for this species within the Narrabeen Lagoon Catchment (Kavanagh et. al 2015), which includes most of the deferred lands area. Arcadis was unable to identify individual territories for pairs of this species, but records show that this species is persisting, especially within riparian forest areas. This is consistent with findings from the Powerful Owl Project run by Birdlife Australia which co-ordinates surveys by trained members of the public to detect this species. Powerful Owls are returning to peri urban environments within the Sydney region, with 212 pairs currently being monitored in the Greater Sydney region (Birdlife Australia www.birdlife.org.au).

We did not detect any other threatened owls, despite call play-back in numerous locations for Barking Owl (*Ninox connivens*), Sooty Owl (*Tyto tenebricosa*) and Masked Owl (*Tyto novaehollandiae*).

Two territories for Barking Owls and one for Sooty Owls have previously been identified (Kavanagh et. al, 2015). It is possible that these species are still present, but that they were not active or responsive at the locations and times surveyed. Spotlighting and call play-back sample only a very small area, during a short space of time. For more detailed information on owls, their territories and breeding areas within the deferred lands, the use of passive recorders over a long period of time (e.g., Audiomoth devices) and the use of a targeted recogniser for analysis of calls, including the calls of chicks (if possible) should be deployed in areas of suitable habitat during breeding and nesting periods. This allows recording of calls to be done all night over several weeks and quickly identified.

If reports of breeding habitat for Masked Owl in the south-eastern part of the deferred lands are confirmed in future, this would present an important opportunity for the protection of the species in the locality.

5.3.8 Amphibians

Giant Burrowing Frog (*Heleioporus australiacus)* tadpoles were observed on three separate survey events at two locations, within the Cromer part of the study area, to the east and near to Oxford Creek in the centre (**Figure 5-1**).

Red-crowned Toadlet (*Pseudophryne australis*) were recorded at many locations across the study area, with tadpoles and calling adults detected. This species is rare in many parts of their range but are well documented within favourable conditions within the study area in previous reports (e.g., Kavanagh et. al., 2015).

5.3.9 Threatened fauna just outside the study area

A number of records of threatened fauna species occur just outside the study area, but it is likely that the species utilises the study area for foraging at least. Two of these species in particular have been recorded on the edge of Wakehurst Parkway, to the north-east of the study area; Sooty Owl (*Tyto tenebricosa*) and Black Bittern (*Ixobrychus flavicollis*). There are numerous records of Black Bittern in and around Narrabeen Lagoon, including on Middle Creek. Further information on the occurrence of both of these species is provided in GHD (2018). The Barking Owl (*Ninox connivens*) is known from nearby Jamieson Park (about 3 kilometres to the east of the study area) and is likely a resident in that area and may utilise the study area for foraging (Kavanagh et. al. 2015).

6 CONSERVATION VALUE OF THE DEFERRED LANDS

6.1 Introduction

The relative conservation value of areas of land can assist in land use planning for an area. This was discussed in detail for the deferred lands in the Stage 1 report. The criteria to determine conservation significance were developed from this discussion and consist of five criteria:

- Threatened species habitat (extent and quality);
- TECs (extent and quality);
- Proximity to protected bushland;
- Wildlife corridors;
- Riparian land/water sustainability.

For the process of defining these criteria, and the references used, refer to the Stage 1 report (Arcadis, 2021).

6.2 Classification

The aim of the mapping and classification of conservation value for the deferred lands was to translate the priorities determined from the desktop review, into a spatial representation of conservation value across the study area. The following “traffic light” system consisting of four levels of conservation significance was used:

- Green – low conservation significance;
- Orange – moderate conservation significance;
- Red – high conservation significance;
- Purple – very high conservation significance.

Levels of conservation significance were classified according to the factors detailed **in Table 6-1.** The conservation value was determined by combining these variables, with the higher conservation ranking taking precedence (for example if an area was classified as red because it was mapped as a PCT but not a TEC, however had a high number of threatened species records, which classified it as purple, then it was mapped as purple (very high conservation value).

Table 6-1 Conservation value classification for the deferred lands

Conservation value classification	Green (low)	Orange (moderate)	Red (high)	Purple (very high)
Variable				
Threatened Species Records	No recent records	Flora or fauna only	Flora and fauna, multiple recent ones of both	Large number of recent for both
TEC	Urban areas, housing, roads	Green spaces, but not classified as a PCT	PCTs that are not TECs	All TECs
Proximity to protected bushland	Not applicable	Buffer of 50 metres around cleared areas, usually disturbed native vegetation	Not applicable	Adjacent to national park– buffer of 100 metre
Wildlife corridors	None	None	Areas of habitat connecting larger patches (at least	Not used for this classification

Conservation value classification	Green (low)	Orange (moderate)	Red (high)	Purple (very high)
			3.5 hectares) that are not already mapped as red or purple	
Riparian Land	None	None	Stream orders 1-2 plus 30 metre buffer	Stream orders 3-5 plus 50 metre buffer

The composite map of these conservation criteria is provided as **Figure 6-1**. The majority of the deferred lands area is mapped as red (high conservation significance), with a further 15% mapped as purple (very high conservation). Around 15% is green (low ecological value) and 17% is considered to be orange (moderate value) (**Table 6-2**).

Table 6-2 Summary of conservation significant areas mapped across the deferred lands area

Category	Hectares	Percentage of the area %
Green – low conservation significance	242.40	17%
Orange – moderate conservation significance	221.6	16%
Red – high conservation significance	728.8	52%
Purple – very high conservation significance	213.1	15%
Total	**1406**	**100%**

Threatened species records and TECs for the study area are discussed in detail in Section 3, 4 & 5 of this report. Riparian land refers to areas adjacent to creeks and streams and its proximity to protected bushland provides a buffer to protected areas of significant habitat. Further detail and discussion is provided within the Stage 1 report. Wildlife corridors are more difficult to determine for the study area, since regional and LGA wide mapping shows much of the deferred lands area to be either core or supporting habitat for a wildlife corridor.

From a regional perspective, the entire deferred lands area is mapped as either priority or supporting habitat for a wildlife corridor (Tyrrell Studio 2017 & SMEC (020a) (shown in Figure 7 of Stage 1 Report). To refine these wildlife corridors at a study area level requires identification of tracts of vegetation that provide connection through the deferred lands area, from North to South and East to West. This habitat should ideally be native vegetation, a mosaic of PCTs, and as free from flight obstacles as possible. It also needs to connect to other areas of vegetation, not into cleared, suburban areas. It is considered that such refinement of any corridors within the deferred lands area is outside of the scope of this report, however any defined corridors within the deferred lands area should be maximised, during further strategic planning. Significant areas of corridor mapping are included as red or purple (at least high conservation significance in **Figure 6-1**).

Wildlife corridors should be consistent with *Sydney Green Grid: Spatial Framework and Project Opportunities. North District* (Tyrrell Studio (2017) and SMEC (2020a)). Any future corridors should be as wide as possible, and not less than 200 metres, further review is included in the Stage 1 report.

The largest constraint for regional corridors that include part of the deferred lands is connectivity outside of the study area to the south. This area is highly constrained due to development across the region (**Figure 6-1**).

6.3 Limitations

The conclusions of this report are based upon available data and field surveys and are therefore indicative of the environmental condition of the study area at the time of the survey. It should be recognised that conditions, including the presence of threatened species, could change with time. To

address this limitation, a precautionary approach has been used which aimed to identify the presence and suitability of habitat for threatened species.

Conservation value of the land has been determined using a combination of knowledge of the study area from surveys and desktop assessment and review of similar categorisation in the literature. However, it should be noted that this is Arcadis' ecological specialist team interpretation of the data and assessment and is currently in draft, requiring input from appropriate stakeholders before finalising.

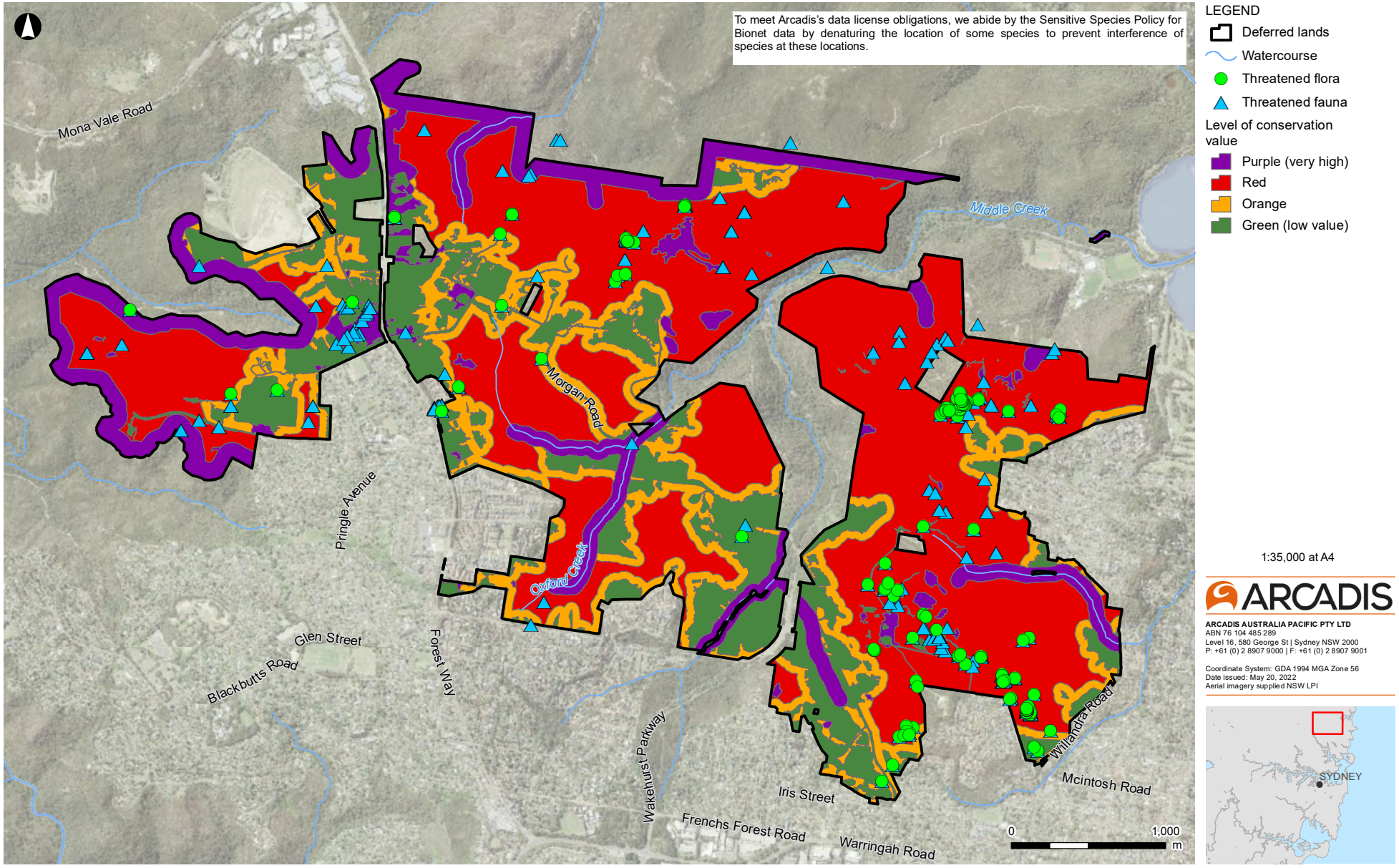

Figure 6-1: Conservation value of the deferred lands

7 DISCUSSION AND RECOMMENDATIONS

7.1 Flora

Sixteen PCTs were identified in the study area, based on regional mapping prepared by OEH (2016), in the desktop assessment undertaken for Stage 1 of this project. Data collected during ground truthing of the PCTs in the study area was used to determine that the regional mapping is mostly accurate, with some minor differences in mapped PCT boundaries and classifications. No additional PCTs were identified. Most of the vegetation within the study area is in good condition, with weed invasion limited to riparian corridors, previously disturbed areas and areas interfacing with urban development.

Review of the mapping of the two most widespread TECs in the study area, *Duffys Forest in the Sydney Basin Bioregion* and *Coastal Upland Swamp in the Sydney Basin Bioregion*, found some minor errors in the existing mapping. One of the patches of Duffys Forest mapped by OEH (2016) has been revised to PCT 1845, which also has a limited distribution and a high percent cleared value. The condition of patches of TEC in the study area is generally high, based on vegetation integrity scores as well as general observations.

Coastal Upland Swamp is known to have a dynamic distribution over time. Given the changes in boundaries of this TEC over time, a conservative approach to mapping its boundaries has been adopted for the current study. The areas of Coastal Upland Swamp TEC mapped by OEH (2016), represented by PCTs 1803 and 1804, have been reviewed with reference to the 1996 and 2000 aerial photographs, LIDAR data, orthomosaic data collected in drone surveys, information in other reports and data collected on site during ground truthing.

Threatened flora surveys conducted for the current survey were limited, and subsequently there are few additional threatened flora records. The most intensive targeted surveys were conducted for the endangered orchid species *Genoplesium baueri,* however no additional populations were recorded. This species is highly cryptic, even when in flower, and it is possible that it is present in the study area given the large areas of potential habitat and proximity to existing populations. There are also large areas of potential habitat for other threatened flora species in the study area. Based on the distribution of existing records and habitat inspection it is considered likely that there are larger populations of *Tetratheca glandulosa* and *Pimelea curviflora* subsp. *curviflora* in the study area, particularly on upper slopes.

A comparison of records of threatened flora and threatened fauna reflects the findings of the review of relevant reports, which indicates that threatened flora surveys have not been conducted to the same level as threatened fauna assessment. This may be partially attributable to the difficulty of conducting systematic surveys in the dense vegetation and rugged terrain that characterises the study area. Most records are located along the edges of existing tracks.

7.2 Fauna

Five habitat units were recognised as part of the desktop assessment in Stage 1 of this report and verified during habitat assessments throughout the deferred lands:

- Freshwater Wetlands;
- Heath;
- Rainforest;
- Ridgetop Woodland;
- Riparian Forest.

These units were similar to the seven developed for previous detailed fauna surveys that included the study area (Kavanagh et.al., 2015). These units were verified at 77 habitat assessment sites during the current fauna surveys.

Potential microbat roosting habitat was mapped within a limited number of places (**Figure 5-2**). Many of these caves corresponded to good microbat echolocation call activity, such as in and around

several large rock formations in the centre of the study area and to the west, adjacent to Ralston Avenue. No roosting bats were located, but the activity suggests that these areas may contain roosts. Microbat breeding habitat is particularly valuable, but difficult to confirm, further targeted work is recommended.

Good foraging habitat for Glossy Black-cockatoo was abundant throughout the study area, with potential breeding habitat (areas containing a high density of large hollows) mainly confined to riparian woodland, particularly around Deep, Middle and Wheeler Creeks (**Figure 5-2**). No nesting was confirmed for this species.

There were 112 fauna species recorded during the period of the project, with 16 of these listed under state or Commonwealth legislation. Most of these species have been recorded previously, however highlights from this survey include:

- Good activity for a number of threatened microbat species including Little Bent-wing Bat, Large Bent-wing Bat, East Coast Freetail-bat and Greater Broad-nosed Bat. Little Bent-wing Bat and Large Bent-wing Bat are species subject to Serious and Irreversible Impacts under the BC Act 2016, while Greater Broad-nosed Bat and East Coast Free-tail Bat have not been previously recorded or recorded rarely (respectively) for the deferred lands area;
- Many observations of Glossy Black-cockatoo, either flying overhead, in vegetation or calling. Evidence of foraging (chewed Allocasuarina cones) were also found throughout much of the study area;
- Positive identification of Spotted-tailed Quoll which has only rarely been recorded in the study area, and not since 2018. A scat confirmed to be from this species was found in proximity to a suburban area, on the eastern edge of the study area;
- Location of a Koala (by a community member) in between two parts of the deferred lands area along Wakehurst Parkway during the current surveys; given its proximity, it is likely that it is at least occasionally utilising the study area.

While Powerful Owl was recorded on several occasions in three locations, especially in the central part of the study area on Oxford and Middle Creeks, other owls previously recorded, were not detected. The absence of Masked Owl, Sooty Owl and Barking Owls is not surprising, since even when they have been recorded in the area, they are rare (Kavanagh *et. al.,* 2015). Critical habitat for Sooty and Masked Owls is similar to the requirements for Powerful Owl, but there is a need for conservation of larger, less disturbed tracts of vegetation and greater area and number of HBTs to allow the establishment of territories for these owl species (DEC, 2006). Barking Owls favour more open woodland, often on the edge of farmland or suburban areas. This species is regularly seen at nearby Warriewood Wetlands but may use more open parts of the study area.

7.3 Conservation value of deferred lands area

As a result of the desktop review (Stage 1 report summarises this process), the following conservation criteria were used to map the deferred lands into varying levels of conservation value:

- Threatened species habitat (extent and quality);
- TECs (extent and quality);
- Proximity to protected bushland;
- Wildlife corridors;
- Riparian land/water sustainability.

Much of the area is mapped as core or supporting habitat corridor habitat as part of the *Sydney Green Grid: Spatial Framework and Project Opportunities. North District* (TyrrellStudio, 2017 and SMEC (2020a). The deferred lands area is a critical component of regional corridor mapping.

The conservation values mapped across the study area are based on well-recognised criteria (threatened species records, riparian areas etc) (reviewed in the Stage 1 report), however there are limitations within each of these criteria. These limitations include;

a. the difficulty in controlling for survey effort in using threatened species records to determine habitat conservation value. That is there may be more records in areas that have been surveyed more, and well-survey areas are likely to be ones that are more easily accessed;

b. the level of conservation value assigned is open to interpretation. Even when the criteria are based on literature and targeted to the location, only a certain number of criteria can be used, and may not capture all relevant conservation values of the land.

In summary, the deferred lands area contains significant habitat for threatened flora and fauna and contains patches of national and state listed TECs, totalling over 30 hectares. It also provides a significant buffer to, and an extension of, suitable habitat from the protected Garigal National Park. In future planning for the area, these values must be retained to assist in protecting the biodiversity of the Northern Beaches LGA. Many of the areas of highest ecological value will likely be inaccessible for development, due to the steep and rugged nature of the area as well as bushfire risk. However, other areas also contain high or very high ecological values, especially along creeks and in areas with vegetation mapped as TECs. Areas mapped as low ecological value are generally already cleared, and mostly developed. Moderate ecological values consist primarily of buffers around urbanised locations that generally show moderate levels of disturbance and few threatened species records.

7.4 Recommendations

7.4.1 Flora

Threatened flora surveys were hindered by the dense shrub cover that characterises much of the vegetation of the study area. It is recommended that any future targeted surveys for threatened flora, particularly smaller cryptic species such as *Tetratheca glandulosa* and *Genoplesium baueri* are timed, where this is possible and seasonally appropriate, to follow hazard reduction burns and other fire events in the deferred lands. This disturbance gives threatened flora a chance to grow with lower competition from established species.

7.4.2 Fauna

Passive fauna vocalisation recorders, such as Audiomoth technology are relatively new and are currently constrained by the development and efficacy of recognisers for calls, since the detector records all sounds, and so the constraint of the technology is in sorting and recognising the data. In order to cover more areas, over a larger time period, this method was used to supplement the stand SAT surveys for Koalas, but Audiomoths were not deployed until towards the end of the juvenile dispersal season (generally from June to December) (Dique et. al., 2003) (detectors were deployed in November/December). For Sydney this is likely to peak from Sept to December. From the current study, and previous studies within and surrounding the deferred lands, Koalas are rare; the use of Audiomoths for a longer period, in suitable habitat may assist with detection of this species. It is recommended that further Audiomoths are deployed over a longer period of the dispersal season.

Threatened species breeding habitat, especially for owls and microbats, is often difficult to locate when areas are rugged and hard to access, however these areas are critical to the persistence of these species. For forest owls such as Sooty, Powerful and Masked owls, large areas of mature forest with a high density of trees with hollows are critical for persistence in an area. Detection of breeding owls can be difficult and time consuming, although citizen science projects such as the Powerful Owl project have been successful in identifying many breeding territories for this species, especially in the Sydney region.

Audiomoths have also been successfully used to detect owls in South East Queensland and recognisers for the main species have been developed. This allows the survey of an area over a 24-hour period for up to 3 weeks at a time, increasing the chance of owl detection compared with short periods of spotlighting and call play-back.

Suitable habitat for the potentially occurring forest owls has been identified as primarily the riparian forest areas. If Audiomoths were deployed along the key riparian forest areas (Deep Creek, Middle Creek, Oxford Creek and Snake Creek) for two periods of two weeks each during both the mating season (March to June) and fledging season (July to September) this would greatly increase survey effort for these species for a fraction of the cost of spotlighting and call play back for an equal amount of effort.

Potential roosting habitat has been identified in a number of locations for microbats, however a more targeted approach is recommended to complete this work, since detailed mapping was outside the scope of the current project. This mapping would be based on the preliminary findings of this project and focus on similar ridgetops to those already identified. The one difficulty is in accessing these ridgetop areas safely. For some assumptions, the use of detailed aerial maps, or perhaps additional drone surveys, could yield good results for roosting and even possibly breeding habitat for threatened microbat such as Little and Large Bent-wing Bats and Large-eared Pied Bats.

Due to very difficult access and some constraints in determining suitable habitat from aerial mapping (where vegetation covers rock faces), some areas may need to be assumed to contain potential roosting habitat. These areas are likely to be highly constrained due to bush fire risk and topography and therefore less likely to be disturbed.

7.4.3 Conservation Value

To combat some of the limitations with the classification of the area for conservation value, conservation modelling tools such as focal species analysis could be employed to assist in mapping the biodiversity features, including modelling threatened species distribution and then determining conservation value based on the distribution of these features. In the focal species approach a suite of species are selected, based on life history characteristics and the area is mapped based on the likelihood of occurrence of these species across the landscape. A review of this approach can be found in *Testing the focal species approach to making conservation decisions for species persistence* (Nicholson et. al., 2013).

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APPENDIX A: SUMMARY OF EXISTING FAUNA SURVEY EFFORT IN THE DEFERRED LANDS AREA

Title	Year	Author(s)	Report type	Study area	Amphibians	Reptiles	Diurnal birds	Forest owls	Arboreal mammals	Small mammals	Microbats
Flora and Fauna Assessment for Proposed Rezoning for Cromer Golf Club Draft Report	2013	Cumberland Ecology	Biodiversity assessment	Lot 2 DP 525492, Lots 859, 860 and 861 DP 752038 and Lot 22 DP 859782, Cromer Road, Cromer	Habitat assessment (1 day) (May 2005) Aural surveys (3 nights) (May 2005)	Habit assessment	Habitat assessment	Habitat assessment	Habitat assessment	Cage trapping (10 days, 5 trap lines of 5 traps, 25m apart, standard mix) (May/June 2005) Elliott B traps (5 days, 2 trap lines, 10m apart, standard mix) (May/June 2005)	-
Rapid Fauna Habitat Assessment of the Sydney Metropolitan Catchment Management Authority Area	2008	Department of Environment and Climate Change (2008a)	Vegetation/habitat assessment	Sydney Catchment Area	Diurnal search (50x100 metre area, 1 hour) Nocturnal search (up to 200m area, 30mins)	Diurnal search (50x100m area, 1 hour)	20min observation and listening search (2ha site)	Call play-back	Spotlighting (200m transect, 30mins)	Diurnal search (50x100m area, 1 hour)	Habitat assessment Harp trapping (1 night per site) Anabat (each site during nocturnal surveys)
Rapid Fauna Habitat Assessment of the Sydney Metropolitan Catchment Management Authority Area: Appendix 4 Site Profiles	2008	Department of Environment and Climate Change (2008a)	Vegetation/habitat assessment	Garigal to Oxford Falls	No targeted flora and fauna surveys. Results based on Rapid Fauna Habitat Assessment of the Sydney Metropolitan Catchment Management Authority Area						
Native vegetation remnants within the Northern Beaches Council LGA area ranked for their habitat value	2008	Department of Environment and Climate Change (2018b)	Vegetation/habitat assessment	Northern Beaches Council LGA	No targeted flora and fauna surveys. Results based on Rapid Fauna Habitat Assessment of the Sydney Metropolitan Catchment Management Authority Area						
Oxford Falls Valley and Belrose North Strategic Review (Draft)	2013	Department of Planning and Infrastructure	Planning review	1341ha Warringah LGA	No targeted flora and fauna surveys. Threatened species based on BioNet records and potential habitat present						
Greener Places: An urban green infrastructure design framework for New South Wales	2020	Department of Planning, Industry and Environment	Planning review	NSW urban areas	No targeted flora and fauna surveys. Design framework to guide planning, design and delivery of green infrastructure in urban areas						
Balise Eco Village Species Impact Statement	2010	Eco Logical Australia	Biodiversity assessment	Lots 808, 809, 812, 813 and 817 DP 752038 Willandra Road, Beacon Hill	Utilised results of previous site surveys (active searches, spotlighting, aural surveys, tadpole	Utilised results of previous site surveys (habitat assessments, active searches combined at least	Utilised results of previous site surveys (habitat assessments, opportunistic sightings at least 7	Utilised results of previous site surveys (habitat assessments, diurnal searches, call play-back and spotlighting at least 8	Utilised results of previous site surveys (combined mammal surveys call play-back and spotlighting at least 42 hours across 24 nights, cage traps, baited camera traps, pitfall traps, Elliot traps combined at least at least 938 trap	Utilised results of previous site surveys (Anabats at least 25 nights, harp trap at

Title	Year	Author(s)	Report type	Study area	Amphibians	Reptiles	Diurnal birds	Forest owls	Arboreal mammals	Small mammals	Microbats
					surveys, pitfall trapping, combined at least 42 hours across 14 days, 12 trap nights) (2002 – 2009 in January, February, September, December) Additional targeted habitat searches (at least 43 hours, 7 days) (2009 – 2010 in July, August)	64 hours across 21 days, 12 pitfall trap nights, 5 camera trap nights) (2002 – 2009 in February, March, December) Additional targeted habitat searches (16 hours, 2 days) (October 2009, May 2010)	days, observation and listening surveys at least 43 hours across 14 days) (across 1999 – 2009 in March, April, July October, December)	nights) (2002 – 2009 in September and December) Additional targeted habitat searches (at least 4 hours, 1 day) (July 2010)	nights, hair tubes at least 1,080 hair tube nights) (2002 – 2009 in February, March, September, October, December) Additional 630 hair tube nights targeting Southern Brown Bandicoot (July 2010)		least 11 nights) (across 2002 – 2009 in February, September, December) Additional Anabat surveys (at least 8 nights) (July 2010)
Balise Eco Village Species Impact Statement: Volume 2	2010	Eco Logical Australia	Biodiversity assessment	Lots 808, 809, 812, 813 and 817 DP 752038 Willandra Road, Beacon Hill	No targeted flora and fauna surveys. Results based on Balise Eco Village Species Impact Statement						
Balise Eco Village Environmental Site Management Plan	2010	Eco Logical Australia	Biodiversity assessment	Lots 808, 809, 812, 813 and 817 DP 752038 Willandra Road, Beacon Hill	No targeted flora and fauna surveys. Results based on Balise Eco Village Species Impact Statement						
Biobank Credit Assessment Report: Wheeler Creek Valley Biobank Site	2010	Eco Logical Australia	Biodiversity assessment	Lots 816, 818, 819, 824, 825, 826, 827, 828, 829, 830, 2012 DP 752038; Lot 7034, 7035 and 7036 DP 93795, Oxford Falls	Utilised results of previous site surveys (including diurnal bird census, scat collection, habitat searches, spotlighting, Anabats, call play-back, hair tubes and trapping undertaken in March and September 2001). Additional targeted surveys undertaken in 2009 for Red-crowned Toadlet and Rosenberg's Goanna						
Biobanking Agreement Credit Assessment Report: Rickards Road Biobank Site	2017	Eco Logical Australia	Biodiversity assessment	240 Rickards Road (Lot 3 DP184056)	No targeted fauna surveys. Threatened fauna species based on BioNet records and potential habitat present						
Flora and Fauna Assessment Little Willandra Road, Cromer	2017	Eco Logical Australia	Biodiversity assessment	Lot B2 DP 358165, 53 Little Willandra Road, Cromer	Call play-back, spotlighting and active searches (2 nights) (March and September 2016)	Habitat assessment, opportunistic sightings	Habitat assessment, opportunistic sightings	Diurnal searches, call play-back, stag-watching, songmeter monitoring and spotlighting (2 nights) (March and September 2016)	Diurnal searches, call play-back, stag-watching, songmeter monitoring and spotlighting (2 nights) (March and September 2016)	Diurnal searches, call play-back, stag-watching, songmeter monitoring and spotlighting (2 nights) (March and September 2016)	Roost searches, stag-watching, Anabats (2 nights) (March and September 2016)
Threatened Fauna of the Narrabeen Lagoon Catchment: Surveys and status of threatened species	2015	Kavanagh, R., Law, B., Lemckert, F., & Stanton, M.	Biodiversity assessment	Narrabeen Lagoon Catchment (within Warringah LGA)	Aural surveys, road surveys, tadpole searches, spotlighting, call identification (7 sites, 14 surveys, 1-2 hours each) (Oct-Nov 2012, Jan-Jun 2013)	Diurnal habitat searches, road surveys, spotlighting ((7 sites, 14 surveys, 1-2 hours each) (Oct-Nov 2012, Jan-Jun 2013) Camera traps (27 sites, 479 nights,	20min observation and listening search (19 plots, surveyed twice) and opportunistic sightings (5 sites, 34 surveys, 20min/survey) (Oct-Nov 2012)	Call play-back, spotlighting (16 sites, 13 surveys, May-June 2011; 13 sites, 17 surveys, Nov 2011 - May 2012)	Call play-back, spotlighting (16 sites, 13 surveys, May-June 2011; 13 sites, 17 surveys, Nov 2011 -May 2012)	Nest boxes (7 sites, 30 boxes, 5 surveys each site, May-June 2011; 10 sites, 40 boxes, 2-9 surveys each site, Nov-Dec 2011, Jan-May 2012; 4 sites, 20 boxes, 8 surveys, Jan-Jun	Diurnal habitat/roost searches (5 sites, 4.5 hours, Oct 2011, Jan 2012, Apr 2012), Anabats (5 sites, 14 nights, May 2011; 11 sites, 27 nights, Oct-Nov 2011, Jan

Title	Year	Author(s)	Report type	Study area	Amphibians	Reptiles	Diurnal birds	Forest owls	Arboreal mammals	Small mammals	Microbats
					Diurnal habitat searches (7 sites, 14 surveys, 1-2 hours each) (Oct 2012, Nov 2012, Jan 2013, Feb 2013, Mar 2013, Jun 2013)	May-June 2011; 12 sites, 160 nights, Oct-Nov 2011, Jan 2012, May 2012; 20 sites, 382 nights, Mar-Apr 2013)				2013), camera traps (27 sites, 479 nights, May-June 2011), Elliot traps (7 sites, 125 traps, 9 nights, May 2013)	2012, Mar 2012, Apr 2012; 9 sites, 18 nights, Mar 2013), harp traps and mist nets (5 sites, 5 nights, Nov 2012)
Warringah Natural Area Survey: Fauna Species	2005	P&J Smith Ecological Consultants	Biodiversity assessment	Warringah LGA outside Ku-ring-gai Chase and Garigal National Parks	No targeted fauna surveys. Provides a comprehensive (although not complete) annotated list of the native fauna species recorded in the Warringah LGA outside the national parks and identifies the species of special conservation significance at national, state, regional (northern Sydney) and local (Warringah) levels						
Warringah Natural Area Survey: Vegetation Communities and Plant Species	2005	P&J Smith Ecological Consultants	Biodiversity assessment	Warringah LGA outside Ku-ring-gai Chase and Garigal National Parks	No targeted fauna surveys. Report detailing the vegetation communities and flora recorded in the Warringah LGA						
Survey of the Duffys Forest Vegetation Community: Report to NSW National Parks and Wildlife Service and Warringah Council	2000	P&J Smith Ecological Consultants	Vegetation/habitat assessment	Warringah LGA	No targeted fauna surveys. Detailed information and review about the Duffys Forest Vegetation Community in the Warringah LGA, including within Ku-ring-gai Chase, Terry Hills, Duffys Forest, Ingleside and Garigal National Park						
Warringah Natural Area Survey: Vegetation History and Wildlife Corridors	2005	P&J Smith Ecological Consultants	Vegetation/habitat assessment	Warringah LGA outside Ku-ring-gai Chase and Garigal National Parks	No targeted fauna surveys. Report detailing the identification and mapping of native vegetation communities in the Warringah LGA outside Ku-ring-gai Chase and Garigal National Parks. Key wildlife corridors also mapped, including within Ku-ring-gai Chase National Park, Garigal National Park, Manly Dam Reserve, Jamieson Park, Dee Why Lagoon, Allenby Park, NSW Gun Club, Coast and coastal lagoon vegetation, Duffys Forest linking Ku-ring-gai Chase National Park and dead-end corridors linking smaller areas of bushland with larger areas of bushland						
Warringah Natural Area Survey: Vegetation History and Wildlife Corridors 2009 Update	2009	P&J Smith Ecological Consultants	Vegetation/habitat assessment	Warringah LGA outside Ku-ring-gai Chase and Garigal National Parks	Updates to the Warringah Natural Area Survey: Vegetation History and Wildlife Corridors report, including updated wildlife corridors and vegetation mapping						
Review of Four Sites Within Oxford Falls Valley For Urban Development	2009	Planning Assessment Commission	Planning review	Lizard Rock, Cromer Golf Course, Oxford Falls West and Red Hill	No targeted fauna surveys. Review of the suitability of four sites in Oxford Falls Valley for future urban development						
NBH CaNE Biodiversity Offset Package Stage 3 Final Report	2020	SMEC	Biodiversity assessment	Lot 100 DP874509 and Lot 2116 DP752038	Habitat assessment (1 day) (May 2016) Active searches (6 days) (September, November, December 2016, March 2017, February 2020)	-	-	-	-	-	-
Northern Beaches Council Biodiversity Planning Review: Natural Values	2020	SMEC	Planning review	Northern Beaches LGA	Biodiversity planning review. Field validation was undertaken for current edges of Grey-headed Flying-fox colonies. No other targeted threatened fauna species surveys undertaken						

Title	Year	Author(s)	Report type	Study area	Amphibians	Reptiles	Diurnal birds	Forest owls	Arboreal mammals	Small mammals	Microbats
Mapping Methodology Report (Draft)											
Ecological Assessment Planning Proposal for Lot 1 DP 1139826 Ralston Avenue, Belrose	2017	Travers Bushfire & Ecology	Biodiversity assessment	Lot 1 DP 1139826 Ralston Avenue, Belrose	Specialist report and study by Michael Mahony Opportunistic habitat searches, funnel trapping, spotlighting, call play-back, tadpole searches (at least 21 nights, October 2011, December 2011, October 2012, April 2013, May 2013, May 2015, March 2017)	Specialist report and study by Gerry Swan Opportunistic habitat and diurnal searches, funnel trapping, burrow searches (at least 21 days, May 2008, December 2011, October 2012, May 2015, March 2017)	Opportunistic sightings (at least 18 days, May 2008, December 2011, October 2012)	Call play-back and spotlighting (at least 5 nights, May 2008, December 2011, October 2012)	Spotlighting, call play-back, cage trapping, Elliott trapping, hair tubes, hollow searches, denning tubes, camera traps, habitat assessments (at least 84 days, May 2008, December 2011, October 2012, August 2013, May 2015, June 2015, July 2015,)	Specialist report and study by Ross Goldingay	Anabats (passive and active), spotlighting, harp trapping (at least 11 nights, May 2008, December 2011, October 2012)
Report of Warringah Council Meeting held on 19 June 2001. (pp. 63-140)	2001	Warringah Council	Planning review	No targeted fauna surveys. Findings of transport and water quality studies required by Stage 1 of the Non-Urban Lands Study and recommended actions							

APPENDIX B: FAUNA SURVEY GUIDELINES

Recommended survey effort and timing as per industry guidelines for key threatened fauna groups recorded within the deferred lands area

Fauna group	Minimum survey requirements[1]	Minimum survey effort	Seasonal survey requirements	Recommended conditions	Survey guidelines
Amphibians (e.g. Giant Burrowing Frog, Red-crowned Toadlet)	Aural-visual surveys and/or tadpole searches with a spotlight at night within 300m of suitable breeding habitat (i.e. ephemeral flowing streams with permanent pools, upland swamps)	Aural-visual: 960mins over a 500m transect, 8 repeated surveys (Giant Burrowing Frog); 460mins over a 500m transect, 4 repeated surveys (Red-crowned Toadlet) Tadpole: 10mins/50m^2, 8 repeated surveys	Sep – May (aural-visual) Feb – May (tadpole)	Within one week of heavy rainfall (i.e. >50mm in 24 hours, >100mm over three days) Avoid cold temperatures	(CoA, 2010a) (DPIE, 2020d) (DEC, 2004)
Arboreal mammals (e.g. Grey-headed Flying-fox, Koala)	Initial review of data to identify important areas (e.g. camps) and foraging resources (e.g. feed trees). Direct surveys (e.g. nocturnal spotlighting, acoustic surveys) and/or indirect surveys (e.g. scat searches)	Spotlighting: minimum two 200m long transects per 5ha, spaced 100m apart and across two separate nights Scat: identify a central tree important to the species (i.e. feed tree), search under this tree and surround 29 trees for 2mins per tree	Aug – Jan (breeding Koala) Oct – Dec (breeding Grey-headed Flying-fox)	Avoid windy and rainy conditions	(CoA, 2014) (CoA, 2010b) (CoA, 2011) (DEC, 2004) (Phillips & Callaghan, 2011)
Cockatoos (e.g. Gang-gang Cockatoo, Glossy Black-Cockatoo)	Stag-watching surveys to identify breeding habitat and individuals	Stag-watching at suitable HBTs (5-8m above ground, >15cm wide) 30mins prior to sunset and continue 60mins after sunset	Oct – Jan (Gang-gang Cockatoo) Apr – Aug (breeding Glossy Black-Cockatoo)	Avoid windy and rainy conditions	(DEC, 2004)
Diurnal raptors (e.g. Eagles, Kites, Ospreys)	Area searches in suitable habitat. Detection by sightings, calls and/or signs of occupancy (i.e. nests, feathers)	Suggested 2ha area search and/or 20min point census	N/A	Avoid windy and rainy conditions Early morning or early evening	(DEC, 2004) (CoA, 2010c)
Microbats	Roost searches, acoustic detection (i.e. Anabats) and/or trapping (e.g. harp trap, mist net) set in woodlands, valley floors, riparian areas and/or fertile parts of the	16 total trapping nights (e.g. 4 nights, 4 Anabats)	Nov (mid) – Jan (end)	Avoid windy and rainy conditions Avoid cold temperatures	(OEH, 2018a) (CoA, 2010b)

Fauna group	Minimum survey requirements[1]	Minimum survey effort	Seasonal survey requirements	Recommended conditions	Survey guidelines
	subject land within proximity to habitat resources (e.g. caves, cliffs, waterbodies)				(DEC, 2004)
Migratory birds (e.g. White-throated Needletail)	Area or transect surveys in suitable habitat. Detection by sighting or call	Suggested 2ha area search and/or 20min point census. Tall trees on ridgetops can be targeted for potential roosting habitat	Oct – May	Avoid windy and rainy conditions Early evening (to detect potential roost sites)	(DEC, 2015) (DEC, 2004) (CoA, 2010c)
Owls (e.g. Barking Owl, Masked Owl, Powerful Owl)	Stag-watching surveys to identify breeding habitat and individuals	Stag-watching at suitable HBTs (>20cm wide) 30mins prior to sunset and continue 60mins after sunset	May – Aug	Avoid windy and rainy conditions	(DEC, 2004)
Reptiles (e.g. Rosenberg's Goanna)	Habitat searches targeting important resources (e.g. termite mounds), spotlighting and or/ trapping in suitable habitat	Habitat searches and spotlighting: 30min searches, 2 nights Baited camera trap: set with meat bait, deployed near potential habitat resources (e.g. termite mounds, rocky outcrops, hollow logs)	N/A	Avoid windy and rainy conditions	(DEC, 2004)
Small-medium mammals (e.g. Bandicoots, Eastern Pygmy-possum, Spotted-tailed Quoll)	Habitat searches, direct surveys (e.g. nocturnal spotlighting, trapping) and/or indirect surveys (e.g. scat searches)	Hair tubes/baited camera traps: set with standard bait or meat bait, deployed near potential habitat resources (e.g. burrows, shrubs, near diggings or waterbodies) for a minimum of 2 surveys each 14 days duration Hair tubes: minimum 20 hair tubes per sampling site. Devices set 20m apart in 2 parallel lines separated by 25m	Oct – Mar (Eastern Pygmy-possum) Dec – Oct (Spotted-tailed Quoll)	Trapping surveys timed at least one month apart, one following significant rainfall Optimal in autumn	(CoA, 2011) (DEC, 2004)
Wetland birds (e.g. Black Bittern)	Call play-back in suitable habitat for solicited call responses and sightings. Area searches in suitable habitat for sightings, nests, footprints and/or feathers	Suggested 2ha area search and/or 20min point census	N/A	Avoid windy and rainy conditions Early morning or early evening	(DEC, 2004) (CoA, 2010c)
Woodland birds (e.g. Little Lorikeet, Regent	Area or transect surveys in suitable habitat. Detection by sighting or call	20 hours, 8 days	Mar – July (Swift Parrot)	Avoid windy and rainy conditions	(CoA, 2010c)

Fauna group	Minimum survey requirements[1]	Minimum survey effort	Seasonal survey requirements	Recommended conditions	Survey guidelines
Honeyeater, Swift Parrot)			May – Mar (peak Sep – Nov; Regent Honeyeater)	Early morning or early evening Peak blossoming period of known foraging resources	

1. Based on recommended survey guidelines

APPENDIX C WEATHER CONDITIONS DURING FIELD SURVEYS

Date	Temperature		Rain	Maximum wind gust	
	Min (°C)	Max (°C)	mm	Direction	Speed (km/h)
28 October 2020	11.1	18.4	0	SE	24
29 October 2020	13.9	19.8	1.4	SE	28
6 November 2020	11.0	18.6	17.4	SW	37
11 November 2020	14.1	23.5	0	ENE	33
12 November 2020	16.2	30.1	0	NNW	35
17 November 2020	17.3	21.3	0	SSE	43
18 November 2020	14.7	21.7	1.6	ENE	35
19 November 2020	14.6	23.9	0	NNE	43
20 November 2020	16.8	31.8	0	S	37
24 November 2020	16.3	21.8	2	S	33
25 November 2020	16.3	23.4	0	ENE	28
27 November 2020	17.1	29.8	0	S	33
6 December 2020	18.6	29.4	0	W	37
7 December 2020	16.5	29.2	0	W	48
8 December 2020	13.7	20.9	0	-	-
9 December 2020	12.0	23.3	0	ENE	35
10 December 2020	14.3	25.3	0	SE	52
11 December 2020	15.0	20.5	0.2	SE	39
12 December 2020	14.4	22.3	0.8	E	35
13 December 2020	14.2	22.8	0.4	E	33
14 December 2020	16.5	22.6	6.8	ENE	33
15 December 2020	17.6	22.1	11.2	ENE	48
16 December 2020	19.4	26.2	28.0	ENE	48
17 December 2020	20.3	30.1	0.2	NE	30
18 December 2020	22.8	30.3	0	WNW	39
23 December 2020	12.9	23.7	0	SE	35
8 February 2021	17.5	22.0	0.4	SE	22
11 February 2021	15.8	25.1	0	NNE	35
15 February 2021	17.2	21.7	0	S	52
16 February 2021	17.4	24.0	4.4	E	37
17 February 2021	17.4	23.1	2.4	ENE	35
18 February 2021	18.6	22.7	0.4	ENE	35
19 February 2021	18.8	24.9	7.2	NE	31
20 February 2021	18.5	26.6	0.2	ENE	24

Date	Temperature		Rain	Maximum wind gust	
	Min (°C)	Max (°C)	mm	Direction	Speed (km/h)
21 February 2021	19.8	26.7	3.2	SSE	26
22 February 2021	18.4	28.2	0.2	S	37
23 February 2021	17.7	19.6	2.2	S	37
24 February 2021	15.1	21.1	3.2	S	20
25 February 2021	16.4	24.0	0.4	ESE	20
26 February 2021	16.7	26.4	1.0	E	31
27 February 2021	18.5	21.6	0.2	ESE	20
28 February 2021	17.9	26.1	0.4	ESE	22
1 March 2021	18.3	29.1	0	S	30
2 March 2021	17.5	22.9	0	ESE	33
3 March 2021	15.3	21.1	0.2	SSE	30
4 March 2021	14.1	26.3	0.4	NNE	24
5 March 2021	16.7	22.9	0	SE	39
6 March 2021	15.6	21.7	0	S	28
7 March 2021	13.9	24.1	0	NNE	28
8 March 2021	17.8	29.5	0	NW	33
9 March 2021	18.3	28.7	0.6	ESE	30
17 March 2021	16.0	20.2	10.0	ENE	44
30 March 2021	14.4	20.7	5.4	SSW	26
22 April 2021	8.1	19.6	0	W	28
28 April 2021	12.6	21.7	0	ENE	17
29 April 2021	12.2	22.2	0	NE	19
12 May 2021	11.3	20.2	0.6	S	22
13 May 2021	12.1	22.0	3.8	SW	24
14 May 2021	10.6	18.3	0.2	WSW	41
20 May 2021	8.7	20.3	0	W	20
31 May 2021	8.9	17.8	0	WSW	22
18 June 2021	8.0	17.2	0	SW	48

APPENDIX D: A SAMPLE OF CAMERA TRAP PHOTOS

Plate 7-1 Rosenbergs Goanna captured near Red Hill during March 2021 deployment event

Plate 7-2 Long-nosed Bandicoot captured near Red Hill during March 2021 deployment event

Plate 7-3 Painted Button-quail captured west of Wakehurst Parkway during February deployment event

Plate 7-4 Echidna captured near Cromer during February deployment event

Plate 7-5 Eastern Pygmy-possum captured near Hilversum during the November deployment event

Plate 7-6 Superb Lyre Bird captured near Slippery Dip track during the March deployment event

Plate 7-7 Brushtail Possum captured near Maybrook Avenue during the March deployment event

Plate 7-8 Swamp Wallaby captured west of Wakehurst Parkway during February deployment event

Plate 7-9 Rosenberg's Goanna captured near Cromer west during the February deployment event

Plate 7-10 Rufous Fantail captured near Maybrook Avenue during the March deployment event

Plate 7-11 Sugar Glider captured near Wearden Road during the March deployment event

Plate 7-12 New Holland Honey-eater captured near Ralston Avenue during the March deployment event

APPENDIX E: BAITED CAMERA DEPLOYMENT SUMMARY

Camera number	Approximate location	Camera nights	Species targeted/Notes
November 2020 – February 2021			
Camera 1	Red Hill Reserve	75	Spotted-tail Quoll, Rosenbergs Goanna
Camera 2*	Red Hill Reserve	75	Eastern Pygmy Possum, arboreal mammals
Camera 3	Five Mile Creek Track	75	Southern Brown Bandicoot, small to medium mammal
Camera 4	Hilversum Track	21	Eastern Pygmy Possum, arboreal mammals
Camera 5	Hilversum Track	74	Spotted-tail Quoll, Rosenbergs Goanna
Camera 6	Off Morgan Road near Slippery Dip	68	Eastern Pygmy Possum, arboreal mammals
Camera 7	Near Kellys Way	68	Spotted-tail Quoll, Rosenbergs Goanna
Camera 8	Off Morgan Road near Slippery Dip	68	Eastern Pygmy Possum, arboreal mammals
February 2021 – March 2021			
Camera 1	Cromer West	27	Spotted-tail Quoll, Rosenbergs Goanna
Camera 2	Cromer West	25	Southern Brown Bandicoot, small to medium mammal
Camera 3	Cromer Road (near residences)	22	Southern Brown Bandicoot, small to medium mammal
Camera 4	Slippery Dip Track	22	Spotted-tail Quoll, Rosenbergs Goanna
Camera 5	Between Slippery Dip and Wakehurst Parkway	22	Spotted-tail Quoll, Rosenbergs Goanna
Camera 6	Near Cromer Golf Course	20	Spotted-tail Quoll, Rosenbergs Goanna
Camera 7	Near Cromer Golf Course	20	Eastern Pygmy Possum, arboreal mammals
March 2021 – June 2021			
Camera 1	Off Maybrook Avenue	44	Southern Brown Bandicoot, small to medium mammal
Camera 2	Off Maybrook Avenue	44	Southern Brown Bandicoot, small to medium mammal
Camera 3	Red Hill Reserve	44	Spotted-tail Quoll, Rosenbergs Goanna
Camera 4	Red Hill Reserve	44	Spotted-tail Quoll, Rosenbergs Goanna
Camera 5*	Red Hill Reserve	44	Spotted-tail Quoll, Rosenbergs Goanna

Camera number	Approximate location	Camera nights	Species targeted/Notes
Camera 6*	Red Hill Reserve	56	Southern Brown Bandicoot, small to medium mammal
Camera 7*	Wearden Road	51	Southern Brown Bandicoot, small to medium mammal
Camera 8	Red Hill Reserve	56	Southern Brown Bandicoot, small to medium mammal
Camera 9	Red Hill Reserve	56	Southern Brown Bandicoot, small to medium mammal
Camera 10	Red Hill Reserve	56	Southern Brown Bandicoot, small to medium mammal
Camera 11	Slippery Dip Track (Remote Control Society)	51	Spotted-tail Quoll, Rosenbergs Goanna
Camera 12*	Ralston Avenue	51	Southern Brown Bandicoot, small to medium mammal
Camera 13	Wearden Road (Corymbia Cct)	51	Eastern Pygmy Possum, arboreal mammals
Camera 14	Ralston Avenue	51	Spotted-tail Quoll, Rosenbergs Goanna
Camera 15	Red Hill Reserve	56	Southern Brown Bandicoot, small to medium mammal
Camera 16*	Red Hill Reserve	68	Southern Brown Bandicoot, small to medium mammal
Camera 17	Red Hill Reserve	68	Southern Brown Bandicoot, small to medium mammal

* Denotes cameras that were dysfunctional and excluded from survey effort.

APPENDIX F BIONET RECORDS OF THREATENED FAUNA SPECIES WITHIN THE DEFERRED LANDS

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (DPIE (EES), 2020)	Number of records (BioNet) within the deferred lands area (year)	Number of records (BioNet) within 10km (year)
Barking Owl	*Ninox connivens*	V	-	905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1828, 1841, 1845	The Barking Owl has declined greatly in southern Australia and occurs in a wide but sparse distribution in NSW. Recent bushfires have further reduced available habitat. Inhabits woodland and open forest, preferentially hunting small arboreal mammals (e.g. Common Ringtail Possum). Requires large, permanent territories up to 6,000ha containing high prey density. Hollows in large, old trees (preferably living eucalypts) are used for breeding.	1 (2017)	64 (2019)
Beach Stone-curlew	*Esacus magnirostris*	CE	-	None	The Beach Stone-curlew is considered a vagrant species south of the Manning River in NSW. It is found exclusively along the coast in a wide variety of coastal habitats including beaches, estuaries and mangroves. The species forages on marine invertebrates in the intertidal zone and breeds in shallow nests above the littoral zone at the backs of beaches, among low vegetation or on sandbanks.	1 (1985)	2 (2013)
Black Bittern	*Ixobrychus flavicollis*	V	-	781, 1250, 1780, 1794, 1795, 1828	Within NSW, the Black Bittern is rarely recorded south of Sydney or inland. It inhabits terrestrial and estuarine wetlands generally in areas with permanent water and dense vegetation. The	None	44 (2019)

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (DPIE (EES), 2020)	Number of records (BioNet) within the deferred lands area (year)	Number of records (BioNet) within 10km (year)
					species forages on a variety of species (including frogs, reptiles and fish) and nests on a bed of sticks in vegetation overhanging water.		
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	-	781, 881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1828, 1841, 1845	The Dusky Woodswallow occurs throughout most of NSW but predominantly breeds on the western slopes of the Great Dividing Range. In NSW, it is largely migratory moving out of the State post breeding. Primarily inhabits dry, open eucalypt forests and woodlands with an open or sparse understorey, foraging on invertebrates and nesting in shrubs or low trees.	5 (1984)	26 (2012)
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	V	-	781, 881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1828, 1841, 1845	The Eastern Coastal Free-tailed Bat is found along the east coast from south Queensland to southern NSW. The species occurs in dry sclerophyll forest, woodland, swamp and mangrove forests east of the Great Dividing Range. Roosts predominately in tree hollows but will also use bark and man-made structures.	6 (2021)	58 (2021)
Eastern Osprey	*Pandion cristatus*	V	-	781, 881, 1250, 1776, 1783, 1794, 1795, 1841	Eastern Ospreys occur widely along the Australian coastline, especially on rocky shorelines, islands and reefs. The species is uncommon from closely settled parts of south-eastern Australia, however, is known from north Sydney. Favours mouths of rivers, lagoons and lakes feeding on fish. Nests within 1km of the coast in a large stick nest made up high in dead or exposed trees or man-made structures (e.g. telegraph poles).	None	73 (2020)

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (DPIE (EES), 2020)	Number of records (BioNet) within the deferred lands area (year)	Number of records (BioNet) within 10km (year)
Eastern Pygmy-possum	*Cercartetus nanus*	V	-	881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1828, 1841, 1845	In NSW, the Eastern Pygmy-possum occurs along the coast and inland as far as the western slopes. The species prefers heath and woodland containing high densities of *Banksia*, eucalypts and bottlebrushes for foraging. Stands of eucalypts with tree hollows and bark, or stumps and/or abandoned nests/dreys (i.e. bird and Ringtail Possum) are used for shelter.	77 (2021)	1,301 (2021)
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V	E	881, 905, 1250, 1776, 1780, 1783, 1786, 1803, 1804, 1824, 1828, 1841, 1845	In NSW, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter and inland to the south-west slopes. A small, endangered population occurs in the Hornsby and Ku-ring-gai LGAs. Generally found in tall woodlands, particularly heavily timbered wet sclerophyll forest, favouring old growth forest for nesting and roosting.	None	95 (2016)
Giant Burrowing Frog	*Heleioporus australiacus*	V	V	881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1828, 1841, 1845	The northern population of the Giant Burrowing Frog is confined to the sandstone geology of the Sydney Basin, extending as far south as Ulladulla. The species prefers heath, woodland and open dry sclerophyll forest and is found within 300m of breeding habitat burrowed in soil, under vegetation or rocks. Requires soaks, pools or seepage lines for breeding.	14 (2021)	78 (2021)
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	V	-	881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1824, 1828, 1841, 1845	In NSW, the species is widespread but uncommon occurring in open forests and woodlands where stands of Sheoak are present. *Allocasuarina littoralis* and *Allocasuarina torulosa* are important foraging resources. The	28 (2021)	284 (2021)

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (DPIE (EES), 2020)	Number of records (BioNet) within the deferred lands area (year)	Number of records (BioNet) within 10km (year)
					species is also dependent on large hollow-bearing eucalypts for nest sites.		
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V	-	781, 881, 905, 1250, 1776, 1780, 1804, 1824, 1828, 1841, 1845	The Greater Broad-nosed Bat is predominately found in gullies and river systems of the Great Dividing Range and in NSW, is widespread on the New England Tablelands below 500m. The species utilises a variety of habitats roosting in tree hollows (sometimes buildings) and foraging mainly on invertebrates. Maternity roosts in tree hollows are used for breeding.	3 (2021)	31 (2021)
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	781, 881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1828, 1841, 1845	The Grey-headed Flying-fox is generally found within 200km of the east coast, occurring mainly in subtropical and temperate rainforests, tall sclerophyll forests, woodlands and heath. Roosts and breeds in camps within 20km of regular resources and travels up to 50km from camps to forage (predominately on nectar and pollen of eucalypts, *Melaleuca* and *Banksia*).	27 (2021)	2,054 (2021)
Koala	*Phascolarctos cinereus*	V	E	905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1828, 1841, 1845	The Koala has a fragmented distribution that has further been reduced due to recent bushfires and urban developments. The species inhabits eucalypt woodlands and forests feeding on specific tree species. Home range size varies with quality of habitat.	None	143 (2021)
Large Bent-winged Bat (formerly the Eastern Bentwing-bat)	*Miniopterus orianae oceanensis*	V	-	781, 881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1828, 1841, 1845	The Large Bent-winged Bat occurs along the east and north-west coasts of Australia. The species hunts for flying insects in forested areas, dispersing within 300km of maternity caves (used for breeding). Caves are also used	37 (2021)	514 (2021)

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (DPIE (EES), 2020)	Number of records (BioNet) within the deferred lands area (year)	Number of records (BioNet) within 10km (year)
					primarily for roosting and hibernation, but they also use derelict mines, storm-water tunnels, buildings or other man-made structures.		
Large-eared Pied Bat	*Chalinolobus dwyeri*	V	V	881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1824, 1828, 1841, 1845	The Large-eared Pied Bat has a rare and patchy distribution in NSW. The species hunts for flying insects in well-timbered areas containing gullies, and in areas with extensive cliffs and caves. Roosts in caves, cliff crevices, old mine workings and in disused Fairy Martin nests. Breeds in sandstone caves and overhangs.	None	33 (2021)
Little Bent-winged Bat	*Miniopterus australis*	V	-	781, 881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1828, 1841, 1845	The Little Bent-winged Bat occurs along the east coast and ranges from Cape York in Queensland to Wollongong in NSW. Inhabits a variety of forests and scrub, but in generally found in well-timbered areas. The species roosts in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and other man-made structures and forages for small insects in densely vegetated habitats. Uses maternity colonies, often associated with the Large Bent-winged Bat, for breeding (only five are known across Australia).	10 (2021)	193 (2021)
Little Eagle	*Hieraaetus morphnoides*	V	-	781, 881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1828, 1841, 1845	The Little Eagle is found throughout Australia in open eucalypt forests and woodlands. The species preys on birds, reptiles and mammals and nests in tall, living trees within remnant patches of bushland.	None	31 (2020)
Little Lorikeet	*Glossopsitta pusilla*	V	-	781, 881, 905, 1250, 1776, 1780, 1783,	The Little Lorikeet is distributed widely with nomadic movements common (influenced by	1 (2011)	68 (2021)

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (DPIE (EES), 2020)	Number of records (BioNet) within the deferred lands area (year)	Number of records (BioNet) within 10km (year)
				1786, 1794, 1795, 1803, 1804, 1824, 1828, 1841, 1845	season and food availability). The species forages primarily in open forest and woodland on nectar and pollen and nests in proximity to feeding areas in hollows of smooth-barked eucalypts. Nests sites are repeatedly used, suggesting preferred sites are limited.		
Long-nosed Bandicoot (North Head)	*Perameles nasuta*	EP	-	881, 905, 1250	The North Head population of the Long-nosed Bandicoot is restricted to North Head. The species occupies a variety of habitats on North Head, sheltering in shallow holes lined with leaves, grass and debris and foraging at dusk digging conical holes for invertebrates, fungi and tubers.	None	2,598 (2021)
Masked Owl	*Tyto novaehollandiae*	V	-	905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1824, 1828, 1841, 1845	The Masked Owl is most abundant along the coast of NSW. It inhabits dry eucalypt forests and woodlands hunting mammals in forests and along edges (including roadsides). Pairs have large home ranges up to 1,000ha and breed in large tree-hollows typically in moist, eucalypt forested gullies. The species occasionally roosts in caves.	None	18 (2020)
New Holland Mouse	*Pseudomys novaehollandiae*	-	V	881, 1250, 1776, 1783, 1786, 1794, 1803, 1804, 1824, 1845	The New Holland Mouse has a fragmented distribution which is likely smaller than current estimates, particularly due to recent bushfires and developments impacting upon available habitat. The species inhabits open heathland, woodland and forest with vegetated sand dunes and a heathy understorey. Lives predominantly in burrows shared with other individuals. Peaks	1 (2017)	14 (2020)

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (DPIE (EES), 2020)	Number of records (BioNet) within the deferred lands area (year)	Number of records (BioNet) within 10km (year)
					in abundance occur during early to mid-stages of vegetation succession (typically induced by fire).		
Powerful Owl	*Ninox strenua*	V	-	905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1828, 1841, 1845,	The Powerful Owl is widely distributed, but exists in low densities, in NSW throughout eastern forests along the coast and inland to the tablelands. The species inhabits a range of vegetation types but requires large tracts of woodland for breeding and hunting (foraging on medium-sized arboreal marsupials). The species roosts in dense vegetation and requires large tree hollows (at least 0.5m deep, 80cm+ wide) for breeding.	39 (2021)	2,247 (2021)
Red-crowned Toadlet	*Pseudophryne australis*	V	-	881, 905, 1250, 1776, 1780, 1783, 1786, 1803, 1804, 1824, 1828, 1841, 1845	The Red-crowned Toadlet is confined to the Sydney Basin, occupying open forests on Hawkesbury and Narrabeen sandstones. It inhabits periodically wet drainage lines below sandstone ridges (often with shale lenses or cappings) and breeds in non-polluted waters within a pH range of 5.5 to 6.5. Shelters under rocks and dense leaf litter within 300m of breeding sites.	86 (2021)	720 (2021)
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	881, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1841, 1845	The Regent Honeyeater's range has dramatically reduced in the last 30 years, occupying temperate woodlands and open forests of the inland slopes of south-east Australia, confined to three known breeding ranges (two in NSW: Capertee Valley and Bundarra-Barraba region). The species inhabits woodlands that support a significantly high abundance and species richness of bird species,	None	55 (2021)

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (DPIE (EES), 2020)	Number of records (BioNet) within the deferred lands area (year)	Number of records (BioNet) within 10km (year)
					with large numbers of mature trees, high canopy cover and abundance of mistletoes.		
Rosenberg's Goanna (known also as Rosenbergs Goanna)	*Varanus rosenbergi*	V	-	881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1828, 1841	Rosenberg's Goanna occurs on Sydney sandstone from north-west Sydney, around the ACT and as far south as Cooma. The species is found in heath, open forest and woodland and requires large areas of habitat with a high density of termite mounds. Shelters in hollow logs, rock crevices and burrows and feeds on carrion, birds, reptiles, mammals and eggs.	63 (2021)	213 (2021)
Southern Brown Bandicoot (eastern)	*Isoodon obesulus obesulus*	E	E	881, 1250, 1780, 1783, 1786, 1803, 1804, 1824, 1828, 1845	The Southern Brown Bandicoot has a patchy distribution. The species inhabits heath or open forest with a heathy understorey on sandy or friable soils. Nests during the day in shallow depressions covered by litter or grass, usually under brushes, shrubs or small trees, and forages at dusk and/or before dawn creating distinctive conical holes while searching for invertebrates and fungi.	13 (2020)	386 (2020)
Southern Myotis (formerly the Large-footed Myotis)	*Myotis macropus*	V	-	781, 881, 905, 1250, 1776, 1780, 1783, 1794, 1795, 1804, 1828, 1841, 1845	The Southern Myotis is found along within 100km of the east coast. The species hunts over streams and pools catching insects and small fish. Roosts in small groups close to water in caves, mine shafts, HBTs, storm-water channels, buildings, under bridges and in dense foliage.	2 (2021)	119 (2021)
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	781, 881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795,	The range of the Spotted-tailed Quoll has contracted significantly since European settlement and only in Tasmania is it considered	3 (2018)	42 (2018)

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (DPIE (EES), 2020)	Number of records (BioNet) within the deferred lands area (year)	Number of records (BioNet) within 10km (year)
				1803, 1804, 1824, 1828, 1841, 1845	relatively common. The species has been recorded across a range of habitat types, using HBTs, logs, burrows, caves and rocky outcrops as den sites. Use common latrine sites often on flat surfaces. Consumes a variety of prey and occupies ranges up to 4,000ha. Known to traverse along densely vegetated creek lines.		
Square-tailed Kite	*Lophoictinia isura*	V	-	781, 881, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1845	The Square-tailed Kite ranges along coastal and subcoastal areas. In NSW, there are scattered records throughout the state, but is more regularly known from major river systems. It is a summer breeding migrant to the NSW south-coast, arriving in September and leaving by March. The species is found in a variety of timbered habitats, particularly near watercourses. It hunts on passerines, especially honeyeaters, and occupies large ranges of more than 100km^2. The species nests in large stick nests located along or near watercourses in forks or on horizontal tree limbs.	1 (2021)	41 (2021)
Swift Parrot	*Lathamus discolor*	E	CE	881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804,1824, 1828, 1841, 1845	The Swift Parrot migrates in the autumn and winter months to forage in south-eastern Australia. In NSW, it mostly occurs on the coast and south-west slopes. On the mainland, the Swift Parrot occurs in areas where eucalypts are flowering profusely or where there are abundant lerp infestations. Following winter, they return to Tasmania to breed.	1 (2009)	55 (2020)

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (DPIE (EES), 2020)	Number of records (BioNet) within the deferred lands area (year)	Number of records (BioNet) within 10km (year)
Turquoise Parrot	*Neophema pulchella*	V	-	881, 1250, 1776, 1780, 1783, 1803, 1804, 1824, 1845	The Turquoise Parrot ranges from southern Queensland to northern Victoria. The species inhabits edges of eucalypt woodlands, adjoining clearings, timbered ridges and farmland. Forages on seeds, grasses and plant material and nests in tree hollows, logs or posts.	1 (2017)	4 (2017)
Varied Sittella	*Daphoenositta chrysoptera*	V	-	881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824, 1828, 1841, 1845	The Varied Sittella is sedentary and is distributed widely in NSW. However, population sizes in NSW are uncertain, and it's believed they've undergone a reduction in recent years. The species inhabits eucalypt forests and woodlands, particularly those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland. Forages on arthropods and builds a nest in tree forks high in the tree canopy.	2 (2011)	32 (2020)
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V	-	781, 881, 1250, 1776, 1780, 1783, 1786, 1794, 1795, 1803, 1804, 1824	The White-bellied Sea-Eagle is distributed around the Australian coastline. In NSW, it is widespread along the east coast and inland waterways. Habitats are characterised by the presence of large areas of open water, with foraging and breeding sites occurring within proximity to water. Hunt mainly on fish, and nest in large stick nests in large eucalypts, often with emergent dead branches.	None	152 (2020)
White-throated Needletail	*Hirundapus caudacutus*	-	V	781, 881, 905, 1250, 1776, 1780, 1783, 1786, 1794, 1795,	The White-throated Needletail is a non-breeding migrant in Australia, present between late spring and early autumn. They're often observed flying	3 (2021)	146 (2021)

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (DPIE (EES), 2020)	Number of records (BioNet) within the deferred lands area (year)	Number of records (BioNet) within 10km (year)
				1803, 1804, 1824, 1828, 1841, 1845	high in the sky catching insects. The species roosts typically along ridgelines in tall trees.		
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	781, 881, 905, 1250, 1795, 1841, 1845	The Yellow-bellied Sheathtail-bat is a wide-ranging species recorded in NSW commonly from the New England Tablelands and North West Slopes. The species forages for insects in a variety of habitats, and roosts in tree hollows, buildings and mammal burrows.	3 (2021)	12 (2021)

V = Vulnerable, E = Endangered, CE = Critically Endangered, EP = Endangered Population BioNet records of threatened flora species within the deferred lands

APPENDIX G BIONET RECORDS OF THREATENED FLORA SPECIES WITHIN THE DEFERRED LANDS

Name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (TBDC)	Number of records (BioNet) within deferred lands area (year)*	Number of records (BioNet) within 10km (year)*	Species records and distribution in the deferred lands area
Acacia terminalis subsp. *terminalis* Sunshine Wattle	E	E	881, 1250, 1824	Coastal scrub and dry sclerophyll woodland on sandy soils.	1 (2002)	230 (2020)	The single BioNet record within the deferred lands area appears to be inaccurate; the location description states 'Chowder Bay Road, Middle Head' and the accuracy is 2000m. There may be some potential habitat for the species in the deferred lands area.
Eucalyptus camfieldii Camfield's Stringybark	V	V	881, 1250	Poor coastal country in shallow sandy soils overlying Hawkesbury sandstone. Coastal heath mostly on exposed sandy ridges.	52 (2020)	150 (2020)	All records are located in the north-east of the deferred lands area, on ridgetops and upper slopes. All records in the deferred lands area are located between 120m and 134m ahd, in areas mapped as PCTs 1783 and 1824.
Genoplesium baueri Bauer's Midge Orchid	E	E	881, 1803, 1824	Grows in dry sclerophyll forest and moss gardens over sandstone.	6 (2021)	73 (2021)	This is a Class 2 sensitive species, and records cannot be published. There is one record of the species in the north of the deferred lands area, located within PCT 1824.

Name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (TBDC)	Number of records (BioNet) within deferred lands area (year)*	Number of records (BioNet) within 10km (year)*	Species records and distribution in the deferred lands area
Grevillea caleyi Caley's Grevillea	CE	CE	1786, 1845	All sites occur on the ridgetop between elevations of 170 to 240m asl, in association with laterite soils and a vegetation community of open forest, generally dominated by *Eucalyptus sieberi* and *Corymbia gummifera*.	48 (2016)	2,320 (2022)	All records located in the west of the deferred lands area, associated with the plateau adjoining Forest Way. Records of the species within the deferred lands area are mapped between about 108m and 200m ahd, with an average asl of 175m ahd. Most records are located within areas mapped as PCT 1786, but others are located in areas mapped as PCTs 1783, 1824, and 1250.
Microtis angusii Angus's Onion Orchid	E	E	1786	Occurs on soils that have been modified but were originally those of the restricted ridgetop lateritic soils that support the Duffys Forest TEC.	None	176 (2018)	This is a Class 2 sensitive species, and records cannot be published. There are several records located within an area of PCT 1824 in the west of the deferred lands area.
Persoonia hirsuta	E	E	881, 1250, 1786, 1824, 1845	Found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	23 (2007)	36 (2007)	All records located in the south-east of the deferred lands area, within areas mapped as PCTs 1783 and 1824. Saving our Species conservation site identified in this area.
Pimelea curviflora subsp. curviflora	V	V	1776, 1786	Occurs on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands.	18 (2021)	86 (2020)	All records located in the south-east of the deferred lands area, with one record in the north-west, which is described as a 'single plant in mound of fill'.

Name	Status (BC Act)	Status (EPBC Act)	Associated PCTs within the deferred lands area	Habitat description (TBDC)	Number of records (BioNet) within deferred lands area (year)*	Number of records (BioNet) within 10km (year)*	Species records and distribution in the deferred lands area
Prostanthera marifolia	CE	CE	1786	Occurs in localised patches in or in close proximity to the endangered Duffys Forest ecological community.	None	173 (2016)	There is potential habitat in patches of Duffys Forest, however the deferred lands appear to be outside the current known distribution of the species.
Syzygium paniculatum	E	V	1794, 1828, 1841	Occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	2 (2016)	95 (2021)	Two records within the deferred lands area, adjoining Forest Way. This specimen is likely to be planted.
Tetratheca glandulosa	V	-	881, 905, 1250, 1786, 1845	Associated with shale-sandstone transition habitat where shale-cappings occur over sandstone, Occupies ridgetops, upper-slopes and to a lesser extent mid-slope sandstone benches. Vegetation structure varies from heaths and scrub to woodlands/open woodlands, and open forest.	108 (2021)	481 (2021)	Scattered records across the deferred lands; this species has by far the most records within the deferred lands and occurs in a range of PCTs, but the two in which it is most frequently recorded are PCTs 1783 and 1824.

APPENDIX H FAUNA SPECIES LIST

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Observation type	Introduced (Yes/No)
BIRDS					
Australian Brush-turkey	*Alectura lathami*	-	-	Q	N
Australian King Parrot	*Alisterus scapularis*	-	-	OW	N
Australian Magpie	*Cracticus tibicen*	-	-	OW, E	N
Australian Owlet-nightjar	*Aegotheles cristatus*	-	-	W	N
Australian Raven	*Corvus coronoides*	-	-	OW, E	N
Bar-shouldered Dove	*Geopelia humeralis*	-	-	W	N
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	-	-	OW	N
Brown Gerygone	*Gerygone mouki*	-	-	OW	N
Brown Goshawk	*Accipiter fasciatus*	-	-	O	N
Brown Thornbill	*Acanthiza pusilla*	-	-	OW	N
Brush Bronzewing	*Phaps elegans*	-	-	W	N
Channel-billed Cuckoo	*Scythrops novaehollandiae*	-	-	W	N
Common Cicadabird	*Coracina tenuirostris*	-	-	OW	N
Eastern Koel	*Eudynamys orientalis*	-	-	W	N

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Observation type	Introduced (Yes/No)
Eastern Spinebill	*Acanthorhynchus tenuirostris*	-	-	OW	N
Eastern Whipbird	*Psophodes olivaceus*	-	-	W, Q	N
Eastern Yellow Robin	*Eopsaltria australis*	-	-	OW, Q	N
Fan-tailed Cuckoo	*Cacomantis flabelliformis*	-	-	W	N
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	V	-	O, G, W	N
Golden Whistler	*Pachycephala pectoralis*	-	-	OW	N
Grey Butcherbird	*Cracticus torquatus*	-	-	OW, E	N
Grey Fantail	*Rhipidura albiscapa*	-	-	OW	N
Grey Shrike-thrush	*Colluricincla harmonica*	-	-	W, Q	N
Horsfield's Bronze-Cuckoo	*Chalcites basalis*			W	N
Laughing Kookaburra	*Dacelo novaeguineae*	-	-	OW	N
Leaden Flycatcher	*Myiagra alecto*	-	-	OW	N
Lewin's Honeyeater	*Meliphaga lewinii*	-	-	OW	N
Little Eagle (light morph)	*Hieraaetus morphnoides*	V	-	O	N
Little Wattlebird	*Anthochaera chrysoptera*	-	-	OW	N
Magpie-lark	*Grallina cyanoleuca*	-	-	OW	N
Mistletoebird	*Dicaeum hirundinaceum*	-	-	W	N

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Observation type	Introduced (Yes/No)
New Holland Honeyeater	*Phylidonyris novaehollandiae*	-	-	OW	N
Noisy Friarbird	*Philemon corniculatus*	-	-	W	N
Noisy Miner	*Manorina melanocephala*	-	-	OW	N
Olive-backed Oriole	*Oriolus sagittatus*	-	-	W	N
Oriental Dollarbird	*Eurystomus orientalis*	-	-	W, E	N
Pacific Koel	*Eudynamys orientalis*				
Pied Currawong	*Strepera graculina*	-	-	OW	N
Powerful Owl	*Ninox strenua*	V	-	OW	N
Rainbow Lorikeet	*Trichoglossus moluccanus*	-	-	OW	N
Red Wattlebird	*Anthochaera carunculata*	-	-	OW	N
Red-browed Finch	*Neochmia temporalis*	-	-	OW	N
Red-whiskered Bulbul	*Pycnonotus jocosus*	-	-	W	Y
Rufous Fantail	*Rhipidura rufifrons*	-	Mi	O, Q	N
Rufous Whistler	*Pachycephala rufiventris*	-	-	W	N
Sacred Kingfisher	*Todiramphus sanctus*	-	-	OW	N
Scarlet Honeyeater	*Myzomela sanguinolenta*	-	-	W	N
Silvereye	*Zosterops lateralis*	-	-	OW	N

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Observation type	Introduced (Yes/No)
Southern Boobook	*Ninox boobook*	-	-	W	N
Spangled Drongo	*Dicrurus bracteatus*			OW	N
Spotted Dove	*Spilopelia chinensis*	-	-	O	Y
Spotted Pardalote	*Pardalotus punctatus*	-	-	OW	N
Striated Pardalote	*Pardalotus striatus*			OW	N
Striated Thornbill	*Acanthiza lineata*	-	-	OW	N
Sulphur-crested Cockatoo	*Cacatua galerita*	-	-	OW, E	N
Superb Fairy-wren	*Malurus cyaneus*	-	-	OW, E	N
Superb Lyrebird	*Menura novaehollandiae*	-	-	W, Q	N
Tawny Frogmouth	*Podargus strigoides*	-	-	O	N
Variegated Fairy-wren	*Malurus lamberti*	-	-	OW	N
Welcome Swallow	*Hirundo neoxena*	-	-	O	N
White-browed Scrubwren	*Sericornis frontalis*	-	-	W, Q	N
White-cheeked Honeyeater	*Phylidonyris niger*	-	-	OW	N
White-eared Honeyeater	*Lichenostomus leucotis*	-	-	OW	N
White-throated Needletail	*Hirundapus caudacutus*	-	V	O	N
Willie Wagtail	*Rhipidura albiscapa*	-	-	OW	N

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Observation type	Introduced (Yes/No)
Yellow-faced Honeyeater	*Lichenostomus chrysops*	-	-	OW	N
Yellow-tailed Black-Cockatoo	*Calyptorhynchus funereus*	-	-	OW	N
MAMMALS					
Black Rat	*Rattus rattus*	-	-	Q	Y
Brown Antechinus	*Antechinus stuartii*	-	-	O (in nest box and spotlighting),Y (hair)	N
Bush Rat	*Rattus fuscipes*	-	-	Q, Y (hair), Q	N
Chocolate Wattled Bat	*Chalinolobus morio*	-	-	AR (Def)	N
Common Brushtail Possum	*Trichosurus vulpecula*	-	-	O, Q, Y (hair)	N
Common Ringtail Possum	*Pseudocheirus peregrinus*	-	-	O, Q, Y (hair)	N
Domestic Dog	*Canis lupus familiaris*	-	-	O, P, F, Q	Y
Eastern Broad-Nosed Bat	*Scotorepens orion*	-	-	AR (Def)	N
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	V	-	AR (Def)	N
Eastern Free-tailed Bat	*Mormopterus ridei*	-	-	AR (Def)	N
Eastern Forest Bat	*Vespadelus pumilus*	-	-	AR (Def)	N
Eastern Horse-shoe Bat	*Rhinolophus megaphyllus*	-	-	AR (Def)	N
Eastern Pygmy-possum	*Cercartetus nanus*	V	-	O (spotlight and nest box),Q	N

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Observation type	Introduced (Yes/No)
European Red Fox	*Vulpes vulpes*	-	-	P, Q	Y
Gould's Wattled Bat	*Chalinolobus gouldii*	-	-	AR (Def)	N
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V	-	AR (Def)	N
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	OW	N
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	V	-	AR (Def)	N
Little Bent-winged Bat	*Miniopterus australis*	V	-	AR (Def)	N
Little Forest Bat	*Vespadelus vulturnus*	-	-	AR (Def)	N
Long-eared bat	*Nyctophilus sp.*	Cannot be determined		AR (Poss)	N
Long-nosed Bandicoot	*Perameles nasuta*	-	-	Q, Y (Hair)	N
Short-beaked Echidna	*Tachyglossus aculeatus*	-	-	Q	N
Southern Myotis	*Myotis macropus*	V	-	O, AR (Poss)	N
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	P	N
Sugar Glider	*Petaurus breviceps*	-	-	O	N
Swamp Wallaby	*Wallabia bicolor*	-	-	O, P, Q, Y (Hair)	N
White-striped Free-tailed Bat	*Austronomus australis*	-	-	OW, AR (Possible)	N
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	AR (Def)	N

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Observation type	Introduced (Yes/No)
AMPHIBIANS					
Common Eastern Froglet	*Crinia signifera*	-	-	W	N
Eastern Dwarf Tree Frog	*Litoria fallax*	-	-	W	N
Giant Burrowing Frog	*Heleioporus australiacus*	V	V	O (tadpole)	N
Green Stream Frog	*Litoria phyllochroa*	-	-	W	N
Peron's Tree Frog	*Litoria peronii*	-	-	W	N
Red-crowned Toadlet	*Pseudophryne australis*	V	-	W	N
Striped Marsh Frog	*Limnodynastes peronii*	-	-	W	N
Wallum Rocket Frog	*Litoria freycineti*	-	-	O (tadpole), W	N
REPTILES					
Common Garden Skink	*Lampropholis guichenoti*	-	-	O	N
Cunningham's Skink	*Egernia cunninghami*	-	-	O	N
Golden-crowned Snake	*Cacophis squamulosus*	-	-	O	N
Eastern Bearded Dragon	*Pogona barbata*	-	-	O	N
Eastern Water Dragon	*Intellagama lesueurii*	-	-	O	N
Eastern Water Skink	*Eulamprus quoyii*	-	-	O	N
Lace Monitor	*Varanus varius*	-	-	O, F, Q	N

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Observation type	Introduced (Yes/No)
Rosenberg's Goanna	*Varanus rosenbergi*	V	-	O, Q	N
Tree Skink	*Egernia striolata*	-	-	Q	N
Yellow-faced Whip Snake	*Demansia psammophis*	-	-	O	N

APPENDIX I FLORA SPECIES LIST

Flora species recorded in BAM plots

Notes:

The values in each BAM plot column represent the percent foliage cover of each species within a 20 metre x 20 metre plot.

HTW = High Threat Weed

V = Vulnerable

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Acacia binervata	Two-veined Hickory	-	-								0.2			
Acacia elata	Mountain Cedar Wattle	-	-											
Acacia linifolia	White Wattle	-	-			1	5	0.1		0.1				
Acacia longifolia		-	-					0.4	4					
Acacia longissima	Long-leaf Wattle	-	-							0.2				
Acacia myrtifolia	Red-stemmed Wattle	-	-			1		2						
Acacia parramattensis	Parramatta Wattle	-	-											
Acacia suaveolens	Sweet Wattle	-	-					0.4	0.2				1	
Acacia terminalis subsp. Glabrous form	Sunshine Wattle	-	-			0.1								
Acacia ulicifolia	Prickly Moses	-	-			1	10							
Actinotus helianthi	Flannel Flower	-	-											
Actinotus minor	Lesser Flannel Flower	-	-					0.2			0.1		0.1	0.4

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Ageratina adenophora	Crofton Weed	-	-	YES	YES									
Allocasuarina distyla		-	-								1		0.2	0.4
Allocasuarina littoralis	Black She-Oak	-	-					0.5		0.2				
Allocasuarina spp.		-	-											
Andropogon virginicus	Whisky Grass	-	-	YES	YES			0.2	0.1					
Angophora bakeri	Narrow-leaved Apple	-	-											10
Angophora costata	Sydney Red Gum	-	-			5	30			10			0.5	
Angophora crassifolia		-	-											
Angophora floribunda	Rough-barked Apple	-	-											
Angophora hispida	Dwarf Apple	-	-								2			
Anisopogon avenaceus	Oat Speargrass	-	-				0.1	1	5	0.1			1	5.5
Austromyrtus tenuifolia		-	-											
Austrostipa puberula		-	-					2						
Austrostipa ramosissima	Stout Bamboo Grass	-	-											
Baeckea imbricata		-	-								1			0.5
Baloskion tetraphyllum		-	-									1		

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Banksia ericifolia	Heath-leaved Banksia	-	-					0.2	0.1		20	10	10	40
Banksia oblongifolia	Fern-leaved Banksia	-	-								2			1.1
Banksia robur	Swamp Banksia	-	-									5		
Banksia serrata	Old-man Banksia	-	-				3	4						
Banksia spinulosa	Hairpin Banksia	-	-			2			2	0.5				
Bauera rubioides	River Rose	-	-								50	5	10	0.4
Machaerina rubiginosa		-	-										0.1	
Bidens pilosa	Cobbler's Pegs	-	-	YES	YES									
Billardiera scandens	Hairy Apple Berry	-	-			0.1		0.2	0.1	0.1				
Blandfordia grandiflora	Christmas Bells	-	-										0.1	
Blandfordia nobilis	Christmas Bells	-	-											
Boronia ledifolia	Sydney Boronia	-	-					2	0.1		0.1		1	1
Boronia pinnata		-	-						0.1				0.1	2
Boronia polygalifolia	Dwarf Boronia	-	-											
Boronia serrulata	Rose Boronia	-	-											
Bossiaea heterophylla	Variable Bossiaea	-	-						0.1				0.1	
Bossiaea scolopendria		-	-										0.1	0.4

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Brunoniella pumilio	Dwarf Blue Trumpet	-	-					0.2	0.1					
Caesia parviflora	Pale Grass-lily	-	-											
Callicoma serratifolia	Black Wattle	-	-											
Callistemon citrinus	Crimson Bottlebrush	-	-											
Cassytha glabella		-	-					0.2			0.1			
Cassytha pubescens	Downy Dodder-laurel	-	-										0.1	
Caustis flexuosa	Curly Wig	-	-			1	20			15			0.1	
Caustis pentandra	Thick Twist Rush	-	-											0.2
Ceratopetalum gummiferum	Christmas Bush	-	-			2				5				
Chorizandra sphaerocephala	Roundhead Bristle-sedge	-	-										0.1	
Clematis aristata	Old Man's Beard	-	-							0.2				
Conospermum longifolium	Long Leaf Smoke-bush	-	-						0.1					
Cortaderia selloana	Pampas Grass	-	-	YES	YES									
Corymbia eximia	Yellow Bloodwood	-	-											
Corymbia gummifera	Red Bloodwood	-	-			3		10	10	5	0.1			
Crowea saligna		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Cryptostylis erecta	Tartan Tongue Orchid	-	-											
Cyathochaeta diandra		-	-					40	1		1		0.2	
Cymbidium suave	Snake Orchid	-	-							0.1				
Cynodon dactylon	Common Couch	-	-											
Dampiera stricta		-	-				0.1						0.1	0.4
Darwinia fascicularis		-	-											
Dianella caerulea	Blue Flax-lily	-	-			0.1		1	0.1	0.1				
Dianella prunina		-	-											
Dichondra repens	Kidney Weed	-	-			0.1		0.2						
Dillwynia floribunda		-	-					0.5					1	0.1
Dillwynia retorta		-	-											
Dodonaea triquetra	Large-leaf Hop-bush	-	-			5				0.1				
Drosera binata	Forked Sundew	-	-									0.1		
Drosera peltata		-	-								0.1			
Drosera spatulata		-	-										0.1	0.1
Ehrharta erecta	Panic Veldtgrass	-	-	YES	YES									

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Elaeocarpus reticulatus	Blueberry Ash	-	-						0.1					
Empodisma minus		-	-									30	3	
Entolasia stricta	Wiry Panic	-	-			5	0.5	10	2	25			0.5	
Epacris longiflora	Fuchsia Heath	-	-											1
Epacris microphylla	Coral Heath	-	-										0.1	0.2
Epacris pulchella	Wallum Heath	-	-			0.1		0.4			0.1			
Eriostemon australasius		-	-				5							
Eucalyptus capitellata	Brown Stringybark	-	-			8								
Eucalyptus haemastoma	Broad-leaved Scribbly Gum	-	-					4	2		2			
Eucalyptus luehmanniana	Yellow Top Mallee Ash	-	-								5			
Eucalyptus oblonga	Stringybark	-	-				5							
Eucalyptus piperita	Sydney Peppermint	-	-											
Eucalyptus punctata	Grey Gum	-	-				5			5				
Eucalyptus sieberi	Silvertop Ash	-	-			5		16	15			1		
Eucalyptus spp.		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Eucalyptus stricta	Blue Mountains Mallee Ash	-	-											10
Eucalyptus umbra	Broad-leaved White Mahogany	-	-							15				
Gahnia sieberiana	Red-fruit Saw-sedge	-	-			20	4		0.2			10	10	
Gleichenia dicarpa	Pouched Coral Fern	-	-									75	5	
Glycine clandestina	Twining glycine	-	-			0.1								
Gonocarpus tetragynus	Poverty Raspwort	-	-			0.1		0.2					15	
Gonocarpus teucrioides	Germander Raspwort	-	-											
Grevillea buxifolia	Grey Spider Flower	-	-					2			1		0.1	
Grevillea linearifolia	Linear-leaf Grevillea	-	-											
Grevillea sericea	Pink Spider Flower	-	-			3				2				
Grevillea speciosa	Red Spider Flower	-	-					2			0.2		0.1	1
Gymnoschoenus sphaerocephalus	Button Grass	-	-									20		
Haemodorum planifolium		-	-											
Hakea bakeriana		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Hakea dactyloides broad leaf form		-	-					4						1
Hakea gibbosa		-	-											1.1
Hakea propinqua		-	-				1							
Hakea salicifolia	Willow-leaved Hakea	-	-			0.2								
Hakea sericea	Needlebush	-	-			0.1			1	0.5				
Hakea spp.		-	-											
Hakea teretifolia	Needlebush	-	-								5	5	0.1	1
Hardenbergia violacea	False Sarsaparilla	-	-											
Hemigenia purpurea		-	-											
Hibbertia linearis		-	-				0.2							
Hibbertia riparia		-	-										0.1	
Hibbertia ericifolia		-	-								0.1		0.1	0.2
Hovea linearis		-	-						0.1					
Hypochoeris radicata	Catsear	-	-	YES				0.2						
Imperata cylindrica	Blady Grass	-	-					0.1		2				
Isopogon anethifolius	Narrow-leaf Drumsticks	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Kunzea ambigua	Tick Bush	-	-										0.1	
Lagenophora spp.		-	-					0.1						
Lambertia formosa	Mountain Devil	-	-						1					
Lantana camara	Lantana	-	-	YES	YES									
Lasiopetalum ferrugineum		-	-			0.2			0.1	12				
Lepidosperma elatius		-	-							0.2				
Lepidosperma forsythii		-	-								10	1	30	
Lepidosperma laterale	Variable Sword-sedge	-	-			0.1			20	2	0.2			5
Lepidosperma limicola		-	-									30	1	
Leptocarpus tenax		-	-								20			
Leptorhynchos squamatus	Scaly Buttons	-	-											10
Leptospermum juniperinum	Prickly Tea-tree	-	-									0.1		
Leptospermum morrisonii		-	-											
Leptospermum parvifolium		-	-								0.2			

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Leptospermum polygalifolium	Tantoon	-	-											0.5
Leptospermum squarrosum		-	-								8	1		10
Leptospermum trinervium	Slender Tea-tree	-	-						1					4
Lepyrodia scariosa		-	-								10		1	50
Leucopogon amplexicaulis	Beard-heath	-	-											
Ligustrum sinense	Small-leaved Privet	-	-	YES	YES									
Lindsaea linearis	Screw Fern	-	-					0.4						
Lissanthe strigosa	Peach Heath	-	-											
Livistona australis	Cabbage Palm	-	-							0.1				
Lomandra filiformis	Wattle Matt-rush	-	-			0.1								
Lomandra glauca	Pale Mat-rush	-	-					5.5	2					
Lomandra longifolia	Spiny-headed Mat-rush	-	-			0.2	1			0.1				
Lomandra multiflora	Many-flowered Mat-rush	-	-					2						
Lomandra obliqua		-	-			0.2	0.1			0.1			0.1	
Lomandra spp.	Mat-rush	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Lomatia silaifolia	Crinkle Bush	-	-			0.1		0.4	0.1					
Macrozamia communis	Burrawang	-	-							2				
Micrantheum ericoides		-	-			0.2		0.1	0.1	0.1				
Microlaena stipoides	Weeping Grass	-	-			0.2		4		2				
Micromyrtus ciliata	Fringed Heath-myrtle	-	-											
Mitrasacme polymorpha		-	-										0.1	
Monotoca scoparia		-	-								0.1			
Oplismenus aemulus		-	-			0.1								
Oplismenus imbecillis		-	-											
Paspalum dilatatum	Paspalum	-	-	YES	YES									
Patersonia glabrata	Leafy Purple-flag	-	-					0.2	1					0.4
Patersonia sericea	Silky Purple-Flag	-	-											
Persoonia lanceolata	Lance Leaf Geebung	-	-											
Persoonia levis	Broad-leaved Geebung	-	-							1				
Persoonia linearis	Narrow-leaved Geebung	-	-					0.2		0.1				
Persoonia pinifolia	Pine-leaved Geebung	-	-					0.1		0.2		0.1		

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Persoonia sp.		-	-											
Petrophile pulchella	Conesticks	-	-											
Phebalium squameum	Satinwood	-	-				0.5							
Phebalium squamulosum	Scaly Phebalium	-	-											
Philotheca salsolifolia		-	-											
Phyllanthus hirtellus	Thyme Spurge	-	-					1	0.1	0.1				
Pimelea linifolia	Slender Rice Flower	-	-					20						0.2
Pittosporum undulatum	Sweet Pittosporum	-	-											
Platysace linearifolia		-	-				20	1	0.1	0.1			30	4
Podocarpus elatus	Plum Pine	-	-							0.5				
Pratia purpurascens	Whiteroot	-	-			0.1								
Prostanthera denticulata	Rough Mint-bush	-	-			0.5								
Pteridium esculentum	Bracken	-	-			0.1	5			5			0.1	
Ptilothrix deusta		-	-								10		1	20
Pultenaea daphnoides	Large-leaf Bush-pea	-	-			0.2				0.1				
Pultenaea elliptica		-	-											2

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Pultenaea rosmarinifolia		-	-											
Pultenaea scabra		-	-											
Pultenaea spp.		-	-											
Pultenaea stipularis		-	-				5				5		0.3	
Pultenaea tuberculata		-	-			0.1					2			2
Pultenaea villosa	Hairy Bush-pea	-	-											0.2
Ricinocarpos pinifolius	Wedding Bush	-	-											
Scaevola ramosissima	Purple Fan-flower	-	-										0.1	
Schizaea dichotoma	Branched Comb Fern	-	-											
Schoenus brevifolius		-	-									0.1		
Schoenus imberbis		-	-											
Senna pendula		-	-	YES	YES									
Senna pendula var. glabrata		-	-	YES		0.1								
Setaria parviflora		-	-	YES										
Sida rhombifolia	Paddy's Lucerne	-	-	YES										
Smilax glyciphylla	Sweet Sarsparilla	-	-					0.2		0.1				

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	DF01	DF02	DF03	DF04	SSF01	CUS01	CUS02	CUS03	CUS04
Sprengelia incarnata	Pink Swamp Heath	-	-									5		
Stackhousia viminea	Slender Stackhousia	-	-											
Sticherus flabellatus	Umbrella Fern	-	-											
Stylidium graminifolium	Grass Triggerplant	-	-											
Styphelia spp.		-	-											
Tetratheca ericifolia		-	-					0.4						
Tetratheca glandulosa		V	-										0.1	
Thysanotus tuberosus	Common Fringe-lily	-	-											
Todea barbara	King Fern	-	-											
Viminaria juncea	Native Broom	-	-										5	
Woollsia pungens		-	-											
Xanthorrhoea media		-	-			0.5	20	2	1	0.2				
Xanthorrhoea resinosa	Grass Tree	-	-								1			1
Xanthosia pilosa	Woolly Xanthosia	-	-				0.1			0.1			0.2	
Xanthosia tridentata	Rock Xanthosia	-	-			0.1	0.1	0.2			0.1		0.1	
Xyris operculata		-	-											
Zieria laevigata		-	-										0.1	

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Acacia binervata	Two-veined Hickory	-	-											
Acacia elata	Mountain Cedar Wattle	-	-											
Acacia linifolia	White Wattle	-	-											
Acacia longifolia		-	-									•		
Acacia longissima	Long-leaf Wattle	-	-									•		
Acacia myrtifolia	Red-stemmed Wattle	-	-											
Acacia parramattensis	Parramatta Wattle	-	-											
Acacia suaveolens	Sweet Wattle	-	-				•							
Acacia terminalis subsp. Glabrous form	Sunshine Wattle	-	-											
Acacia ulicifolia	Prickly Moses	-	-											
Actinotus helianthi	Flannel Flower	-	-											
Actinotus minor	Lesser Flannel Flower	-	-			•		•	•	•		•	•	•
Ageratina adenophora	Crofton Weed	-	-	YES	YES						•			
Allocasuarina distyla		-	-					•	•				•	•
Allocasuarina littoralis	Black She-Oak	-	-								•			

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Allocasuarina spp.		-	-											
Andropogon virginicus	Whisky Grass	-	-	YES	YES									
Angophora bakeri	Narrow-leaved Apple	-	-											
Angophora costata	Sydney Red Gum	-	-			•				•	•	•		
Angophora crassifolia		-	-						•	•				
Angophora floribunda	Rough-barked Apple	-	-											
Angophora hispida	Dwarf Apple	-	-				•						•	•
Anisopogon avenaceus	Oat Speargrass	-	-			•					•	•		•
Austromyrtus tenuifolia		-	-											
Austrostipa puberula		-	-											
Austrostipa ramosissima	Stout Bamboo Grass	-	-											
Baeckea imbricata		-	-											
Baloskion tetraphyllum		-	-											
Banksia ericifolia	Heath-leaved Banksia	-	-			•	•	•	•	•			•	•
Banksia oblongifolia	Fern-leaved Banksia	-	-			•		•					•	
Banksia robur	Swamp Banksia	-	-											
Banksia serrata	Old-man Banksia	-	-				•		•	•		•		•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Banksia spinulosa	Hairpin Banksia	-	-							•				
Bauera rubioides	River Rose	-	-			•	•							
Machaerina rubiginosa		-	-											
Bidens pilosa	Cobbler's Pegs	-	-	YES	YES		•							
Billardiera scandens	Hairy Apple Berry	-	-				•							
Blandfordia grandiflora	Christmas Bells	-	-											
Blandfordia nobilis	Christmas Bells	-	-											
Boronia ledifolia	Sydney Boronia	-	-				•				•			•
Boronia pinnata		-	-											•
Boronia polygalifolia	Dwarf Boronia	-	-											
Boronia serrulata	Rose Boronia	-	-											
Bossiaea heterophylla	Variable Bossiaea	-	-											
Bossiaea scolopendria		-	-				•	•	•				•	
Brunoniella pumilio	Dwarf Blue Trumpet	-	-											
Caesia parviflora	Pale Grass-lily	-	-											
Callicoma serratifolia	Black Wattle	-	-											
Callistemon citrinus	Crimson Bottlebrush	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Cassytha glabella		-	-											
Cassytha pubescens	Downy Dodder-laurel	-	-											
Caustis flexuosa	Curly Wig	-	-							•		•		
Caustis pentandra	Thick Twist Rush	-	-											
Ceratopetalum gummiferum	Christmas Bush	-	-									•		
Chorizandra sphaerocephala	Roundhead Bristle-sedge	-	-											
Clematis aristata	Old Man's Beard	-	-											
Conospermum longifolium	Long Leaf Smoke-bush	-	-											
Cortaderia selloana	Pampas Grass	-	-	YES	YES	•					•			
Corymbia eximia	Yellow Bloodwood	-	-											
Corymbia gummifera	Red Bloodwood	-	-			•		•		•	•	•		•
Crowea saligna		-	-											
Cryptostylis erecta	Tartan Tongue Orchid	-	-											
Cyathochaeta diandra		-	-				•							•
Cymbidium suave	Snake Orchid	-	-											
Cynodon dactylon	Common Couch	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Dampiera stricta		-	-			•		•	•	•	•		•	
Darwinia fascicularis		-	-			•	•	•	•				•	
Dianella caerulea	Blue Flax-lily	-	-											
Dianella prunina		-	-											
Dichondra repens	Kidney Weed	-	-											
Dillwynia floribunda		-	-											
Dillwynia retorta		-	-							•				•
Dodonaea triquetra	Large-leaf Hop-bush	-	-											
Drosera binata	Forked Sundew	-	-											
Drosera peltata		-	-											
Drosera spatulata		-	-											
Ehrharta erecta	Panic Veldtgrass	-	-	YES	YES									
Elaeocarpus reticulatus	Blueberry Ash	-	-											
Empodisma minus		-	-								•			
Entolasia stricta	Wiry Panic	-	-			•	•	•		•	•	•		•
Epacris longiflora	Fuchsia Heath	-	-											
Epacris microphylla	Coral Heath	-	-				•						•	•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Epacris pulchella	Wallum Heath	-	-									•		
Eriostemon australasius		-	-											
Eucalyptus capitellata	Brown Stringybark	-	-											
Eucalyptus haemastoma	Broad-leaved Scribbly Gum	-	-			•		•	•	•			•	•
Eucalyptus luehmanniana	Yellow Top Mallee Ash	-	-											
Eucalyptus oblonga	Stringybark	-	-							•				
Eucalyptus piperita	Sydney Peppermint	-	-									•		
Eucalyptus punctata	Grey Gum	-	-					•		•				
Eucalyptus sieberi	Silvertop Ash	-	-								•			
Eucalyptus spp.		-	-											
Eucalyptus stricta	Blue Mountains Mallee Ash	-	-											
Eucalyptus umbra	Broad-leaved White Mahogany	-	-											
Gahnia sieberiana	Red-fruit Saw-sedge	-	-											
Gleichenia dicarpa	Pouched Coral Fern	-	-				•							
Glycine clandestina	Twining glycine	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Gonocarpus tetragynus	Poverty Raspwort	-	-											
Gonocarpus teucrioides	Germander Raspwort	-	-								•			
Grevillea buxifolia	Grey Spider Flower	-	-			•	•		•	•			•	
Grevillea linearifolia	Linear-leaf Grevillea	-	-			•								
Grevillea sericea	Pink Spider Flower	-	-											
Grevillea speciosa	Red Spider Flower	-	-						•					
Gymnoschoenus sphaerocephalus	Button Grass	-	-											
Haemodorum planifolium		-	-											
Hakea bakeriana		-	-											
Hakea dactyloides broad leaf form		-	-			•		•		•			•	
Hakea gibbosa		-	-			•								
Hakea propinqua		-	-						•					
Hakea salicifolia	Willow-leaved Hakea	-	-											
Hakea sericea	Needlebush	-	-											
Hakea spp.		-	-											
Hakea teretifolia	Needlebush	-	-			•	•	•						

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Hardenbergia violacea	False Sarsaparilla	-	-											
Hemigenia purpurea		-	-										•	•
Hibbertia linearis		-	-			•								
Hibbertia riparia		-	-											
Hibbertia ericifolia		-	-											
Hovea linearis		-	-											
Hypochoeris radicata	Catsear	-	-	YES		•								
Imperata cylindrica	Blady Grass	-	-											
Isopogon anethifolius	Narrow-leaf Drumsticks	-	-						•					
Kunzea ambigua	Tick Bush	-	-				•	•						
Lagenophora spp.		-	-											
Lambertia formosa	Mountain Devil	-	-			•				•				•
Lantana camara	Lantana	-	-	YES	YES									
Lasiopetalum ferrugineum		-	-											
Lepidosperma elatius		-	-											
Lepidosperma forsythii		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Lepidosperma laterale	Variable Sword-sedge	-	-			•	•	•			•			
Lepidosperma limicola		-	-											
Leptocarpus tenax		-	-											
Leptorhynchos squamatus	Scaly Buttons	-	-											
Leptospermum juniperinum	Prickly Tea-tree	-	-											
Leptospermum morrisonii		-	-									•		
Leptospermum parvifolium		-	-											
Leptospermum polygalifolium	Tantoon	-	-											
Leptospermum squarrosum		-	-			•	•						•	•
Leptospermum trinervium	Slender Tea-tree	-	-				•	•		•				•
Lepyrodia scariosa		-	-			•	•	•	•	•		•		
Leucopogon amplexicaulis	Beard-heath	-	-											
Ligustrum sinense	Small-leaved Privet	-	-	YES	YES									

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Lindsaea linearis	Screw Fern	-	-											
Lissanthe strigosa	Peach Heath	-	-											
Livistona australis	Cabbage Palm	-	-											
Lomandra filiformis	Wattle Matt-rush	-	-											
Lomandra glauca	Pale Mat-rush	-	-			•				•				•
Lomandra longifolia	Spiny-headed Mat-rush	-	-											
Lomandra multiflora	Many-flowered Mat-rush	-	-											
Lomandra obliqua		-	-											•
Lomandra spp.	Mat-rush	-	-											
Lomatia silaifolia	Crinkle Bush	-	-											
Macrozamia communis	Burrawang	-	-											
Micrantheum ericoides		-	-											
Microlaena stipoides	Weeping Grass	-	-											
Micromyrtus ciliata	Fringed Heath-myrtle	-	-			•	•	•	•					
Mitrasacme polymorpha		-	-											
Monotoca scoparia		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Oplismenus aemulus		-	-			•								
Oplismenus imbecillis		-	-											
Paspalum dilatatum	Paspalum	-	-	YES	YES									
Patersonia glabrata	Leafy Purple-flag	-	-			•			•	•				•
Patersonia sericea	Silky Purple-Flag	-	-			•	•	•	•	•			•	•
Persoonia lanceolata	Lance Leaf Geebung	-	-											
Persoonia levis	Broad-leaved Geebung	-	-			•								
Persoonia linearis	Narrow-leaved Geebung	-	-											
Persoonia pinifolia	Pine-leaved Geebung	-	-			•								
Persoonia sp.		-	-											•
Petrophile pulchella	Conesticks	-	-			•								
Phebalium squameum	Satinwood	-	-											
Phebalium squamulosum	Scaly Phebalium	-	-			•		•		•				•
Philotheca salsolifolia		-	-											
Phyllanthus hirtellus	Thyme Spurge	-	-											
Pimelea linifolia	Slender Rice Flower	-	-			•				•				

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Pittosporum undulatum	Sweet Pittosporum	-	-											
Platysace linearifolia		-	-			•	•	•		•	•	•		•
Podocarpus elatus	Plum Pine	-	-											
Pratia purpurascens	whiteroot	-	-											
Prostanthera denticulata	Rough Mint-bush	-	-											
Pteridium esculentum	Bracken	-	-				•							
Ptilothrix deusta		-	-										•	
Pultenaea daphnoides	Large-leaf Bush-pea	-	-											
Pultenaea elliptica		-	-											
Pultenaea rosmarinifolia		-	-			•		•	•					
Pultenaea scabra		-	-							•				
Pultenaea spp.		-	-											
Pultenaea stipularis		-	-											
Pultenaea tuberculata		-	-											
Pultenaea villosa	Hairy Bush-pea	-	-											
Ricinocarpos pinifolius	Wedding Bush	-	-											
Scaevola ramosissima	Purple Fan-flower	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Schizaea dichotoma	Branched Comb Fern	-	-											
Schoenus brevifolius		-	-											
Schoenus imberbis		-	-					•	•	•				
Senna pendula		-	-	YES	YES									
Senna pendula var. glabrata		-	-	YES										
Setaria parviflora		-	-	YES										
Sida rhombifolia	Paddy's Lucerne	-	-	YES		•								
Smilax glyciphylla	Sweet Sarsparilla	-	-											
Sprengelia incarnata	Pink Swamp Heath	-	-											
Stackhousia viminea	Slender Stackhousia	-	-											
Sticherus flabellatus	Umbrella Fern	-	-											
Stylidium graminifolium	Grass Triggerplant	-	-					•	•					•
Styphelia spp.		-	-											
Tetratheca ericifolia		-	-							•				
Tetratheca glandulosa		V	-											
Thysanotus tuberosus	Common Fringe-lily	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F009	F015	F016	F017	F018	F020	F021	F023	F024
Todea barbara	King Fern	-	-											
Viminaria juncea	Native Broom	-	-											
Woollsia pungens		-	-											
Xanthorrhoea media		-	-			•	•	•	•	•	•	•	•	•
Xanthorrhoea resinosa	Grass Tree	-	-											
Xanthosia pilosa	Woolly Xanthosia	-	-								•			
Xanthosia tridentata	Rock Xanthosia	-	-			•								•
Xyris operculata		-	-											
Zieria laevigata		-	-											

Flora species recorded in Rapid Assessment Points

Notes:

HTW = High Threat Weed

V = Vulnerable

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Acacia binervata	Two-veined Hickory	-	-											
Acacia elata	Mountain Cedar Wattle	-	-											
Acacia linifolia	White Wattle	-	-					•		•			•	
Acacia longifolia		-	-											
Acacia longissima	Long-leaf Wattle	-	-											
Acacia myrtifolia	Red-stemmed Wattle	-	-											
Acacia parramattensis	Parramatta Wattle	-	-											
Acacia suaveolens	Sweet Wattle	-	-				•							
Acacia terminalis subsp. Glabrous form	Sunshine Wattle	-	-				•						•	
Acacia ulicifolia	Prickly Moses	-	-											
Actinotus helianthi	Flannel Flower	-	-											
Actinotus minor	Lesser Flannel Flower	-	-			•	•	•	•	•		•		•
Ageratina adenophora	Crofton Weed	-	-	YES	YES									

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Allocasuarina distyla		-	-			•								
Allocasuarina littoralis	Black She-Oak	-	-											
Allocasuarina spp.		-	-				•			•				•
Andropogon virginicus	Whisky Grass	-	-	YES	YES									
Angophora bakeri	Narrow-leaved Apple	-	-						•					
Angophora costata	Sydney Red Gum	-	-			•		•			•	•	•	
Angophora crassifolia		-	-			•								•
Angophora floribunda	Rough-barked Apple	-	-				•							
Angophora hispida	Dwarf Apple	-	-											
Anisopogon avenaceus	Oat Speargrass	-	-			•					•			
Austromyrtus tenuifolia		-	-					•						
Austrostipa puberula		-	-											
Austrostipa ramosissima	Stout Bamboo Grass	-	-											
Baeckea imbricata		-	-											
Baloskion tetraphyllum		-	-											
Banksia ericifolia	Heath-leaved Banksia	-	-			•		•	•	•		•	•	•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Banksia oblongifolia	Fern-leaved Banksia	-	-			•					•	•		•
Banksia robur	Swamp Banksia	-	-											
Banksia serrata	Old-man Banksia	-	-				•		•				•	•
Banksia spinulosa	Hairpin Banksia	-	-											
Bauera rubioides	River Rose	-	-			•		•	•			•		•
Machaerina rubiginosa		-	-											
Bidens pilosa	Cobbler's Pegs	-	-	YES	YES									
Billardiera scandens	Hairy Apple Berry	-	-											
Blandfordia grandiflora	Christmas Bells	-	-											
Blandfordia nobilis	Christmas Bells	-	-											
Boronia ledifolia	Sydney Boronia	-	-								•	•		
Boronia pinnata		-	-					•	•					
Boronia polygalifolia	Dwarf Boronia	-	-											
Boronia serrulata	Rose Boronia	-	-											
Bossiaea heterophylla	Variable Bossiaea	-	-											
Bossiaea scolopendria		-	-			•								•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Brunoniella pumilio	Dwarf Blue Trumpet	-	-											
Caesia parviflora	Pale Grass-lily	-	-											
Callicoma serratifolia	Black Wattle	-	-									•		
Callistemon citrinus	Crimson Bottlebrush	-	-					•						
Cassytha glabella		-	-											
Cassytha pubescens	Downy Dodder-laurel	-	-			•								
Caustis flexuosa	Curly Wig	-	-				•					•	•	•
Caustis pentandra	Thick Twist Rush	-	-			•				•		•		
Ceratopetalum gummiferum	Christmas Bush	-	-											
Chorizandra sphaerocephala	Roundhead Bristle-sedge	-	-											
Clematis aristata	Old Man's Beard	-	-											
Conospermum longifolium	Long Leaf Smoke-bush	-	-											
Cortaderia selloana	Pampas Grass	-	-	YES	YES									
Corymbia eximia	Yellow Bloodwood	-	-					•						
Corymbia gummifera	Red Bloodwood	-	-			•			•	•	•	•		•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Crowea saligna		-	-						•					
Cryptostylis erecta	Tartan Tongue Orchid	-	-											
Cyathochaeta diandra		-	-			•								
Cymbidium suave	Snake Orchid	-	-											
Cynodon dactylon	Common Couch	-	-											
Dampiera stricta		-	-			•	•		•	•		•		
Darwinia fascicularis		-	-							•				
Dianella caerulea	Blue Flax-lily	-	-										•	•
Dianella prunina		-	-											
Dichondra repens	Kidney Weed	-	-											
Dillwynia floribunda		-	-											
Dillwynia retorta		-	-									•	•	
Dodonaea triquetra	Large-leaf Hop-bush	-	-											
Drosera binata	Forked Sundew	-	-											
Drosera peltata		-	-											
Drosera spatulata		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Ehrharta erecta	Panic Veldtgrass	-	-	YES	YES									
Elaeocarpus reticulatus	Blueberry Ash	-	-											
Empodisma minus		-	-											
Entolasia stricta	Wiry Panic	-	-			•	•	•		•	•	•	•	•
Epacris longiflora	Fuchsia Heath	-	-											
Epacris microphylla	Coral Heath	-	-			•								
Epacris pulchella	Wallum Heath	-	-				•		•	•		•		•
Eriostemon australasius		-	-							•		•		
Eucalyptus capitellata	Brown Stringybark	-	-											
Eucalyptus haemastoma	Broad-leaved Scribbly Gum	-	-			•	•		•	•	•	•		
Eucalyptus luehmanniana	Yellow Top Mallee Ash	-	-											
Eucalyptus oblonga	Stringybark	-	-										•	•
Eucalyptus piperita	Sydney Peppermint	-	-											
Eucalyptus punctata	Grey Gum	-	-			•	•	•		•		•	•	•
Eucalyptus sieberi	Silvertop Ash	-	-					•			•			

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Eucalyptus spp.		-	-											
Eucalyptus stricta	Blue Mountains Mallee Ash	-	-											
Eucalyptus umbra	Broad-leaved White Mahogany	-	-											
Gahnia sieberiana	Red-fruit Saw-sedge	-	-								•		•	•
Gleichenia dicarpa	Pouched Coral Fern	-	-					•	•					•
Glycine clandestina	Twining glycine	-	-											
Gonocarpus tetragynus	Poverty Raspwort	-	-											
Gonocarpus teucrioides	Germander Raspwort	-	-								•	•	•	•
Grevillea buxifolia	Grey Spider Flower	-	-			•	•	•	•	•		•		
Grevillea linearifolia	Linear-leaf Grevillea	-	-											
Grevillea sericea	Pink Spider Flower	-	-										•	
Grevillea speciosa	Red Spider Flower	-	-			•	•		•	•				
Gymnoschoenus sphaerocephalus	Button Grass	-	-											
Haemodorum planifolium		-	-								•			
Hakea bakeriana		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Hakea dactyloides broad leaf form		-	-					•					•	
Hakea gibbosa		-	-											
Hakea propinqua		-	-					•	•					
Hakea salicifolia	Willow-leaved Hakea	-	-											
Hakea sericea	Needlebush	-	-			•								
Hakea spp.		-	-								•			
Hakea teretifolia	Needlebush	-	-			•	•	•	•					
Hardenbergia violacea	False Sarsaparilla	-	-				•							
Hemigenia purpurea		-	-				•		•					
Hibbertia linearis		-	-									•	•	
Hibbertia riparia		-	-											
Hibbertia ericifolia		-	-											
Hovea linearis		-	-											
Hypochoeris radicata	Catsear	-	-	YES										
Imperata cylindrica	Blady Grass	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Isopogon anethifolius	Narrow-leaf Drumsticks	-	-											
Kunzea ambigua	Tick Bush	-	-			•					•			
Lagenophora spp.		-	-											
Lambertia formosa	Mountain Devil	-	-				•					•		•
Lantana camara	Lantana	-	-	YES	YES									
Lasiopetalum ferrugineum		-	-						•	•				
Lepidosperma elatius		-	-											
Lepidosperma forsythii		-	-											
Lepidosperma laterale	Variable Sword-sedge	-	-			•			•	•	•			
Lepidosperma limicola		-	-											
Leptocarpus tenax		-	-											
Leptorhynchos squamatus	Scaly Buttons	-	-											
Leptospermum juniperinum	Prickly Tea-tree	-	-											
Leptospermum morrisonii		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Leptospermum parvifolium		-	-									•		
Leptospermum polygalifolium	Tantoon	-	-											
Leptospermum squarrosum		-	-			•		•						
Leptospermum trinervium	Slender Tea-tree	-	-			•			•	•		•		•
Lepyrodia scariosa		-	-			•		•	•	•				•
Leucopogon amplexicaulis	Beard-heath	-	-											
Ligustrum sinense	Small-leaved Privet	-	-	YES	YES									
Lindsaea linearis	Screw Fern	-	-											
Lissanthe strigosa	Peach Heath	-	-											
Livistona australis	Cabbage Palm	-	-											
Lomandra filiformis	Wattle Matt-rush	-	-								•	•		
Lomandra glauca	Pale Mat-rush	-	-				•							
Lomandra longifolia	Spiny-headed Mat-rush	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Lomandra multiflora	Many-flowered Mat-rush	-	-											
Lomandra obliqua		-	-										•	
Lomandra spp.	Mat-rush	-	-											
Lomatia silaifolia	Crinkle Bush	-	-										•	
Macrozamia communis	Burrawang	-	-											
Micrantheum ericoides		-	-											
Microlaena stipoides	Weeping Grass	-	-											
Micromyrtus ciliata	Fringed Heath-myrtle	-	-							•		•		•
Mitrasacme polymorpha		-	-											
Monotoca scoparia		-	-											
Oplismenus aemulus		-	-											
Oplismenus imbecillis		-	-											
Paspalum dilatatum	Paspalum	-	-	YES	YES									
Patersonia glabrata	Leafy Purple-flag	-	-			•	•							•
Patersonia sericea	Silky Purple-Flag	-	-			•				•				
Persoonia lanceolata	Lance Leaf Geebung	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Persoonia levis	Broad-leaved Geebung	-	-				•	•						
Persoonia linearis	Narrow-leaved Geebung	-	-					•		•				
Persoonia pinifolia	Pine-leaved Geebung	-	-											
Persoonia sp.		-	-											
Petrophile pulchella	Conesticks	-	-						•					
Phebalium squameum	Satinwood	-	-											
Phebalium squamulosum	Scaly Phebalium	-	-			•	•		•	•			•	•
Philotheca salsolifolia		-	-											
Phyllanthus hirtellus	Thyme Spurge	-	-									•	•	
Pimelea linifolia	Slender Rice Flower	-	-									•	•	
Pittosporum undulatum	Sweet Pittosporum	-	-											
Platysace linearifolia		-	-			•	•		•	•	•	•	•	•
Podocarpus elatus	Plum Pine	-	-											
Pratia purpurascens	whiteroot	-	-											
Prostanthera denticulata	Rough Mint-bush	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Pteridium esculentum	Bracken	-	-										•	
Ptilothrix deusta		-	-							•	•	•		
Pultenaea daphnoides	Large-leaf Bush-pea	-	-											
Pultenaea elliptica		-	-					•	•	•				
Pultenaea rosmarinifolia		-	-						•					
Pultenaea scabra		-	-									•		
Pultenaea spp.		-	-											
Pultenaea stipularis		-	-			•	•		•	•				
Pultenaea tuberculata		-	-											
Pultenaea villosa	Hairy Bush-pea	-	-											
Ricinocarpos pinifolius	Wedding Bush	-	-											
Scaevola ramosissima	Purple Fan-flower	-	-					•				•		
Schizaea dichotoma	Branched Comb Fern	-	-											
Schoenus brevifolius		-	-											
Schoenus imberbis		-	-			•				•		•		
Senna pendula		-	-	YES	YES						•			

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Senna pendula var. glabrata		-	-	YES										
Setaria parviflora		-	-	YES										
Sida rhombifolia	Paddy's Lucerne	-	-	YES										
Smilax glyciphylla	Sweet Sarsparilla	-	-										•	
Sprengelia incarnata	Pink Swamp Heath	-	-											
Stackhousia viminea	Slender Stackhousia	-	-											
Sticherus flabellatus	Umbrella Fern	-	-											
Stylidium graminifolium	Grass Triggerplant	-	-			•				•				
Styphelia spp.		-	-											
Tetratheca ericifolia		-	-					•	•					
Tetratheca glandulosa		V	-											
Thysanotus tuberosus	Common Fringe-lily	-	-											
Todea barbara	King Fern	-	-											
Viminaria juncea	Native Broom	-	-											
Woollsia pungens		-	-											
Xanthorrhoea media		-	-			•		•		•	•	•	•	

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F031	F032	F033	F034	F035	F036	F041	F042	F043
Xanthorrhoea resinosa	Grass Tree	-	-											
Xanthosia pilosa	Woolly Xanthosia	-	-				•					•	•	
Xanthosia tridentata	Rock Xanthosia	-	-											
Xyris operculata		-	-											
Zieria laevigata		-	-										•	

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Acacia binervata	Two-veined Hickory	-	-											
Acacia elata	Mountain Cedar Wattle	-	-											
Acacia linifolia	White Wattle	-	-											
Acacia longifolia		-	-								•			
Acacia longissima	Long-leaf Wattle	-	-											
Acacia myrtifolia	Red-stemmed Wattle	-	-											
Acacia parramattensis	Parramatta Wattle	-	-										•	
Acacia suaveolens	Sweet Wattle	-	-							•		•		

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Acacia terminalis subsp. Glabrous form	Sunshine Wattle	-	-											
Acacia ulicifolia	Prickly Moses	-	-											
Actinotus helianthi	Flannel Flower	-	-						•	•				
Actinotus minor	Lesser Flannel Flower	-	-			•		•	•			•		•
Ageratina adenophora	Crofton Weed	-	-	YES	YES									
Allocasuarina distyla		-	-							•				
Allocasuarina littoralis	Black She-Oak	-	-											•
Allocasuarina spp.		-	-											
Andropogon virginicus	Whisky Grass	-	-	YES	YES						•		•	
Angophora bakeri	Narrow-leaved Apple	-	-			•								
Angophora costata	Sydney Red Gum	-	-					•						
Angophora crassifolia		-	-						•					
Angophora floribunda	Rough-barked Apple	-	-											
Angophora hispida	Dwarf Apple	-	-								•	•		•
Anisopogon avenaceus	Oat Speargrass	-	-						•	•		•		•
Austromyrtus tenuifolia		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Austrostipa puberula		-	-											
Austrostipa ramosissima	Stout Bamboo Grass	-	-											
Baeckea imbricata		-	-											
Baloskion tetraphyllum		-	-											
Banksia ericifolia	Heath-leaved Banksia	-	-			•	•	•		•	•	•	•	•
Banksia oblongifolia	Fern-leaved Banksia	-	-											•
Banksia robur	Swamp Banksia	-	-											
Banksia serrata	Old-man Banksia	-	-			•			•	•	•	•		
Banksia spinulosa	Hairpin Banksia	-	-									•		
Bauera rubioides	River Rose	-	-									•		
Machaerina rubiginosa		-	-											
Bidens pilosa	Cobbler's Pegs	-	-	YES	YES									
Billardiera scandens	Hairy Apple Berry	-	-											
Blandfordia grandiflora	Christmas Bells	-	-											
Blandfordia nobilis	Christmas Bells	-	-						•					
Boronia ledifolia	Sydney Boronia	-	-			•								

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Boronia pinnata		-	-					•	•					
Boronia polygalifolia	Dwarf Boronia	-	-											
Boronia serrulata	Rose Boronia	-	-											
Bossiaea heterophylla	Variable Bossiaea	-	-											
Bossiaea scolopendria		-	-			•								
Brunoniella pumilio	Dwarf Blue Trumpet	-	-											
Caesia parviflora	Pale Grass-lily	-	-			•								
Callicoma serratifolia	Black Wattle	-	-											
Callistemon citrinus	Crimson Bottlebrush	-	-											
Cassytha glabella		-	-											
Cassytha pubescens	Downy Dodder-laurel	-	-											
Caustis flexuosa	Curly Wig	-	-					•						
Caustis pentandra	Thick Twist Rush	-	-								•			•
Ceratopetalum gummiferum	Christmas Bush	-	-					•						
Chorizandra sphaerocephala	Roundhead Bristle-sedge	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Clematis aristata	Old Man's Beard	-	-											
Conospermum longifolium	Long Leaf Smoke-bush	-	-			•								
Cortaderia selloana	Pampas Grass	-	-	YES	YES						•		•	
Corymbia eximia	Yellow Bloodwood	-	-											
Corymbia gummifera	Red Bloodwood	-	-			•	•	•	•	•	•	•	•	•
Crowea saligna		-	-					•	•	•				
Cryptostylis erecta	Tartan Tongue Orchid	-	-							•				
Cyathochaeta diandra		-	-				•		•	•				
Cymbidium suave	Snake Orchid	-	-											
Cynodon dactylon	Common Couch	-	-										•	
Dampiera stricta		-	-						•	•	•	•	•	•
Darwinia fascicularis		-	-									•		
Dianella caerulea	Blue Flax-lily	-	-							•	•			
Dianella prunina		-	-					•						
Dichondra repens	Kidney Weed	-	-											
Dillwynia floribunda		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Dillwynia retorta		-	-											
Dodonaea triquetra	Large-leaf Hop-bush	-	-								•			
Drosera binata	Forked Sundew	-	-											
Drosera peltata		-	-											
Drosera spatulata		-	-											
Ehrharta erecta	Panic Veldtgrass	-	-	YES	YES								•	
Elaeocarpus reticulatus	Blueberry Ash	-	-											
Empodisma minus		-	-											
Entolasia stricta	Wiry Panic	-	-			•	•	•	•				•	•
Epacris longiflora	Fuchsia Heath	-	-											
Epacris microphylla	Coral Heath	-	-											•
Epacris pulchella	Wallum Heath	-	-				•					•		
Eriostemon australasius		-	-			•						•		•
Eucalyptus capitellata	Brown Stringybark	-	-											
Eucalyptus haemastoma	Broad-leaved Scribbly Gum	-	-			•	•		•		•	•	•	

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Eucalyptus luehmanniana	Yellow Top Mallee Ash	-	-											
Eucalyptus oblonga	Stringybark	-	-			•	•	•		•				•
Eucalyptus piperita	Sydney Peppermint	-	-											
Eucalyptus punctata	Grey Gum	-	-					•	•	•	•			•
Eucalyptus sieberi	Silvertop Ash	-	-											
Eucalyptus spp.		-	-											
Eucalyptus stricta	Blue Mountains Mallee Ash	-	-											
Eucalyptus umbra	Broad-leaved White Mahogany	-	-											
Gahnia sieberiana	Red-fruit Saw-sedge	-	-				•				•			
Gleichenia dicarpa	Pouched Coral Fern	-	-					•						
Glycine clandestina	Twining glycine	-	-											
Gonocarpus tetragynus	Poverty Raspwort	-	-											
Gonocarpus teucrioides	Germander Raspwort	-	-					•	•					
Grevillea buxifolia	Grey Spider Flower	-	-											
Grevillea linearifolia	Linear-leaf Grevillea	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Grevillea sericea	Pink Spider Flower	-	-											
Grevillea speciosa	Red Spider Flower	-	-			•								
Gymnoschoenus sphaerocephalus	Button Grass	-	-											
Haemodorum planifolium		-	-											
Hakea bakeriana		-	-									•		
Hakea dactyloides broad leaf form		-	-			•								
Hakea gibbosa		-	-											
Hakea propinqua		-	-											
Hakea salicifolia	Willow-leaved Hakea	-	-											
Hakea sericea	Needlebush	-	-											•
Hakea spp.		-	-											
Hakea teretifolia	Needlebush	-	-				•					•		•
Hardenbergia violacea	False Sarsaparilla	-	-											
Hemigenia purpurea		-	-			•								
Hibbertia linearis		-	-			•	•							

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Hibbertia riparia		-	-											
Hibbertia ericifolia		-	-											
Hovea linearis		-	-											
Hypochoeris radicata	Catsear	-	-	YES										
Imperata cylindrica	Blady Grass	-	-											
Isopogon anethifolius	Narrow-leaf Drumsticks	-	-											
Kunzea ambigua	Tick Bush	-	-								•			•
Lagenophora spp.		-	-											
Lambertia formosa	Mountain Devil	-	-			•					•			•
Lantana camara	Lantana	-	-	YES	YES								•	
Lasiopetalum ferrugineum		-	-											
Lepidosperma elatius		-	-											
Lepidosperma forsythii		-	-											
Lepidosperma laterale	Variable Sword-sedge	-	-			•	•	•	•	•				•
Lepidosperma limicola		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Leptocarpus tenax		-	-											
Leptorhynchos squamatus	Scaly Buttons	-	-											
Leptospermum juniperinum	Prickly Tea-tree	-	-											
Leptospermum morrisonii		-	-											
Leptospermum parvifolium		-	-											
Leptospermum polygalifolium	Tantoon	-	-											
Leptospermum squarrosum		-	-											•
Leptospermum trinervium	Slender Tea-tree	-	-			•	•	•	•			•		
Lepyrodia scariosa		-	-					•			•	•		•
Leucopogon amplexicaulis	Beard-heath	-	-											
Ligustrum sinense	Small-leaved Privet	-	-	YES	YES								•	
Lindsaea linearis	Screw Fern	-	-					•	•					
Lissanthe strigosa	Peach Heath	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Livistona australis	Cabbage Palm	-	-											
Lomandra filiformis	Wattle Matt-rush	-	-											
Lomandra glauca	Pale Mat-rush	-	-			•		•		•				•
Lomandra longifolia	Spiny-headed Mat-rush	-	-											
Lomandra multiflora	Many-flowered Mat-rush	-	-											
Lomandra obliqua		-	-					•	•	•	•			
Lomandra spp.	Mat-rush	-	-											
Lomatia silaifolia	Crinkle Bush	-	-											
Macrozamia communis	Burrawang	-	-											
Micrantheum ericoides		-	-							•				•
Microlaena stipoides	Weeping Grass	-	-											
Micromyrtus ciliata	Fringed Heath-myrtle	-	-			•								
Mitrasacme polymorpha		-	-											
Monotoca scoparia		-	-											
Oplismenus aemulus		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Oplismenus imbecillis		-	-								•			
Paspalum dilatatum	Paspalum	-	-	YES	YES								•	
Patersonia glabrata	Leafy Purple-flag	-	-			•		•		•				
Patersonia sericea	Silky Purple-Flag	-	-				•							•
Persoonia lanceolata	Lance Leaf Geebung	-	-											
Persoonia levis	Broad-leaved Geebung	-	-				•							•
Persoonia linearis	Narrow-leaved Geebung	-	-											
Persoonia pinifolia	Pine-leaved Geebung	-	-											
Persoonia sp.		-	-											
Petrophile pulchella	Conesticks	-	-					•				•		
Phebalium squameum	Satinwood	-	-											
Phebalium squamulosum	Scaly Phebalium	-	-						•			•		•
Philotheca salsolifolia		-	-											
Phyllanthus hirtellus	Thyme Spurge	-	-				•							
Pimelea linifolia	Slender Rice Flower	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Pittosporum undulatum	Sweet Pittosporum	-	-										•	
Platysace linearifolia		-	-			•	•					•		•
Podocarpus elatus	Plum Pine	-	-											
Pratia purpurascens	whiteroot	-	-											
Prostanthera denticulata	Rough Mint-bush	-	-								•			
Pteridium esculentum	Bracken	-	-											
Ptilothrix deusta		-	-											
Pultenaea daphnoides	Large-leaf Bush-pea	-	-											
Pultenaea elliptica		-	-											•
Pultenaea rosmarinifolia		-	-											
Pultenaea scabra		-	-									•		
Pultenaea spp.		-	-											
Pultenaea stipularis		-	-											
Pultenaea tuberculata		-	-											
Pultenaea villosa	Hairy Bush-pea	-	-											
Ricinocarpos pinifolius	Wedding Bush	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Scaevola ramosissima	Purple Fan-flower	-	-								•			
Schizaea dichotoma	Branched Comb Fern	-	-											
Schoenus brevifolius		-	-											
Schoenus imberbis		-	-			•			•	•		•		•
Senna pendula		-	-	YES	YES						•		•	
Senna pendula var. glabrata		-	-	YES										
Setaria parviflora		-	-	YES									•	
Sida rhombifolia	Paddy's Lucerne	-	-	YES										
Smilax glyciphylla	Sweet Sarsparilla	-	-											
Sprengelia incarnata	Pink Swamp Heath	-	-											
Stackhousia viminea	Slender Stackhousia	-	-											
Sticherus flabellatus	Umbrella Fern	-	-											
Stylidium graminifolium	Grass Triggerplant	-	-									•		
Styphelia spp.		-	-											
Tetratheca ericifolia		-	-			•		•						
Tetratheca glandulosa		V	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F046	F047	F048	F049	F050	F051	F053	F054	F062
Thysanotus tuberosus	Common Fringe-lily	-	-											
Todea barbara	King Fern	-	-											
Viminaria juncea	Native Broom	-	-											
Woollsia pungens		-	-											
Xanthorrhoea media		-	-			•	•				•	•		•
Xanthorrhoea resinosa	Grass Tree	-	-											
Xanthosia pilosa	Woolly Xanthosia	-	-						•	•				
Xanthosia tridentata	Rock Xanthosia	-	-											
Xyris operculata		-	-											
Zieria laevigata		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Acacia binervata	Two-veined Hickory	-	-											
Acacia elata	Mountain Cedar Wattle	-	-											
Acacia linifolia	White Wattle	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Acacia longifolia		-	-											
Acacia longissima	Long-leaf Wattle	-	-											
Acacia myrtifolia	Red-stemmed Wattle	-	-											
Acacia parramattensis	Parramatta Wattle	-	-											
Acacia suaveolens	Sweet Wattle	-	-											•
Acacia terminalis subsp. Glabrous form	Sunshine Wattle	-	-											
Acacia ulicifolia	Prickly Moses	-	-											
Actinotus helianthi	Flannel Flower	-	-											
Actinotus minor	Lesser Flannel Flower	-	-			•			•			•	•	•
Ageratina adenophora	Crofton Weed	-	-	YES	YES									
Allocasuarina distyla		-	-			•		•					•	•
Allocasuarina littoralis	Black She-Oak	-	-											
Allocasuarina spp.		-	-											
Andropogon virginicus	Whisky Grass	-	-	YES	YES									
Angophora bakeri	Narrow-leaved Apple	-	-											
Angophora costata	Sydney Red Gum	-	-				•	•	•	•	•			

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Angophora crassifolia		-	-										•	
Angophora floribunda	Rough-barked Apple	-	-											
Angophora hispida	Dwarf Apple	-	-										•	•
Anisopogon avenaceus	Oat Speargrass	-	-						•					
Austromyrtus tenuifolia		-	-											
Austrostipa puberula		-	-											
Austrostipa ramosissima	Stout Bamboo Grass	-	-											
Baeckea imbricata		-	-											
Baloskion tetraphyllum		-	-											
Banksia ericifolia	Heath-leaved Banksia	-	-				•	•	•	•		•	•	•
Banksia oblongifolia	Fern-leaved Banksia	-	-						•					•
Banksia robur	Swamp Banksia	-	-											
Banksia serrata	Old-man Banksia	-	-				•		•	•		•		•
Banksia spinulosa	Hairpin Banksia	-	-			•								
Bauera rubioides	River Rose	-	-				•		•					
Machaerina rubiginosa		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Bidens pilosa	Cobbler's Pegs	-	-	YES	YES									
Billardiera scandens	Hairy Apple Berry	-	-											
Blandfordia grandiflora	Christmas Bells	-	-											
Blandfordia nobilis	Christmas Bells	-	-											
Boronia ledifolia	Sydney Boronia	-	-										•	
Boronia pinnata		-	-								•			
Boronia polygalifolia	Dwarf Boronia	-	-											
Boronia serrulata	Rose Boronia	-	-											
Bossiaea heterophylla	Variable Bossiaea	-	-											
Bossiaea scolopendria		-	-			•							•	•
Brunoniella pumilio	Dwarf Blue Trumpet	-	-											
Caesia parviflora	Pale Grass-lily	-	-											
Callicoma serratifolia	Black Wattle	-	-											
Callistemon citrinus	Crimson Bottlebrush	-	-											
Cassytha glabella		-	-				•							
Cassytha pubescens	Downy Dodder-laurel	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Caustis flexuosa	Curly Wig	-	-			•	•							
Caustis pentandra	Thick Twist Rush	-	-										•	
Ceratopetalum gummiferum	Christmas Bush	-	-							•				
Chorizandra sphaerocephala	Roundhead Bristle-sedge	-	-											
Clematis aristata	Old Man's Beard	-	-											
Conospermum longifolium	Long Leaf Smoke-bush	-	-											
Cortaderia selloana	Pampas Grass	-	-	YES	YES									
Corymbia eximia	Yellow Bloodwood	-	-											
Corymbia gummifera	Red Bloodwood	-	-				•		•		•		•	
Crowea saligna		-	-				•							
Cryptostylis erecta	Tartan Tongue Orchid	-	-											
Cyathochaeta diandra		-	-											•
Cymbidium suave	Snake Orchid	-	-											
Cynodon dactylon	Common Couch	-	-											
Dampiera stricta		-	-								•	•	•	

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Darwinia fascicularis		-	-					•	•					•
Dianella caerulea	Blue Flax-lily	-	-											
Dianella prunina		-	-											
Dichondra repens	Kidney Weed	-	-											
Dillwynia floribunda		-	-											
Dillwynia retorta		-	-										•	
Dodonaea triquetra	Large-leaf Hop-bush	-	-								•			
Drosera binata	Forked Sundew	-	-											
Drosera peltata		-	-											
Drosera spatulata		-	-											
Ehrharta erecta	Panic Veldtgrass	-	-	YES	YES									
Elaeocarpus reticulatus	Blueberry Ash	-	-											
Empodisma minus		-	-											
Entolasia stricta	Wiry Panic	-	-				•	•			•	•		
Epacris longiflora	Fuchsia Heath	-	-											
Epacris microphylla	Coral Heath	-	-											•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Epacris pulchella	Wallum Heath	-	-											
Eriostemon australasius		-	-											•
Eucalyptus capitellata	Brown Stringybark	-	-											
Eucalyptus haemastoma	Broad-leaved Scribbly Gum	-	-				•						•	•
Eucalyptus luehmanniana	Yellow Top Mallee Ash	-	-											
Eucalyptus oblonga	Stringybark	-	-				•			•	•			
Eucalyptus piperita	Sydney Peppermint	-	-											
Eucalyptus punctata	Grey Gum	-	-							•	•			
Eucalyptus sieberi	Silvertop Ash	-	-											
Eucalyptus spp.		-	-						•					
Eucalyptus stricta	Blue Mountains Mallee Ash	-	-			•							•	
Eucalyptus umbra	Broad-leaved White Mahogany	-	-											
Gahnia sieberiana	Red-fruit Saw-sedge	-	-							•				
Gleichenia dicarpa	Pouched Coral Fern	-	-							•				
Glycine clandestina	Twining glycine	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Gonocarpus tetragynus	Poverty Raspwort	-	-											
Gonocarpus teucrioides	Germander Raspwort	-	-											
Grevillea buxifolia	Grey Spider Flower	-	-										•	•
Grevillea linearifolia	Linear-leaf Grevillea	-	-											
Grevillea sericea	Pink Spider Flower	-	-								•			
Grevillea speciosa	Red Spider Flower	-	-					•						•
Gymnoschoenus sphaerocephalus	Button Grass	-	-											
Haemodorum planifolium		-	-											
Hakea bakeriana		-	-											
Hakea dactyloides broad leaf form		-	-										•	
Hakea gibbosa		-	-										•	
Hakea propinqua		-	-			•								
Hakea salicifolia	Willow-leaved Hakea	-	-											
Hakea sericea	Needlebush	-	-				•			•				
Hakea spp.		-	-							•				

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Hakea teretifolia	Needlebush	-	-						•					
Hardenbergia violacea	False Sarsaparilla	-	-											
Hemigenia purpurea		-	-											
Hibbertia linearis		-	-											•
Hibbertia riparia		-	-											
Hibbertia ericifolia		-	-				•							
Hovea linearis		-	-											
Hypochoeris radicata	Catsear	-	-	YES										
Imperata cylindrica	Blady Grass	-	-											
Isopogon anethifolius	Narrow-leaf Drumsticks	-	-										•	
Kunzea ambigua	Tick Bush	-	-					•	•					
Lagenophora spp.		-	-											
Lambertia formosa	Mountain Devil	-	-				•		•					
Lantana camara	Lantana	-	-	YES	YES									
Lasiopetalum ferrugineum		-	-								•	•		

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Lepidosperma elatius		-	-											
Lepidosperma forsythii		-	-											
Lepidosperma laterale	Variable Sword-sedge	-	-					•						•
Lepidosperma limicola		-	-											
Leptocarpus tenax		-	-						•					
Leptorhynchos squamatus	Scaly Buttons	-	-											
Leptospermum juniperinum	Prickly Tea-tree	-	-											
Leptospermum morrisonii		-	-											
Leptospermum parvifolium		-	-											
Leptospermum polygalifolium	Tantoon	-	-											
Leptospermum squarrosum		-	-			•			•				•	
Leptospermum trinervium	Slender Tea-tree	-	-							•	•	•		•
Lepyrodia scariosa		-	-			•		•	•					•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Leucopogon amplexicaulis	Beard-heath	-	-											
Ligustrum sinense	Small-leaved Privet	-	-	YES	YES									
Lindsaea linearis	Screw Fern	-	-								•			
Lissanthe strigosa	Peach Heath	-	-										•	
Livistona australis	Cabbage Palm	-	-											
Lomandra filiformis	Wattle Matt-rush	-	-											
Lomandra glauca	Pale Mat-rush	-	-											
Lomandra longifolia	Spiny-headed Mat-rush	-	-							•				
Lomandra multiflora	Many-flowered Mat-rush	-	-											
Lomandra obliqua		-	-											
Lomandra spp.	Mat-rush	-	-											
Lomatia silaifolia	Crinkle Bush	-	-											
Macrozamia communis	Burrawang	-	-											
Micrantheum ericoides		-	-											
Microlaena stipoides	Weeping Grass	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Micromyrtus ciliata	Fringed Heath-myrtle	-	-			•		•				•	•	•
Mitrasacme polymorpha		-	-											
Monotoca scoparia		-	-											
Oplismenus aemulus		-	-											
Oplismenus imbecillis		-	-											
Paspalum dilatatum	Paspalum	-	-	YES	YES									
Patersonia glabrata	Leafy Purple-flag	-	-										•	
Patersonia sericea	Silky Purple-Flag	-	-									•		
Persoonia lanceolata	Lance Leaf Geebung	-	-										•	
Persoonia levis	Broad-leaved Geebung	-	-								•			
Persoonia linearis	Narrow-leaved Geebung	-	-											
Persoonia pinifolia	Pine-leaved Geebung	-	-											
Persoonia sp.		-	-											
Petrophile pulchella	Conesticks	-	-											
Phebalium squameum	Satinwood	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Phebalium squamulosum	Scaly Phebalium	-	-			•	•						•	•
Philotheca salsolifolia		-	-											
Phyllanthus hirtellus	Thyme Spurge	-	-											
Pimelea linifolia	Slender Rice Flower	-	-											
Pittosporum undulatum	Sweet Pittosporum	-	-											
Platysace linearifolia		-	-			•	•			•	•	•	•	•
Podocarpus elatus	Plum Pine	-	-											
Pratia purpurascens	whiteroot	-	-											
Prostanthera denticulata	Rough Mint-bush	-	-											
Pteridium esculentum	Bracken	-	-											
Ptilothrix deusta		-	-											•
Pultenaea daphnoides	Large-leaf Bush-pea	-	-											
Pultenaea elliptica		-	-											•
Pultenaea rosmarinifolia		-	-							•				•
Pultenaea scabra		-	-											
Pultenaea spp.		-	-										•	

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Pultenaea stipularis		-	-				•							
Pultenaea tuberculata		-	-											
Pultenaea villosa	Hairy Bush-pea	-	-											
Ricinocarpos pinifolius	Wedding Bush	-	-											
Scaevola ramosissima	Purple Fan-flower	-	-			•						•		
Schizaea dichotoma	Branched Comb Fern	-	-											
Schoenus brevifolius		-	-											
Schoenus imberbis		-	-						•				•	•
Senna pendula		-	-	YES	YES									
Senna pendula var. glabrata		-	-	YES										
Setaria parviflora		-	-	YES										
Sida rhombifolia	Paddy's Lucerne	-	-	YES										
Smilax glyciphylla	Sweet Sarsparilla	-	-											
Sprengelia incarnata	Pink Swamp Heath	-	-											
Stackhousia viminea	Slender Stackhousia	-	-											
Sticherus flabellatus	Umbrella Fern	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F063	F064	F069	F075	F078	F082	F083	F089	F090
Stylidium graminifolium	Grass Triggerplant	-	-					•	•					
Styphelia spp.		-	-											
Tetratheca ericifolia		-	-											
Tetratheca glandulosa		V	-											
Thysanotus tuberosus	Common Fringe-lily	-	-											
Todea barbara	King Fern	-	-											
Viminaria juncea	Native Broom	-	-											
Woollsia pungens		-	-											
Xanthorrhoea media		-	-			•	•			•			•	•
Xanthorrhoea resinosa	Grass Tree	-	-											
Xanthosia pilosa	Woolly Xanthosia	-	-											
Xanthosia tridentata	Rock Xanthosia	-	-			•							•	
Xyris operculata		-	-											
Zieria laevigata		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Acacia binervata	Two-veined Hickory	-	-											
Acacia elata	Mountain Cedar Wattle	-	-											
Acacia linifolia	White Wattle	-	-											
Acacia longifolia		-	-											
Acacia longissima	Long-leaf Wattle	-	-											
Acacia myrtifolia	Red-stemmed Wattle	-	-											
Acacia parramattensis	Parramatta Wattle	-	-											
Acacia suaveolens	Sweet Wattle	-	-					•						
Acacia terminalis subsp. Glabrous form	Sunshine Wattle	-	-											
Acacia ulicifolia	Prickly Moses	-	-											
Actinotus helianthi	Flannel Flower	-	-											
Actinotus minor	Lesser Flannel Flower	-	-			•	•		•				•	•
Ageratina adenophora	Crofton Weed	-	-	YES	YES									
Allocasuarina distyla		-	-			•	•		•	•		•	•	•
Allocasuarina littoralis	Black She-Oak	-	-											
Allocasuarina spp.		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Andropogon virginicus	Whisky Grass	-	-	YES	YES								•	
Angophora bakeri	Narrow-leaved Apple	-	-											
Angophora costata	Sydney Red Gum	-	-								•			
Angophora crassifolia		-	-											•
Angophora floribunda	Rough-barked Apple	-	-											
Angophora hispida	Dwarf Apple	-	-			•	•			•		•		
Anisopogon avenaceus	Oat Speargrass	-	-										•	
Austromyrtus tenuifolia		-	-											
Austrostipa puberula		-	-											
Austrostipa ramosissima	Stout Bamboo Grass	-	-					•						
Baeckea imbricata		-	-											
Baloskion tetraphyllum		-	-											
Banksia ericifolia	Heath-leaved Banksia	-	-			•	•		•	•	•		•	•
Banksia oblongifolia	Fern-leaved Banksia	-	-			•								
Banksia robur	Swamp Banksia	-	-											
Banksia serrata	Old-man Banksia	-	-						•	•	•			•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Banksia spinulosa	Hairpin Banksia	-	-											
Bauera rubioides	River Rose	-	-							•				•
Machaerina rubiginosa		-	-											
Bidens pilosa	Cobbler's Pegs	-	-	YES	YES									
Billardiera scandens	Hairy Apple Berry	-	-						•					
Blandfordia grandiflora	Christmas Bells	-	-											
Blandfordia nobilis	Christmas Bells	-	-											
Boronia ledifolia	Sydney Boronia	-	-					•	•					
Boronia pinnata		-	-										•	
Boronia polygalifolia	Dwarf Boronia	-	-											
Boronia serrulata	Rose Boronia	-	-											•
Bossiaea heterophylla	Variable Bossiaea	-	-											
Bossiaea scolopendria		-	-											
Brunoniella pumilio	Dwarf Blue Trumpet	-	-											
Caesia parviflora	Pale Grass-lily	-	-											
Callicoma serratifolia	Black Wattle	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Callistemon citrinus	Crimson Bottlebrush	-	-											
Cassytha glabella		-	-							•				
Cassytha pubescens	Downy Dodder-laurel	-	-						•					
Caustis flexuosa	Curly Wig	-	-											
Caustis pentandra	Thick Twist Rush	-	-					•	•	•				•
Ceratopetalum gummiferum	Christmas Bush	-	-											
Chorizandra sphaerocephala	Roundhead Bristle-sedge	-	-											
Clematis aristata	Old Man's Beard	-	-											
Conospermum longifolium	Long Leaf Smoke-bush	-	-											
Cortaderia selloana	Pampas Grass	-	-	YES	YES									
Corymbia eximia	Yellow Bloodwood	-	-											
Corymbia gummifera	Red Bloodwood	-	-					•	•		•	•		•
Crowea saligna		-	-											
Cryptostylis erecta	Tartan Tongue Orchid	-	-											
Cyathochaeta diandra		-	-				•					•	•	

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Cymbidium suave	Snake Orchid	-	-											
Cynodon dactylon	Common Couch	-	-											
Dampiera stricta		-	-					•	•		•		•	
Darwinia fascicularis		-	-			•	•		•	•	•			•
Dianella caerulea	Blue Flax-lily	-	-											
Dianella prunina		-	-											
Dichondra repens	Kidney Weed	-	-											
Dillwynia floribunda		-	-											
Dillwynia retorta		-	-							•				•
Dodonaea triquetra	Large-leaf Hop-bush	-	-											
Drosera binata	Forked Sundew	-	-											
Drosera peltata		-	-											
Drosera spatulata		-	-											
Ehrharta erecta	Panic Veldtgrass	-	-	YES	YES									
Elaeocarpus reticulatus	Blueberry Ash	-	-								•			
Empodisma minus		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Entolasia stricta	Wiry Panic	-	-								•		•	
Epacris longiflora	Fuchsia Heath	-	-								•			
Epacris microphylla	Coral Heath	-	-				•			•				
Epacris pulchella	Wallum Heath	-	-											•
Eriostemon australasius		-	-					•		•				
Eucalyptus capitellata	Brown Stringybark	-	-											
Eucalyptus haemastoma	Broad-leaved Scribbly Gum	-	-				•	•	•	•		•	•	
Eucalyptus luehmanniana	Yellow Top Mallee Ash	-	-											
Eucalyptus oblonga	Stringybark	-	-								•		•	
Eucalyptus piperita	Sydney Peppermint	-	-								•			
Eucalyptus punctata	Grey Gum	-	-									•		•
Eucalyptus sieberi	Silvertop Ash	-	-											
Eucalyptus spp.		-	-											
Eucalyptus stricta	Blue Mountains Mallee Ash	-	-											
Eucalyptus umbra	Broad-leaved White Mahogany	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Gahnia sieberiana	Red-fruit Saw-sedge	-	-					•			•			
Gleichenia dicarpa	Pouched Coral Fern	-	-											
Glycine clandestina	Twining glycine	-	-											
Gonocarpus tetragynus	Poverty Raspwort	-	-											
Gonocarpus teucrioides	Germander Raspwort	-	-											
Grevillea buxifolia	Grey Spider Flower	-	-						•					•
Grevillea linearifolia	Linear-leaf Grevillea	-	-											
Grevillea sericea	Pink Spider Flower	-	-											
Grevillea speciosa	Red Spider Flower	-	-						•					
Gymnoschoenus sphaerocephalus	Button Grass	-	-											
Haemodorum planifolium		-	-											
Hakea bakeriana		-	-											
Hakea dactyloides broad leaf form		-	-						•					
Hakea gibbosa		-	-											
Hakea propinqua		-	-						•					

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Hakea salicifolia	Willow-leaved Hakea	-	-											
Hakea sericea	Needlebush	-	-											
Hakea spp.		-	-											
Hakea teretifolia	Needlebush	-	-				•			•			•	•
Hardenbergia violacea	False Sarsaparilla	-	-											
Hemigenia purpurea		-	-			•								•
Hibbertia linearis		-	-							•				•
Hibbertia riparia		-	-											
Hibbertia ericifolia		-	-											
Hovea linearis		-	-											
Hypochoeris radicata	Catsear	-	-	YES										
Imperata cylindrica	Blady Grass	-	-											
Isopogon anethifolius	Narrow-leaf Drumsticks	-	-			•								•
Kunzea ambigua	Tick Bush	-	-											
Lagenophora spp.		-	-											
Lambertia formosa	Mountain Devil	-	-										•	•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Lantana camara	Lantana	-	-	YES	YES									
Lasiopetalum ferrugineum		-	-											
Lepidosperma elatius		-	-											
Lepidosperma forsythii		-	-											
Lepidosperma laterale	Variable Sword-sedge	-	-			•	•					•		
Lepidosperma limicola		-	-											
Leptocarpus tenax		-	-					•						
Leptorhynchos squamatus	Scaly Buttons	-	-											
Leptospermum juniperinum	Prickly Tea-tree	-	-											
Leptospermum morrisonii		-	-											
Leptospermum parvifolium		-	-			•	•							
Leptospermum polygalifolium	Tantoon	-	-											
Leptospermum squarrosum		-	-								•			•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Leptospermum trinervium	Slender Tea-tree	-	-				•			•	•			•
Lepyrodia scariosa		-	-				•				•			•
Leucopogon amplexicaulis	Beard-heath	-	-											
Ligustrum sinense	Small-leaved Privet	-	-	YES	YES									
Lindsaea linearis	Screw Fern	-	-											
Lissanthe strigosa	Peach Heath	-	-											
Livistona australis	Cabbage Palm	-	-											
Lomandra filiformis	Wattle Matt-rush	-	-											
Lomandra glauca	Pale Mat-rush	-	-											
Lomandra longifolia	Spiny-headed Mat-rush	-	-											
Lomandra multiflora	Many-flowered Mat-rush	-	-											
Lomandra obliqua		-	-								•			
Lomandra spp.	Mat-rush	-	-											
Lomatia silaifolia	Crinkle Bush	-	-											
Macrozamia communis	Burrawang	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Micrantheum ericoides		-	-											
Microlaena stipoides	Weeping Grass	-	-											
Micromyrtus ciliata	Fringed Heath-myrtle	-	-						•			•		•
Mitrasacme polymorpha		-	-										•	
Monotoca scoparia		-	-											
Oplismenus aemulus		-	-											
Oplismenus imbecillis		-	-											
Paspalum dilatatum	Paspalum	-	-	YES	YES									
Patersonia glabrata	Leafy Purple-flag	-	-				•		•					•
Patersonia sericea	Silky Purple-Flag	-	-						•					
Persoonia lanceolata	Lance Leaf Geebung	-	-											
Persoonia levis	Broad-leaved Geebung	-	-											
Persoonia linearis	Narrow-leaved Geebung	-	-											
Persoonia pinifolia	Pine-leaved Geebung	-	-											
Persoonia sp.		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Petrophile pulchella	Conesticks	-	-								•			
Phebalium squameum	Satinwood	-	-											
Phebalium squamulosum	Scaly Phebalium	-	-						•					•
Philotheca salsolifolia		-	-											
Phyllanthus hirtellus	Thyme Spurge	-	-											
Pimelea linifolia	Slender Rice Flower	-	-										•	
Pittosporum undulatum	Sweet Pittosporum	-	-											
Platysace linearifolia		-	-				•	•	•	•	•		•	•
Podocarpus elatus	Plum Pine	-	-											
Pratia purpurascens	whiteroot	-	-											
Prostanthera denticulata	Rough Mint-bush	-	-											
Pteridium esculentum	Bracken	-	-											
Ptilothrix deusta		-	-				•			•			•	
Pultenaea daphnoides	Large-leaf Bush-pea	-	-											
Pultenaea elliptica		-	-						•					•
Pultenaea rosmarinifolia		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Pultenaea scabra		-	-					•						
Pultenaea spp.		-	-											
Pultenaea stipularis		-	-											•
Pultenaea tuberculata		-	-					•					•	
Pultenaea villosa	Hairy Bush-pea	-	-											
Ricinocarpos pinifolius	Wedding Bush	-	-											
Scaevola ramosissima	Purple Fan-flower	-	-											•
Schizaea dichotoma	Branched Comb Fern	-	-				•							
Schoenus brevifolius		-	-											
Schoenus imberbis		-	-							•				
Senna pendula		-	-	YES	YES									
Senna pendula var. glabrata		-	-	YES										
Setaria parviflora		-	-	YES										
Sida rhombifolia	Paddy's Lucerne	-	-	YES										
Smilax glyciphylla	Sweet Sarsparilla	-	-											
Sprengelia incarnata	Pink Swamp Heath	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F093	F094	F096	F103	F104	F107	F108	F109	F114
Stackhousia viminea	Slender Stackhousia	-	-										•	
Sticherus flabellatus	Umbrella Fern	-	-											
Stylidium graminifolium	Grass Triggerplant	-	-			•								•
Styphelia spp.		-	-											
Tetratheca ericifolia		-	-			•			•	•			•	
Tetratheca glandulosa		V	-											
Thysanotus tuberosus	Common Fringe-lily	-	-				•							
Todea barbara	King Fern	-	-								•			
Viminaria juncea	Native Broom	-	-											
Woollsia pungens		-	-							•				
Xanthorrhoea media		-	-			•	•		•	•			•	•
Xanthorrhoea resinosa	Grass Tree	-	-											
Xanthosia pilosa	Woolly Xanthosia	-	-					•						
Xanthosia tridentata	Rock Xanthosia	-	-											•
Xyris operculata		-	-											
Zieria laevigata		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Acacia binervata	Two-veined Hickory	-	-											
Acacia elata	Mountain Cedar Wattle	-	-											
Acacia linifolia	White Wattle	-	-											
Acacia longifolia		-	-											
Acacia longissima	Long-leaf Wattle	-	-											
Acacia myrtifolia	Red-stemmed Wattle	-	-											
Acacia parramattensis	Parramatta Wattle	-	-											
Acacia suaveolens	Sweet Wattle	-	-											
Acacia terminalis subsp. Glabrous form	Sunshine Wattle	-	-											
Acacia ulicifolia	Prickly Moses	-	-											
Actinotus helianthi	Flannel Flower	-	-											
Actinotus minor	Lesser Flannel Flower	-	-				•	•					•	•
Ageratina adenophora	Crofton Weed	-	-	YES	YES									
Allocasuarina distyla		-	-			•	•	•	•	•	•	•	•	•
Allocasuarina littoralis	Black She-Oak	-	-											
Allocasuarina spp.		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Andropogon virginicus	Whisky Grass	-	-	YES	YES									
Angophora bakeri	Narrow-leaved Apple	-	-											
Angophora costata	Sydney Red Gum	-	-											
Angophora crassifolia		-	-			•								
Angophora floribunda	Rough-barked Apple	-	-											•
Angophora hispida	Dwarf Apple	-	-					•	•	•				
Anisopogon avenaceus	Oat Speargrass	-	-											
Austromyrtus tenuifolia		-	-											
Austrostipa puberula		-	-											
Austrostipa ramosissima	Stout Bamboo Grass	-	-											
Baeckea imbricata		-	-											
Baloskion tetraphyllum		-	-											
Banksia ericifolia	Heath-leaved Banksia	-	-			•	•	•		•	•		•	•
Banksia oblongifolia	Fern-leaved Banksia	-	-			•		•		•				
Banksia robur	Swamp Banksia	-	-											
Banksia serrata	Old-man Banksia	-	-				•	•	•				•	•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Banksia spinulosa	Hairpin Banksia	-	-						•					
Bauera rubioides	River Rose	-	-				•			•	•			
Machaerina rubiginosa		-	-											
Bidens pilosa	Cobbler's Pegs	-	-	YES	YES									
Billardiera scandens	Hairy Apple Berry	-	-											
Blandfordia grandiflora	Christmas Bells	-	-											
Blandfordia nobilis	Christmas Bells	-	-											
Boronia ledifolia	Sydney Boronia	-	-											
Boronia pinnata		-	-											
Boronia polygalifolia	Dwarf Boronia	-	-											•
Boronia serrulata	Rose Boronia	-	-											
Bossiaea heterophylla	Variable Bossiaea	-	-											
Bossiaea scolopendria		-	-			•		•	•			•	•	
Brunoniella pumilio	Dwarf Blue Trumpet	-	-											
Caesia parviflora	Pale Grass-lily	-	-											
Callicoma serratifolia	Black Wattle	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Callistemon citrinus	Crimson Bottlebrush	-	-											
Cassytha glabella		-	-											
Cassytha pubescens	Downy Dodder-laurel	-	-											
Caustis flexuosa	Curly Wig	-	-											
Caustis pentandra	Thick Twist Rush	-	-										•	•
Ceratopetalum gummiferum	Christmas Bush	-	-									•		
Chorizandra sphaerocephala	Roundhead Bristle-sedge	-	-											
Clematis aristata	Old Man's Beard	-	-											
Conospermum longifolium	Long Leaf Smoke-bush	-	-											
Cortaderia selloana	Pampas Grass	-	-	YES	YES									
Corymbia eximia	Yellow Bloodwood	-	-											
Corymbia gummifera	Red Bloodwood	-	-					•	•		•		•	
Crowea saligna		-	-											
Cryptostylis erecta	Tartan Tongue Orchid	-	-											
Cyathochaeta diandra		-	-							•				•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Cymbidium suave	Snake Orchid	-	-											
Cynodon dactylon	Common Couch	-	-											
Dampiera stricta		-	-											
Darwinia fascicularis		-	-			•			•	•	•	•		•
Dianella caerulea	Blue Flax-lily	-	-											
Dianella prunina		-	-											
Dichondra repens	Kidney Weed	-	-											
Dillwynia floribunda		-	-											
Dillwynia retorta		-	-											
Dodonaea triquetra	Large-leaf Hop-bush	-	-											•
Drosera binata	Forked Sundew	-	-											
Drosera peltata		-	-											
Drosera spatulata		-	-											
Ehrharta erecta	Panic Veldtgrass	-	-	YES	YES									
Elaeocarpus reticulatus	Blueberry Ash	-	-											
Empodisma minus		-	-								•			

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Entolasia stricta	Wiry Panic	-	-								•	•		
Epacris longiflora	Fuchsia Heath	-	-											
Epacris microphylla	Coral Heath	-	-			•					•	•		
Epacris pulchella	Wallum Heath	-	-					•						
Eriostemon australasius		-	-											
Eucalyptus capitellata	Brown Stringybark	-	-											
Eucalyptus haemastoma	Broad-leaved Scribbly Gum	-	-			•	•			•	•	•	•	•
Eucalyptus luehmanniana	Yellow Top Mallee Ash	-	-											
Eucalyptus oblonga	Stringybark	-	-											
Eucalyptus piperita	Sydney Peppermint	-	-											
Eucalyptus punctata	Grey Gum	-	-				•				•	•	•	
Eucalyptus sieberi	Silvertop Ash	-	-											
Eucalyptus spp.		-	-											
Eucalyptus stricta	Blue Mountains Mallee Ash	-	-											
Eucalyptus umbra	Broad-leaved White Mahogany	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Gahnia sieberiana	Red-fruit Saw-sedge	-	-											
Gleichenia dicarpa	Pouched Coral Fern	-	-								•			
Glycine clandestina	Twining glycine	-	-											
Gonocarpus tetragynus	Poverty Raspwort	-	-											
Gonocarpus teucrioides	Germander Raspwort	-	-											
Grevillea buxifolia	Grey Spider Flower	-	-				•		•		•	•	•	•
Grevillea linearifolia	Linear-leaf Grevillea	-	-											
Grevillea sericea	Pink Spider Flower	-	-											
Grevillea speciosa	Red Spider Flower	-	-							•	•			
Gymnoschoenus sphaerocephalus	Button Grass	-	-											
Haemodorum planifolium		-	-											
Hakea bakeriana		-	-				•					•	•	
Hakea dactyloides broad leaf form		-	-											
Hakea gibbosa		-	-											
Hakea propinqua		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Hakea salicifolia	Willow-leaved Hakea	-	-											
Hakea sericea	Needlebush	-	-											
Hakea spp.		-	-											
Hakea teretifolia	Needlebush	-	-				•			•		•		
Hardenbergia violacea	False Sarsaparilla	-	-											
Hemigenia purpurea		-	-					•						
Hibbertia linearis		-	-										•	
Hibbertia riparia		-	-											
Hibbertia ericifolia		-	-											
Hovea linearis		-	-											
Hypochoeris radicata	Catsear	-	-	YES										
Imperata cylindrica	Blady Grass	-	-											
Isopogon anethifolius	Narrow-leaf Drumsticks	-	-											•
Kunzea ambigua	Tick Bush	-	-											
Lagenophora spp.		-	-											
Lambertia formosa	Mountain Devil	-	-				•							•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Lantana camara	Lantana	-	-	YES	YES									
Lasiopetalum ferrugineum		-	-											
Lepidosperma elatius		-	-											
Lepidosperma forsythii		-	-											
Lepidosperma laterale	Variable Sword-sedge	-	-						•			•		•
Lepidosperma limicola		-	-											
Leptocarpus tenax		-	-				•	•				•		
Leptorhynchos squamatus	Scaly Buttons	-	-											
Leptospermum juniperinum	Prickly Tea-tree	-	-											
Leptospermum morrisonii		-	-											
Leptospermum parvifolium		-	-											
Leptospermum polygalifolium	Tantoon	-	-											
Leptospermum squarrosum		-	-			•	•	•		•	•	•		

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Leptospermum trinervium	Slender Tea-tree	-	-											
Lepyrodia scariosa		-	-			•				•	•			•
Leucopogon amplexicaulis	Beard-heath	-	-											
Ligustrum sinense	Small-leaved Privet	-	-	YES	YES									
Lindsaea linearis	Screw Fern	-	-					•						
Lissanthe strigosa	Peach Heath	-	-											
Livistona australis	Cabbage Palm	-	-											
Lomandra filiformis	Wattle Matt-rush	-	-											
Lomandra glauca	Pale Mat-rush	-	-											
Lomandra longifolia	Spiny-headed Mat-rush	-	-											
Lomandra multiflora	Many-flowered Mat-rush	-	-											
Lomandra obliqua		-	-											
Lomandra spp.	Mat-rush	-	-									•		
Lomatia silaifolia	Crinkle Bush	-	-							•				
Macrozamia communis	Burrawang	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Micrantheum ericoides		-	-			•		•						
Microlaena stipoides	Weeping Grass	-	-											
Micromyrtus ciliata	Fringed Heath-myrtle	-	-						•	•	•	•	•	•
Mitrasacme polymorpha		-	-											
Monotoca scoparia		-	-											
Oplismenus aemulus		-	-											
Oplismenus imbecillis		-	-											
Paspalum dilatatum	Paspalum	-	-	YES	YES									
Patersonia glabrata	Leafy Purple-flag	-	-				•						•	
Patersonia sericea	Silky Purple-Flag	-	-											
Persoonia lanceolata	Lance Leaf Geebung	-	-					•						
Persoonia levis	Broad-leaved Geebung	-	-											
Persoonia linearis	Narrow-leaved Geebung	-	-											
Persoonia pinifolia	Pine-leaved Geebung	-	-											
Persoonia sp.		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Petrophile pulchella	Conesticks	-	-					•						
Phebalium squameum	Satinwood	-	-											
Phebalium squamulosum	Scaly Phebalium	-	-						•		•		•	
Philotheca salsolifolia		-	-											
Phyllanthus hirtellus	Thyme Spurge	-	-											
Pimelea linifolia	Slender Rice Flower	-	-											
Pittosporum undulatum	Sweet Pittosporum	-	-											
Platysace linearifolia		-	-			•					•		•	
Podocarpus elatus	Plum Pine	-	-											
Pratia purpurascens	whiteroot	-	-											
Prostanthera denticulata	Rough Mint-bush	-	-											
Pteridium esculentum	Bracken	-	-											
Ptilothrix deusta		-	-											
Pultenaea daphnoides	Large-leaf Bush-pea	-	-											
Pultenaea elliptica		-	-											
Pultenaea rosmarinifolia		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Pultenaea scabra		-	-											
Pultenaea spp.		-	-											
Pultenaea stipularis		-	-				•							
Pultenaea tuberculata		-	-											
Pultenaea villosa	Hairy Bush-pea	-	-											
Ricinocarpos pinifolius	Wedding Bush	-	-											
Scaevola ramosissima	Purple Fan-flower	-	-			•								
Schizaea dichotoma	Branched Comb Fern	-	-											
Schoenus brevifolius		-	-											
Schoenus imberbis		-	-			•								
Senna pendula		-	-	YES	YES									
Senna pendula var. glabrata		-	-	YES										
Setaria parviflora		-	-	YES										
Sida rhombifolia	Paddy's Lucerne	-	-	YES										
Smilax glyciphylla	Sweet Sarsparilla	-	-											
Sprengelia incarnata	Pink Swamp Heath	-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	F115	F124	F125	F126	F127	F131	F132	F133	F134
Stackhousia viminea	Slender Stackhousia	-	-											
Sticherus flabellatus	Umbrella Fern	-	-											
Stylidium graminifolium	Grass Triggerplant	-	-											•
Styphelia spp.		-	-											
Tetratheca ericifolia		-	-											•
Tetratheca glandulosa		V	-											
Thysanotus tuberosus	Common Fringe-lily	-	-											
Todea barbara	King Fern	-	-											
Viminaria juncea	Native Broom	-	-											
Woollsia pungens		-	-											
Xanthorrhoea media		-	-				•	•		•				
Xanthorrhoea resinosa	Grass Tree	-	-											
Xanthosia pilosa	Woolly Xanthosia	-	-											
Xanthosia tridentata	Rock Xanthosia	-	-											
Xyris operculata		-	-											
Zieria laevigata		-	-											

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Acacia binervata	Two-veined Hickory	-	-								
Acacia elata	Mountain Cedar Wattle	-	-			•					
Acacia linifolia	White Wattle	-	-								
Acacia longifolia		-	-								
Acacia longissima	Long-leaf Wattle	-	-								
Acacia myrtifolia	Red-stemmed Wattle	-	-								
Acacia parramattensis	Parramatta Wattle	-	-			•					
Acacia suaveolens	Sweet Wattle	-	-					•			
Acacia terminalis subsp. Glabrous form	Sunshine Wattle	-	-					•	•		
Acacia ulicifolia	Prickly Moses	-	-								
Actinotus helianthi	Flannel Flower	-	-					•			
Actinotus minor	Lesser Flannel Flower	-	-					•		•	•
Ageratina adenophora	Crofton Weed	-	-	YES	YES						
Allocasuarina distyla		-	-					•		•	•
Allocasuarina littoralis	Black She-Oak	-	-			•					
Allocasuarina spp.		-	-								

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Andropogon virginicus	Whisky Grass	-	-	YES	YES						
Angophora bakeri	Narrow-leaved Apple	-	-								
Angophora costata	Sydney Red Gum	-	-			•	•			•	
Angophora crassifolia		-	-								
Angophora floribunda	Rough-barked Apple	-	-								
Angophora hispida	Dwarf Apple	-	-								•
Anisopogon avenaceus	Oat Speargrass	-	-					•		•	
Austromyrtus tenuifolia		-	-								
Austrostipa puberula		-	-								
Austrostipa ramosissima	Stout Bamboo Grass	-	-								
Baeckea imbricata		-	-								
Baloskion tetraphyllum		-	-								•
Banksia ericifolia	Heath-leaved Banksia	-	-				•	•	•	•	
Banksia oblongifolia	Fern-leaved Banksia	-	-				•	•			•
Banksia robur	Swamp Banksia	-	-								
Banksia serrata	Old-man Banksia	-	-			•		•			

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Banksia spinulosa	Hairpin Banksia	-	-			•					
Bauera rubioides	River Rose	-	-					•	•	•	•
Machaerina rubiginosa		-	-							•	
Bidens pilosa	Cobbler's Pegs	-	-	YES	YES						
Billardiera scandens	Hairy Apple Berry	-	-								
Blandfordia grandiflora	Christmas Bells	-	-								
Blandfordia nobilis	Christmas Bells	-	-								
Boronia ledifolia	Sydney Boronia	-	-							•	•
Boronia pinnata		-	-								
Boronia polygalifolia	Dwarf Boronia	-	-								
Boronia serrulata	Rose Boronia	-	-								
Bossiaea heterophylla	Variable Bossiaea	-	-								•
Bossiaea scolopendria		-	-					•			
Brunoniella pumilio	Dwarf Blue Trumpet	-	-								
Caesia parviflora	Pale Grass-lily	-	-								
Callicoma serratifolia	Black Wattle	-	-						•		

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Callistemon citrinus	Crimson Bottlebrush	-	-								
Cassytha glabella		-	-								
Cassytha pubescens	Downy Dodder-laurel	-	-								
Caustis flexuosa	Curly Wig	-	-			•					•
Caustis pentandra	Thick Twist Rush	-	-					•			
Ceratopetalum gummiferum	Christmas Bush	-	-				•				
Chorizandra sphaerocephala	Roundhead Bristle-sedge	-	-								
Clematis aristata	Old Man's Beard	-	-								
Conospermum longifolium	Long Leaf Smoke-bush	-	-								
Cortaderia selloana	Pampas Grass	-	-	YES	YES						
Corymbia eximia	Yellow Bloodwood	-	-								
Corymbia gummifera	Red Bloodwood	-	-			•	•	•			
Crowea saligna		-	-					•			
Cryptostylis erecta	Tartan Tongue Orchid	-	-								
Cyathochaeta diandra		-	-					•		•	

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Cymbidium suave	Snake Orchid	-	-								
Cynodon dactylon	Common Couch	-	-								
Dampiera stricta		-	-								
Darwinia fascicularis		-	-					•			•
Dianella caerulea	Blue Flax-lily	-	-								
Dianella prunina		-	-								
Dichondra repens	Kidney Weed	-	-								
Dillwynia floribunda		-	-								•
Dillwynia retorta		-	-								
Dodonaea triquetra	Large-leaf Hop-bush	-	-								
Drosera binata	Forked Sundew	-	-								
Drosera peltata		-	-								
Drosera spatulata		-	-								
Ehrharta erecta	Panic Veldtgrass	-	-	YES	YES						
Elaeocarpus reticulatus	Blueberry Ash	-	-								
Empodisma minus		-	-				•	•	•	•	•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Entolasia stricta	Wiry Panic	-	-				•	•		•	
Epacris longiflora	Fuchsia Heath	-	-					•			
Epacris microphylla	Coral Heath	-	-					•			
Epacris pulchella	Wallum Heath	-	-			•					
Eriostemon australasius		-	-								
Eucalyptus capitellata	Brown Stringybark	-	-								
Eucalyptus haemastoma	Broad-leaved Scribbly Gum	-	-			•				•	
Eucalyptus luehmanniana	Yellow Top Mallee Ash	-	-								
Eucalyptus oblonga	Stringybark	-	-								
Eucalyptus piperita	Sydney Peppermint	-	-								
Eucalyptus punctata	Grey Gum	-	-				•				
Eucalyptus sieberi	Silvertop Ash	-	-			•					
Eucalyptus spp.		-	-								
Eucalyptus stricta	Blue Mountains Mallee Ash	-	-								
Eucalyptus umbra	Broad-leaved White Mahogany	-	-								

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Gahnia sieberiana	Red-fruit Saw-sedge	-	-				•	•	•		
Gleichenia dicarpa	Pouched Coral Fern	-	-				•	•	•	•	
Glycine clandestina	Twining glycine	-	-								
Gonocarpus tetragynus	Poverty Raspwort	-	-								
Gonocarpus teucrioides	Germander Raspwort	-	-				•				•
Grevillea buxifolia	Grey Spider Flower	-	-					•			•
Grevillea linearifolia	Linear-leaf Grevillea	-	-								
Grevillea sericea	Pink Spider Flower	-	-								
Grevillea speciosa	Red Spider Flower	-	-					•		•	
Gymnoschoenus sphaerocephalus	Button Grass	-	-								
Haemodorum planifolium		-	-								
Hakea bakeriana		-	-								
Hakea dactyloides broad leaf form		-	-								
Hakea gibbosa		-	-								
Hakea propinqua		-	-								

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Hakea salicifolia	Willow-leaved Hakea	-	-								
Hakea sericea	Needlebush	-	-								
Hakea spp.		-	-								
Hakea teretifolia	Needlebush	-	-						•	•	•
Hardenbergia violacea	False Sarsaparilla	-	-								
Hemigenia purpurea		-	-								
Hibbertia linearis		-	-								
Hibbertia riparia		-	-								
Hibbertia ericifolia		-	-								
Hovea linearis		-	-								
Hypochoeris radicata	Catsear	-	-	YES							
Imperata cylindrica	Blady Grass	-	-								
Isopogon anethifolius	Narrow-leaf Drumsticks	-	-					•			
Kunzea ambigua	Tick Bush	-	-					•			
Lagenophora spp.		-	-								
Lambertia formosa	Mountain Devil	-	-								•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Lantana camara	Lantana	-	-	YES	YES						
Lasiopetalum ferrugineum		-	-								
Lepidosperma elatius		-	-								
Lepidosperma forsythii		-	-								•
Lepidosperma laterale	Variable Sword-sedge	-	-			•		•			
Lepidosperma limicola		-	-								
Leptocarpus tenax		-	-								
Leptorhynchos squamatus	Scaly Buttons	-	-								
Leptospermum juniperinum	Prickly Tea-tree	-	-								
Leptospermum morrisonii		-	-								
Leptospermum parvifolium		-	-								
Leptospermum polygalifolium	Tantoon	-	-								
Leptospermum squarrosum		-	-					•	•	•	•

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Leptospermum trinervium	Slender Tea-tree	-	-				•	•			
Lepyrodia scariosa		-	-					•		•	•
Leucopogon amplexicaulis	Beard-heath	-	-				•				
Ligustrum sinense	Small-leaved Privet	-	-	YES	YES						
Lindsaea linearis	Screw Fern	-	-								
Lissanthe strigosa	Peach Heath	-	-								
Livistona australis	Cabbage Palm	-	-								
Lomandra filiformis	Wattle Matt-rush	-	-								
Lomandra glauca	Pale Mat-rush	-	-								
Lomandra longifolia	Spiny-headed Mat-rush	-	-								
Lomandra multiflora	Many-flowered Mat-rush	-	-								
Lomandra obliqua		-	-								
Lomandra spp.	Mat-rush	-	-								
Lomatia silaifolia	Crinkle Bush	-	-								
Macrozamia communis	Burrawang	-	-								

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Micrantheum ericoides		-	-								
Microlaena stipoides	Weeping Grass	-	-								
Micromyrtus ciliata	Fringed Heath-myrtle	-	-					•			
Mitrasacme polymorpha		-	-								
Monotoca scoparia		-	-			•					
Oplismenus aemulus		-	-								
Oplismenus imbecillis		-	-								
Paspalum dilatatum	Paspalum	-	-	YES	YES						
Patersonia glabrata	Leafy Purple-flag	-	-								
Patersonia sericea	Silky Purple-Flag	-	-					•			
Persoonia lanceolata	Lance Leaf Geebung	-	-								
Persoonia levis	Broad-leaved Geebung	-	-								
Persoonia linearis	Narrow-leaved Geebung	-	-								
Persoonia pinifolia	Pine-leaved Geebung	-	-								
Persoonia sp.		-	-								

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Petrophile pulchella	Conesticks	-	-							•	•
Phebalium squameum	Satinwood	-	-								
Phebalium squamulosum	Scaly Phebalium	-	-					•			
Philotheca salsolifolia		-	-					•			
Phyllanthus hirtellus	Thyme Spurge	-	-								
Pimelea linifolia	Slender Rice Flower	-	-					•			
Pittosporum undulatum	Sweet Pittosporum	-	-			•					
Platysace linearifolia		-	-								•
Podocarpus elatus	Plum Pine	-	-								
Pratia purpurascens	whiteroot	-	-								
Prostanthera denticulata	Rough Mint-bush	-	-								
Pteridium esculentum	Bracken	-	-								
Ptilothrix deusta		-	-					•		•	•
Pultenaea daphnoides	Large-leaf Bush-pea	-	-								
Pultenaea elliptica		-	-					•			
Pultenaea rosmarinifolia		-	-					•			

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Pultenaea scabra		-	-								
Pultenaea spp.		-	-								
Pultenaea stipularis		-	-								
Pultenaea tuberculata		-	-								
Pultenaea villosa	Hairy Bush-pea	-	-								
Ricinocarpos pinifolius	Wedding Bush	-	-								
Scaevola ramosissima	Purple Fan-flower	-	-								
Schizaea dichotoma	Branched Comb Fern	-	-								
Schoenus brevifolius		-	-								
Schoenus imberbis		-	-				•	•			
Senna pendula		-	-	YES	YES						
Senna pendula var. glabrata		-	-	YES							
Setaria parviflora		-	-	YES							
Sida rhombifolia	Paddy's Lucerne	-	-	YES							
Smilax glyciphylla	Sweet Sarsparilla	-	-								
Sprengelia incarnata	Pink Swamp Heath	-	-								

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Exotic	HTW	FA01	FA02	FA03	FA04	FA05	FA06
Stackhousia viminea	Slender Stackhousia	-	-								•
Sticherus flabellatus	Umbrella Fern	-	-				•				
Stylidium graminifolium	Grass Triggerplant	-	-								
Styphelia spp.		-	-								•
Tetratheca ericifolia		-	-								
Tetratheca glandulosa		V	-								
Thysanotus tuberosus	Common Fringe-lily	-	-					•			
Todea barbara	King Fern	-	-								
Viminaria juncea	Native Broom	-	-								
Woollsia pungens		-	-								
Xanthorrhoea media		-	-					•	•		•
Xanthorrhoea resinosa	Grass Tree	-	-								
Xanthosia pilosa	Woolly Xanthosia	-	-					•			
Xanthosia tridentata	Rock Xanthosia	-	-								
Xyris operculata		-	-								•
Zieria laevigata		-	-								

APPENDIX J MICROBAT ECHOLOCATION CALL ANALYSIS

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4th May 2021

Hi Kate,

Following are the results for the files you sent for the Northern Beaches investigation, NSW (Table 1). Previous results were already conveyed to Jess via email but I have included results in the table below as well.

Calls from the following species were found with confidence (threatened in bold): *Chalinolobus gouldii*, *Chalinolobus morio*, ***Miniopterus australis***, ***Miniopterus orianae oceanensis***, **Mormopterus norfolkensis**, Mormopterus ridei, *Nyctophilus* spp., *Rhinolophus megaphyllus* (cave-roosting), ***Saccolaimus flaviventris***, ***Scoteanax rueppellii***, *Scotorepens orion*, *Vespadelus pumilis* and *Vespadelus vulturnus*.

Numbers of Mormopterus calls are likely overestimates as open area *Chalinolobus gouldii* calls from open space present similar characteristics.

Austronomus australis was only recorded from possible calls, which are likely noise attributed with low confidence by the automatic recognition program.

Falsistrellus tasmaniensis was also only recorded from possible calls. This species can often be confused with poor *Chalinolobus gouldii* calls, which was recorded with confidence in abundance. Its presence is unlikely.

One possible call was recorded for *Myotis Macropus*, but poor quality calls for this species can easily be confused with poor quality calls for *Nyctophilus* species.

Best wishes

Glenn Hoye

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Table 1: Call analysis results

Date	A. au	C. dw	C. go	C. mo	F. ta	Mi. au	Mi. or	Mo. no	Mo. ri	My. ma	Ny. spp.	R. me	Sa. fl	Sce. ru	Sco. or	V. da	V. pu	V. tr	V. vu
Slippery Dip Trail 10/12/20	0 (0)	0 (0)	2 (2)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0)
Slippery Dip Trail 11/12/20	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Slippery Dip Trail 12/12/20	0 (0)	0 (0)	0 (0)	5 (5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Wearden Rd 10/12/20	0 (0)	0 (0)	1 (1)	1 (1)	0 (0)	1 (1)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Wearden Rd 11/12/20	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Wearden Rd 16/12/20	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)
Slippery Dip Powerline 15/2/21	0 (0)	0 (0)	5 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Slippery Dip Powerline 16/2/21	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Radio Cave 15/2/21	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Radio Cave 16/2/21	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Moon Rock Sth 15/2/21	0 (0)	0 (0)	3 (1)	0 (0)	3 (0)	0 (0)	1 (0)	0 (0)	3 (0)	1 (0)	2 (1)	0 (0)	0 (0)	5 (4)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Moon Rock Sth 16/2/21	0 (0)	1 (0)	3 (2)	0 (0)	3 (0)	0 (0)	0 (0)	3 (0)	3 (2)	0 (0)	4 (2)	0 (0)	2 (1)	6 (2)	3 (1)	0 (0)	0 (0)	0 (0)	0 (0)

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Date	A. au	C. dw	C. go	C. mo	F. ta	Mi. au	Mi. or	Mo. no	Mo. ri	My. ma	Ny. spp.	R. me	Sa. fl	Sce. ru	Sco. or	V. da	V. pu	V. tr	V. vu
Moon Rock Nth 15/2/21	1 (0)	0 (0)	191 (139)	0 (0)	8 (0)	1 (1)	33 (22)	98 (45)	141 (61)	0 (0)	1 (0)	0 (0)	0 (0)	11 (7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Moon Rock Nth 16/2/21	2 (0)	0 (0)	6 (6)	0 (0)	0 (0)	2 (2)	3 (0)	5 (2)	10 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	1 (1)
Cromer Rd 15/2/21	0 (0)	0 (0)	2 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	2 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Cromer Rd 16/2/21	0 (0)	0 (0)	3 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Slippery Dip Top cave 15/2/21	0 (0)	1 (0)	151 (98)	0 (0)	1 (0)	0 (0)	3 (2)	46 (17)	154 (103)	0 (0)	0 (0)	0 (0)	1 (1)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Slippery Dip Top cave 16/2/21	0 (0)	0 (0)	37 (21)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	2 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Ralston Sth Gully 24/2/2021	0 (0)	0 (0)	20 (4)	0 (0)	1 (0)	0 (0)	0 (0)	67 (13)	110 (40)	0 (0)	0 (0)	2 (2)	0 (0)	0 (0)	0 (0)	0 (0)	3 (3)	0 (0)	0 (0)
Ralston Sth Gully 25/2/2021	0 (0)	0 (0)	8 (2)	0 (0)	0 (0)	3 (2)	0 (0)	20 (1)	25 (4)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	1 (1)	0 (0)	1 (1)
Ralston Sth Gully 1/3/2021	2 (0)	0 (0)	2 (0)	0 (0)	0 (0)	5 (5)	0 (0)	1 (0)	17 (4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)
Slippery Dip 2/3/2021	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Slippery Dip 6/3/2021	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Ralston Ave West 18/2/2021	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

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Date	A. au	C. dw	C. go	C. mo	F. ta	Mi. au	Mi. or	Mo. no	Mo. ri	My. ma	Ny. spp.	R. me	Sa. fl	Sce. ru	Sco. or	V. da	V. pu	V. tr	V. vu
Ralston Ave West 24/2/2021	0 (0)	2 (0)	7 (5)	0 (0)	0 (0)	1 (1)	2 (0)	7 (3)	15 (9)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Ralston Ave West 1/3/2021	1 (0)	0 (0)	32 (19)	0 (0)	1 (0)	0 (0)	27 (10)	19 (9)	40 (26)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	1 (0)	1 (0)	0 (0)	0 (0)
Cromer Rd 2/3/2021	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Cromer Rd 7/3/2021	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

The number of echolocation calls identified to a high level of confidence to a species are marked in brackets. Species codes explained below (Table 2), those in bold are listed as threatened.

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Table 2: Species codes for NSW along with State and Federal conservation status

Species code	Scientific name	Common name	NSW status	C'th status
A.au	*Austronomus australis*	White-striped Free-tailed Bat	-	-
C.dw	***Chalinolobus dwyeri***	**Large-eared pied Bat**	**V**	**V**
C.go	*Chalinolobus gouldii*	Gould's Wattled Bat	-	-
C.mo	*Chalinolobus morio*	Chocolate Wattled bat	-	-
C.ni	***Chalinolobus nigrogriseus***	**Hoary Wattled Bat**	**V**	**-**
F.ta	***Falsistrellus tasmaniensis***	**Eastern False Pipistrelle**	**V**	**-**
K.pa	***Kerivoula/Phoniscus papuensis***	**Golden-tipped Bat**	**V**	**-**
Mi.au	***Miniopterus australis***	**Little Bent-winged Bat**	**V**	**-**
Mi.or	***Miniopterus orianae oceanensis***	**Large Bent-winged Bat**	**V**	**-**
Mo.nor	***Mormopterus norfolkensis***	**Eastern Coastal Free-tailed Bat**	**V**	**-**
Mo.pet	*Mormopterus petersi*	Inland Free-tailed Bat (sp.3)	-	-
Mo.pla	*Mormopterus planiceps*	South Eastern Free-tailed Bat (sp.4)	-	-
Mo.rid	*Mormopterus ridei*	Eastern Free-tailed Bat (sp.2)	-	-
My.ma	***Myotis macropus***	**Southern Myotis**	**V**	**-**
Ny. spp.	Nyctophilus spp.	Long-eared Bat species (unidentifiable to species)	-	-
N.bi	***Nyctophilus bifax***	**Eastern Long-eared Bat**	**V**	**-**
N.co	***Nyctophilus corbeni***	**Corben's Long-eared Bat**	**V**	**V**
N.ge	*Nyctophilus geoffroyi*	Lesser Long-eared Bat	-	-
N.go	*Nyctophilus gouldii*	Gould's Long-eared Bat	-	-
R.meg	*Rhinolophus megaphyllus*	Eastern Horseshoe Bat	-	-
Sa.fl	***Saccolaimus flaviventris***	**Yellow-bellied Sheathtail-bat**	**V**	**-**
Scote.ru	***Scoteanax rueppellii***	**Greater Broad-nosed Bat**	**V**	**-**
Scoto.ba	*Scotorepens balstoni*	Inland Broad-nosed Bat	-	-
Scoto.gr	*Scotorepens greyii*	Little Broad-nosed Bat	-	-
Scoto.or	*Scotorepens orion*	Eastern Broad-nosed Bat	-	-
V.dar	*Vespadelus darlingtoni*	Large Forest Bat	-	-
V.pum	*Vespadelus pumilis*	Eastern Forest Bat	-	-
V.reg	*Vespadelus regulus*	Southern Forest Bat	-	-
V.tro	***Vespadelus troughtoni***	**Eastern Cave Bat**	**V**	**-**
V.vul	*Vespadelus vulturnus*	Little Forest Bat	-	-