

BlueScope Blast Furnace No. 6 Modification
Biodiversity Development Assessment Report
Streamlined assessment module – Planted Native Vegetation

Prepared for BlueScope Steel (AIS) Pty Ltd | 7 July 2023



Project number	Client	Project manager/Accredited assessor	LGA	
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This Biodiversity Development Assessment Report has been prepared on the basis of the requirements of (and information provided under) the Biodiversity Assessment Method as certified by BAM Accredited Assessor: Sian Griffiths (BAAS17066)				
Version	Author	Review	Status	Date
D1	Amy Legge	Christie Chapman & Sian Griffiths	Draft 1	19 June 2023
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As required by Section 6.15(1) of the NSW *Biodiversity Conservation Act 2016*, I certify that this Biodiversity Development Assessment Report has been prepared by Niche Environment and Heritage, on the basis of the requirements of (and information provided under) the Biodiversity Assessment Method.

A handwritten signature in grey ink, appearing to read 'Sian Griffiths', with a long horizontal flourish extending to the right.

Sian Griffiths – Accredited Assessor (Accreditation No. BAAS17066)

19 June 2023

Executive summary

Context

Niche Environment and Heritage Pty Ltd (Niche) was engaged by BlueScope Steel (AIS) Pty Ltd (BlueScope) to prepare a Biodiversity Development Assessment Report (BDAR) for the No. 6 Blast Furnace Reline Project (the Project) at BlueScope owned land located in Port Kembla, NSW, approximately 6km south of Wollongong (Subject Area). BlueScope requires a modification to the original approval SSI 22545215 for vegetation removal required for a new slag handling area as well as ancillary activities in relation to the Project.

This report describes the ecological values within the Subject Area as per the Biodiversity Assessment Methodology (BAM) and determines whether the Project is likely to have an impact on threatened biodiversity listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The BAM Streamlined Assessment Module – Planted native vegetation has been applied for this BDAR. The vegetated areas located within the Subject Area align with question 5 from the decision-making key in Appendix D of the BAM.

The ecological assessment, undertaken in accordance with the BAM, included the following:

- Site walkover to map type and extent of native vegetation and determine habitat for threatened biodiversity
- Collection of floristic and habitat data from Rapid Data Points (RDPs)
- Opportunistic flora and fauna surveys

Targeted flora and fauna surveys were not undertaken.

Results

Vegetation occurring across the Subject Area did not align with any Plant Community Type (PCT) and is considered native planted vegetation.

There was no threatened flora recorded within the Subject Area. There is one threatened flora species that is considered to have a moderate or higher likelihood of occurrence in the Subject Area: White-flowered Wax plant (*Cynanchum elegans*) (considered to have a moderate likelihood of occurrence).

No threatened fauna was recorded within the Subject land. Four threatened fauna are considered to have a moderate or higher likelihood of occurrence in the Subject Area:

- Green and Golden Bell Frog (*Litoria aurea*)
- Grey-headed Flying Fox (*Pteropus poliocephalus*)
- Southern Myotis (*Myotis Macropus*)
- Large-eared pied bat (*Chalinolobus dwyeri*).

Impact assessment

The Project will result in the following:

- Direct removal of 2.5 ha of planted native vegetation.
- No impacts to threatened flora or fauna

- No impacts to Serious and Irreversible Impacts (SII) entities.

As threatened biodiversity listed under the EPBC Act was considered unlikely to be impacted by the Project, no assessment/s of significance under the EPBC Act were required. As such, there is no requirement for an EPBC Act Referral regarding Commonwealth threatened species, communities or populations.

Avoid/mitigate impacts

BlueScope have aimed to avoid and minimise environmental impacts from the Project through detailed design, siting of the Project and implementation of actions aimed at mitigating and managing potential indirect impacts of the Project, as detailed in Section 3.1.1.

Credit calculations and offsetting

No biodiversity offsets are required for this Project.

Glossary and list of abbreviations

Term or abbreviation	Definition
BAM	Biodiversity Assessment Method
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BC Reg	NSW <i>Biodiversity Conservation Regulation 2017</i>
BDAR	Biodiversity Development Assessment Report
cm	Centimetre/s
DAWE	Commonwealth Department of Agriculture, Water and the Environment (now DCCEEW)
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DPIE	NSW Department of Planning, Industry and Environment (now DPE)
DPE	NSW Department of Planning and Environment
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
ha	Hectare/s
IBRA	Interim Biogeographic Regionalisation for Australia
km	Kilometre/s
LEP	Local Environment Plan
LGA	Local Government Area
Locality	The Subject Area and surrounds, nominally a 10 km radius from the Subject Area
m	Metre/s
MNES	Matters of National Environmental Significance (from the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>).
PCT	Plant Community Type
RDP	Rapid Data Point
SAII	Serious and Irreversible Impacts
SEPP	State Environmental Planning Policy
SSI	State Significant Infrastructure

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1. Introduction

1.1 Project description

BlueScope Steel (AIS) Pty Ltd (BlueScope) operates the Port Kembla Steelworks located approximately 6 kilometres (km) south of Wollongong (Figure 1). BlueScope is proposing to reline No. 6 Blast Furnace (the Project) that has been in care and maintenance for the past 12 years. The proposed reline of No. 6 Blast Furnace will allow the transfer of ironmaking from No. 5 Blast Furnace to No. 6. No. 5 Blast Furnace is set to be decommissioned sometime between 2026 and 2030. BlueScope requires a modification to the original approval SSI 22545215 for vegetation removal required for a new slag handling area in relation to the Project.

A Biodiversity Development Assessment Report (BDAR) waiver was originally granted (SSI-22545215) on the basis that the Project will not involve the disturbance or removal of any native vegetation or exotic vegetation that could provide habitat for any listed species. At the time of the EIS preparation, the formal design of the slag handling area had not yet commenced, rather the focus was on developing the appropriate scope for the Best Available Technology Slag Granulation system. As a result, the need to clear vegetation was not identified. Since the submission, the design has progressed and will now result in the removal of native and exotic vegetation to accommodate the new slag handling area as well as ancillary activities including several trees in the north of the Subject Area that now need to be removed to facilitate construction activities. The modification application requires a BDAR to be prepared in accordance with the *Biodiversity Conservation Act 2016* (BC Act).

A Modification and Preliminary Biodiversity Assessment was completed by Niche (2023) to assess the Subject Area. This assessment concluded that the use of the Streamlined Assessment Module- planted native vegetation is appropriate for the Project. Justification of the use of the Streamlined Assessment Module- planted native vegetation is provided in Section 2.3.2.

1.2 Description of the Subject Area

The Project is located on BlueScope owned land within the Wollongong Local Government Area (LGA) which is currently used to stockpile coal and was once used as the No.2 Open Hearth. The Subject Area constitutes the proposed slag handling area as part of the Project, including the areas of vegetation removal (Figure 1).

The Subject Area encompasses approximately 10 hectares (ha) of land, which is currently zoned IN3 (heavy industrial) in the State Environment Planning Policy (Transport and Infrastructure) 2021.

All areas within the Subject Area were previously cleared of all vegetation sometime between 1948 and 1961 (Plate 1 and Plate 2). A 2008 Landscape plan shows evidence of plantings completed around the ironmaking office (now Mellor centre) in 2008, located in the northern section of the Subject Area (Figure 1, Plate 4).

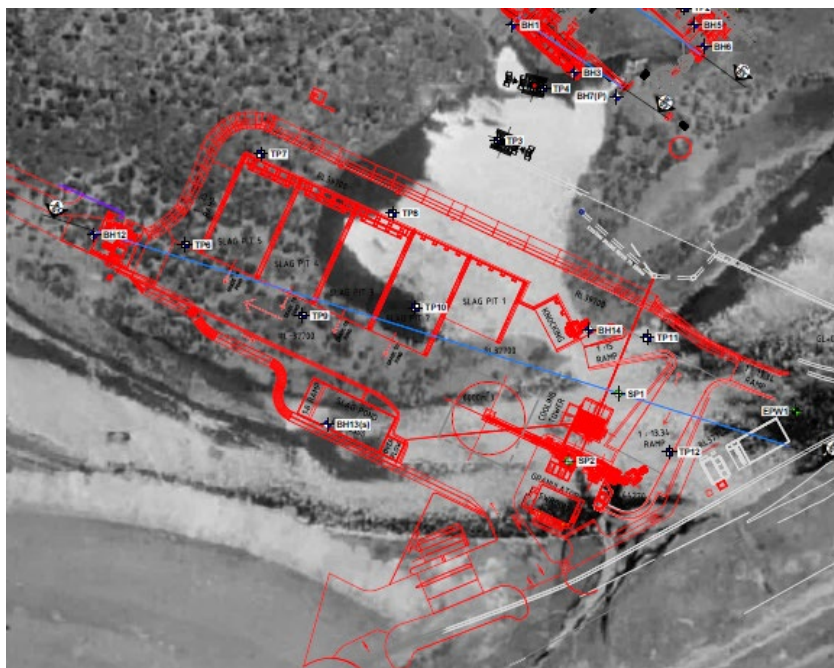


Plate 1: Aerial imagery of the Subject Area from 1948



Plate 2: Aerial imagery of the Subject Area from 1961

1 Landscape Plan
1:200

NOTE: REFER TO BLUESCOPE STEEL LANDSCAPE STANDARDS SPECIFICATION

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1.3.1 State approval and assessment process

The proposed modification of the Project Approval (SSI-22545215) will be sought under Section 5.19 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) as it is deemed Critical State Significant Infrastructure (CSSI). In accordance with Section 7.9 of the BC Act a BDAR must accompany a CSSI application for approval. A BDAR is prepared in accordance with the NSW Biodiversity Assessment Method (BAM) (NSW Department of Planning, Industry and Environment [DPIE] 2020a) and is required to assess impacts to biodiversity as per the BC Act.

1.3.2 Streamlined assessment module planted native vegetation

The streamlined assessment module planted native vegetation (Appendix D of the BAM) has been applied to the Project as part of this BDAR. With reference to the decision-making key in Appendix D of the BAM, question 5 applied to the vegetation present within the Subject Area.

D1. 5. Is the native vegetation (including individuals of a threatened flora species) planted for functional, aesthetic, horticultural or plantation forestry purposes? This includes examples such as: windbreaks in agricultural landscapes, roadside plantings (including street trees, median strips, roadside batters), landscaping in parks, gardens and sport fields/complexes, macadamia plantations or teatree farms?

As such, D2 of Appendix D applies (assessment of planted native vegetation for threatened species habitat), whereby Chapter 4 (assessment of native vegetation, threatened ecological communities and vegetation integrity) and Chapter 5 (assessment of habitat suitability for threatened species) of the BAM are not required to be applied as part of the BDAR. As per D2, the suitability of the planted native vegetation for use by threatened species must be assessed and any incidental sightings or evidence (e.g. scats, stick nests) of threatened species credit species (flora and fauna) using, inhabiting or being part of the planted native vegetation recorded. Section 8.4 of the BAM (mitigate and manage impacts on biodiversity values) must be applied where evidence indicates that threatened species are using the planted native vegetation as habitat. Should this be the case, it is noted that species credits are not required to offset the proposed impacts.

This streamlined BDAR addresses the requirements of Table 28 (Appendix L) of the BAM. Specifically, Section 2.3 of this amended BDAR describes and assesses the planted native vegetation.

1.3.3 Commonwealth approval and assessment process

Matters of National Environmental Significance (MNES) are protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The BAM (DPIE 2020a) requires proponents to identify and assess the impacts on all nationally listed threatened species and threatened ecological communities that may be present on or near the Subject Area. Where threatened biodiversity listed under the EPBC Act may be potentially impacted by the Project, an assessment of impacts will be undertaken via the Significance Impact Criteria provided under the EPBC Act.

Under the EPBC Act, activities that have potential to result in significant impacts on MNES must be referred to the Commonwealth Minister for the Environment for assessment.

This report considers the impact of the Project on MNES.

1.3.4 Assessment format

The primary objective of this assessment is to use the guidelines and methodology provided in the BAM (DPIE 2020a, DPIE 2022) to determine the impact the Project would have on biodiversity, avoid and mitigate these impacts and then calculate the Project's biodiversity offset requirement.

This BDAR consist of two broad stages consistent with the BAM (DPIE 2020a):

Stage 1 – Biodiversity Assessment

- Assessment of landscape features
- Assessment of native vegetation
- Assessment of threatened species and populations.

Stage 2 – Impact Assessment

- Avoid and minimise impacts on biodiversity values
- Consider impact and offset thresholds
- Determine and calculate offset requirements.

1.4 Assessment resources and assessor qualifications

This BDAR has been prepared by the accredited personnel and support staff identified in Table 1. Resources and survey guidelines used in the preparation of this BDAR are detailed in Table 2.

Table 1: Assessor and support staff qualifications and resources

Personnel	Role	Qualifications	Tasks carried out
Christie Chapman	Experienced Consultant- Environmental Approvals	BEnvSc (Hons)	Project management, field surveys, field survey planning and coordination, report preparation and data management.
Sian Griffiths	Principal – Ecology	BEnvSc (Hons) Accredited Biodiversity Assessor (BAAS 17066)	Project Management, Data management, Field survey planning and coordination and quality assurance.
Amy Legge	Ecology Consultant	BSc	Field surveys, field survey planning and coordination, report preparation and data management.

Table 2: Assessment resources, guidelines and databases used

Assessment resources/guideline	
Resources	<ul style="list-style-type: none"> • BAM (DPIE 2020a) • BAM 2020 Operational Manual – Stage 1 (DPIE 2020b) • BAM Operational Manual – Stage 2 (DPIE 2019a) • BAM Operational Manual – Streamlined assessment module planted native vegetation (DPE 2022)
Databases	<ul style="list-style-type: none"> • The BioNet Atlas of NSW Wildlife (DPE 2023b) • EPBC Act Protected Matters Search Tool (PMST) (Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023a) • BioNet Threatened Species Database (DPE 2023c) • Species Profile and Threats Database (SPRAT) with information on threatened species profiles, recovery plans and final determinations (DCCEEW 2023b).

2. Biodiversity Assessment

2.1 Landscape context

As detailed in Section 3 of the BAM (DPIE 2020a), a landscape assessment for the Project is required.

Landscape value is derived from the assessment of a number of factors including:

- Native vegetation cover
- Rivers, streams and estuaries
- Areas of geological significance
- Habitat connectivity.

For each factor the current state of the landscape is assessed then compared with the state of the landscape if the Project were to proceed.

Table 3 provides details of the landscape settings and scored landscape features for the Project.

Table 3: Landscape features and scoring under the BAM

Landscape features	Description	Figure reference
Interim Biogeographic Regionalisation for Australia (IBRA) bioregion/subregion	Sydney Basin bioregion/ Illawarra subregion	Figure 2
NSW (Mitchell) Landscapes	Lake Illawarra Barrier Landscape	Figure 2
Rivers, streams and estuaries and Strahler stream order	No rivers, streams or estuaries run into the Subject Area. Allans creek is located North of the Subject Area and flows into Tom Thumbs Lagoon which borders Port Kembla Steel Works. Channels built around the Subject Area flow into Allans creek. These areas are listed as Key Fish Habitat.	Figure 2
Wetlands within and adjacent to development	Port Kembla Harbour an Estuarine wetland is located 500m east of the Subject Area. Lake Illawarra is located 3km south of the Subject Area. It is listed under Coastal Wetlands, Coastal Management SEPP 2018. The nearest RAMSAR wetland consists of the Towra Point Nature Reserve located 75 km to the north of the Subject Area (DPIE 2012).	-
Connectivity features	The planted native vegetation is isolated from any surrounding native vegetation. The Subject Area is approximately 7 km east of the Illawarra Escarpment State Conservation Area. The Subject Area provides little to no connectivity to remnant vegetation. The Subject Area is isolated and is located in a heavy industrial area. The closest patch of vegetation is approximately 2 km west of the Subject Area.	Figure 2
Karst, caves, crevices, cliffs, rocks and other geological features of significance	The Subject Area does not contain any geological features of significance.	-
Areas of Outstanding Biodiversity Value (AOBVs)	The Register of Declared Areas of Outstanding Biodiversity Value (AOBV) has information about declared AOBV in NSW. AOBV declarations in NSW include the following: <ul style="list-style-type: none"> ▪ Gould's Petrel – critical habitat declaration ▪ Little penguin population in Sydney's North Harbour – critical habitat 	-

Landscape features	Description	Figure reference
	<p>declaration</p> <ul style="list-style-type: none"> ▪ Mitchell's Rainforest Snail in Stotts Island Nature Reserve – critical habitat declaration ▪ Wollemi Pine – critical habitat declaration. <p>No registered AOBVs occur within the Subject Area or surrounds.</p>	

2.2 Data review

A review of relevant literature, databases and existing vegetation mapping was undertaken to identify likely vegetation communities and threatened biodiversity with the potential to occur in the Subject Area. This information was reviewed prior to field surveys to inform initial survey effort and design and identify species for consideration.

Database searches within the locality (a 10 km radius around the Subject Area) were conducted to identify threatened species and Threatened Ecological Communities (TECs) with known occurrences or with the potential to occur on the Subject Area. A likelihood of occurrence analysis (Annex 2) was then undertaken prior to field surveys for each species/TEC, based on preliminary information regarding habitat present within the Subject Area. The following resources were used for this purpose:

- Database searches:
 - NSW BioNet Atlas Database (DPE 2023b) for spatial records of threatened flora listed under the BC Act within a 10 km radius of the Subject Area.
 - EPBC Act (PMST) (DCCEEW 2023a) for flora and ecological communities identified as MNES known from or with potential habitat within a 10 km radius of the Subject Area.
 - Preliminary run of the BAM-C tool (using benchmark condition for previously mapped Plant Community Types [PCTs]) to identify candidate species credit species and predicted ecosystem credit species known or predicated to occur within the IBRA subregion.
- Vegetation mapping: existing vegetation mapping (DPIE 2016) was examined prior to the field survey to determine the vegetation communities likely to be present in the Subject Area.

Five categories for likelihood of occurrence were attributed to threatened biodiversity after considering the number and proximity of known records, presence or absence of preferred habitat types (e.g. native vegetation types) and professional judgement. The categories are outlined in Table 4. Species considered further for assessment included:

- Those in the 'Known', 'High' or 'Moderate' categories and where impacts for the species could reasonably occur from the Project
- Candidate species as identified by the BAM-C.

Species listed with a 'Low' or 'None' likelihood of occurrence are those for which there is limited, or no habitat present within the Subject Area.

The likelihood of occurrence analysis (Annex 1) was then updated for each species, based on the habitat present within the Subject Area, following the onsite habitat assessment.

Table 4: Likelihood of occurrence criteria

Likelihood rating	Threatened flora criteria	Threatened and migratory fauna criteria
Known	The species was observed within the Subject Area.	The species was observed within the Subject Area.

Likelihood rating	Threatened flora criteria	Threatened and migratory fauna criteria
High	It is likely that a species inhabits or utilises habitat within the Subject Area.	It is likely that a species inhabits or utilises habitat within the Subject Area.
Moderate	Potential habitat for a species occurs within the Subject Area. Adequate field survey would determine if there is a 'high' or 'low' likelihood of occurrence for the species within the Subject Area.	Potential habitat for a species occurs within the Subject Area and the species may occasionally utilise that habitat. Species unlikely to be wholly dependent on the habitat present within the Subject Area.
Low	It is unlikely that the species inhabits the Subject Area.	It is unlikely that the species inhabits the Subject Area. If present, the species would likely be a transient visitor. The Subject Area contains only very common habitat for this species which the species would not rely on for its on-going local existence.
None	The habitat within the Subject Area is unsuitable for the species.	The habitat within the Subject Area is unsuitable for the species.

2.3 Planted native vegetation

This Section describes the survey effort, identification and determination of the planted native vegetation occurring across the Subject Area.

2.3.1 Field survey

Three days of field surveys were undertaken on 21 March, 10 May and 14 June 2023. As detailed in Appendix D.2 of the BAM (DPIE 2020a) the planted native vegetation is not required to be assessed under the standard BAM. Therefore, no BAM plots were undertaken, and instead rapid data point surveys and opportunistic threatened species surveys were conducted throughout the Subject Area. An assessment of the vegetation was completed using a combination of rapid data points and walking meanders. Vegetation mapped as occurring within the Subject Area and flora survey effort is shown on Figure 3.

The following survey tasks were completed for the flora survey:

- Vegetation mapping, using rapid data points.
- Opportunistic observations of threatened flora, TECs, habitat quality and high threat and priority weeds.

Ecological values of the Subject Area (including potential threatened species habitat) were appraised via survey and assessment of planted native vegetation and condition.

2.3.2 Planted native vegetation assessment and mapping

All vegetation within the Subject Area was assessed via field survey and associated documentation, including historical aerial photography and records of landscaping plans. The mapping was updated to reflect vegetation observed and surveyed during field assessment. The vegetation present within the Subject Area aligns with question 5 of the decision-making key in Appendix D (D.1) of the BAM. The justification for the alignment is provided in Table 5.

Given the application of D.1 of the Streamlined assessment module planted native vegetation justifies the application of the streamlined assessment under the D.2, the planted native vegetation is not required to be assessed under the standard BAM (DPE 2022). However, assessment of the suitability of the planted

native vegetation for use by threatened species (both ecosystem and species-credit species) is required under D.2 of the Streamlined assessment module planted native vegetation (see Section 2.4).

Table 5: Streamlined assessment module planted native vegetation - decision-making key (DPE 2022)

Decision making key	Response
<p>1 Does the planted native vegetation occur within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT known to occur in the same IBRA subregion as the proposal?</p>	<p>No</p> <p>The areas mapped as planted native vegetation generally occur as rows of Eucalyptus, Casuarina, or Acacia, with limited structural complexity (often lacking a shrub layer), exotic understorey and limited natural resilience. The plantings also occur within a heavily industrial area, in association with artificial bunds, appearing as even aged stands (see Annex 2 for site photos). The planted native vegetation within the Subject Area cannot be reasonably assigned to a best-fit PCT known to naturally occur in the locality of IBRA subregion and occurs as an isolated patch within an industrial area. See Plates 1-2 for evidence of historical clearing of the entire Subject Area (occurring between 1948 and 1961). Plate 4 shows a landscape plan for the iron making building from 2008.</p> <p>Remnant vegetation was generally absent from areas mapped as planted native vegetation. Figures 1 and 3 show that the vegetation in the Subject Area is isolated from remnant vegetation.</p>
<p>2 Is the planted native vegetation:</p> <ul style="list-style-type: none"> a. planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and b. the primary objective was to replace or regenerate a plant community type or a threatened plant species population or its habitat? 	<p>No</p> <p>From review of aerial photographs and ground truthing, areas mapped as planted native vegetation appear to be mostly for aesthetic purposes and/or acting as windbreaks within a heavy industrial area. The plantings were not likely to have been required for the purpose of environmental rehabilitation or restoration under an existing conservation agreement or to replace or regenerate a plant community type or a threatened plant species population or habitat.</p>
<p>3 Is the planted or translocated native vegetation individuals of a threatened species or other native species planted or translocated for the purpose of providing threatened species habitat under one of the following:</p> <ul style="list-style-type: none"> a. a species recovery Project b. Saving our Species Project c. other types of government funded restoration project d. condition of consent for a development approval that required those species to be planted or translocated for the purpose of providing threatened species habitat e. legal obligation as part of a condition or ruling of court. This includes regulatory directed or ordered remedial plantings (e.g. Remediation Order for clearing without consent issued under the BC Act or the Native Vegetation Act) f. ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan, or g. approved vegetation management plan (e.g. as required as part of a Controlled Activity Approval for works on waterfront land under the NSW Water Management Act 	<p>No</p> <p>The plantings are not likely to have been required for any of the listed purposes in question 3. As stated above, it appears that the areas mapped as planted native vegetation appear to be mostly for aesthetic purposes and/or acting as windbreaks within a heavy industrial area.</p>

	2000)?	
4	Was the planted native vegetation (including individuals of a threatened flora species) undertaken voluntarily for revegetation, environmental rehabilitation or restoration without a legal obligation to secure or provide for management of the native vegetation?	Unlikely Given the location of the plantings, it is more likely that these planting were established for aesthetic purposes and to create a windbreak within a heavy industrial area, as detailed in question 5 below.
5	Is the native vegetation (including individuals of a threatened flora species) planted for functional, aesthetic, horticultural or plantation forestry purposes? This includes examples such as: windbreaks in agricultural landscapes, roadside plantings (including street trees, median strips, roadside batters), landscaping in parks, gardens and sport fields/complexes, macadamia plantations or teatree farms?	Yes The areas of planted native vegetation generally occur as linear strips of vegetation of even age, often concentrated along road edges and next to buildings. Presumably, the primary purposes of these plantings was for aesthetic purposes and to act as a windbreak within a heavy industrial area. See Plates 1 and 2 for evidence that the site was cleared between 1948 and 1961; Plate 4 for landscape plan for the Subject Area from 2008; Figure 3 for location of plantings in relation to industrial surrounds; and Annex 2 for site photos of planted vegetation relative to industrial landscape.

2.3.3 Site values

Flora

A total of 23 flora species were recorded in the rapid data points; including nine native species and 14 exotic species. Floristic point data of all species recorded is provided in Annex 3.

2.3.4 High threat and priority weeds

Four High Threat Weed (HTW) species or priority weeds were recorded during the field survey. These include: Crofton weed (*Ageratina Adenophora*), Coolatai grass (*Hyparrhenia hirta*), Lantana (*Lantana camara*) and Castor oil plant (*Ricinus communis*).

2.4 Habitat suitability for threatened species

As detailed in Section 2.3, assessment of the suitability of the planted native vegetation for use by threatened species (both ecosystem and species-credit species) is required under D.2 of the *Streamlined assessment module planted native vegetation*.

2.4.1 Data review

A review of relevant literature, databases and existing vegetation mapping was undertaken to identify threatened species habitat and their potential to occur on the Subject Area. Methodology is detailed in Section 2.2, including database searches, literature reviews and assessment of the likelihood of occurrence of each species. Results of the searches and reviews were undertaken prior to field survey to inform survey requirements.

A likelihood of occurrence analysis was undertaken for each species, prior to field surveys, based on the PCTs/vegetation mapped surrounding the Subject Area. This was updated within the current report (Annex 1) to reflect the suitability and condition of habitat present within the Subject Area, as identified following the onsite habitat assessment.

2.4.2 Methods – field survey

Field surveys were undertaken on 21 March, 10 May 2023 and 14 June 2023. The following tasks were completed:

1. Habitat assessment – identification of important habitat features

2. Evaluation of habitat quality of native vegetation present
3. Opportunistic observations of threatened species.

The key habitat features recorded were used to determine the likely presence of threatened species. These features included:

- Type, condition and diversity of vegetation communities present
- Presence of roosting/breeding/shelter resources such as:
 - large stick nests suitable for raptors
 - hollow-bearing trees and stags
 - rock ledges, shelters, caves, outcrops
 - logs and leaf litter.
- Permanent and ephemeral aquatic habitat.

2.4.3 Threatened fauna and fauna habitats

No targeted surveys for threatened fauna were conducted. There were no incidentally recorded threatened species within or near the Subject Area during the field survey. Habitat survey was conducted during the vegetation assessment and used to identify the likelihood of threatened species occurring within the Subject Area.

The native vegetation present consisted of planted native vegetation and exotic species. The Subject Area vegetation lacked important habitat features. The vegetation was planted, the midstorey and understorey were dominated by weeds and no hollow bearing trees were recorded. Due to previous clearing and disturbance, the Subject Area did not contain any surface rock and fallen timber recorded was minimal (<30cm).

Four threatened species are considered to have a moderate likelihood of occurrence (Annex 1), including , Green and Golden Bell Frog, Large Bent-winged Bat, Southern Myotis and Grey-headed flying-fox (Table 6).

Large Bent-winged Bat, Southern Myotis and Grey-headed Flying-fox would potentially utilise the habitat within the Subject Area, however, the Subject Area is located within a heavily disturbed industrial area. Industrial buildings that may provide roosting habitat for microbats will be impacted by the Project. However, while the No.6 Blast furnace has been in care and maintenance for over 10 years, the building has been used as storage for machinery during this time and as such has been regularly impacted by human activity. The building is located in the middle of Port Kembla Steel Works and is in an area that would experience continuous noise disturbance. Considering the above it is unlikely that the buildings within the Subject Area are being used as roosting habitat for microbats. No evidence of microbat activity was recorded during the site survey. Vegetation present adjacent to the existing waterbodies to the west of the northern and southern end of the Subject Area may be used for foraging purposes, however this vegetation is not proposed to be removed as part of the Project (Figure 2).

The Subject Area is unlikely to provide habitat other than limited foraging habitat for transient threatened fauna. The Subject Area is unlikely to provide suitable breeding habitat for threatened fauna. Considering this and the fact that there is better natural and anthropogenic habitat for breeding present nearby, Large Bent-winged Bat, Southern Myotis, and Grey-headed Flying-fox do not require further assessment. The habitat present within the Subject Area is not likely to be utilised by these threatened species, with the exception of potential transient use.

Aquatic habitat

No rivers, streams or estuaries run into the Subject Area. Allans creek is located North of the Subject Area and flows into Tom Thumbs Lagoon which borders Port Kembla Steel Works. Channels built around the Subject Area flow into Allans creek. These areas are listed as Key Fish Habitat.

The aquatic habitat within the Subject Area consists of two ponds located in the southern end of the Subject Area (Figure 4, Annex 2). Both of these aquatic habitats will be impacted by the Project. The two ponds within the Subject Area are shallow pools that have a build-up of coal from the adjacent coal stockpile and support limited aquatic vegetation (Figure 4, Annex 2). The pools are predominantly lined with exotic plant species including Crofton weed and Lantana. These pools appear to be established waterbodies and may provide limited habitat for common or threatened amphibian species.

A known population of Green and Golden Bell Frog (listed as Endangered under the BC Act and Vulnerable under the EPBC Act) is located within the greater Port Kembla Steel Work site (previous records occur approximately 1.4 km from the Subject Area). Known habitat and associated corridors for this population include the rail line from Coniston to Port Kembla railway station, the Plate Mill within the Port Kembla Steel Works site and the Steelhaven site immediately adjacent to the steel works. BlueScope has an established site management protocol that will be implemented during the Project to avoid impacting areas that are known to support Green and Golden Bell Frogs or are being used as corridors (BlueScope 2022). This management plan includes habitat construction (two ponds) at Greenhouse Park, north of BlueScope rail loop. Frog-proof fences have been installed to discourage frogs from entering Port Kembla Steel Works site (BlueScope 2021). The measures that have been put into place by Port Kembla Steel Works and the presence of more suitable habitat in close proximity to the Subject Area make it unlikely that Green and Golden Bell Frogs will utilise the ponds located within the Subject Area. Further, Green and Golden Bell Frogs are known to inhabit areas that contain aquatic vegetation such as bullrushes and spikerushes (BlueScope 2021), which were absent from the ponds in the Subject Area, making the habitat present marginal at best.

Table 6: Threatened fauna species considered to have a moderate or high likelihood of occurrence

Common Name	Scientific Name	BC Act	EPBC Act	Class of Credit	SAIL	Likelihood of occurrence
Green and Golden Bell Frog	<i>Litoria aurea</i>	E	V	species	No	Moderate-marginal potential habitat.
Large Bent-winged bat	<i>Miniopterus orianae oceanensis</i>	V	-	Species/ecosystem	Yes- Impacts to breeding habitat considered potentially serious and irreversible.	Moderate-Potential foraging habitat (anthropogenic and natural).
Southern Myotis	<i>Myotis macropus</i>	V	-	Species	No	Moderate-Potential foraging habitat (anthropogenic)

						and natural).
Grey-headed Flying Fox	<i>Pteropus poliocephalus</i>	V	V	Species/ecosystem	No	Moderate- A roost is located nearby, less than 10km from the Subject Area. Potential foraging and roosting habitat.

2.4.4 Threatened flora

No targeted threatened flora surveys were conducted. There was no incidental threatened flora species recorded during the survey. No species of threatened flora species are considered to have a moderate likelihood of occurring within the Subject Area. The native vegetation within the Subject Area consisted of planted native vegetation, with exotic species dominant in the midstorey and understorey. The Subject Area is unlikely to provide suitable habitat for threatened flora.

2.5 Prescribed impacts

Prescribed biodiversity impacts are impacts on biodiversity values in addition to, or instead of, impacts from clearing vegetation and/or loss of habitat. Prescribed impacts identified in Chapter 6 of the BAM (DPIE 2020a) which require consideration include impacts to:

- Karst, caves, crevices, cliffs, rocks or other geologically significant feature
- Human-made structure
- Non-native vegetation
- Corridors and habitat connectivity
- Hydrological process sustaining/interacting with rivers, streams or wetlands
- Wind farm development
- Vehicle strikes on threatened species.

The Subject Area is located away from karsts, caves, and cliff lines. Such features would therefore not be impacted by the Project. Prescribed impacts that are applicable to the Subject Area include vehicle strikes and hydrological processes.

Project specific prescribed impacts are detailed further in Section 3.2.3 and will be managed and mitigated via the measures detailed in Table 9.

3. Impact Assessment

The Impact Assessment forms Stage 2 of the BDAR as detailed in Section 8 of the BAM (DPIE 2020a).

In accordance with the BAM (DPIE 2020a), proponents must demonstrate the measures employed to avoid, mitigate and offset impacts of a project on biodiversity values. This Section outlines the avoidance, management and mitigation measures that have been incorporated into the Project design or will employ during construction, operation or completion of the Project to reduce impacts on biodiversity values.

3.1 Avoiding or minimising impacts on biodiversity values

Location and design

The development footprint of the Project is located where the current stockpile is located. This area has been previously cleared and is highly disturbed and all vegetation to be removed is either exotic or planted native vegetation. The project has been designed to limit any impacts to native vegetation and habitat within the Subject Area and immediate surroundings.

Prescribed impacts

Prescribed impacts relevant to the Project and relevant avoidance and mitigation measures are detailed in Section 3.2.3.

3.2 Impact summary

An assessment of the potential impact of the Project on biodiversity is provided below. It considers direct and indirect impacts as defined in the BAM (DPIE 2020a).

3.2.1 Direct impacts

The area of direct impact has been defined as the area that will need to be cleared to accommodate the Project. The area of direct impact is presented in Figure 2.

The primary direct impacts are the removal of 2.5 ha of planted native vegetation. This vegetation provides potential foraging resources for insectivorous, frugivorous and nectivorous fauna. Assessment of direct impacts is presented in Table 7.

3.2.2 Indirect impacts

The area of indirect impact is limited to native planted vegetation present around the borders of the Subject Area. Vegetation within the Subject Area has previously been cleared for the construction of BlueScope Steel Works and all remaining vegetation is planted. Indirectly impacted areas include planted native vegetation which do not contain any important habitat features such as hollow bearing trees. Assessment of potential indirect impacts is presented in Table 7.

Table 7. Assessment of direct and indirect impacts

Impact	Extent of impact as a result of the Project
Direct impacts	
Removal or modification of native vegetation	Known: Approximately 2.5 ha of planted native vegetation would be removed.
Loss of individuals of a threatened species	Low: No important threatened flora or fauna habitat were identified within the area of direct impact, such as important breeding habitat or limiting foraging resources. No threatened

Impact	Extent of impact as a result of the Project
	<p>species are likely to be harmed as part of the Project.</p> <p>Green and Golden Bell Frogs have been previously recorded within the Port Kembla Steel Works (approximately 1.4 km south-east of the Subject Area). Two ponds will be removed as part of the Project. Green and Golden Bell Frogs are unlikely to be impacted considering the existing Green and Golden Bell Frog Management procedure in place and the more suitable habitat located nearby in comparison to the poor condition of the habitat to be removed within the Subject Area.</p>
Removal or modification of threatened species habitat other than native vegetation (micro-habitat features)	<p>Low: No threatened species habitat (excluding planted native vegetation) was identified on the Subject Area. Potential habitat for Green and Golden Bell Frog was identified in the southern end of the Subject Area. However, these two ponds provide very limited foraging habitat and are unlikely to be utilised by Green and Golden Bell Frogs.</p>
Death through trampling or vehicle strike	<p>Low: The Project is unlikely to cause death through trampling or vehicle strike. An ecologist would conduct a preclearing inspection prior to clearing or construction works to ensure no fauna would be impacted.</p>
Death through poisoning	<p>Low: No poisons or chemicals are proposed to be used as part of the Project. Harmful substances used in construction would be controlled as per required Australian Standards.</p>
Fragmentation	<p>Low: Approximately 2.5 ha of planted native vegetation would be modified. Given this vegetation is planted and occurs within a heavily industrialised area, its removal is not considered to contribute to fragmentation of remnant native vegetation in the locality.</p>
Indirect impacts	
Predation by domestic and/or feral animals	<p>Low: The Project is not likely to increase the presence of domestic or feral animals in the local area.</p>
Loss of shade/shelter	<p>Known: The removal of vegetation in the Subject Area would result in a loss of approximately 2.5 ha of planted native vegetation which provides shade and shelter for local fauna. This impact is considered low in magnitude as the area to be impacted is located within a heavily industrialised area, is in poor condition and would provide minimal habitat.</p>
Loss of individuals through starvation	<p>Low: Removal of the habitat on the Subject Area is not considered likely to cause loss of individuals through starvation. The habitat to be impacted is relatively isolated, located within a heavily industrialised area and potentially used seasonally as a foraging resource by insectivorous, frugivorous and nectivorous species occupying a much larger territory and relying on other resources throughout the year. No limiting habitat would be impacted by the Project.</p>
Loss of individuals through exposure	<p>Low: The habitat (2.5 ha) to be removed in the Subject Area has previously been cleared, is isolated, located within a heavily industrialised area and provides limited habitat value. Therefore, the Project is not considered likely to cause a loss of individuals</p>

Impact	Extent of impact as a result of the Project
	through exposure.
Edge effects (noise, light, traffic)	<p>Low: Given the Subject Area supports only planted native vegetation of limited habitat value within close proximity to heavy industry, the Subject Area is unlikely to provide suitable habitat for noise and light sensitive species.</p> <p>The area may experience some additional noise and traffic during the construction phase of the Project, however, this would only occur during the day and operational noise and traffic are unlikely to increase from current levels.</p>
Traffic impacts	<p>Low: Increased traffic within the Subject Area, particularly during the construction period, has the potential to impact on locally occurring fauna that may be traversing the locality. Traffic on site will be confined to existing internal roads and hardstand areas with very low speed restrictions. Threatened species are unlikely to be subject to this impact.</p>
Deleterious hydrological changes	<p>Low: The quantity of water output from the blast furnace and slag handling operation will be minimal. Minor changes to water uses and cooling water discharges are expected due to the alternative cooling system associated with the blast furnace.</p> <p>There is a stormwater drainage system proposed for the Project that will enable the capture and reuse of stormwater. This will provide an improvement of the current stormwater management capabilities.</p>
Contamination of groundwater and surface water	<p>None: Runoff and wastewater from site processes would be retained with the proposed stormwater drainage system. An extensive list of mitigation measures relating to water discharge and water use will minimise the risk of surface water or groundwater contamination. These mitigation measures include improvements to process and discharge controls, stormwater management, discharge locations, water use, wastewater management and spill management.</p>
Weed invasion	<p>Low: Construction machinery will be cleaned prior to entering and leaving site to ensure weed propagules are not transported.</p>
Increased human activity within or directly adjacent to sensitive habitat areas	<p>Low: There are no sensitive habitat areas directly adjacent to the Subject Area. However, any increase in human activity experienced as part of the construction period would be contained to within the Subject Area, which is located within an area of heavy industry and already subject to daily human activity.</p>

3.2.3 Prescribed impacts

Project specific prescribed impacts have been considered in Table 8. Prescribed impacts that are applicable to the Subject Area include:

- Vehicle strikes
- Water quality and hydrological processes.

Prescribed impacts will be managed and mitigated via the measures detailed in Table 9.

Table 8: Prescribed impacts

Feature	Description of feature characteristics and location	Potential impact	Threatened species or community using or dependent on feature
Hydrological process sustaining/interacting with rivers, streams or wetlands	The ponds are shallow pools located in the southern end of the Subject Area. The pools have a build-up of coal from the adjacent coal stockpile and have predominantly have exotic species surrounding them, including Crofton weed and Lantana.	The Project requires the removal of two ponds. Chemicals used during the construction process may find their way into nearby water bodies. Trampling of Green and Golden Bell Frogs during construction.	The two ponds that are to be removed provide minimal potential habitat for Green and Golden Bell Frogs. No Threatened species were found during the surveys. If appropriate procedures are followed as detailed in Section 3.2.5, the Project is highly unlikely to impact on threatened amphibians, namely the Green and Golden Bell Frog.
Vehicle strikes on threatened species	Site access and internal machinery.	Mortality or injury as a result of vehicle strike.	Ground-dwelling threatened species are unlikely to be using habitats in the Subject Area. Staff will be made aware of the risks of wildlife crossing roads. The chance of vehicle strike is very low.

3.2.4 Potential serious and irreversible impacts (SAIL)

The BC Act and the *Local Land Services Act 2013* (LLS Act) imposes various obligations on decision-makers in relation to impacts on biodiversity values that are at risk of SAIL. These obligations generally require a decision-maker to determine whether the residual impacts of a proposed development on biodiversity values (that is, the impacts that would remain after any proposed avoid or mitigate measures have been taken) are serious and irreversible (DPIE 2020b).

The BC Act and the NSW *Biodiversity Conservation Regulation 2017* (BC Reg) provide a framework to guide the consent authority in making a determination in relation to SAIL. The framework consists of a series of principles defined in the BC Reg and supporting guidance, provided for under Section 6.5 of the BC Act, to interpret these principles (DPIE 2019b). Criteria to interpret the principles is included in Table 1 of *Guidance to assist a decision-maker to determine a serious and irreversible impact* (DPIE 2019b). Namely, an impact is considered serious and irreversible under Part 6.7 of the BC Reg if it:

1. Will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline.
2. Will further reduce the population size of the species that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or will further degrade or disrupt an ecological community that is already observed, inferred or reasonably suspected to be severely degraded or disturbed.
3. Impacts on the habitat of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution.
4. Impacts on a species or ecological community that is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.

Under the BAM (DPIE 2020a), an assessor must provide information on a range of factors affecting the vulnerability of the species to SAIL.

One SAIL candidate species is considered to have potential to occur in the Subject Area, as identified in Table 6: Large Bent-winged Bat. Large Bent-winged Bat is listed as a species at risk of SAIL under the BAM for impacts to breeding habitat. Breeding habitat for the Large Bent-winged Bat includes cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding (DPE 2023c). The Project is not likely to result in an SAIL to Large Bent-winged Bat, as the Project is not likely to impact breeding habitat of this species. The Project is considered unlikely to cause SAIL to any threatened species.

3.2.5 Mitigation and management of impacts

Management and mitigation measures to be implemented during the construction and operational phases of the Project are detailed in Table 9. The Blast Furnace No. 6 Reline Project- Environmental Impact Statement for BlueScope Steel Works includes a number of management plans including:

- Construction noise and vibration management plan (CNVMP)
- Operational noise management plan
- Dust management plan
- Construction environmental management plan & operational environmental management plan
- Soil and water management plan
- Water quality management plan (WQMP)
- Waste management plan
- Existing pollution incident response management plan (PIRMP)

The available management plans have been reviewed and used to inform the management actions provided in Table 9.

Table 9: Mitigation measures

Mitigation measure	Responsibility
Pre-construction	
Erosion and sediment controls will be established prior to works commencing on site.	Construction manager
Flagging to be erected prior to clearing to demarcate areas which are to be cleared and vegetation retention within the Subject Area boundary.	Construction manager
Pre-clearing inspection conducted by an ecologist to identify native wildlife which may need to be removed before clearing begins.	Construction manager/Project Ecologist
Control on-site traffic by following specific routes for haulage and access in accordance with signposted speeds.	Construction manager
Construction	
Erosion and sediment controls will be inspected on a regular basis and replaced when their function is compromised. Erosion and sediment controls will be inspected promptly after rainfall events.	Construction manager
An Ecologist is to supervise the removal of the two ponds and remove and relocate native wildlife before or during the removal. If native fauna is identified during clearing all work must stop until fauna has been removed or left site. If Green and Golden Bell Frog tadpoles are present within the pools supervision by an ecologist would be required to prevent potential trampling of Green and Golden Bell Frog tadpoles.	Ecologist
No chemicals would be used as part of the Project however, equipment containing diesel and oil will be required. Appropriate spill kits would be carried and spill procedures followed in the unlikely event of a spill.	Construction manager
Implement hygiene protocols to minimise the spread of weeds and pathogens by staff/machines/vehicles into areas of retained native vegetation and waterways.	Construction manager
Limit cleared areas of land and stockpiles, and clear only when necessary to reduce fugitive dust emissions.	Construction manager
To manage impacts to water quality during construction, a site specific soil and water management plan including an Erosion and Sediment Control Plan will be developed and implemented.	Construction manager
Post construction	
Management and removal of all waste from the Subject Area.	Construction manager

3.2.6 Adaptive management strategy

The mitigation measures provided in Table 9, Section 3.2.5 are considered adequate to protect the terrestrial and aquatic environment against any potential impacts. Therefore, it is considered that an adaptive management strategy is not required.

4. Summary

Impacts of the Project on ecological values are summarised as follows:

- Direct removal of 2.5 ha of planted native vegetation.
- Removal of highly modified non-threatened fauna habitat (native planted vegetation)
- Removal of previously disturbed flora habitat
- Potential impacts to water bodies, water quality and hydrological processes and potential vehicle strikes on threatened species.

As no threatened biodiversity listed under the EPBC Act are considered likely to be impacted by the Project, no assessment/s of significance under the EPBC Act were required. As such, there is no requirement for an EPBC Act Referral regarding Commonwealth threatened species, communities or populations.

BlueScope have aimed to avoid and minimise environmental impacts from the Project through detailed design of the Project and implementation of actions aimed at mitigating and managing potential indirect impacts of the Project as detailed in Section 3.

No biodiversity offsets are required for this Project.

References

BlueScope (2021) MA-ENV-03-03 Management of threatened species, the Green and Golden Bell Frog, *Litoria aurea*- Environmental Management Manual. BlueScope Environment Department.

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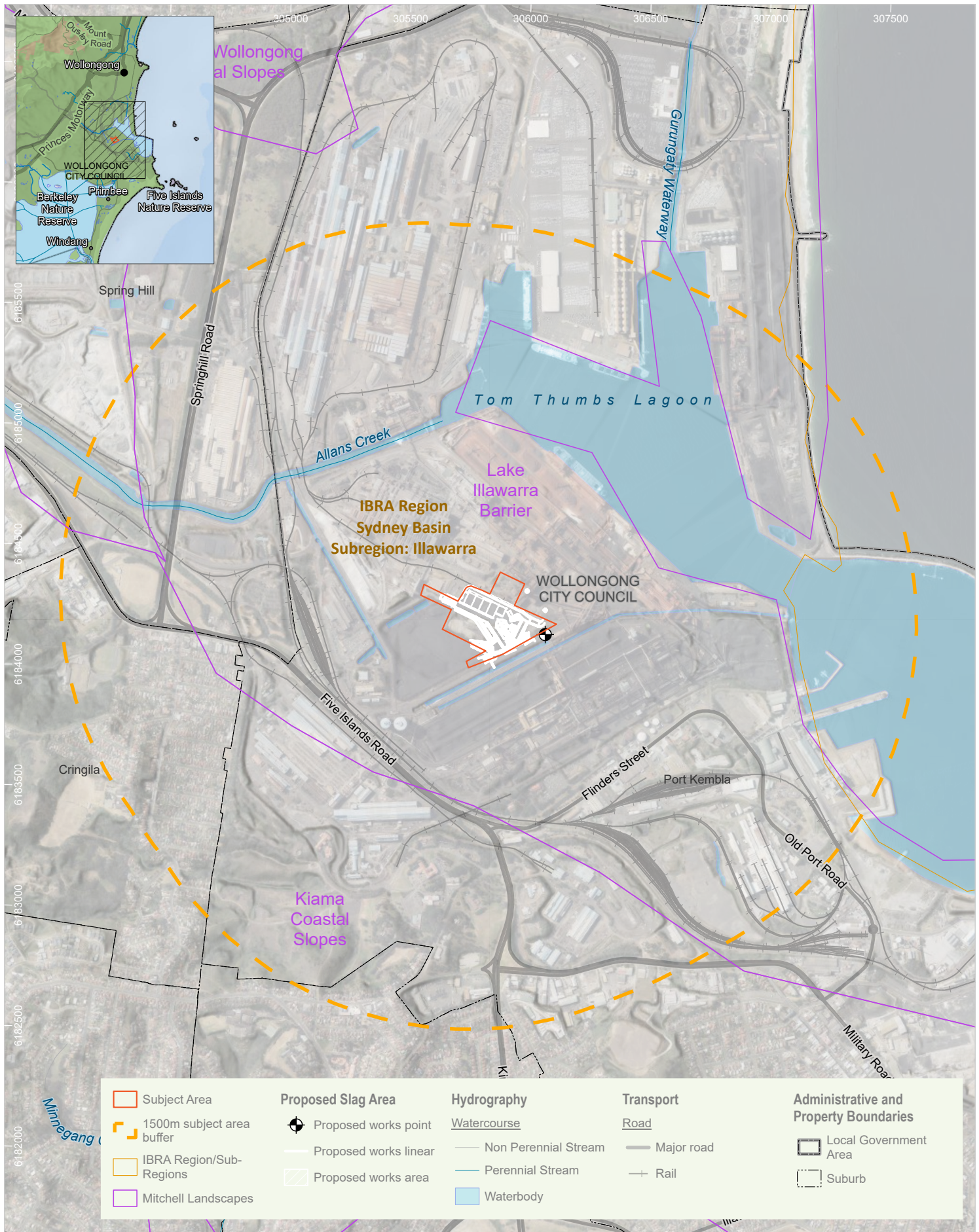
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GHD (2022) Blast Furnace No. 6 Reline Project. Environmental Impact Statement.

Niche (2023) No. 6 Blast Furnace Reline Project – Modification and Preliminary Biodiversity Assessment. Letter report to Nathan McColl of BlueScope Australia & New Zealand. Dated 16 May 2023.

Figures





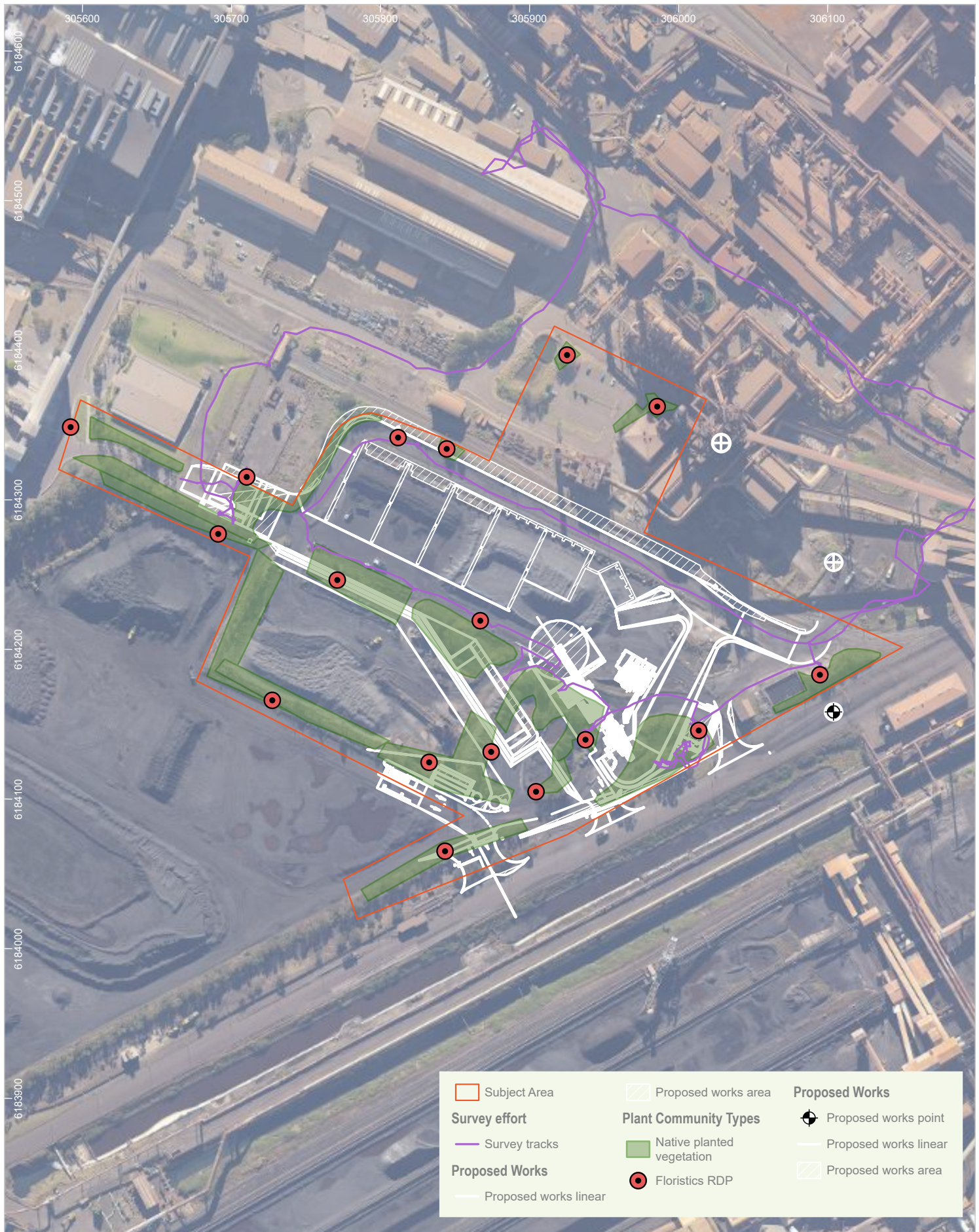
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Location Map
BSL No. 6 Blast Furnace Reline Project BDAR

Niche PM: Christie Chapman
Niche Proj. #: 7954
Client: BlueScope Steel

Figure 2

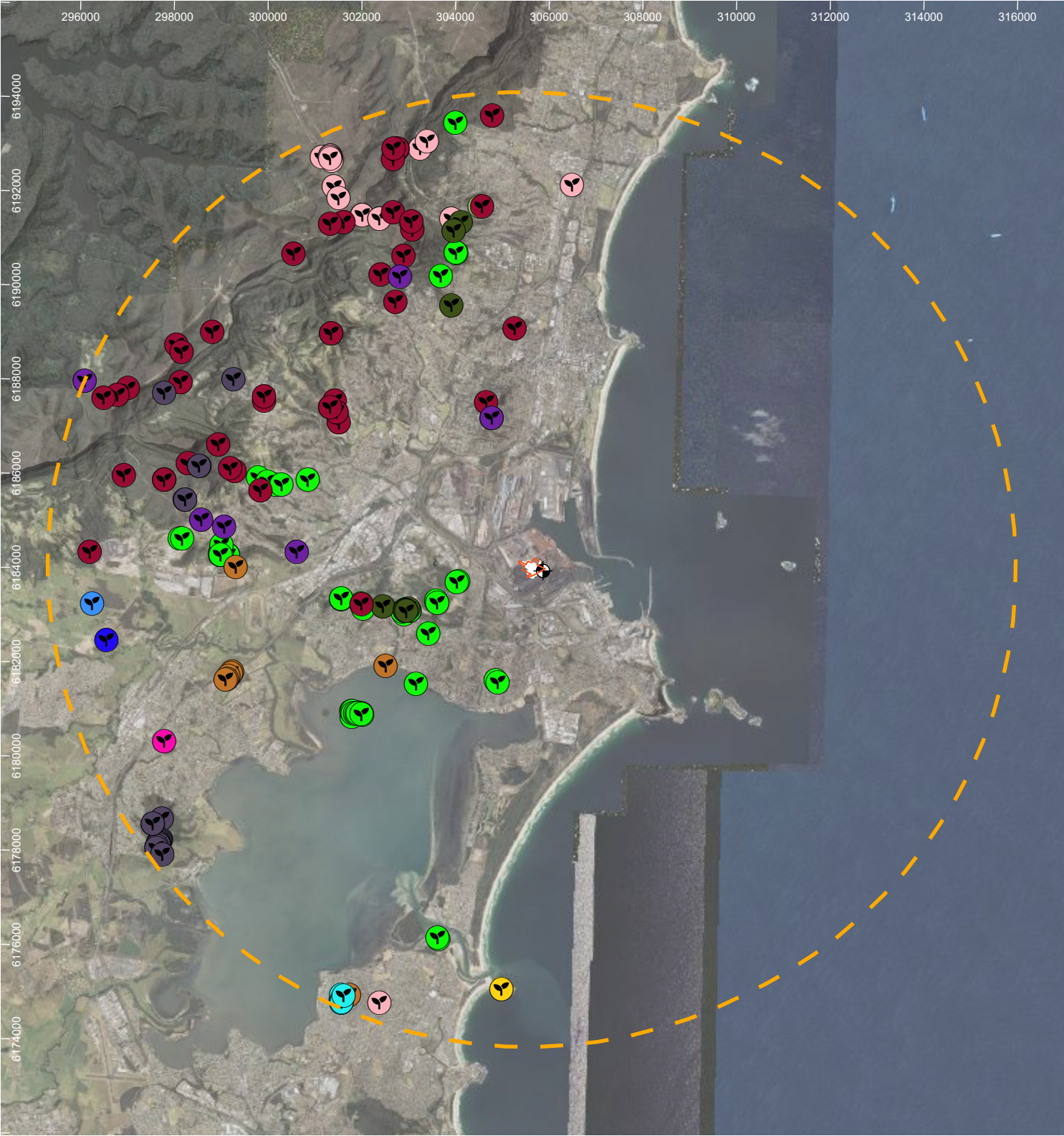
public/NSW_Imagery: © Department of Customer Service 2020/Terrain: Multi-Directional Hillshade: Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastreisen,GSA,GSI and the GIS User Community/World_Ocean_Base: NIWA, GeosciencesAustralia, Esri, DeLorme, NaturalVue/World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS | Watercourses, Waterbodies, Road and Rail alignments, Protected areas of NSW © Spatial Services 2021. | Niche uses GDA2020 as standard for all project-related data. In order to ensure that data from numerous sources and coordinate systems is aligned, on-the-fly transformation to WGS1984 Web Mercator Auxiliary Sphere is used in the map above. For ease of reference, the grid tick marks and labels shown around the border of the map are presented in GDA2020, using the relevant MGA zone.



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Subject Area

10km buffer

Proposed works point

Proposed works linear

Proposed works area

BioNet Flora Results
(20230119)

Flora

Chorizema parviflorum

Cynanchum elegans

Epacris purpurascens
var. purpurascens

Gossia acmenoides

Grevillea raybrownii

Macadamia integrifolia

Pimelea curviflora *var. curviflora*

Pimelea spicata

Pultenaea aristata

Rhodamnia rubescens

Senna acclinis

Solanum celatum

Syzygium paniculatum

Zieria granulata

Sensitive species (not displayed)

Arthropteris palisotii

niche

Environment and Heritage

0

2

km

WGS 1984 Web Mercator

NSW Bionet Atlas Threatened Species 10km Search - Flora

BSL No. 6 Blast Furnace Reline Project BDAR

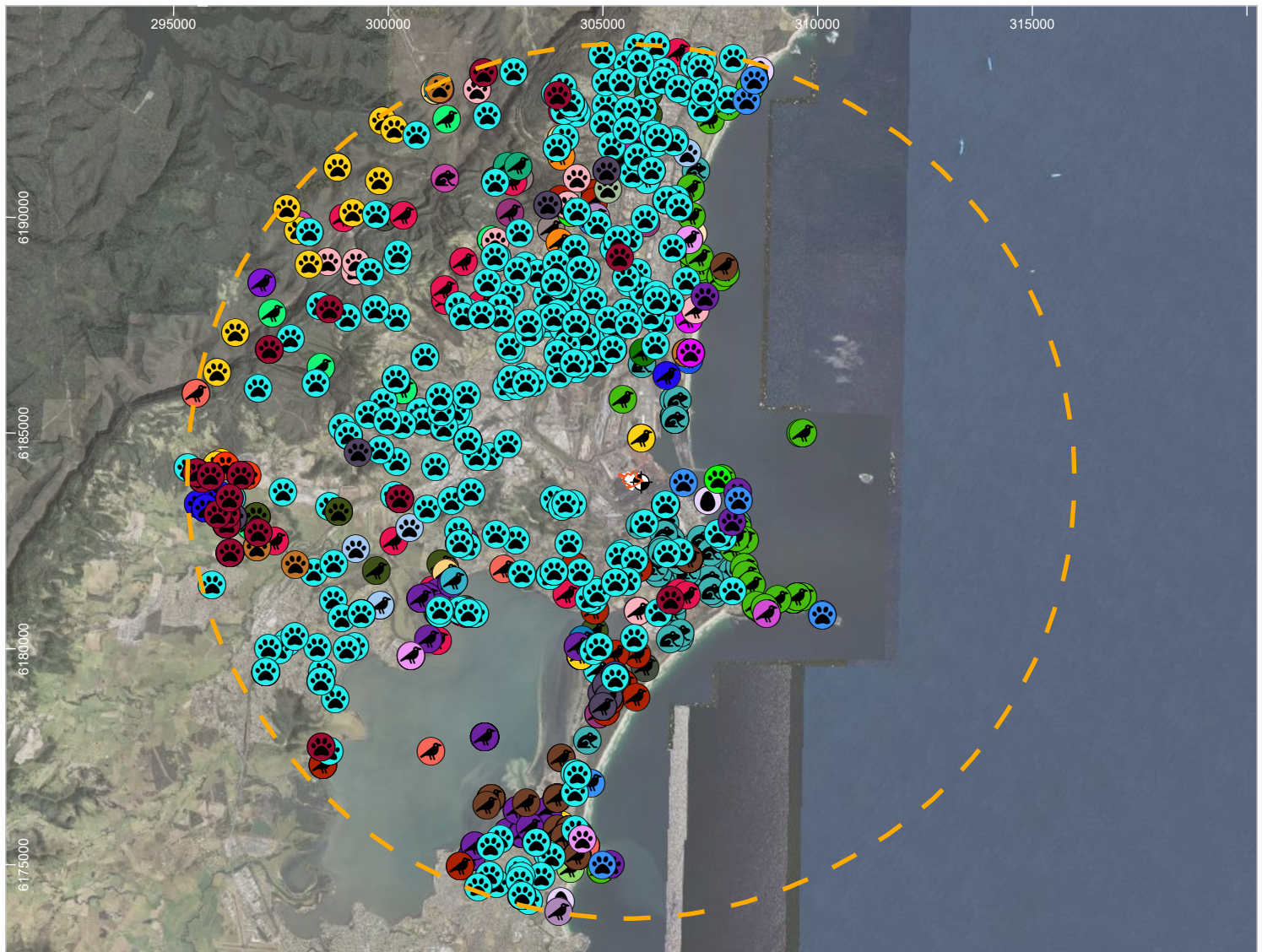
Niche PM: Christie Chapman

Niche Proj. #: 7954

Client: BlueScope Steel

Figure 5

NSW Office of Environment and Heritage's BioNet Atlas, which holds the data from a number of custodians. Data Obtained 19/01/2023. | World Imagery: Earthstar Geographics/ public/NSW_Imagery: © Department of Customer Service 2020/ Terrain: Multi-Directional Hillshade: Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User Community | Watercourses, Waterbodies, Road and Rail alignments, Protected areas of NSW © Spatial Services 2021. | Niche uses GDA2020 as standard for all project-related data. In order to ensure that data from numerous sources and coordinate systems is aligned, on-the-fly transformation to WGS1984 Web Mercator Auxiliary Sphere is used in the map above. For ease of reference, the grid tick marks and labels shown around the border of the map are presented in GDA2020, using the relevant MGA zone.



Annex 1. Threatened species status and likelihood of occurrence

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

Unless otherwise stated, habitat information obtained from the BioNet Threatened Species Database (DPIE 2022c) and SPRAT Profiles (DAWE 2022b).

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
Amphibians						
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	V	Species	The Giant Burrowing Frog has been recorded breeding in a range of water bodies associated with more sandy environments of the coast and adjacent ranges from the Sydney Basin south the eastern Victoria. It breeds in hanging swamps, perennial non-flooding creeks and occasionally permanent pools, but permanent water must be present to allow its large tadpoles time to reach metamorphosis.	None
<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	Species	Inhabits a very wide range of water bodies including marshes, dams and streams, particularly those containing emergent vegetation such as bullrushes or spikerushes. It also inhabits numerous types of man-made water bodies including quarries and sand extraction sites. Optimum habitat includes water-bodies that are un-shaded, free of predatory fish such as Plague Minnow, have a grassy area nearby and diurnal sheltering sites available.	Moderate- marginal potential foraging and breeding habitat.
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog	E	E	Species	Occurs in wet and dry sclerophyll forests and heathland associated with sandstone outcrops between 280 and 1000 m on the eastern slopes of the Great Dividing Range from the Central Coast down into Victoria. Individuals have been collected from a wide range of water bodies that includes semi-permanent dams, permanent ponds, temporary pools and permanent streams, with calling occurring from fringing vegetation or on the banks. Individuals have been observed sheltering under rocks on high exposed ridges during summer and within deep leaf litter adjacent to the breeding site. Calling occurs in all months of the year, often in association with heavy rains. The tadpoles are distinctive, being large and very dark	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					in colouration.	
<i>Litoria watsoni</i>	Watson's Tree Frog		E	Species	Within NSW the distribution of <i>L. watsoni</i> is fragmented. There are few specimens recorded between Nadgee NP, in the far south-east of the state, and Monga NP and no specimens between Monga and the one population know from a fire dam in Yadboro State Forest. The Morton plateau population covers the largest area inhabited by the species but is separated from the Budderoo population to the north. These major disjunctions in populations are caused by the species being restricted to upland (above 100m ADH) sites, primarily in heath-woodland with sandy substrates.	Low
<i>Mixophyes balbus</i>	Stuttering Frog	E	V	Species	Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Outside the breeding season adults live in deep leaf litter and thick understorey vegetation on the forest floor. Breed in streams during summer after heavy rain. Eggs are laid on rock shelves or shallow riffles in small, flowing streams.	Low
Birds						
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V	-	Ecosystem	Dusky woodswallows are widespread in eastern, southern and southwestern Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris.	Low
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	CE	Species/Ecosystem	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. The distribution of the species has contracted dramatically in the last 30 years to between north-eastern Victoria and south-eastern	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests.	
<i>Ardenna carneipes</i>	Flesh-footed Shearwater	-	M, MA	EEC/Marine	Ranges throughout the Pacific and Indian Oceans. There are two main breeding areas in the world: one in the South West Pacific includes Lord Howe Island and New Zealand; the other along the coast of Western Australia.	None
<i>Ardenna grisea</i>	Sooty Shearwater	-	M, MA		Northern Hemisphere to eastern coast of Australia and Antarctic waters. Found in pelagic, sub-tropical, sub-Antarctic and Antarctic waters and may forage inshore occasionally, especially during rough weather. Breeds on islands off NSW and Tasmania.	None
<i>Botaurus poiciloptilus</i>	Australian bittern	E	E	Ecosystem	The Australasian Bitterns is widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the State except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes and spikerushes.	None
<i>Calidris canutus</i>	Red Knot	-	E, M, MA	Species/Ecosystem	The Red Knot is a non-breeding migratory visitor from Arctic regions of Siberia. In NSW it is recorded in small numbers replenishing fat stores along some of the major river estuaries and sheltered embayments of the coastline, in particular the Hunter River estuary, after which the birds proceed to Victoria by October.	Low
<i>Calidris ferruginea</i>	Curlew Sandpiper	E	CE, M, MA	Species/Ecosystem	The Curlew Sandpiper is distributed around most of the Australian coastline (including Tasmania). It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. It generally occupies littoral and estuarine habitats, and in NSW is mainly found in intertidal mudflats of sheltered coasts.	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	E	Species/Ecosystem	In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger in eucalypts.	Low
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	E	-	Species/Ecosystem	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (<i>Allocasuarina littoralis</i>) and Forest Sheoak (<i>A. torulosa</i>) are important foods. Feeds almost exclusively on the seeds of several species of she-oak (<i>Casuarina</i> and <i>Allocasuarina</i> species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites. A single egg is laid between March and May.	Low
<i>Charadrius leschenaultii</i>	Greater Sand-plover	V	V, M, MA	Species/Ecosystem	In Australia the species is commonly recorded in parties of 10-20 on the west coast, with the far northwest being the stronghold of the population. Almost entirely restricted to coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks. In NSW, the species has been recorded between the northern rivers and the Illawarra, with most records coming from the Clarence and Richmond estuaries.	Low
<i>Charadrius mongolus</i>	Lesser Sand Plover	V	M, MA	Species/Ecosystem	Inhabits large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. Non-breeding in Australia.	Low
<i>Circus assimilis</i>	Spotted Harrier	V	-	Ecosystem	The Spotted Harrier occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast,	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.	
<i>Coracina lineata</i>	Barred Cuckoo-shrike	V	-	Ecosystem	Occurs in rainforest, eucalypt forests and woodlands, clearings in secondary growth, swamp woodlands and timber along watercourses. They are usually seen in pairs or small flocks foraging among foliage of trees for insects and fruit. They are active birds, frequently moving from tree to tree.	Low
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	E	E	Species	The distribution of the Eastern Bristlebird has contracted to three disjunct areas of south-eastern Australia. There are three main populations: Northern - southern Queensland/northern NSW, Central - Barren Ground NR, Budderoo NR, Woronora Plateau, Jervis Bay NP, Booderee NP and Beecroft Peninsula and Southern - Nadgee NR and Croajingalong NP in the vicinity of the NSW/Victorian border. Habitat for central and southern populations is characterised by dense, low vegetation including heath and open woodland with a heathy understorey. In northern NSW the habitat occurs in open forest with dense tussocky grass understorey and sparse mid-storey near rainforest ecotone; all of these vegetation types are fire prone.	Low
<i>Diomedea exulans</i>	Wandering Albatross	E	V, M, MA	EEC/Marine	The Wandering Albatross is marine, pelagic and aerial. It occurs where water surface temperatures range from -2° to 24°C. On breeding islands, it nests on coastal or inland ridges, slopes, plateaux, and plains, often on marshy ground.	Low
<i>Epthianura albifrons</i>	White-fronted Chat	V	-	Ecosystem	Low vegetation in salty coastal and inland areas and crops. Runs along ground and is found in local flocks in Winter.	Low
<i>Epthianura albifrons</i>	White-fronted Chat population	EP	-	Ecosystem	Low vegetation in salty coastal and inland areas and crops. Runs along ground and is found in local flocks in Winter.	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
	in the Sydney Metropolitan Catchment Management Area					
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E	-	Ecosystem	Black-necked Storks are widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW. Primary habitat is comprised of floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers, followed by minor floodplains, coastal sandplain wetlands and estuaries. They nest in high trees adjacent to water.	Low
<i>Esacus magnirostris</i>	Beach Stone-curlew	CE	-	Species/Ecosystem	In NSW, the species occurs regularly to about the Manning River, and the small population of north-eastern NSW is at the limit of the normal range of the species in Australia. Beach Stone-curlews are found exclusively along the coast, on a wide range of beaches, islands, reefs and in estuaries, and may often be seen at the edges of or near mangroves. They forage in the intertidal zone of beaches and estuaries, on islands, flats, banks and spits of sand, mud, gravel or rock, and among mangroves. Beach Stone-curlews breed above the littoral zone, at the backs of beaches, or on sandbanks and islands, among low vegetation of grass, scattered shrubs or low trees; also among open mangroves.	None
<i>Falco hypoleucos</i>	Grey Falcon	V	V	Species	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW.	Low
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-	Ecosystem	Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range in NSW, extending westwards to	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					the vicinity of Albury, Parkes, Dubbo and Narrabri. Mostly occur in dry, open eucalypt forests and woodlands. They feed primarily on nectar and pollen in the tree canopy. Nest hollows are located at heights of between 2 m and 15 m, mostly in living, smooth-barked eucalypts. Most breeding records come from the western slopes.	
<i>Grantiella picta</i>	Painted Honeyeater	V	V	Species	Inhabits Boree/ Weeping Myall (<i>Acacia pendula</i>), Brigalow (<i>A. harpophylla</i>) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus <i>Amyema</i> .	Low
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	V	-	Species	In NSW the Sooty Oystercatcher occupies rocky headlands, reefs and offshore islands along the entire coast, apparently as a single continuous population.	None
<i>Haematopus longirostris</i>	Pied Oystercatcher	E	-	Species	The Pied Oystercatcher inhabits marine littoral habitats, including islands. It occupies muddy, sandy, stony or rocky estuaries, inlets and beaches, particularly intertidal mudflats and sandbanks in large marine bays.	None
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	-	Species/Ecosystem	Inhabits coastal and near coastal areas, building large stick nests, and feeding mostly on marine and estuarine fish and aquatic fauna.	Low
<i>Hieraaetus morphnoides</i>	Little Eagle	V	-	Species/Ecosystem	Most abundant in lightly timbered areas with open areas nearby. Often recorded foraging in grasslands, crops, treeless dune fields, and recently logged areas. May nest in farmland, woodland and forest in tall trees.	Low
<i>Hirundapus caudacutus</i>	White-throated Needletail	-	M	N/A	An aerial species found in feeding concentrations over cities, hilltops and timbered ranges.	Low
<i>Ixobrychus flavicollis</i>	Black Bittern	V	-	Ecosystem	Usually found on coastal plains below 200 m. Often found along timbered watercourses, in wetlands with fringing trees and shrub vegetation. The sites where they occur are characterized by dense waterside vegetation.	Low
<i>Lathamus discolor</i>	Swift Parrot	E	CE	Species/Ecosystem	The Swift Parrot occurs in woodlands and forests of NSW from May	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					to August, where it feeds on eucalypt nectar, pollen and associated insects. The Swift Parrot is dependent on flowering resources across a wide range of habitats in its wintering grounds in NSW. This species is migratory, breeding in Tasmania and also nomadic, moving about in response to changing food availability.	
<i>Limosa limosa</i>	Black-tailed Godwit	V	M, MA	Species/Ecosystem	An aerial, non-breeding migratory wader that occurs in NSW from August - March before returning to the northern hemisphere. They most frequently inhabit coastal habitat, such as sheltered bays, estuaries and lagoons with large intertidal sandflats or mudflats. They also travel regularly through western NSW on inland migratory passages, and may occur around large lakes, mudflats and swamps such as the Murray Darling Basin, western slopes of the Northern Tablelands and far north-west NSW.	Low
<i>Lophoictinia isura</i>	Square-tailed Kite	V	-	Species/Ecosystem	Typically inhabits coastal forested and wooded lands of tropical and temperate Australia. In NSW it is often associated with ridge and gully forests dominated by <i>Eucalyptus longifolia</i> , <i>Corymbia maculata</i> , <i>E. elata</i> or <i>E. smithii</i> . Individuals appear to occupy large hunting ranges of more than 100km ² . They require large living trees for breeding, particularly near water with surrounding woodland - forest close by for foraging habitat. Nest sites are generally located along or near watercourses, in a tree fork or on large horizontal limbs.	Low
<i>Macronectes giganteus</i>	Southern Giant Petrel	E	E	EEC/Marine	The Southern Giant Petrel has a circumpolar pelagic range from Antarctica to approximately 20°S and is a common visitor off the coast of NSW. Over summer, the species nests in small colonies amongst open vegetation on Antarctic and subantarctic islands, including Macquarie and Heard Islands and in Australian Antarctic territory.	None
<i>Macronectes halli</i>	Northern Giant-petrel	V	V, M, MA	EEC/Marine	Breeding in Australian territory is limited to Macquarie Island and occurs during spring and summer.	None
<i>Neophema</i>	Orange-bellied	CE	CE	Species	The Orange-bellied Parrot breeds in the south-west of Tasmania and	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
<i>chrysogaster</i>	Parrot				migrates in autumn to spend the winter on the mainland coast of south-eastern South Australia and southern Victoria. There are occasional reports from NSW, with the most recent records from Shellharbour and Maroubra in May 2003. It is expected that NSW habitats may be being more frequently utilised than observations suggest. Typical winter habitat is saltmarsh and strandline/foredune vegetation communities either on coastlines or coastal lagoons. Spits and islands are favoured but they will turn up anywhere within these coastal regions. The species can be found foraging in weedy areas associated with these coastal habitats or even in totally modified landscapes such as pastures, seed crops and golf courses.	
<i>Ninox connivens</i>	Barking Owl	V	-	Species/Ecosystem	Generally found in open forests, woodlands, swamp woodlands and dense scrub. Can also be found in the foothills and timber along watercourses in otherwise open country.	Low
<i>Ninox strenua</i>	Powerful Owl	V	-	Species/Ecosystem	Occupies wet and dry eucalypt forests and rainforests. Can occupy both un-logged and lightly logged forests as well as undisturbed forests where it usually roosts on the limbs of dense trees in gully areas. It is most commonly recorded within red turpentine in tall open forests and black she-oak within open forests. Large mature trees with hollows at least 0.5 m deep are required for nesting. Tree hollows are particularly important for the Powerful Owl because a large proportion of the diet is made up of hollow-dependent arboreal marsupials. Nest trees for this species are usually emergent with a diameter at breast height of at least 100 cm.	Low
<i>Numenius madagascariensis</i>	Eastern Curlew	-	CE, MA, M	Species/Ecosystem	A primarily coastal distribution. Found in all states, particularly the north, east, and south-east regions including Tasmania. Rarely recorded inland. Mainly forages on soft sheltered intertidal sand flats or mudflats, open and without vegetation or cover. Breeds in the northern hemisphere.	None
<i>Numenius phaeopus</i>	Whimbrel	-	M, MA		The Sooty Tern is found over tropical and sub-tropical seas and on associated islands and cays around Northern Australia. Large flocks	None

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					can be seen soaring, skimming and dipping but seldom plunging in offshore waters. Occasionally seen along coastal NSW, especially after cyclones. Breeds in large colonies in sand or coral scrapes on offshore islands and cays. In NSW only known to breed at Lord Howe Island.	
<i>Oxyura australis</i>	Blue-billed Duck	V	-	Ecosystem	The Blue-billed Duck is endemic to south-eastern and south-western Australia. It is widespread in NSW, but most common in the southern Murray-Darling Basin area. Birds disperse during the breeding season to deep swamps up to 300 km away. It is generally only during summer or in drier years that they are seen in coastal areas.	Low
<i>Pandion cristatus</i>	Eastern Osprey	V	M, MA	Species/Ecosystem	Found right around the Australian coastline, except for Victoria and Tasmania. They are common around the northern coast, especially on rocky shorelines, islands and reefs. The species is uncommon to rare or absent from closely settled parts of south-eastern Australia. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water.	None
<i>Petroica phoenicea</i>	Flame Robin	V	-	Ecosystem	Flame Robins are found in a broad coastal band from southern Queensland to just west of the South Australian border. The species is also found in Tasmania. The preferred habitat in summer includes eucalyptus forests and woodland, whilst in winter prefers open woodlands and farmlands. It is considered migratory. The Flame Robin breeds from about August to January.	Low
<i>Petroica rodinogaster</i>	Pink Robin	V	-	Species	The Pink Robin is found in Tasmania and the uplands of eastern Victoria and far south-eastern NSW, almost as far north as Bombala. On the mainland, the species disperses north and west and into more open habitats in winter, regularly as far north as the ACT area, and sometimes being found as far north as the central coast of NSW.	Low
<i>Polytelis swainsonii</i>	Superb Parrot	V	V	Species/Ecosystem	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina, the bird's nest in the hollows of	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the Southwest Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Nest in small colonies, often with more than one nest in a single tree. May forage up to 10 km from nesting sites, primarily in grassy box woodland. Feed in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. Also eaten are fruits, berries, nectar, buds, flowers, insects and grain.	
<i>Pterodroma leucoptera leucoptera</i>	Gould's Petrel	V	E, M	EEC/Marine	Breeds on both Cabbage Tree Island, 1.4 km offshore from Port Stephens and on nearby Boondelbah island. The range and feeding areas of non-breeding petrels are unknown. Principal nesting habitat is located within two gullies which are characterised by steeply, sloping rock scree with a canopy of Cabbage Tree Palms.	None
<i>Ptilinopus regina</i>	Rose-crowned Fruit-Dove	V	-	Ecosystem	Coast and ranges of eastern NSW and Queensland, from Newcastle to Cape York. Vagrants are occasionally found further south to Victoria.	Low
<i>Ptilinopus superbus</i>	Superb Fruit-Dove	V	-	Ecosystem	The Superb Fruit-dove occurs principally from north-eastern in Queensland to north-eastern NSW. It is much less common further south, where it is largely confined to pockets of suitable habitat as far south as Moruya. There are records of vagrants as far south as eastern Victoria and Tasmania.	Low
<i>Pycnoptilus floccosus</i>	Pilotbird	-	V		Pilotbirds are strictly terrestrial, living on the ground in dense forests with heavy undergrowth. They are typically seen in pairs or occasionally in family parties, occupying small territories all year round. Birds forage mostly in pairs for insects, and occasionally eat seeds and fruits. Breeding takes places between August and January. Adults build a domed nest on or near the ground in which they usually lay two eggs.	Low
<i>Sternula albifrons</i>	Little Tern	E	M,	Species/Ecosystem	The Little Tern is found on the north, east and south-east Australian	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
			MA		coasts, from Shark Bay in WA to the Gulf of St Vincent in SA. In NSW, it arrives from September to November, occurring mainly north of Sydney, with smaller numbers found south to Victoria. Almost exclusively coastal, preferring sheltered environments; however, may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records).	
<i>Stictonetta naevosa</i>	Freckled Duck	V	-	Ecosystem	The freckled duck breeds in permanent fresh swamps that are heavily vegetated. Found in fresh or salty permanent open lakes, especially during drought. Often seen in groups on fallen trees and sand spits.	None
<i>Thalassarche impavida</i>	Campbell Albatross	-	V, M, MA	EEC/Marine	Non-breeding migrant visitor to Australian waters. Campbell Albatrosses occur in Antarctic and sub-Antarctic waters, and in the subtropical South Pacific Ocean, breeding only on Campbell Island (New Zealand). After the breeding season, they move north to temperate shelf waters and forage over the continental slopes around Australia, inhabiting pelagic to shelf-break water habitats. They are specialised shelf feeders, concentrating around breeding islands or over adjacent submarine banks, or in the coastal waters of continents over up-wellings or along the boundaries of currents.	None
<i>Thalassarche melanophris</i>	Black-browed Albatross	V	V, M, MA	EEC/Marine	The Black-browed Albatross has a circumpolar range over the southern oceans and are seen off the southern Australian coast mainly during winter. This species migrates to waters off the continental shelf from approximately May to November and is regularly recorded off the NSW coast during this period. The species has also been recorded in Botany Bay National Park.	None
<i>Thinornis cucullatus cucullatus</i>	Eastern Hooded Dotterel	CE	V	Species/Ecosystem	The Hooded Plover is endemic to southern Australia and is nowadays found mainly along the coast from south of Jervis Bay, NSW, south through Victoria and Tasmania to the western side of the Eyre Peninsula (South Australia). In south-west Western Australia the Hooded Plover is not restricted to the coast, and can also live and breed around inland salt lakes. The range of the	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					Hooded Plover has declined in eastern Australia since European settlement. Southern coastal Queensland and northern NSW were probably once part of the range of the Hooded Plover, but the species has not been recorded there since the 1920s. In the late 1920s and early 1930s the species was recorded from Port Stephens but are now considered locally extinct. It has not been seen in the Sydney area since the 1940s. Presently the Hooded Plover occurs in NSW north to Sussex Inlet. Occasionally, individual birds are sighted slightly further north to the Shoalhaven River and Comerong Beach and one bird was sighted at Lake Illawarra in March 2001.	
<i>Tyto novaehollandiae</i>	Masked Owl	V	-	Species/Ecosystem	Inhabits a diverse range of wooded habitat that provide tall or dense mature trees with hollows suitable for nesting and roosting. Mostly recorded in open forest and woodlands adjacent to cleared lands. Nest in hollows, in trunks and in near vertical spouts or large trees, usually living but sometimes dead. Nest hollows are usually located within dense forests or woodlands. Masked owls prey upon hollow-dependent arboreal marsupials, but terrestrial mammals make up the largest proportion of the diet.	Low
Mammals						
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	-	Species	Inhabits rainforest through to sclerophyll forest and tree heath. Banksias and myrtaceous shrubs and trees are a favoured food source. Will often nest in tree hollows but can also construct its own nest. Because of its small size it is able to utilise a range of hollow sizes including very small hollows. Individuals will use a number of different hollows and an individual has been recorded using up to 9 nest sites within a 0.5ha area over a 5 month period.	Low
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Species/Ecosystem	Located in a variety of drier habitats, including the dry sclerophyll forests and woodlands to the east and west of the Great Dividing Range. Can also be found on the edges of rainforests and in wet sclerophyll forests. This species roosts in caves and mines in groups of between 3 and 37 individuals.	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	-	Ecosystem	Inhabit sclerophyll forests, preferring wet habitats where trees are more than 20 m high. Two observations have been made of roosts in stem holes of living eucalypts. There is debate about whether or not this species moves to lower altitudes during winter, or whether they remain sedentary but enter torpor. This species also appears to be highly mobile and records showing movements of up to 12 km between roosting and foraging sites.	Low
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern)	E	E	Species	Prefers sandy soils with scrubby vegetation and-or areas with low ground cover that are burn from time to time. A mosaic of post fire vegetation is important for this species.	Low
<i>Micronomus norfolkensis</i>	Eastern Freetail-bat	V	-	Ecosystem	Most records are from dry eucalypt forests and woodlands to the east of the Great Dividing Range. Appears to roost in trees, but little is known of this species' habits.	Low
<i>Miniopterus australis</i>	Little Bentwing-bat	V	-	Species/Ecosystem	Coastal north-eastern NSW and eastern Queensland. Little Bent-wing Bat is an insectivorous bat that roost in caves, in old mines, in tunnels, under bridges, or in similar structures. They breed in large aggregations in a small number of known caves and may travel 100s km from feeding home ranges to breeding sites. Little Bent-wing Bat has a preference for moist eucalypt forest, rainforest or dense coastal banksia scrub where it forages below the canopy for insects.	Low
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V	-	Species/Ecosystem	Eastern Bent-wing Bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young.	Moderate- Potential foraging habitat (anthropogenic and natural).
<i>Myotis macropus</i>	Southern Myotis	V	-	Species	The Large-footed Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. Generally, roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings,	Moderate- Potential foraging habitat (anthropogenic and natural).

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					under bridges and in dense foliage.	natural).
<i>Notamacropus parma</i>	Parma Wallaby	V	V	Species	The species once occurred in north-eastern NSW from the Queensland boarder to the Bega area in the southeast. Their range is now confined to the coast and ranges of central and northern NSW from the Gosford district to south of the Bruxner Highway between Tenterfield and Casino.	Low
<i>Petaurus australis</i>	Yellow-bellied Glider	V	-	Ecosystem	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria.	Low
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	-	Species	Generally, occurs in dry sclerophyll forests and woodlands but is absent from dense coastal ranges in the southern part of its range. Requires abundant hollow bearing trees and a mix of eucalypts, banksias and acacias. There is only limited information available on den tree use by Squirrel gliders, but it has been observed using both living and dead trees as well as hollow stumps. Within a suitable vegetation community at least one species should flower heavily in winter and one species of eucalypt should be smooth barked. Endangered population in the Wagga Wagga LGA.	Low
<i>Petauroides volans</i>	Greater Glider	E	E	Species	The Greater Glider occurs in eucalypt forests and woodlands. The Greater Glider occurs in eucalypt forests and woodlands. The species nests in hollows and are typically found in older forests. Generally, the home range for the greater glider is between 0.7-3 hectares and tends to have a population density of 0.01-5 individuals per hectare. The home ranges of females can overlap with males and females however for the males the home ranges never overlap.	Low
<i>Petrogale</i>	Brush-tailed	E	V	Species	Found in rocky areas in a wide variety of habitats including	None

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
<i>penicillata</i>	Rock-wallaby				rainforest gullies, wet and dry sclerophyll forest, open woodland and rocky outcrops in semi-arid country. Commonly sites have a northerly aspect with numerous ledges, caves and crevices.	
<i>Phascolarctos cinereus</i>	Koala	E	E	Species/Ecosystem	Inhabits eucalypt forests and woodlands. The suitability of these forests for habitation depends on the size and species of trees present, soil nutrients, climate and rainfall.	Low
<i>Potorous tridactylus trisulcatus</i>	Long-nosed Potoroo	V	V	Species	Long-nosed Potoroo is found on the south-eastern coast of Australia, from Queensland to eastern Victoria and Tasmania, including some of the Bass Strait islands. In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm. Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grasstrees, sedges, ferns, or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature. The fruit-bodies of hypogenous (underground-fruited) fungi are a large component of the diet of the Long-nosed Potoroo. They also eat roots, tubers, insects and their larvae and other soft-bodied animals in the soil. Often digs small holes in the ground in a similar way to bandicoots. Mainly nocturnal, hiding by day in dense vegetation - however, during the winter months animals may forage during daylight hours. Individuals are mainly solitary, non-territorial and have home range sizes ranging between 2-5 ha. Breeding peaks typically occur in late winter to early summer and a single young is born per litter. Adults are capable of two reproductive bouts per annum.	Low
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	Species/Ecosystem	This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Bats commute daily to foraging areas, usually within 15 km of the day roost although some individuals may travel up to 70 km.	Moderate- A roost is located nearby, less than 10km from the Subject Area. Potential foraging and roosting habitat.

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
Reptiles						
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	E	V	Species/Ecosystem	Occurs almost exclusively in association with communities occurring on Triassic sandstone within the Sydney Basin. Typically found among exposed sandstone outcrops with vegetation types ranging from woodland to heath. Within these habitats they spend most of the year sheltering in and under rock crevices and exfoliating rock. However, some individuals will migrate to tree hollows within 500m of escarpment to find shelter during hotter parts of summer.	Low
Flora						
<i>Acacia bynoeana</i>	Bynoe's Wattle	E	V	Species	Grows mainly in heath and dry sclerophyll forest in sandy soils. Mainly south of Dora Creek-Morriset area to Berrima and the Illawarra region, west to the Blue Mountains, also recorded from near Kurri Kurri in the Hunter Valley and from Morton National Park.	Low
<i>Allocasuarina glareicola</i>		E	E	Species	Grows in Castlereagh woodland on lateritic soil. Found in open woodland with Eucalyptus parramattensis, Eucalyptus fibrosa, Angophora bakeri, Eucalyptus sclerophylla and Melaleuca decora. Common associated understorey species include Melaleuca nodosa, Hakea dactyloides, Hakea sericea, Dillwynia tenuifolia, Micromyrtus minutiflora, Acacia elongata, Acacia brownei, Themeda australis and Xanthorrhoea minor.	Low
<i>Caladenia tessellata</i>	Thick-lip Spider Orchid	E	V	Species	The Tessellated Spider Orchid is found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. Known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct.	Low
<i>Calochilus pulchellus</i>	Pretty Beard Orchid	E	-	Species	Calochilus pulchellus is endemic to New South Wales. It is known from the Sydney Basin Bioregion, where a total of less than 30 adult plants have been recorded in three sites over a range of 40 km on the South Coast of NSW, at altitudes from 20-560 m above sea level. All currently known sites are within the Shoalhaven Local	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					Government Area. Occurrence in small, widely separated colonies is not unusual in the genus. The cryptic nature of the species, with a single leaf above ground for only a few months and a flowering stem lasting a few days or a week, makes detection difficult for most of the year. It is likely that additional scattered individuals and small colonies exist within the area of occurrence.	
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	V	V	Species	Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. The larger populations typically occur in woodland dominated by Scribbly Gum (<i>Eucalyptus sclerophylla</i>), Silvertop Ash (<i>E. sieberi</i>), Red Bloodwood (<i>Corymbia gummifera</i>) and Black Sheoak (<i>Allocasuarina littoralis</i>); appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (<i>C. subulata</i>) and the Tartan Tongue Orchid (<i>C. erecta</i>).	Low
<i>Cynanchum elegans</i>	White-flowered Wax plant	E	E	Species	Usually occurs on the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest; Coastal Tea-tree <i>Leptospermum laevigatum</i> – Coastal Banksia <i>Banksia integrifolia</i> subsp. <i>integrifolia</i> coastal scrub; Forest Red Gum <i>Eucalyptus tereticornis</i> aligned open forest and woodland; Spotted Gum <i>Corymbia maculata</i> aligned open forest and woodland; and Bracelet Honey Myrtle <i>Melaleuca armillaris</i> scrub to open scrub.	Low. Population located nearby, approximately 2km from the Subject Area. However no suitable habitat present.
<i>Daphnandra johnsonii</i>	Illawarra Socketwood	E	E	Species	Restricted to the Illawarra region where it has been recorded from the local government areas of Shoalhaven, Kiama, Shellharbour and Wollongong.	Low
<i>Genoplesium baueri</i>	Bauer's Midge Orchid	E	E	Species	Grows in dry sclerophyll forest and moss gardens over sandstone. Flowers February to March. Has been recorded between Ulladulla and Port Stephens. Currently the species is known from just over 200 plants across 13 sites. The species has been recorded in Berowra Valley Regional Park, Royal National Park and Lane Cove	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					National Park and may also occur in the Woronora, O'Hares, Metropolitan and Warragamba Catchments.	
<i>Gossia acmenoides</i>		EP	-	Species	Known from Shellharbour, Wollongong and Kiama LGAs and encompasses all occurrences south of the Georges River. This population is the southern most occurrence of the species and is approximately 175 km from the nearest population to the north in the Hunter region of NSW.	Low
<i>Grevillea raybrownii</i>	-	V	-	Species	All natural remnant sites occur within a habitat that is both characteristic and consistent between sites. Generally, occurs on ridgetops and, less often, slopes and benches of Hawkesbury Sandstone and Mittagong Formation. It occurs in Eucalyptus open forest and woodland with a shrubby understorey on sandy, gravelly loam soils derived from sandstone that are low in nutrients. Killed by fire and relies entirely on seed that is stored in the soil for regeneration. Recruitment appears to be promoted by fire or other disturbances.	Low
<i>Haloragis exalata</i> subsp. <i>exalata</i>	Square Raspwort	V	V	Species	Square Raspwort appears to require protected and shaded damp situations in riparian habitats. Flowering specimens in NSW are recorded from November to January. Square Raspwort occurs in 4 widely scattered localities in eastern NSW. It is disjunctly distributed in the Central Coast, South Coast and North-western Slopes botanical subdivisions of NSW.	Low
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	V	Species	Biconvex Paperbark is only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north.	Low
<i>Melaleuca deanei</i>	Deane's Paperbark	V	V	Species	Grows in wet heath on sandstone in coastal districts from Berowra to Nowra.	Low
<i>Persicaria elatior</i>	Tall Knotweed	V	V	Species	Tall Knotweed has been recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). The species also occurs in Queensland.	
<i>Persoonia hirsuta</i>	Hairy Geebung	E	E	Species	Distributed from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west. A large area of occurrence, but occurs in small populations, increasing the species' fragmentation in the landscape. Found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone. Usually present as isolated individuals or very small populations. Probably killed by fire (as other <i>Persoonia</i> spp. are) but will regenerate from seed.	Low
<i>Persoonia nutans</i>	Nodding Geebung	E	E	Species	Restricted to the Cumberland Plain in western Sydney, between Richmond in the north and Macquarie Fields in the south. The species has a disjunct distribution, with the majority of populations (and 99% of individuals) occurring in the north of the species range in the Agnes Banks, Londonderry, Castlereagh, Berkshire Park and Windsor Downs areas. Core distribution occurs within the Penrith, and to a lesser extent Hawkesbury, local government areas, with isolated and relatively small populations also occurring in the Liverpool, Campbelltown, Bankstown and Blacktown local government areas. The southern and northern populations have distinct habitat differences.	Low
<i>Pimelea spicata</i>	Spiked Rice-flower	E	E	Species	Once widespread on the Cumberland Plain, the Spiked Rice-flower occurs in two disjunct areas; the Cumberland Plain (Marayong and Prospect Reservoir south to Narellan and Douglas Park) and the Illawarra (Landsdowne to Shellharbour to northern Kiama).	Low
<i>Pomaderris brunnea</i>	Brown Pomaderris	E	V	Species	The species is expected to live for 10 - 20 years, while the minimum time to produce seed is estimated to be 4 - 6 years. Found in a very limited area around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area. It also occurs at Walcha on the New England Tableland and in far eastern Gippsland in Victoria.	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
<i>Prasophyllum affine</i>	Jervis Bay Leek Orchid	E	E	Species	Jervis Bay Leek Orchid is currently known from three areas south-east of Nowra on South Coast. These are Kinghorne Point, Wowly Gully near the town of Callala Bay, and near the township of Vincentia.	Low
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	-	V	Ecosystem	The New Holland Mouse has a fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Genetic evidence indicates that the New Holland Mouse once formed a single continuous population on mainland Australia and the distribution of recent subfossils further suggest that the species has undergone a large range contraction since European settlement. Total population size of mature individuals is now estimated to be less than 10,000 individuals although, given the number of sites from which the species is known to have disappeared between 1999 and 2009, it is likely that the species' distribution is actually smaller than current estimates.	Low
<i>Pterostylis gibbosa</i>	Illawarra Greenhood	E	E	Species	Known from a small number of populations in the Hunter region (Milbrodale), the Illawarra region (Albion Park and Yallah) and the Shoalhaven region (near Nowra). It is apparently extinct in western Sydney which is the area where it was first collected (1803).	Low
<i>Pterostylis saxicola</i>	Sydney Plains Greenhood	E	E	Species	Restricted to western Sydney between Freemans Reach in the north and Picton in the south. Most commonly found growing in small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines. The vegetation communities above the shelves where <i>Pterostylis saxicola</i> occurs are sclerophyll forest or woodland on shale-sandstone transition soils or shale soils.	Low
<i>Pultenaea aristata</i>	-	V	V	Species	Grows in moist, dry sclerophyll woodland to heath on sandstone, specifically the drier areas of Upland Swamps. Restricted to the Woronora Plateau, a small area between Helensburgh, south of Sydney, and Mt Keira above Wollongong.	Low
<i>Rhizanthella slateri</i>	Eastern Australian	V	E	Species	Occurs from south-east Queensland to south-east NSW. In NSW, currently known from fewer than 10 locations, including near	Low

Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
	Underground Orchid				Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra.	
<i>Rhodamnia rubescens</i>	Scrub Turpentine	CE	CE	Species	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Populations of <i>R. rubescens</i> typically occur in coastal regions and occasionally extend inland onto escarpments up to 600 m a.s.l. in areas with rainfall of 1,000-1,600 mm. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Low
<i>Rhodomyrtus psidioides</i>	Native Guava	CE	CE	Species	Occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales, to Maryborough in Queensland. Populations are typically restricted to coastal and sub-coastal areas of low elevation however the species does occur up to c. 120 km inland in the Hunter and Clarence River catchments and along the Border Ranges in NSW.	Low
<i>Senna acclinis</i>	Rainforest Cassia	E	-	Species	Occurs in coastal districts and adjacent tablelands of NSW from the Illawarra in NSW to Queensland.	Low
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E	V	Species	Found only in NSW, in a narrow, linear coastal strip from Bulahdelah to Conjola State forest. On the south coast the species occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral rainforest. On the central coast it occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities	None
<i>Thelymitra kangaloonica</i>	Kangaloon Sun Orchid	CE	CE	Species	<i>Thelymitra kangaloonica</i> (<i>Thelymitra</i> sp. Kangaloon) is only known to occur on the southern tablelands of NSW in the Moss Vale / Kangaloon / Fitzroy Falls area at 550-700 m above sea level. It is known to occur at three swamps that are above the Kangaloon Aquifer. These swamps are a part of the ecological community "Coastal Upland Swamp" which is listed under the NSW Threatened Species Conservation Act 1995 as an Endangered Ecological Community, also known as "Temperate Highland Peat Swamps on	Low

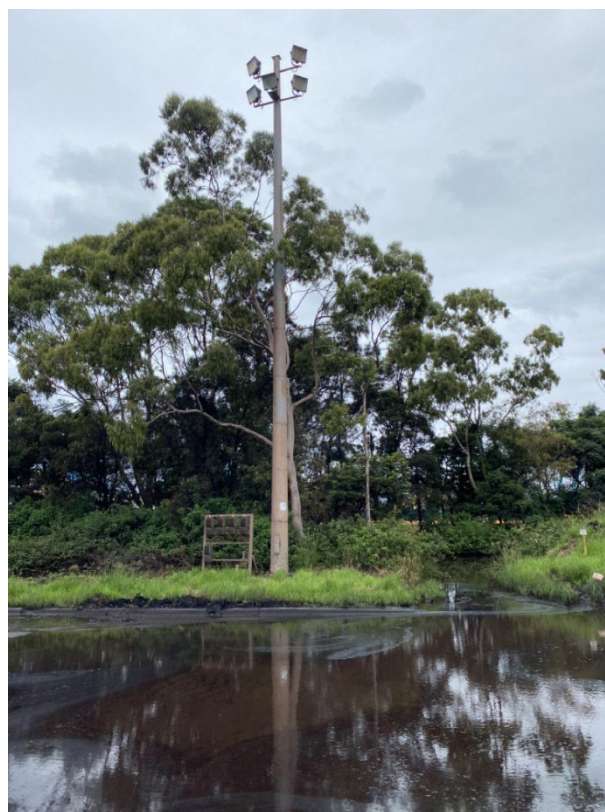
Scientific Name	Common name	BC Act	EPBC Act	Class of credit	Habitat	Likelihood of occurrence
					Sandstone" which is listed under the Environment Protection and Biodiversity Conservation Act 1999.	
<i>Thesium australe</i>	Austral Toadflax	V	V	Species	Austral Toad-flax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. It is also found in Tasmania and Queensland and in eastern Asia. Although originally described from material collected in the SW Sydney area, populations have not been seen in a long time. It may persist in some areas in the broader region.	Low
<i>Xerochrysum palustre</i>	Swamp Everlasting	-	V	Species	Xerochrysum palustre has been recorded in Kosciuszko National Park and the eastern escarpment south of Badja. The species grows in swamps and bogs which are often dominated by heaths. It also grows at the edges of bog margins on peaty soils with a cover of shrubs or grasses and sometimes grows in bogs with Sphagnum.	Low
<i>Zieria granulata</i>	Illawarra Zieria	E	E	Species	Restricted to the Illawarra region where it is recorded from a number of sites. The species primarily occupies the coastal lowlands between Oak Flats and Toolijooa, in the local government areas of Shellharbour and Kiama. This is a range of approximately 22 kilometres.	Low

Annex 2. Site photos

Photos of planted vegetation

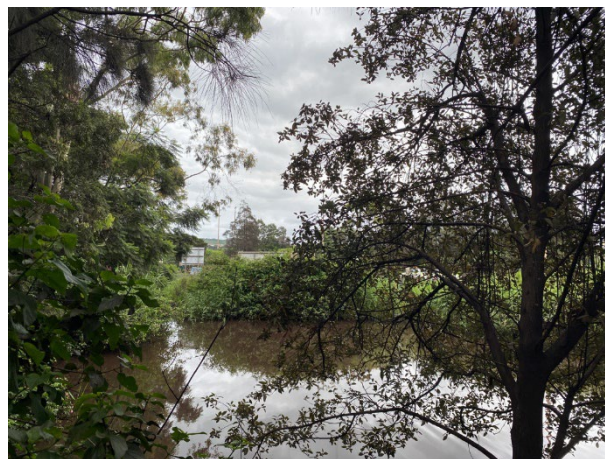






Photos of aquatic habitat





Annex 3. Floristic plot data

Scientific name	Common Name
<i>Acacia saligna</i> *	Golden wreath wattle
<i>Ageratina Adenophora</i> *	Crofton weed
<i>Araujia sericiflora</i> *	Moth vine
<i>Bidens Pilosa</i> *	Black-jack
<i>Brachychiton acerifolius</i>	Illawarra flame tree
<i>Callistemon citrinus</i>	Crimson bottlebrush
<i>Casuarina glauca</i>	Swamp sheoak
<i>Chloris gayana</i> *	Rhodes grass
<i>Chrysanthemoides monilifera</i> *	Bitou bush
<i>Conyza bonariensis</i> *	Flaxleaf fleabane
<i>Corymbia maculata</i>	Spotted gum
<i>Digitaria spp.</i>	Finger-grass
<i>Eucalyptus tereticornis</i>	Forest red gum
<i>Foeniculum vulgare</i> *	Fennel
<i>Hyparrhenia hirta</i> *	Coolatai Grass
<i>Lagunaria patersonia</i>	Pyramid tree
<i>Lantana camara</i> *	
<i>Lomandra longiflora</i>	Basket grass
<i>Paspalum Dilatatum</i> *	Dallis grass
<i>Pennistum setaceum</i> *	Fountain grass
<i>Pittosporum undulatum</i>	Sweet pittosporum
<i>Ricinus communis</i> *	Caster oil plan
<i>Setaria pumila</i> *	Pigeon grass

Note: field data was collected in electronic format, therefore raw data sheets have not been provided

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Central Coast
Gold Coast
Canberra



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Heritage management

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Archaeological, built and landscape values

Environmental management and approvals

Impact assessments
Development and activity approvals
Rehabilitation
Stakeholder consultation and facilitation
Project management

Environmental offsetting

Offset strategy and assessment (NSW, QLD, Commonwealth)
Accredited BAM assessors (NSW)
Biodiversity Stewardship Site Agreements (NSW)
Offset site establishment and management
Offset brokerage
Advanced Offset establishment (QLD)